

A century of Zoology and Entomology at Rhodes University, 1905 to 2005

A.N. Hodgson & A.J.F.K. Craig

Department of Zoology & Entomology, Rhodes University, Grahamstown 6140, South Africa.
E-mail: a.hodgson@ru.ac.za

The history of the Department of Zoology & Entomology at Rhodes University is traced from its origin with a single staff member, through the era of permanent heads of department to the present day staff. Significant achievements and developments in teaching and research are highlighted, and some anecdotal material is included.

THE EARLY YEARS (1905–1936)

Within the first 12 months of the founding of Rhodes University College (31 May 1904), the Chair of Zoology was established. In 1905 James Edwin Duerden (Figure 1a) was appointed to this Chair at a salary of £500 per annum, £150 of which was paid by the Albany Museum (an arrangement that ceased in 1910). He arrived in May of that year (Currey, 1970) and he occupied this position for 27 years (Figure 1b is a photograph of Duerden shortly after he retired). Initially, he was the only staff member of the Department. James Duerden was born in Burnley, England, on the 7th of April 1865. He received his early tertiary education at the Royal College of Science in London (1885–1889) where he gained their Associateship in Zoology. From 1893 to 1895 he worked as a demonstrator in Biology and Palaeontology at the Royal College of Science for Ireland, Dublin. During this time he carried out research on bryozoans and hydroids. In 1895 he accepted a position of Curator of the Museum at the Institute of Jamaica, Kingston, where he began to work on corals, and by 1900 he had been awarded his PhD by Johns Hopkins University, Baltimore. After temporary positions at the Universities of North Carolina and Michigan, he secured a permanent post at the very new and small Rhodes University.

Students entering Rhodes at this time were able to register for a Bachelor of Arts degree in science, the registration fee for

which was £5.5s per term. Duerden offered an intermediate course (1 year), an advanced course (2nd and 3rd year) and an Honours course (4th year). He ran the courses on classical lines with strong emphasis on an understanding of animal anatomy and taxonomy, which reflected Duerden's own interests. To quote an early University calendar entry, the course was "designed for those who wish to gain a general knowledge of animal life and biological methods and principles". In addition, the Department of Zoology combined with Selmar Schonland (Department of Botany) to offer a course in Biology (this course was discontinued in 1914, but re-established in 1971). However, Duerden was more advanced in his outlook than many of his contemporaries as he also offered a course in Applied Biology. Duerden wanted to develop this applied aspect of zoology and he and Schonland campaigned long and hard to establish a Department of Agriculture at Rhodes and to have 'Agriculture' included in the curriculum (Currey, 1970). Despite their best efforts lobbying both the University and the government, they were unsuccessful. For the zoology practical classes students were provided with small razors, dissecting implements and blow pipes (use unknown!). Recommended text books were: Thomson, *Outline of Zoology*; Wells & Davies, *Text Book of Zoology* and Parker & Hasswell, *Text Book of Zoology* (2 volumes). In each course students attended three lectures per week (each 50 minutes long) and two laboratory sessions. Lectures were regu-



Figure 1. Professor James Edwin Duerden in 1911 (a) and shortly after he retired (b). Photograph (a) is from a group staff picture housed in the Cory Library; (b) from the Albany museum archives.



Figure 2. The new science block shortly after its completion in 1914. Zoology occupied the ground floor in 1916. Photograph from the Cory Library.

larly held on Saturday mornings at 09h50. As courses were not semesterised, students sat all examinations in December. The intermediate course had one theory paper and one practical, each Advanced Course, two papers and an all-day practical. Honours students were rigorously examined with three theory papers and one practical examination that lasted two days!

During the early years of Rhodes, students were bound by strict regulations, for example: "Men students only enter the main building of the college by the door on the right and women students only by that on the left of the central entrance of the main building". Smoking was not allowed in the college precincts except in the men's common room, and academic dress had to be worn by students during lectures.

The first Honours students to graduate in Zoology (with a BA) were C.F. Heathcote and W.A. Visser in 1909. In 1910 the only Honours graduate, G.S. Grobbelaar, obtained a class I Honours degree, the first to be conferred by the Department. During the next 10 years the Department only had one Honours student, W.M.B. Tooke, who graduated in 1914. After 1913, the zoology Honours degree was discontinued and not offered again until 1945. Despite the declining student numbers due to the impact World War I, a new science block was built in 1914 (Figure 2) and, in 1916, the Zoology Department took occupation of the ground floor. In 1916 there were 116 students only at Rhodes (Currey, 1970), which is about the size of our current 1st year zoology intake! Rhodes was further affected by the influenza epidemic in 1918, and in October of that year Zoology (and all other departments) was forced to suspend classes until February of 1919. During 1919, however, Bachelor of Science degrees were first conferred, and science at Rhodes began to develop. The BSc degree was a three-year degree (now called 1st, 2nd and 3rd year) and V. Seagull (appropriately enough) was the first student to graduate in 1919 with a BSc in Zoology and Chemistry.

The next decade (1920–1930) saw a number of notable changes at Rhodes, which ultimately affected Zoology. The rule dictating separate entrances for men and women was abolished (1921), laboratory fees were introduced (7 shillings & 6 pence per term for 1 year; 10 shillings per term for subsequent years), electric lighting powered by a generator was installed into laboratories (1924), and in 1921 4th and 5th year courses were offered in Zoology for the degree of MSc Zoology produced its first two MSc students (V.F. Fitzsimmons and M.F.I. Ritchie) in 1923 (Figure 4). In 1925, Council decided to move Zoology as the science block was becoming too congested. The Department was given a converted gymnasium nearby (situ-



Figure 3. Dr Gwendolin Trude Brock, acting Head of Department from 1933–36. Photograph from Zoology & Entomology archives.

ated between Botany and Beit women's residence) as its new premises. From correspondence with graduates the building was rather uninspiring. It consisted of one large laboratory, also used as a lecture room that could accommodate about 50 students.

In 1924, Zoology had been given an additional member of staff, Gwendolin Trude Brock (BSc) (Figure 3) who was appointed as a demonstrator. Duerden had therefore run the Zoology department for 20 years by himself. Despite this he had time to carry out a considerable amount of research and during his 27 years at Rhodes he published 109 papers (most in South African journals), being sole author on nearly all of them.

After his arrival at Rhodes, Duerden at first continued to publish on corals. Grahamstown clearly was not an ideal place to study corals and he soon turned his attention to vertebrates, initially the taxonomy and morphology of reptiles. Much of this work must have been undertaken in the Albany museum where he was a curator. He also became friendly with many farmers in the Albany and surrounding districts where the ostrich feather industry flourished at that time. Their problems (especially the husbandry of ostriches, *Struthio camelus*) immediately became his special interest. He soon became a world authority on these birds and between 1906 and 1924 he published 56 articles on ostrich biology. His studies were the first scientific investigations of ostrich morphology, the structure and formation of feathers, breeding, development and genetics, as well as behaviour. Although the majority of Duerden's papers appeared in South African journals, he also published ostrich research in international journals such as the *Journal of Heredity* (Duerden, 1918), *American Naturalist* (Duerden, 1919a, 1920a) *Journal of Genetics* (Duerden, 1919b, 1920b), *Science* (Duerden, 1920c) and *Nature* (Duerden, 1920d,e) (a complete bibliography of Duerden's work whilst at Rhodes is available from the Department). However, with the advent of World War I, the demand for feathers ceased and the resultant slump in ostrich farming caused widespread financial ruin. Duerden promptly switched to work on Merino (*Ovis aries*) wool. Working in close collaboration with the Grootfontein Agricultural College in Middleburg, he became a pioneer in wool research. He linked his laboratory studies with practical

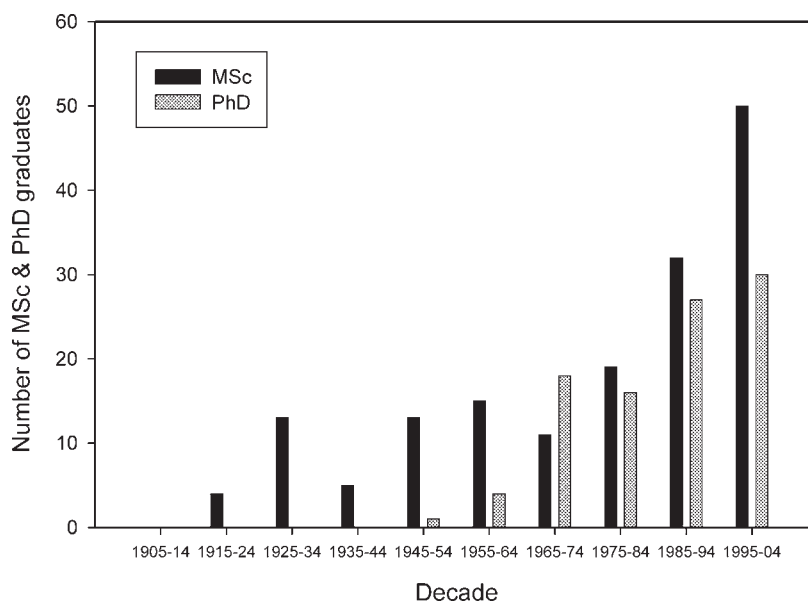


Figure 4. Number of graduates (MSc and PhD) per decade from the Department of Zoology & Entomology.

issues in wool production and the wool industry as a whole. His worth was soon recognised, and the Department of Agriculture appointed him as Director of Wool Research. It was only 22 years after Duerden retired that Rhodes and the Council for Scientific and Industrial Research (C.S.I.R.) established a Wool and Textile Research Institute! He gathered around him a team of post-graduate students and encouraged them to continue their studies on wool. Their combined efforts resulted in many valuable publications. Duerden's standards of thickness and crimp scale for Merino wool (Duerden, 1927) has stood the test of time. It is not 100% accurate but it is still the best practical guide to fibre fineness and some sheep farmers and woolmen still use it.

Duerden was highly regarded by other South African scientists. In honour of some of his contributions to zoology, his name is commemorated in the scientific names *Homostichanthus duerdeni* (a sea anemone), *Pavona duerdeni* (a madreporarian coral), and *Atractaspis duerdeni* (a stiletto snake). He also played a very active role in the South African Association for the Advancement of Science and served as President in 1921.

In 1926 Trude Brock, who had obtained her MSc with distinction in 1924 under the supervision of Duerden, was promoted to lecturer and received a University Research Fellowship. With this Fellowship she studied vertebrate anatomy at Oxford, where she received her DPhil in 1930. During this period the number of MSc students under Duerden's guidance began to grow (Figure 4) and several obtained scholarships. Graham Moodie (perhaps our oldest living graduate, BSc 1933) remembers Duerden with great fondness. To quote Graham "Prof. Duerden was a real character and quite a good lecturer. We regarded him as rather a cunning old scientist as he seemed to look hard at the economic aspect of his profession. When talking at the practical on frog anatomy to 1st year students it was a favourite habit of old Duerden to discuss at length the position and function of the parotid gland and its value to prevent attack by dogs etc. He would then say "it tastes bad but it can do you no harm" and he would open one to display its contents and then say "taste it" and demonstrate by dipping a finger into the muck and putting it nonchalantly into his mouth. He would then enjoy the expressions on the faces of those who had not noticed that he had changed fingers". Clearly Duerden had a zoological sense of humour, but we do not believe that he was an eccentric as suggested recently by

Buckland & Neville (2004). They described Duerden as eccentric because he kept ostriches, which were after all the focus of his research for a number of years.

During his tenure at Rhodes, Duerden supervised 17 MSc students (Figure 4). He eventually retired in 1932, moving to Leeds in England, where he became a member of the Wool Industries Research Association and was made an Honorary Fellow of Leeds University. He maintained contact with Grootfontein Agricultural College and the Onderstepoort Veterinary Institute for some time. He died on the 4th September 1937 after an accidental fall on a bus journey to a scientific meeting. Although based in an isolated, fledgling university, Duerden commanded international respect and his work helped to give Rhodes much-needed recognition. His obituary in *Nature* (Anon., 1937) carried this tribute "His enthusiasm and personality made him a delightful colleague and an inspiration to all who worked with him".

Owing to financial hardship in the 1930s (Currey, 1970) the University froze the position of Professor of Zoology upon Duerden's retirement. Financial matters had become so bad that in 1932 all staff had the choice of accepting either an 8% salary cut or loss of employment (Currey, 1970). Between 1933 and 1935 Brock, who had returned from Oxford and was now a Senior Lecturer, ran the Department (as Acting Professor) with the help of a demonstrator, John Dick. Brock was also remembered as a "bright and very good speaker" by Graham Moodie. On average, 10 students per year were now graduating in Zoology; two notable alumni were John Day FRSSAf (1930) (former Professor of Zoology, University of Cape Town, awarded an honorary DSc by Rhodes in 1981) and Eric Edney (1933) (former Professor of Physiology, University of British Columbia). Edney recalled the Zoology degree courses as being "ones of straight comparative morphology with no ecology and no field work. Practical work consisted entirely of dissections and drawing slides which were in poor condition". Nevertheless he claims that the course was thoroughly enjoyed by all, with all students working very hard. Student life cannot have been easy during the financial depression of the early 1930s. Board and fees were £100, and male students had to contend with the iron discipline imposed in the men's residence by Major Edward Bolingbroke Walker MC with the help of his bulldog Binks!

Brock resigned from Rhodes in 1935, moving to the USA in



Figure 5. Ms Alice Lyle, acting Head of Department in 1936. Photograph from Zoology & Entomology archives.

1936 as a Radcliffe-Harvard Research Fellow, and then one year later she returned to Oxford as a tutor. During this time she decided to change careers and in 1940 she took vows in South Africa, and became Sister Truda in the Community of the Resurrection. Sister Truda's role as an educator, however, continued, and she dedicated much of her life to the training of primary and secondary school teachers. In 1946 she became principal of the Grahamstown Training College, a position she occupied until 1962. After other work within South Africa and Zimbabwe, she retired to Grahamstown. In 1990 Rhodes University honoured her tremendous contribution as an educator with an L.L.D. *honoris causa*. She died in Grahamstown on 3 October 1998.

OMER-COOPER AND THE BIRTH OF ENTOMOLOGY (1937–1954)

After the resignation of Brock, Alice Lyle (Figure 5), a Lecturer on leave from the University of Fort Hare, ran the Department. In 1936, Joseph Omer-Cooper (Figure 6) was appointed as a Senior Lecturer and he took over as Head of Department in 1937. Joseph Omer-Cooper was born in Reading, England, on the 16 April 1893. He had obtained his zoology degrees, BA in 1925 and M.A. in 1927, from Cambridge University. From 1924 to 1927 he served on the staff of the Department of Zoology at Cambridge, first as demonstrator and then Lecturer (van Hille & Whitnall, 1973). In 1927 he was appointed Lecturer at the University of Durham and held this appointment until his move to Rhodes. In the decade preceding his departure from England, he had already specialised on African fauna and ecology (or oecology as he preferred) (van Hille & Whitnall, 1973), and undertook expeditions to several African countries. Omer-Cooper's arrival at Rhodes may have been delayed because he had spent from April to September 1935 on the Armstrong College (eventually to become part of Newcastle University) Zoological expedition to the Siwa Oasis in the Libyan desert, which he had organised. Omer-Cooper initially ran the Department with Lyle (Lecturer) and a demonstrator (M.M. Brewer).

In 1940 Omer-Cooper was promoted to the Chair of Zoology, which had therefore been vacant for seven years. The appointment of Omer-Cooper was significant as it heralded the devel-



Figure 6. Professor Joseph Omer-Cooper shortly before his retirement in 1953. Photograph from Zoology & Entomology archives.

opment of Entomology at Rhodes (although Brock had suggested that this should happen a few years earlier). His special interest was invertebrate zoology and particularly the Arthropoda. He was a taxonomist and morphologist but he preferred first-hand knowledge of animals under natural conditions. During the early 1940s, Omer-Cooper began to develop entomology at Rhodes and by 1948, the Department offered two independent entomology courses (Entomology I and II). Although named Entomology, these courses included lectures on arthropod biology as well as the biology of other invertebrates. They were 2nd and 3rd year courses and with their introduction the Department was renamed as the Department of Zoology and Entomology. In 1949 the first student (J. Zinn) graduated with Entomology as a major. In addition to the Entomology courses, an Honours BSc degree was offered, Honours having been re-introduced in 1945, which was similar to the 1st year MSc degree.

By 1949 the student and staff complement of the renamed Department had grown (see below). Consequently the university provided the Department with an additional building



Figure 7. Zoology & Entomology lower building which was first occupied in 1949. Photograph by P.E. Hulley.

(Figure 7) just behind the main university block.

The insistence by Omer-Cooper that Entomology be taught as a distinct discipline rather than part of an agricultural course as at other universities e.g. Pretoria and Stellenbosch, was of great significance. At Rhodes the subject was taught beyond the role of insects as agricultural pests, and a Rhodes entomologist could claim to be a more 'rounded' graduate, having also received a thorough grounding in insect systematics. This was reinforced by the introduction of an insect collection as an integral part of the entomology degree, something that still forms the backbone of entomological training at Rhodes. According to Peter Jackson (Honorary Fellow, South African Institute for Aquatic Biodiversity, Grahamstown) students would purchase their cyanide killing bottles and long insect pins from the chemist shops and Mr. Tasmer (a woodwork teacher at St Andrew's College) made setting boards and beautiful dove-tailed, cork-lined insect boxes. Students were not allowed to identify specimens to species as, "a fear of species seemed to prevail" (P. Jackson, pers. comm.); Omer-Cooper and his staff would not encourage speculation as to the specific name. Students soon learned that high marks were awarded for rarity, and especially for primitive thysanurans, Omer-Cooper informing the students "for one of those you would get a great quantity of marks". One of the first students to graduate, Peter Miles (1st Class Honours in 1950, Emeritus Professor of Entomology, Adelaide University) recalls submitting his collection that contained 3000 specimens classified to family and genus. He still wonders whether this has ever been bettered! Although students received this thorough training in insect systematics, the Department did not lose sight of the need to produce graduates that were employable, and the entomology courses still prepared students for positions in government or pest control agencies (P. Jackson, pers. comm.).

Many students remembered Omer-Cooper with great fondness. For example, Miles remembers him as "a real character, with a whimsical, if not always very comprehensible, attitude to teaching and life in general". Omer-Cooper certainly had his eccentricities, which included always wearing wide-brimmed hats (Figure 6), more often than not a brown corduroy suit (Brown, 1977), and relying on his wife Joyce (who had a PhD from the University of Durham and was an expert on dytiscid beetles) for transportation as he never bothered to learn to drive. Such transportation was necessary as the Omer-Coopers lived outside of town at Waterloo farm. For many years Omer-Cooper was driven to and from work by horse and trap (van Hille, 1979). He also was renowned for his ancient mildewed black academic gown (which he wore when giving lectures) and absent-mindedness; in short, he was the archetypal professor (Brown, 1977).

The development of Entomology at Rhodes was undoubtedly made possible because Omer-Cooper was allowed to appoint more staff. After the tough financial constraints of the early thirties, the university was able to increase the staff complement of the department and by 1942 this consisted of a Professor, two lecturers (Lyle and J.C. [Bob] van Hille), one research assistant, three demonstrators and a technical officer (who also served in the Geology and Geography departments). Van Hille had arrived in the Department in October 1940. He had left Holland in 1938 prior to the outbreak of World War II. After teaching in Springbok and Cape Town (everything apparently except English) he obtained a job at Rhodes. His contribution to the Department spanned more than 50 years. Although employed as a lecturer in Zoology, van Hille developed an interest in, and became a world authority on, the systematics of

anthicid beetles. He continued this passion after his retirement, much of his research culminating in a monograph on *Aulacoderus* (van Hille, 1984). No doubt other monographs would have followed but for his tragic accidental death in 1991.

At the end of 1943, Alice Lyle took leave from the Department to serve in the war, returning in 1946 to continue her lecturing duties. Despite organising adventurous collecting expeditions, Omer-Cooper's administrative skills were not strong and Miles recalls that, "It was Alice Lyle and Doc van Hille that kept the department running smoothly". Peter Jackson remembers Lyle as very knowledgeable about zoology in general and an excellent undergraduate teacher. Van Hille always considered that Alice Lyle never received credit for her achievements. He also believed that she played a critical role in the identification of the first coelacanth (*Latimeria chalumnae*) in 1938. In a letter to Miles dated 30 April 1980 van Hille wrote: "The zoo lecturer you refer to was Alice Lyle, she was a dear! It was actually she who identified the coelacanth. Miss Latimer, of the East London museum saw that it was something quaint and kept it in formalin in her bath. She sent a little sketch to J.L.B. who was on holiday in Knysna and was slow in reacting. Eventually he took the sketch to Omer-Cooper who also had no idea. Alice came in to bring them tea and saw it and said 'I have seen it before'. She studied in Bloemfontein [Grey University College which became the University College of the Orange Free State] where the emphasis was on vertebrates. Omer was more of an Entomologist and Smith a Chemist. So Alice got the Cambridge Natural History from the library and there was a good picture of the coelacanth. I [van Hille] have this story from Omer and always think of it when in all the books and articles it mentions that J.L.B identified the coelacanth." Lyle resigned from Rhodes in 1949 for an appointment as Guide Lecturer at the Durban Museum, where she also lectured to 1st year medical students at Natal University. She was appointed to Fort Hare as Professor of Zoology in 1952 but sadly died in October of that year in Cape Town.

During 1951 Rhodes became a fully-fledged independent University and by 1952 the Department had in addition to Omer-Cooper and van Hille (now Senior Lecturer in Zoology), two other permanent academic members of staff, E. McC Callan (Senior Lecturer in Entomology) and W. Macnae (Lecturer in Zoology) as well as two Honorary Lecturers (A.B.M. Whitnall, Entomology; Joyce Omer-Cooper, Zoology). Technical assistance up until 1953 had been sporadic, but now the Department had its first full-time Technical Assistant, Vera Foote. She had a BSc from Reading University and had previously been employed as Biology mistress at Achimota College in Ghana. She came to work each day by bicycle along with (in a cycle basket) her fox terrier bitch Cleopatra, which went everywhere with her. On one occasion she caused chaos in the Department by arriving at work chased by some 20 Grahamstown dogs all baying for the bitch that was on heat at the time.

After Duerden retired, the publication output of the Department declined and remained low throughout Omer-Cooper's tenure (Figure 8). However, under the guidance of Omer-Cooper the Department became involved in vital work on insecticide resistant ticks. This pioneer work (e.g. Omer-Cooper & Whitnall, 1945; Whitnall *et al.*, 1949), largely funded by African Explosives and Chemicals Industries, laid the foundation for the establishment of the Tick Research Unit at Rhodes University some 30 years later (see later). In 1954 Alfred Whitnall was awarded his DSc (the first to be conferred by the Department) for his work that had advanced knowledge of

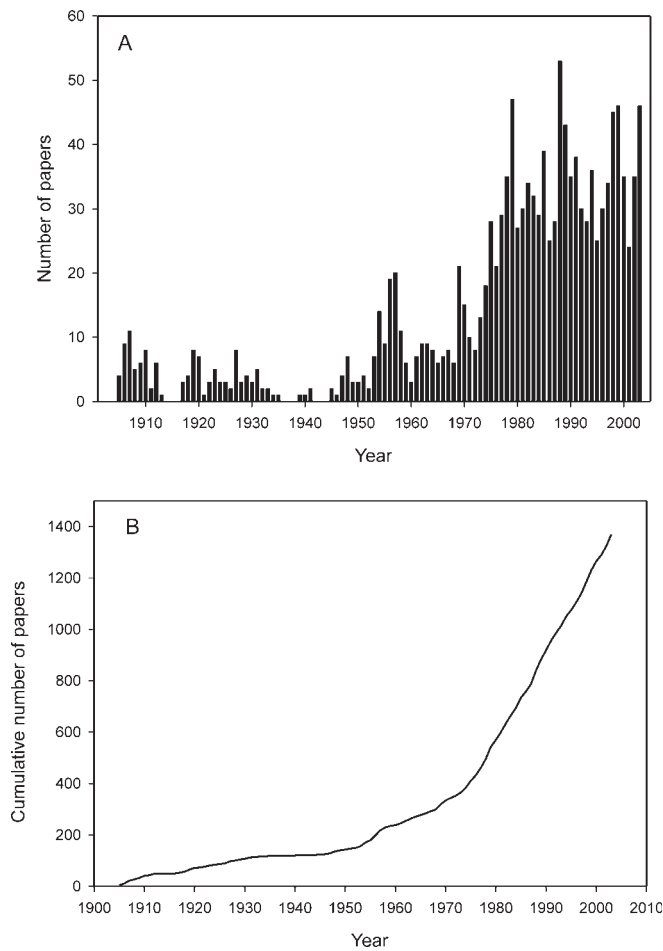


Figure 8. Publication statistics of the Department, 1905–2003. **A**, number of papers per year in peer-reviewed journals. **B**, cumulative number of peer-reviewed papers.

insecticide resistance in ticks, work begun as a student under the mentorship of Omer-Cooper. Omer-Cooper also supervised a number of MSc students, and during his time the Department produced 12 MSc graduates (1935 to 1954, Figure 4), many undertaking research that had an economic slant including insect pests of citrus, hide and skin beetles and insect pests in turf-grasses. Two notable MSc graduates from the Department at this time were Alec Brown FRSSAf (Emeritus Professor, U.C.T.) and Graham Whitehead (former Associate Professor of Entomology and first Director of the Tick Research Unit at Rhodes, Figure 9). Omer-Cooper also began a research library and in 1975 the departmental library in the new building was named after him. From 1940 reprints of all staff publications were kept on file; we have recently obtained copies of all departmental publications prior to this date.

Although Omer-Cooper's publication output was low (he published only 19 papers whilst associated with Rhodes), his contribution to South African entomology and zoology should not be underestimated. He served as President of the Entomological Society of Southern Africa (1954/55) and at the same time was President of the South African Association for the Advancement of Science. He and his wife undertook several important and adventurous collecting expeditions whilst at Rhodes. Using a 12-year-old Studebaker they went to Rhodesia (now Zimbabwe) and Malawi in 1948, and in 1953 they used a 7-year-old Ford panel van (which had seen service as an ambulance) to collect specimens in Sudan (van Hille, 1979). Joyce Omer-Cooper would have done all the driving! Just as

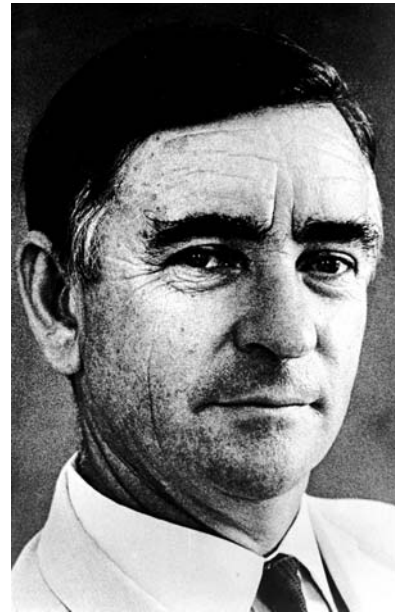


Figure 9. Professor Graham Whitehead, first director of the Tick Research Unit. Photograph from Zoology & Entomology archives.

Omer-Cooper retired in 1954, the first PhD in Zoology at Rhodes was awarded to Gerda Hudson (Figure 4).

D.W. EWER AND THE INTRODUCTION OF PHYSIOLOGY (1955–1963)

When Omer-Cooper retired he was given a room in the department that he used occasionally. He also made one final expedition to Nigeria and Chad in 1963 where Joyce obtained many valuable dytiscid specimens. Progressive illness, however, made work impossible and he died on the 9 November 1972. Joyce continued to work in and publish papers under the name of the Department until 1979. Of particular note was her study, published in a series of nine papers in the *Journal of the Entomological Society of Southern Africa*, of dytiscids from Rhodesia and Nyasaland (now Malawi). Denis William (Jakes) Ewer FRSSAf (Figure 10) succeeded Omer-Cooper.

Jakes Ewer was born in London in 1913. He went to the University College School and then, in 1931 to Trinity College, Cambridge where he read for the Natural Science Tripos, obtaining a BA in 1934. It was in his 2nd year at university where he picked up the name of Jakes by the tortuous route of 'ewer' meaning jug, which was not far in idea from a chamber pot, or jerry, and hence the progress to 'jakes' which was Elizabethan English for an outside lavatory. From Cambridge Jakes Ewer moved to the University of Birmingham where he obtained a PhD in 1940 under H. Munro Fox. During the war years he was an Experimental Officer for the Army Operational Research Group (Ministry of Supply) and in 1944 he was a commissioned Major and served as a Scientific Advisor to the Chief, Air Defense Division, S.H.A.E.F. For his significant war work he was awarded an M.B.E.

In 1946 Ewer moved to the University of Natal as a lecturer with his Irish wife R.F. (Griff) Ewer¹ (Figure 12), whom he had met when she also was a young zoologist working under Fox, and their two small children. In 1948 he was promoted to Senior Lecturer. Whilst in Natal, Ewer's research concerned problems of behaviour and neuro-muscular physiology of invertebrates; Griff's interests were palaeontology, genetics

¹She was born Rosalie Griffith, and everyone, except those who had known her as a child, called her Griff.



Figure 10. Professor Denis William (Jakes) Ewer FRSSAf, Head of Department 1955 to 1963. Photograph from Zoology & Entomology archives.

and mammalian behaviour.

Prior to his arrival at Rhodes, Ewer had acted as external examiner for the Department and noted that there was no balance to the courses. For example, under Omer-Cooper a great deal of attention was paid to the Coleoptera and a few minor groups, whereas the curriculum included very little genetics, and the physiology and ecology taught was very outdated. Ewer was therefore determined to modernise the curriculum and it was not long before he introduced physiology into the Zoology 2nd and 3rd year courses. Kymographs were obtained (for free, which of course pleased senior



Figure 12. Dr R.J. (Griff) Ewer, wife of Jakes Ewer. Photograph courtesy of C.K. Brain.

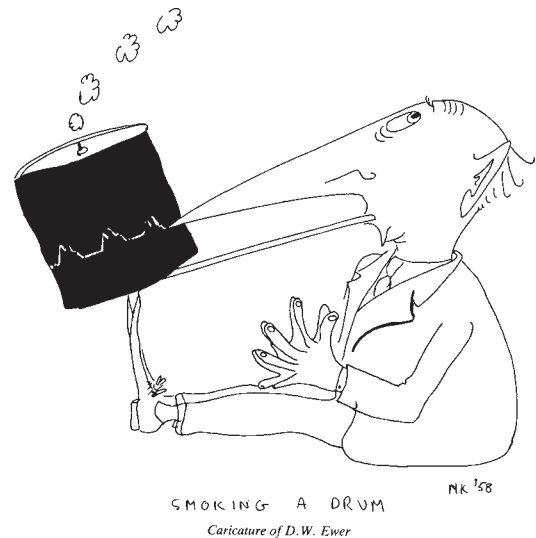


Figure 11. Caricature of Jakes Ewer drawn by Mary Kraft, an Honours and MSc graduate of the department.

management) from the University of Fort Hare. These old-fashioned instruments became available because the government had decided to close down health science at Fort Hare and move it to Durban. Drums were now smoked for physiology practicals (Figure 11). Jakes Ewer also introduced serious research projects for Honours students and as part of the Honours examination, students had to pass a translation test from French or German. Ewer and van Hille tutored students in these languages. Along with these changes, research within the Department began to diversify, the publication rate increased (Figure 8) and once again zoologists at Rhodes began to make greater contributions to the international literature. Whilst Ewer and his students continued the work on invertebrate neuromuscular physiology (e.g. Pople & Ewer, 1958; Ewer, 1960; Ewer, Pople & Ross, 1961; Gruber & Ewer, 1962), Griff Ewer published a series of important papers on mammalian palaeontology (e.g. Ewer, 1956a–d; 1958). As student numbers rose, administrative assistance was clearly needed, and the first departmental secretary (known as a short-hand typist), Karen Longfield, was appointed in 1961.

The facilities that Ewer inherited were not very inspiring, and the Department was still split between two buildings, referred to as the 'upper' and 'lower' huts. The upper hut according to Ewer "appeared to have been built as a makeshift at the end of the Boer War"! In its time it had served as a women's hostel and a gymnasium (for Physical Education) and Ewer noted that the markings of "a badminton court were still clear on the wooden floor of a wide corridor which ran down one side of the building." This hut housed a lecture room for 25 students, two stores, a professorial office, a darkroom and three rooms for research students. The lower building (Figure 7) was also very old as it features on some of the earliest maps of the university. It housed the teaching staff and Honours students as well as an insectary that was devoid of insects and therefore used as a tearoom.

Ewer always expected everyone to attend morning tea, where he made most of his announcements and took note of who was present (as well as buying cigarettes for a penny apiece from the smokers – for some reason he wouldn't smoke his pipe in the tearoom, but he refused to buy a packet of cigarettes). There was also a laboratory, which housed about 60 students, looked after by the fearsome Ms Foote (who had a mania for locking everything away most of the time, and

terrorising the cleaning staff) with the equally ferocious fat Cleopatra. The dog spent its days in the preparation room and would attack anyone who tried to enter. From correspondence with Ewer it was clear that he and Ms Foote had a difficult working relationship and he was relieved when she resigned at the end of his 2nd year as HoD. During the Omer-Cooper era most research had been of an entomological nature. The exception was the research of Bill Macnae, a soft-sediment marine ecologist, who had also published important descriptions of some South African opisthobranch gastropods (Macnae 1954a,b, 1955). As mentioned above, the Ewers soon introduced studies on vertebrate palaeontology and carnivore biology, which were undertaken by Griff Ewer, as well as animal physiology, Jakes' speciality. When Macnae resigned in 1956 to move to the Zoology department at Witwatersrand University, Anne Alexander, a graduate of the University of Natal, Pietermaritzburg, replaced him. She and Jakes Ewer published a number of important studies on the behaviour and physiology of spiders and scorpions (e.g. Alexander, 1956, 1957, 1958; Alexander & Ewer, 1957a,b; 1958). The work added another dimension to departmental research as well as large numbers of these animals to the building.

The Ewers enthusiasm for their subject resulted in a growth in the postgraduate school (Figure 4). Staff, however, had a very heavy lecture load. In addition to Honours courses, lecturers had to teach five one-year undergraduate courses as Tom Alty, the University Vice-Chancellor, would not allow any combined teaching for Zoology and Entomology students. Both Ewers were outstanding lecturers, and for Jakes, each lecture was a performance that was carefully rehearsed. Those who lectured by 'dictation' therefore horrified him and this brought him into conflict with some of his staff that taught in such a way.

Life in Zoology & Entomology during the tenure of the Ewer's was anything but dull. Over the years a number of animals (other than Ms Foote's terrier) lived in the Department, including a Cape porcupine (*Hystrix africae australis*) (Aristotle) that selected the darkroom for a den, two striped polecats (*Ictonyx striatus*), two small grey mongooses (*Galerella pulverulenta*) (known as O. Elbereth Esq. and Gilthoniel²), an injured and rather smelly Jackass penguin (*Spheniscus demersus*) (returned to the sea upon recovery) and an African wild cat (*Felis sylvestris*) (that lived in Griff Ewer's Office). Upon arrival at Rhodes, Griff Ewer introduced skeleton preparations into the curriculum, and dogs and cats as well as other vertebrates (all presumably deceased) were often delivered to the Department.

Griff was generally regarded as being wonderfully eccentric and there are numerous stories (many probably apocryphal) about her. She always wore green trousers that she had made, often a collar and tie, and smoked a pipe (Figure 12). When Harry Thackwray arrived in Grahamstown on a Saturday afternoon to attend his interview for a technical position in the Department (he was appointed in 1960), he arrived early and drove around town. One of the first people he saw was someone sitting outside smoking a pipe. He was shocked to find this same person was none other than Griff, and was a member of his interview committee!

Griff also kept meerkats (*Suricata suricatta*) as pets at home, the two best known being Gollum and Gandalf. The meerkats had the run of the Ewer house, including the dining-room table when the family was eating, Griff finding the behaviour of the animals fascinating as they explored what was on offer. Gollum appeared to dislike women and it was not unknown for him to nip the ankles of the odd visitor. However, all of the animals

that Griff Ewer kept were an important part of her rapidly growing interest in animal behaviour (see Ewer, 1956e, 1957). The observations that she made on them formed the basis of her scholarly text (which carried a dedication to her meerkats) on mammal ethology, published five years after she left Rhodes (Ewer, 1968). In 1975 she was awarded a Gold Medal by the Zoological Society of Southern Africa in recognition of her immense contribution to zoology.

Griff was rarely seen in a dress. At one 'Inkey³ Ball' the Ewer's were host and hostess (Jakes was Dean of Science). For that evening Griff wore an elegant evening dress, but then shocked those students who did not know her by revealing that underneath she wore green slacks and veldskoens. These students were further horrified when she then pulled out her pipe, knocked it on her shoe, stuffed it with tobacco and lit it. Despite her eccentricities, Griff was remembered by almost all of her students as a most attractive personality, and by many as the one who brought Zoology alive for them.

Thackwray vividly remembers his first job as departmental Technician, which was to prepare 30 ostrich heads (possibly left over from Duerden's time!). In addition to helping to run lab classes Harry had to turn his hand to building any equipment that was needed (with very few workshop tools), as well as collect specimens. As the only university transport at the time was an old Fargo truck and a Ford bakkie, the Department managed to acquire a 125 cc Triumph motorcycle, which was used for collecting specimens (as well as sea water!).

The Ewers were not the only ones to keep animals. Thackwray was accompanied around the labs by a tame red-winged starling (*Onychognathus morio*) and hornbill (*Tockus alboterminatus*). In 1960 Robin Bolt (then an Honours student) arrived back from Zimbabwe with a caracal (*Caracal caracal*) (named Gringo), which lived in the Honours Lab. Unfortunately the cat, which was not particularly friendly, escaped and for some time it was spotted in the botanical gardens and Mountain Drive. The ever-resourceful Thackwray built a trap for the caracal but only succeeded in capturing J.L.B. Smith's dogs (Mako and Tiger). Fortunately the rest of the University was unaware of the roaming caracal, which was never re-captured, and the Smiths were never informed of why their dogs were missing for a time.

A more serious incident was when an Honours student, Harold Koopowitz, brought back a tree dassie (*Dendrohyrax arborius*), captured in the Alexandria forest. One night the dassie got out of its cage and rampaged through the Department. After the beserk animal was cornered and killed with a spade, an unamused State Veterinarian (Lance Rossiter) was called in. Samples sent off to Onderstepoort Veterinary Institute came back positive for rabies, which meant that the entire department had to be washed with alcohol/formalin and all staff inoculated against rabies. Koopowitz, the dassie owner, was allergic to horse (*Equus caballus*) serum and his inoculation (in duck serum) had to be flown in from America.

Ewer was not one to retreat from confrontations with University management. He campaigned successfully to have chalk boards put in the General Lecture Theatre (G.L.T.). Zoology classes needed to be held in this lecture theatre because of the increase in student numbers. Prior to this lecturers from the humanities, who presented by 'oration' rather than 'illustration', had been the only users of G.L.T. It is ironic that in recent lecture theatre refurbishments, the chalkboards that Ewer and other science lecturers had relied on have been removed!

When the university changed its schedule of collecting the

²An oblique quotation from Lord of the Rings that the Ewers read in 1958, long before it became a cult book.

³Ink was a term used for a 1st year student.



Figure 13. The first purpose-built Zoology & Entomology building (now occupied by the Department of Psychology) erected on the site of the 'upper hut'. This building was occupied by the Department from 1957 to 1974. Photograph by A.N. Hodgson.

departmental rubbish from every day to every other day, Ewer immediately protested that the Department had rather smelly rubbish that required daily removal. When his complaints fell on deaf ears, Ewer organised a protest with the Department marching in full academic dress to the office of the Registrar (Brigadier Martin) with full rubbish bins, which they then left at his door. The grounds' staff immediately changed their schedule of rubbish collection back to every day!

Shortly after arriving at Rhodes, Ewer persuaded the University to provide a new building for Zoology & Entomology (although this had been in the planning stage during the time of Omer-Cooper with some money raised by the local farming community for a laboratory for Entomology). Alty had indicated that between £20 000 and £30 000 would be made available. The new building (Figure 13) went up on the site of the upper hut, which was vacated and dismantled towards the end of 1956. Building eventually began in July 1957 and, although staff and students took occupation in 1958, it required another 12 months to complete, to the exasperation of the Ewers.

At about this time the University was approached by the Niven family (from Uitenhage) to discuss the creation of an institute for research on birds. A meeting was set up at the Niven family farm, 'Amanzi', but the day before it was due Ewer asked Jack Skead to represent Rhodes as he was unable to attend. Skead remembers being shown a small room that Ewer thought would serve to house the institute. Skead knew that the room would be utterly inadequate and that Ewer had no enthusiasm for the project; nevertheless, he still went to the meeting. Shortly after Cecily Niven had begun explaining her proposal, Alty, who had been at a meeting in Port Elizabeth, arrived and took over the responsibility of putting the viewpoint of Rhodes. As Skead put it "the rest was charade" and the idea of an ornithological institute at Rhodes was never given a chance. Subsequently the Cape Bird Club lobbied successfully for the establishment of the Percy FitzPatrick Institute for African Ornithology at the University of Cape Town, sadly not in the Eastern Cape where the Niven family lived.

Ewer was – and still is – a man of wide cultural interests especially keen on the theatre and Shakespeare. Guy Butler remembered him as a fine Shakespearean actor, taking the lead in an acclaimed Rhodes Dramatic Society production of *Othello*, which Butler directed. He often appeared in annual pantomimes as the dame. Griff was usually in charge of the lighting for these productions, and was very jealous of her 'bridge', swearing roundly at anyone who came close to trespassing on

her domain. Jakes still has a gilded papier mâché lion of St Mark proudly on display upon his mantelpiece, "swiped" (D.W. Ewer, pers. comm.) as a souvenir from the *Othello* production.

Jakes and Griff Ewer left Rhodes (and South Africa) in 1963 for positions at the University of Ghana. They both did much to stimulate more rigour in experimental zoology and animal behaviour in South African universities. Jakes had also laid solid foundations for his successor, Brian Allanson, to build upon. When Jakes retired he returned to England where he still lives.

NEW CHAIR, ANOTHER NEW BUILDING, NEW DIRECTIONS (1963–1988)

Brian Allanson FRSSAf (Figure 14), who was appointed as Chair of Zoology & Entomology and Head of Department in 1963, succeeded Ewer. Brian Robert Allanson was born in Colombo, Sri Lanka, in January 1928. Although his early years were spent in England, his secondary education was completed at Grey High School, Port Elizabeth, where he matriculated in 1945. After obtaining a BSc from Natal University (where he was taught by the Ewers) in Zoology and Chemistry he did his post-graduate training at U.C.T. (under the mentorship of John Day), gaining his BSc (Hons) in 1953, MSc in 1954 and PhD in 1960. Allanson's first job was as Junior Lecturer at U.C.T. (1955). He later became a River Research Fellow, C.S.I.R. (1955–1960) and from 1960–1963 he headed the hydrobiology division of National Institute for Water Research in Pretoria. During Allanson's tenure, the Department saw a number of important developments in the expansion of facilities, research and staff numbers as well as modifications to curricula.

Aquatic research

In July 1965 Allanson arranged a ground-breaking research trip to Lake Sibaya and Nhlanga in Tongoland (Figure 15). For this he borrowed and hired Land Rovers, one of which got no further than Fraser's Camp, only 40 km from Grahamstown! Despite breakdowns, poor roads and lack of bridges to cross the rivers in northern KwaZulu-Natal, the trip was an immense success and researchers returned twice yearly (A.G. Bruton, 1979). Initially the team was housed in tented camps (Figure 16), and thus research was limited by these rudimentary facilities. Consequently Allanson proposed to the chief

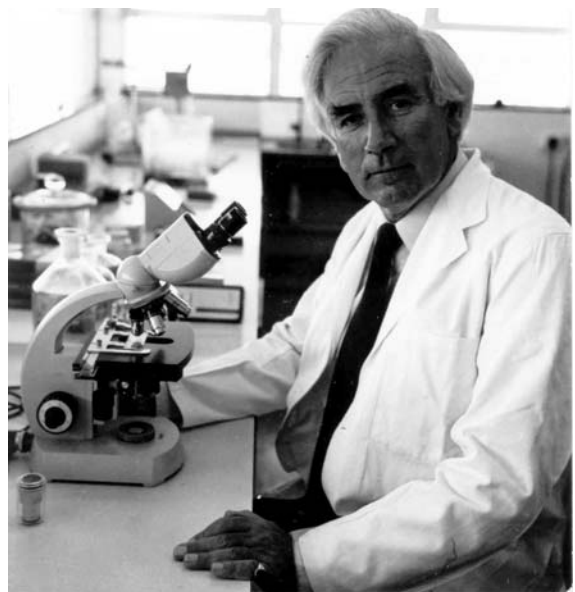


Figure 14. Professor Brian Robert Allanson FRSSAf, Head of Department 1963–1988. Photograph courtesy of B.R. Allanson.



Figure 15. Members of the 1965 Lake Sibaya expedition led by Professor Brian Allanson. Photograph taken by John Minshull and provided by H. Thackwray.

Bantu Affairs Commissioner in KwaZulu-Natal that a permanent field station should be established on Lake Sibaya. His application was successful, and in 1967 building of the research station commenced (A.G. Bruton 1979). At the same time the University Council formally approved the formation of the Institute of Freshwater Studies (I.F.W.S.) at Rhodes with Allanson as its first director. The Sibaya Research Station (Figure 17) was permanently manned and it was here that Burke Hill, Robin Bolt, Rob Hart and Mike Bruton FRSSAf amongst others, began their careers as aquatic biologists. The field station attracted many research workers. By 1968, 42 scientists had visited the station and by 1976 this had grown to 202 (A.G. Bruton, 1979). Research at Sibaya, however, was not without its hazards, primarily the ever-present crocodiles (*Crocodylus niloticus*) and hippos (*Hippopotamus amphibius*) but also the high winds that were a feature of the open lake. Under-

water research was facilitated by Scuba and later by a 'Hookah' diving apparatus, air being supplied by a pump driven by a generator. During 1975–1977 lake levels rose dramatically due to heavy rains and despite their best efforts the staff were unable to prevent the research station from becoming flooded and reluctantly the station had to be abandoned permanently. Nevertheless the research at Sibaya had made its scientific impact with publications of both local and international importance (see Allanson, 1979 for a synthesis of Lake Sibaya research).

The Sibaya effort was largely replaced by multidisciplinary work on Lake le Roux, a large silt laden reservoir on the Orange River. This work was completed in 1984. In addition, in 1974, the I.F.W.S. opened a new research station at Swartvlei (near Wilderness) (Figure 18) following the award of a Water Research Commission (W.R.C.) grant to investigate the role of



Figure 16. The first field base at Sibaya. Photograph by B.R. Allanson.

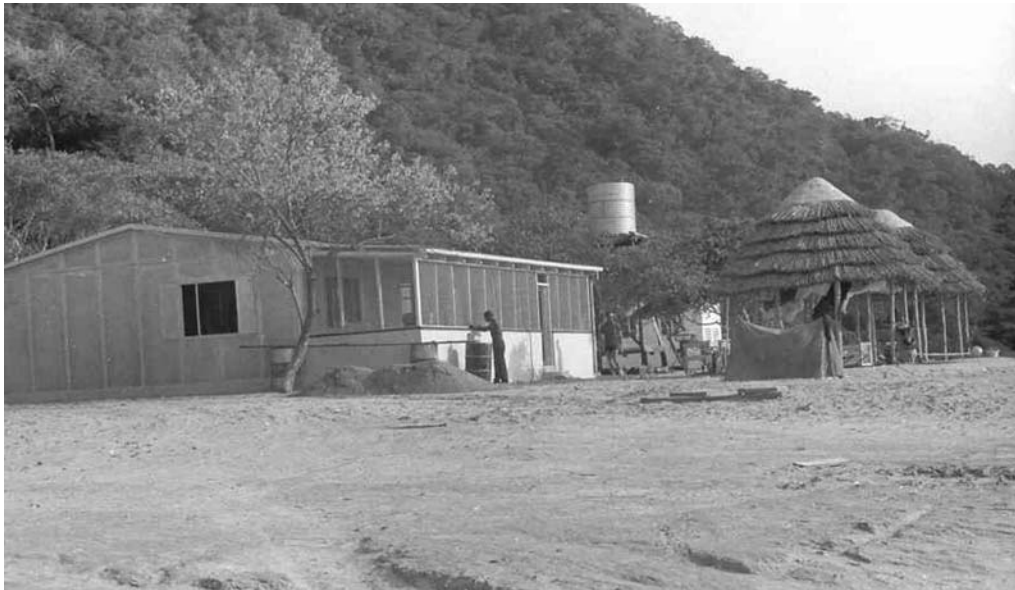


Figure 17. The permanent field station on the banks of Sibaya. Photograph by B.R. Allanson.

fringing water-plant communities in the nutrient cycles and energetics of this unique lake, which was periodically flooded with sea water. This research was later expanded to the limnology of other coastal lakes, as well as the ecology of the Touw River flood plain and Swartvlei estuary. The station had a small permanent staff. The first research officer was Clive Howard-Williams who was succeeded by Alan Whitfield (now Deputy Director of S.A.I.A.B., Grahamstown). Results from the Swartvlei base (see Allanson & Whitfield, 1983; Whitfield *et al.*, 1983) again made important contributions to knowledge of aquatic ecosystem function and management. The Swartvlei station ceased to be used as a permanent research base in 1988.

Whilst much of the Department's aquatic research from 1965 to 1980 was ecosystem or community based, a number of staff published bench-mark single species studies. Examples include the work of:– Burke Hill on *Upogebia africana* and *Scylla serrata* (e.g. Hill & Allanson, 1971; Hill, 1975, 1977); Ticky Forbes on *Callianassa krausii* (e.g. Forbes, 1973); Stephen Blaber on *Rhabdosargus holubi* (e.g. Blaber, 1973, 1974); Tony Ribbink on cichlid fish (e.g. Ribbink, 1977), Rob Hart on freshwater copepods (e.g. Hart, 1977) and Mike Bruton on *Clarias* (e.g. Bruton, 1979).

In the 1980s Allanson also saw a need for biological research in the Southern Oceans to complement the existing physical oceanography of scientists at U.C.T. In 1981 he initiated a research programme, which rapidly yielded results of interna-

tional importance and placed South African biological oceanography on the world map (McQuaid & Froneman, 2004). After Allanson retired from the Department, Christopher McQuaid FRSSAf (who joined the Department in 1986) took over as leader of the Southern Oceans Group ensuring its continuing success. The group was further strengthened by the appointment of William Froneman to the departmental staff in 2002. This small research group has received international acclaim, and its significant achievements and contributions to biological oceanography have been elegantly synthesised recently by McQuaid & Froneman (2004).

Terrestrial research

Four years after the establishment of the I.F.W.S., Allanson also oversaw the establishment of a Tick Research Unit (T.R.U.) with the late Graham Whitehead (Figure 9) (a Rhodes graduate and associate Professor in Entomology) as its first Director. There was an urgent need for research on ticks because of their growing resistance to insecticides (e.g. Whitehead, 1973), although this had already been noted in Omer-Cooper's time (see Whitnall, 1954). Research initially focussed on understanding the life cycles and ecology of ticks of economic importance. Much of this work was undertaken by Richard Norval whose contributions to tick ecology, begun at Rhodes and continued in Zimbabwe, were recognised with the award of his DSc by Rhodes in 1985 (Norval, 1985). Other works of significance were the studies on assembly pheromones by Ygar Rechav (e.g. Rechav, *et al.*, 1976). When Whitehead retired in 1982, Ivan Horak was appointed as the new Director of the T.R.U. Under his leadership research was expanded to studies of parasite loads of both domestic and wild animal populations.

Another important research group that emerged in the 1970s was the Biological Control Group led by Cliff Moran FRSSAf (see Figure 19 and below). The research on insect pests (see Annecke & Moran, 1982) and the use of insects for biological control of alien weeds (e.g. Zimmerman & Moran, 1982) received both local and international acclaim, especially the work on cactus control, and put Rhodes at the forefront of the discipline.

Further diversification of terrestrial research occurred when Mike Perrin was appointed to the staff in 1976. His focus was the ecology of small mammals, which provided some balance to both research and teaching within the department.



Figure 18. The field station at Swartvlei. Photograph by B.R. Allanson

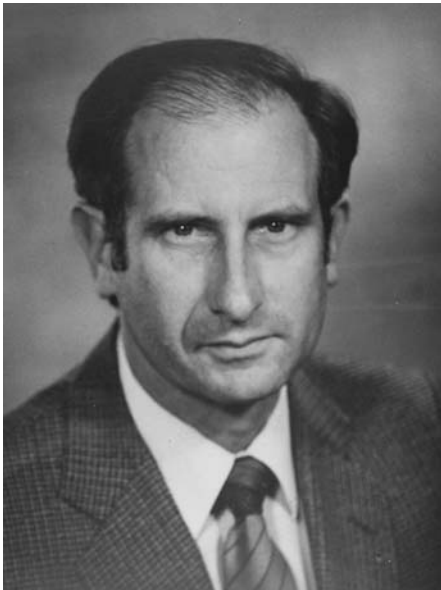


Figure 19. Professor Vincent Clifford Moran, FRSSAf Chair of Entomology 1980 to 1985. Photograph from Zoology & Entomology archives.

Facilities, teaching and staff

In the 1960s student numbers grew, and Allanson successfully campaigned for additional staff. He strengthened the aquatic sciences with the appointment of Hill and Bolt in 1965 whilst Moran (appointed to replace Ed McC Callan who had taken up a position in Australia) and Whitehead looked after Entomology. The staff complement now comprised seven academics, two technical assistants and a secretary. By the early 1970s a further academic staff member and technician had joined the Department.

Allanson introduced many reforms to the undergraduate curriculum. Not long after his arrival aquatic biology featured prominently in students' education and ecology field camps became an integral part of student training in quantitative ecology, a tradition that is maintained to this day. He persuaded the Port Alfred Council to give the university a derelict building (originally built in 1930 as a studio by the first professor of Fine Art, F.W. Armstrong) on the banks of the Kowie estuary. Money was raised to equip the laboratory, and Thackwray drove down once a week to rebuild the ruin. In 1964, in the presence of the University Vice-Chancellor (Dr Hyslop), and local dignitaries, the 'F.W. Armstrong laboratory for Biological Research' was opened by J.L.B. Smith and Rex Jubb (Figure 20). Zoology 2 and 3 field trips (Figures 20, 21) were then undertaken in Port Alfred with staff and students staying at the Central Boarding House opposite the lab. Unfortunately regular theft from the lab and damage to the boat jetty forced its closure in 1972, although the lab was to be eventually revived some 25 years later by the Department of Ichthyology and Fisheries Science. From 1972 onwards student field camps were held at a variety of Eastern Cape localities.

Allanson also ensured that students were given a good grounding in the rapidly expanding discipline of cell biology, regarding this as fundamental to understanding higher processes. To support such work he motivated successfully for funds to purchase a transmission electron microscope. The university's first electron microscope, a Hitachi HU IIB, was installed in July 1968. Robin Cross, then a technician in zoology, went on a two-month course to the Poliomyelitis Research Foundation in Johannesburg, and he became the Technical Officer in charge of this new piece of equipment (a separate



Figure 20. The F.W. Armstrong Biological Laboratory at Port Alfred. Top: opening day in 1964. Bottom: a group of students about to depart on a sampling trip on the Kowie. Photographs by B.R. Allanson (above) and G. Youthed (below)

EM unit, eventually housed in the basement of the zoology building, was created in 1972). Interestingly, the first pictures taken on the new TEM were not by a zoologist but by a microbiologist, David Woods (then Senior Lecturer in the Botany department and now Vice-Chancellor of Rhodes), who was studying a T4 bacteriophage.

Because the departmental staff taught courses (undergraduate and honours) in zoology and entomology courses, many of which required lab classes (2nd and 3rd year courses then had two lab classes per week), lectures and practicals were often held on evenings and Saturday mornings, a practice that was discontinued in the mid-1980s. Staff also taught two biology courses: Biological Science 1A (a 1st year course taught jointly between Zoology and Botany) was first offered in 1970. This course was accepted as a credit towards a medical degree. In 1971 Biological Science 1B, a 2nd year course taught jointly by biochemists, zoologists and botanists, was introduced. These courses were renamed Biological Science I and II in 1972. The former course ultimately formed the basis of Biology 1, which was adopted by the faculty of Pharmacy for their 1st year students. BioScience II was discontinued in 1983 to allow students greater subject choice in their 2nd year. During the early 1970s it became clear that the Department was rapidly outgrowing its accommodation. Allanson lobbied successfully for a new building, and in 1975 a Zoology and Entomology block with its purpose-built laboratories and research facilities, was opened (Figure 22). Meanwhile Entomology at Rhodes was strengthened by the creation of a chair in Entomology. Vincent Clifford (Cliff) Moran FRSSAf (Figure 19) was appointed to this post in 1978.



Figure 21. Port Alfred field trip group, 1965. Left to right at back: Keith Soloman, Joan Dangerfield, Colin Anderson, Vicky Schultz, Brian Allanson, Bob van Hille, Burke Hill, Dick Kilburn, Lil Rademeyer, Meg Thwaites, Robin Bolt. Sitting: Sparky (Martina) Roeveland, Jean Garrett, unknown, Roy Setchel, Roberta Imrie, Alan Kemp. Photograph by G. Youthed.

Moran was born in Harare (then Salisbury), Zimbabwe, in 1937. After high school, he registered in 1956 as a student at Rhodes University where he obtained a 1st Class Honours degree (1959) in the Department of Zoology and Entomology. He then went on to complete his MSc in 1962 and PhD in 1967. Shortly after he had started his PhD research, he was appointed lecturer in Entomology (1964). Moran rose steadily through the academic ranks at Rhodes, and in 1980 was promoted to Full Professor and Head of Entomology. During his tenure as Head of Entomology, the discipline thrived, not only at an undergraduate, but also at a postgraduate level. In particular he developed the existing entomology degree ensuring that it remained academically thorough, stimulating, and relevant to African entomological, environmental and agricultural problems. This made Rhodes graduates highly employable and sought after.

Between 1977 and 1982 the Department experienced considerable staff turnover. Hill (appointed 1965), Tony Ribbink (appointed 1970), Meyrick Peak (appointed 1975), Perrin and Bryan Davies (both appointed 1976, Davies replac-



Figure 22. The 2nd purpose-built Zoology & Entomology building before the outside shutters were removed and additional floors added. Photograph by A.J.F.K. Craig.

ing Bolt who had sadly died in 1975), all moved to more senior positions at other institutions. By 1982 these positions were filled by Pat Hulley (entomologist), Moosa Motara (cytogeneticist), Adrian Craig (ornithologist), Ric Bernard (mammalogist) and Alan Hodgson (marine invertebrate biologist). These appointments not only strengthened the breadth of teaching within the Department, but also diversified research (see next section). In 1982 a Chair of Limnology with Hart as the first incumbent was established by a most generous grant from Barclay's National Bank, although funding for this came to an end in 1987 and Hart also left Rhodes. In the mid-1980s, Entomology also experienced staff turn over. Gimme Walter, a graduate of Rhodes appointed as a Junior Lecturer in 1979, moved to a more senior position at Witwatersrand University at the end of 1984, and Steve Compton replaced him.

Although Allanson placed great emphasis on his staff maintaining an active research programme, he also insisted on excellence and full participation in teaching. Departmental equipment had to be fully functional at all times (and in its place) and the Department had to be kept scrupulously clean. Many students suffered his wrath if equipment was not maintained and used correctly. Luckily the departmental technical staff was able to meet the challenges presented by these demands.

One of the technicians who had to meet these demands was Mervyn Mansell, who joined the Department as a Technical Assistant in 1967 after completing his BSc with Entomology as a major. Mansell was the first student to be given special dispensation to do the Entomology Honours degree part-time over two years, working after hours while employed as the entomology technician. Allanson and Moran encouraged Mansell to continue his research and he registered as a post-graduate student. This led to several publications and his PhD. In 1978 Mansell moved to Pretoria as a professional scientist employed by the Agricultural Research Council.

Two other technicians appointed to the department in the early 1970s were Dale Ranchhod and Dudley Forsyth. Whilst Ranchhod was unflappable in his organisation of the laboratory

classes, Forsyth cheerfully ensured the functioning of the building and its equipment and in addition constructed equipment in the workshop. Ranchhod, an outstanding histologist, also produced most of the slides required for teaching tissue structure, which must have saved the university a fortune at this time. However it required the combined talents of both Ranchhod and Forsyth to ensure that Allanson's physiology practical classes worked! Unbeknownst to students, Ranchhod and Forsyth would spend a great deal of time setting up the experiments and testing equipment to make sure that experiments were text-book demonstrations.

Although Allanson sometimes berated his technicians (and other staff) he valued them greatly. This was exemplified when Ranchhod informed Allanson that he had been offered a job by Phillip Tobias FRSSAf at Witwatersrand University. Ranchhod's problem was that the apartheid laws of the time meant that he was unable to purchase property in Grahamstown, since there was no designated 'Indian' area. He therefore had nowhere for his family to live. Allanson's response to this was to refuse to allow Ranchhod to leave and immediately meet with the Vice-Principal (Vladimir Brommert) and between them they organised a Rhodes University house on campus for Ranchhod and his family. This of course was against the law, but it did mean that Allanson got to retain his technician. The Department (and University) was to face a similar accommodation problem when Motara was appointed as a lecturer in 1978. Appointing Motara as warden of Adamson house (also illegal) solved this. More difficult was getting a residence permit for Motara's wife. Whilst Motara was from South Africa, his wife was from Pakistan. The closest she could get to Moosa was by living in the former Transkei (Butterworth) where she had a job as a teacher. This situation was clearly unacceptable and after making direct contact with the then Minister of Home Affairs, Allanson was able to secure a residence permit for Tahira Motara. Motara was to soon encounter further racial problems. At the beginning of a Zoology 1 practical class one male white student (who had just completed two years of military service) stood up and hurled abuse at Motara informing him that he had been trained by the military and "would not take orders from a black man" (M. Motara, pers. comm.). Needless to say the Department was outraged, and the university asked this student to withdraw.

Whilst Ranchhod and Forsyth (and more recently Terry Butterworth) kept the zoology staff functioning during the 1970s, 1980s and 1990s a number of people filled the position of the Entomology Technician after the departure of Mansell. During the late 1980s one incumbent fled the country one night, hotly pursued by the police on charges of illegal trading in crocodiles from a crocodile farm where he had previously worked. Stability was restored to the entomology technical position with the appointment of Milton Ngeju in 1990.

During the Allanson years, the high standing of the staff of the Department was reflected in their involvement in the administration and development of South African science through membership of a wide array of scientific societies, as well as advisory and research committees both at government and Council for Scientific and Industrial Research (C.S.I.R.) level. Furthermore, despite the difficult political climate in South Africa, departmental staff maintained collaboration with international research groups, attended international conferences and took research leave at overseas institutions. Numerous international researchers also spent time working in the Department. This ensured that research and teaching were maintained at the highest standards.

At the end of 1987, Allanson took well-earned retirement

after 24 years as HoD. During his time departmental research output grew markedly (Figure 8), with the Department often publishing more papers in peer-reviewed journals per annum than all other Rhodes University departments combined. The research drive and enthusiasm of the staff encouraged more students to pursue post-graduate studies (Figure 4). Although a late starter (the first in 1954) in training PhD students, the Department soon had a distinguished list of alumni who held senior positions in local and overseas universities, museums and research facilities. Allanson received several accolades, elected Fellow of the Royal Society of South Africa in 1969, awarded the Gold Medal of the Limnological Society of South Africa in 1983 and that of the Zoological Society of Southern Africa in 1987. In 1990 South Africa paid tribute to his contributions to university education and science with the State President presenting him with the Order of Meritorious Service (Silver). Rhodes also paid tribute to him with the award of a DSc *honoris causa* in 1992.

Despite his academic achievements and heavy administrative load, Allanson found time for yachting and qualified as a light aircraft pilot. Upon retirement he moved to Knysna where he established an ecological consultancy (Allanson Associates) and (yet another) small field station (recently closed), which was visited regularly by university students as well as local and international researchers. In Knysna he has continued to publish papers, and was the chief editor of a book on estuaries, published in 1999 by Cambridge University Press (Allanson & Baird, 1999). He was also the driving force behind the Knysna Basin Project. The results of this multidisciplinary research were published in an issue of the Transactions of the Royal Society of South Africa in 2000 (volume 55, part 2).

Brian Allanson was to be the last permanent HoD as the Department entered the more modern system of a rotating headship.

INTO THE NEXT CENTURY (1988–2005)

Randall Hepburn FRSSAf was appointed HoD in 1988, a position he was to fill until 1996. Hepburn, appointed to the Chair of Entomology in 1986, was a specialist in honeybee biology. Previously he had been Reader in Biological Materials in the Physiology Department at the University of the Witwatersrand. Although he had worked on insect physiology and morphology, and published on a wide range of topics in the late 1970s, he had become completely obsessed with honeybees. His early bee work focused on physico-chemical studies of beeswax, and associated comb-building behaviour of honeybees (see Hepburn, 1986). Shortly after his arrival in Grahamstown he began detailed investigations into the peculiar reproductive habits of Cape honeybees (*Apis mellifera capensis*). This in turn led to comparative studies of the honeybees of all of Africa (Hepburn & Radloff, 1998). In the process many collaborations were formed, particularly with German scientists, and the 'Bee Lab' was inundated with research visitors for many years. On completion of the African bees monograph, Hepburn and colleagues turned their attentions to the Asian honeybee fauna. New collaborations were forged after visiting several Asian countries. This work continues unabated despite his 'theoretical retirement' in 2001; he remains a Research Professor in Apiculture at the University and has published more than 200 formal papers and five books on entomological topics. Hepburn received a number of accolades for his research, including the Gold medal of the Zoological Society of Southern Africa, and the Vice-Chancellor's Senior Research Medal. He was also elected a Fellow of the Royal Society of South Africa and a Fellow of the Entomological Society of



Figure 23. The Zoology & Entomology building in 1993 after the removal of the shutters and addition of floors. Photograph by A.N. Hodgson.

Southern Africa.

During his time as HoD, Hepburn had to steer the Department through two traumatic periods of building alterations. The first, in 1990, involved the Department having to vacate the 4th floor and most of the 3rd floor in order to accommodate the Microbiology section of the Department of Biochemistry & Microbiology. The Department lost its dedicated Entomology lab (redesigned as research labs and offices) as well as two ground floor 1st year laboratories and the two dedicated physiology labs. The “moving of a few partitions” as a member of senior management described the proposed changes, took nine months with staff having to endure dust, the noise of drills and hammers, and regular power cuts. With the memory of these building alterations still vivid, the staff had to endure further structural work in 1993 when the University decided to expand the crowded and re-named Biological Sciences building to accommodate the entire Biochemistry and Microbiology department, adding extra floors and a sloping red tiled roof (Figure 23). This meant that there was no longer the option of using the flat roof for experimental facilities. The Department also lost its in-house library, with all books and journals transferred to the main library. Despite the ‘space-wars’, as the changes were named, relationships between the staff of the two departments remained generally good. It was remarkable, therefore, that despite the poor working conditions, and low staff morale during this time, research output did not diminish (Figure 8), and that postgraduate numbers continued to increase (Figure 4). The only change in the academic staff at this time was the resignation of Compton who moved to a position at Leeds University in 1992. Martin Villet, a graduate of Witwatersrand University, was appointed in his place.

Two other regrettable changes were the closure of the Tick Research Unit (in 1993) and the relocation of the staff of the Institute of Water Research (I.W.R.) into another building (2000). Although consisting of one or two staff members only, the T.R.U. under the leadership of its directors, Whitehead (1974–1982), Horak (1983–1987), and Bruce Fivaz (1988–1993), contributed significantly to teaching, postgraduate training and the research output of the Department over 19 years. However, funding for the Unit was problematic, and its closure unavoidable. The I.W.R. was formed in 1991 by the amalgamation of the I.F.W.S. and Hydrological Research Unit. Whilst the biology staff were located with Zoology & Entomology, the hydrologists were housed in the Geography building. Staff of the I.W.R. were keen to be in the same location and the univer-

sity made this possible in 2000.

In 1996 Hepburn handed over the position of HoD to McQuaid who had arrived in 1986 to replace Motara who had left to become HoD of Zoology at the University of Durban Westville. By 1991 McQuaid was appointed to the Chair of Zoology and he has played a leading role in maintaining strength in aquatic science teaching and research. Since 2000 Adrian Craig has shouldered the task of HoD, with Ric Bernard and Alan Hodgson acting HoD whenever required.

It will be for others to look back upon and assess the quality and impact of the research and teaching of the more recent staff. However, there are a number of important indicators of their research excellence and scientific standing. Staff members continue to secure competitive funding from a number of funding bodies (e.g. National Research Foundation, Department of Environmental Affairs, Water Research Commission). Nearly all (90%) of staff are currently N.R.F. rated, three, McQuaid, Bernard and Hodgson, being highly rated. The scientific standing of the current staff is also reflected in the publication of scholarly reviews of their research fields (e.g. Bernard, 1989; Adams & Brown, 1990; Hodgson, 1995, 1997, 1999a; McQuaid, 1996a,b; Bernard & Cumming, 1997; Cumming & Bernard, 1997; Craig, 1999; Pakhamov & Froneman, 1999) and invitations to write book chapters (e.g. Craig, 1988; 2000, 2004; O’Keeffe *et al.*, 1989; Perissinotto, 1995; De Villiers, Hodgson & Forbes, 1999; Hodgson 1999b; Martin & Bernard, 2000). Other recent research accolades awarded to staff include Vice-Chancellors Distinguished Research Awards to McQuaid (1991 and Senior Award in 2002), Bernard (1992) and Froneman (1999). McQuaid was elected a Fellow of the Royal Society of South Africa in 1999 and Froneman was awarded the Royal Society’s Meiring Naude Medal for outstanding young scientists under the age of 35 in 2001. Hodgson was recently awarded his DSc by Manchester University for his contributions to invertebrate tissue structure and function. Staff are also in great demand as referees of scientific manuscripts and research proposals (international and local), external examiners of theses and undergraduate courses, plenary speakers, and as editors or members of editorial boards of journals. Finally many have served in a variety of capacities (including presidencies) on local and international scientific committees.

Since 1990 a number of modifications to teaching have been made. Two new Honours courses have been introduced: one in Marine Biology (1992) followed by African Vertebrate Biodiversity in 2001. Both courses have proved to be popular, and they reflect the research strengths of many of the current teaching staff (McQuaid, Hodgson and Froneman, marine and estuarine biology; Bernard and Craig, mammalian biology and ornithology). The Marine Biology Honours students not only study local coastal ecosystems, but also often participate in Southern Ocean research cruises onboard the *SA Agulhas* where they receive training in biological oceanography. The Zoology and African Vertebrate Biodiversity Honours students are able to undertake research at many of the local national and private game reserves, taking advantage of the strong links forged by Bernard with game park owners and managers. When the Faculty of Science adopted semesterisation in 1998, undergraduate courses were also reorganised. In the past few years undergraduate student numbers in the Department have grown considerably. After an alarming dip in the numbers of Entomology students in the mid-1990s, the Department has seen growth in these courses, under the leadership of Martin Hill who was appointed Head of Entomology in 2002. Hill’s appointment once more sees biological control as a major

Table 1. Summary of significant milestones in the Department of Zoology & Entomology, Rhodes University

1905	Establishment of Chair of Zoology, J.E. Duerden appointed and arrived in May that year
1909	First Honours students
1913	Honours degree discontinued
1914/15	Science block built, Zoology occupied ground floor in 1916
1918	Zoology classes suspended due to influenza epidemic
1919	BSc degree introduced
1923	First MSc students
1924	Electric lights in laboratories
1925	Zoology moved into a converted gymnasium
1932	J.E. Duerden retired
1933	G.T. Brock acting head of department
1936	A. Lyle acting head of department, J. Omer-Cooper appointed senior lecturer
1937	J. Omer-Cooper appointed head of department
1940	J. Omer-Cooper promoted to Professor
1945	Honours degree re-introduced
1948	Department renamed Zoology & Entomology, Entomology courses offered
1949	1949 Department expanded into 2nd building next to the main university building
1950	First Entomology Honours students
1954	J. Omer-Cooper retired. First PhD student graduated
1955	D.W. Ewer appointed Professor and Head of Department, physiology and behaviour introduced into curriculum
1957	Rhodes turned down opportunity to house a new 'bird institute'
1958	Zoology & Entomology occupied new building on site of upper hut
1963	D.W. Ewer resigned, B.R. Allanson appointed to Chair of Zoology & Entomology and Head of Department, aquatic ecology significant component of curriculum
1963	Opening of the F.W. Armstrong laboratory, Port Alfred
1964	First expedition to Sibaya
1967	Building of Sibaya field station, establishment of Institute of Fresh Water Studies
1968	New transmission electron microscope purchased
1971	Establishment of Tick Research Institute, G.B. Whitehead appointed director
1972	F.W. Armstrong laboratory closed
1974	IFWS opened research station at Swartvlei
1975	New Zoology & Entomology building opened
1976	Sibaya research station flooded and closed
1977	Chair of Entomology established. V.C. Moran appointed to position. Biological Control group firmly established
1981	Southern Oceans Group established
1982	Establishment of Barclays Bank Chair of Limnology, R.C. Hart appointed
1983	G.B. Whitehead retired, I.G. Horak appointed director of TRU
1985	V.C. Moran resigned and moved to UCT in 1986
1986	H.R. Hepburn appointed to Chair of Entomology
1987	B.R. Allanson retired, I.G. Horak resigned as director of TRU, Chair of Limnology discontinued
1988	B. H. Fivaz appointed director of TRU
1990	Zoology & Entomology vacated 4th floor of building and lost ground floor laboratories
1991	C.D. McQuaid appointed to Chair of Zoology
1992	Honours course in Marine Biology introduced
1993	Additional floors added to building to house Biochemistry, departmental library is closed down, B.H. Fivaz resigns & TRU closed, 1000th peer-reviewed article published
1998	Courses semesterised
1999	Entomology celebrated 50 anniversary
2001	H.R. Hepburn retired, Honours in African Vertebrate Biodiversity introduced
2005	Centenary of department

research thrust within the Department. Whilst it is pleasing that so many students are keen to study zoology and entomology, staff are facing important challenges, including diminishing teaching resources but larger classes.

SOME CONCLUDING REMARKS

The major milestones of the Department have been summarised in Table 1. By international standards the Zoology & Entomology department has always had to cope with meagre resources, including a small complement of academic and technical staff (a complete record of staff since 1905 is lodged in the Cory library at Rhodes). This has required academic staff to teach outside of their area of expertise, and technicians have

had to acquire new skills. However, we have been fortunate in contributions from staff of other institutions to student training. Throughout the 100-year history of the Department, staff have maintained close links with the Albany Museum. Many of the Museum staff lecture in courses, and in turn departmental staff have served on the Museum Board of Directors and as honorary curators. Members of the I.W.R. and S.A.I.A.B. (formerly J.L.B. Smith Institute) have also taught courses in the Department.

In the last two decades academic staff turnover has been relatively low, while research productivity has remained high. At an average of 35 peer-reviewed papers per year, just over sixty per cent of the total number of departmental papers has

been published in the last 25 years. Despite offers of local or overseas appointments, some staff have elected to stay at Rhodes. Perhaps one reason for this is that the Department provides a cooperative and supportive working environment.

This history would not be complete without acknowledging the important role the students have played. Student training at both an undergraduate and postgraduate level has been the core business of the Department ever since its inception. In addition to the countless undergraduates who have obtained a major in Zoology and/or Entomology, 92 Doctoral, 153 Masters, and 259 Honours students have graduated from the Department. The staff have been privileged to have trained many exceptional students. The list of Honours, MSc and PhD graduates (housed in the Cory Library at Rhodes) reveals many names of successful academics as well as directors of museums and research institutions. Whereas some students completed their academic training at Rhodes, others proceeded to other centres of higher education.

The Department has always prided itself on its international contacts, and recently the number of international students studying for higher degrees has grown. These students have integrated into the Department and greatly enriched it. All students have also played a significant role in the Department's social life. This includes the establishment of an active Zoological Society, which organises regular talks, social functions, excursions and sporting events. Students are, of course, the future of the Department. Judging by the number of students attracted to zoology and entomology in recent years, the outlook for the department at Rhodes as we enter the next 100 years is excellent.

ACKNOWLEDGEMENTS

In 1985 a short history of the Department was published (Hodgson & Allanson, 1985). This centennial history can be regarded as a corrected, expanded and revised 2nd edition of that document which formed the backbone of this work. In addition a considerable amount of information was obtained from Rhodes University calendars, graduation programmes and documents lodged in the Cory Library at Rhodes. Nevertheless this history would not have been possible without considerable assistance and input of others. Numerous people have provided photographs, information, letters and anecdotes, and we regret that we could not include them all. All correspondence and documents, however, are lodged in the Cory Library, Rhodes University, Grahamstown. We give special thanks for assistance to Brian Allanson, Robin Cross, Casper de Villiers, Jakes Ewer, Randall Hepburn, Pat Hulley, Bidy Greene (nee Ewer), Peter Jackson, Mervyn Mansell, Peter Miles, Graham Moodie, Moosa Motara, Dale Ranchhod, Jack Skead, Donal Skinner, Harry Thackwray and Gay Youthed. We are particularly indebted to Patrick Wyse Jackson for sending us an unpublished biographical account of J.E. Duerden. Thanks to the library staff of Rhodes University especially Sue Rionda and Sue van der Riet as well as the staff of the Cory library. Finally we thank Leigh Stuart who assisted with the onerous task of compiling information on departmental publications, staff and students.

REFERENCES

ADAMS N.J. & BROWN C.R. 1990. Energetics of molt in penguins. In Davis, L.S. & Darby, J.T. (Eds) *Penguin Biology*. New York, Academic Press. pp. 297–315.

ALEXANDER A.J. 1956. Mating in scorpions. *Nature* **178**: 867–868.

ALEXANDER, A.J. 1957. The courtship and mating of the scorpion, *Opisthophthalmus latimanus*. *Proceedings of the Zoological Society of London* **128**: 529–544.

ALEXANDER, A.J. 1958. On the stridulation of scorpions. *Behaviour* **12**: 339–352.

ALEXANDER, A.J. & EWER, D.W. 1957a. On the origin of mating behaviour in spiders. *The American Naturalist* **91**: 311–317.

ALEXANDER, A.J. & EWER, D.W. 1957b. A chemo-receptor in the scorpion *Opisthophthalmus*. *South African Journal of Science* **53**: 421–422.

ALEXANDER, A.J. & EWER, D.W. 1958. Temperature adaptive behaviour in the scorpion, *Opisthophthalmus latimanus* Koch. *The Journal of Experimental Biology* **35**: 349–359.

ALLANSON, B.R. (Ed.) 1979. *Lake Sibaya. Monographiae Biologicae* **36**. 347 pp.

ALLANSON, B.R. & BAIRD, D. (Eds) 1999. *Estuaries of South Africa*. Cambridge, Cambridge University Press. 340 pp.

ALLANSON, B.R. & WHITFIELD, A.K. 1983. The limnology of the Touw River floodplain. *South African National Scientific Programmes Report No. 79*. 35 pp.

ANNECKE, D.P. & MORAN, V.C. 1982. *Insects and Mites of Cultivated Plants in South Africa*. Durban, Butterworths. 383 pp.

ANON. 1937. Prof. J.E. Duerden. *Nature* **140**: 576.

BERNARD, R.T.F. 1989. The adaptive significance of reproductive delay phenomena in some South African Microchiroptera. *Mammal Review* **19**: 27–34.

BERNARD, R.T.F. & CUMMING, G.S. 1997. African bats: evolution of reproductive patterns and delays. *The Quarterly Review of Biology* **72**: 253–274.

BLABER, S.J.M. 1973. Temperature and salinity tolerance of juvenile *Rhabdosargus holubi* (Steindachner) (Teleostei: Sparidae). *Journal of Fish Biology* **5**: 593–598.

BLABER, S.J.M. 1974. Field studies of the diet of *Rhabdosargus holubi* (Pisces: Teleostei: Sparidae). *Journal of Zoology, London* **173**: 407–417.

BROWN, A.C. 1977. The amateur scientist. In Brown, A.C. (Ed.) *A History of Scientific Endeavour in South Africa*. Cape Town, Royal Society of South Africa. pp. 454–473.

BRUTON, A.G. 1979. A history of the research station at Lake Sibaya: its people and development. In Allanson, B.R. (Ed.) *Lake Sibaya. Monographiae Biologicae* **36**. pp. 329–343.

BRUTON, M.N. 1979. The breeding biology and early development of *Clarias gariepinus* (Pisces: Clariidae) in Lake Sibaya, South Africa, with a review of breeding in species of the subgenus *Clarias* (*Clarias*). *Transactions of the Zoological Society of London* **35**: 1–45.

BUCKLAND, R. & NEVILLE, T. 2004. *A Story of Rhodes. Rhodes University 1904 to 2004*. Braamfontein, MacMillan. 150 pp.

CRAIG, A.J.F.K. 1988. Coastal birds. In Lubke, R.A., Gess, F.W. & Bruton, M.N. (Eds) *A Field Guide to the Eastern Cape Coast*. Grahamstown, Wildlife Society. pp. 265–287.

CRAIG, A.J.F.K. 1999. Anting in Afrotropical birds: a review. *Ostrich* **70**: 203–207.

CRAIG, A.J. F. 2000. Family Sturnidae: 7 species accounts. In Fry, C.H. & Keith, S. (Eds) *The Birds of Africa. Vol. VI. Picathartes to Oxpeckers*. London, Academic Press. pp. 582–584, 586–587, 592–593, 599–600, 602–603, 618–619, 634–636.

CRAIG, A.J.F. 2004. Family Ploceidae: 86 species accounts. In Fry, C.H. & Keith, S. (Eds) *The Birds of Africa. Vol. VII. Sparrows to Buntings*. London, Christopher Helm. pp. 48–73, 76–77, 101–137, 140–142, 148–151, 153–164, 170–196, 204–251.

CUMMING, G.S. & BERNARD, R.T.F. 1997. Rainfall, food abundance and timing of parturition in African bats. *Oecologia* **111**: 309–317.

CURREY, R.F. 1970. *Rhodes University 1904–1970. A Chronicle*. Cape Town, The Rustica Press. 186 pp.

DE VILLIERS, C., HODGSON, A.N. & FORBES, A. 1999. Studies on estuarine macroinvertebrates. In Allanson, B.R. & Baird, D. (Eds) *Estuaries of South Africa*. Cambridge, Cambridge University Press. pp. 167–207.

DUERDEN, J.E. 1918. Absence of xenia in ostrich eggs. *Journal of Heredity* **9**: 243–245.

DUERDEN, J.E. 1919a. The germplasm of the ostrich. *American Naturalist* **53**: 312–337.

DUERDEN, J.E. 1919b. Crossing the North African and South African ostrich. *Journal of Genetics* **8**: 155–199.

DUERDEN, J.E. 1920a. Inheritance of callosities in the ostrich. *American Naturalist* **54**: 289–312.

- DUERDEN, J.E. 1920b. Methods of degeneration in the ostrich. *Journal of Genetics* **9**: 131–193.
- DUERDEN, J.E. 1920c. Parallel mutations of the ostrich. *Science* **52**: 165–168.
- DUERDEN, J.E. 1920d. Ostrich study in South Africa. *Nature* **105**: 106–108.
- DUERDEN, J.E. 1920e. A stalked parapineal vesicle in the ostrich. *Nature* **105**: 516–517.
- DUERDEN, J.E. 1927. Standards of thickness and crimps in Merino wools. *Journal of the Textile Institute* **20**: T93–T100.
- EWER, D.W. 1960. Inhibition and rhythmic activity of the circular muscles of *Calliactis parasitica* (Couch). *The Journal of Experimental Biology* **37**: 812–831.
- EWER, D.W., POPLER, W. & ROSS, D.M. 1961. Sulfhydryl groups and neuromuscular activity in invertebrates. *Doklady Akademija Nauk SSSR* **137**: 240–243.
- EWER, R.F. 1956a. The fossil carnivores of the Transvaal Caves: Felinae. *Proceedings of the Zoological Society of London* **126**: 83–95.
- EWER, R.F. 1956b. The fossil carnivores of the Transvaal Caves: Canidae. *Proceedings of the Zoological Society of London* **126**: 97–119.
- EWER, R.F. 1956c. The fossil carnivores of the Transvaal Caves: two new viverrids, together with some general considerations. *Proceedings of the Zoological Society of London* **126**: 259–274.
- EWER, R.F. 1956d. The fossil suids of the Transvaal Caves. *Proceedings of the Zoological Society of London* **127**: 527–544.
- EWER, R.F. 1956e. Imprinting in animal behaviour. *Nature* **177**: 227–228.
- EWER, R.F. 1957. Ethological concepts. *Science* **126**: 599–603.
- EWER, R.F. 1958. The fossil Suidae of Makapansgat. *Proceedings of the Zoological Society of London* **130**: 329–372.
- EWER, R.F. 1968. *Ethology of Mammals*. London, Logos Press. 418 pp.
- FORBES, A.T. 1973. An unusual abbreviated larval life in the estuarine burrowing prawn *Callinassa kraussi* (Crustacea: Decapod: Thalassinidea). *Marine Biology* **22**: 361–365.
- GRUBER, S.A. & EWER, D.W. 1962. Observations on the myo-neural physiology of the polychaete, *Planocera gilchristi*. *Journal of Experimental Biology* **39**: 459–477.
- HART, R.C. 1977. Feeding rhythmicity in a migratory copepod (*Pseudodiaptomus hessei* Mrazek). *Freshwater Biology* **7**: 1–8.
- HEPBURN, H.R. 1986. *Honeybees and Wax: an Experimental History*. Berlin, Springer Verlag. 205 pp.
- HEPBURN, H.R. & RADLOFF, S.E. 1998. *Honeybees of Africa*. Berlin, Springer Verlag. 367 pp.
- HILL, B.J. 1975. Abundance, breeding and growth of the crab *Scylla serrata* in two South African estuaries. *Marine Biology* **32**: 119–126.
- HILL, B.J. 1977. The effect of heated effluent on egg production in the estuarine prawn *Upogebia africana* (Ortmann). *Journal of Experimental Marine Biology and Ecology* **29**: 291–302.
- HILL, B.J. & ALLANSON, B.R. 1971. Temperature tolerance of the estuarine prawn *Upogebia africana* (Anomura, Crustacea). *Marine Biology* **11**: 337–343.
- HODGSON, A.N. 1995. Spermatozoal morphology of Patellogastropoda and Vetigastropoda (Mollusca: Prosobranchia). *Memoirs du Muséum national d'Histoire naturelle* **166**: 167–177.
- HODGSON, A.N. 1997. Paraspermatozoa in gastropod molluscs. *Invertebrate Reproduction and Development* **31**: 31–38.
- HODGSON, A.N. 1999a. The biology of siphonariid limpets (Gastropoda: Pulmonata). *Oceanography and Marine Biology: an Annual Review* **37**: 245–314.
- HODGSON, A.N. 1999b. Paraspermatozoa. *Encyclopedia of Reproduction* **3**: 656–668.
- HODGSON, A.N. & ALLANSON, B.R. 1985. *80 Years of Zoology at Rhodes University*. Port Elizabeth, Acme Print & Pack. 18 pp.
- MACNAE, W. 1954a. On some eolidacean nudibranchiate molluscs from South Africa. *Annals of the Natal Museum* **13**: 1–50.
- MACNAE, W. 1954b. On four sacoglossan molluscs new to South Africa. *Annals of the Natal Museum* **13**: 51–64.
- MACNAE, W. 1955. On four species of the genus *Aplysia* common in South Africa. *Annals of the Natal Museum* **13**: 223–241.
- MARTIN, L. & BERNARD, R.T.F. 2000. Endocrine regulation of reproduction in bats: the role of circulating gonadal hormones. In Crichton, E.G. & KRUTZSCH, P.H. (Eds.) *Reproductive Biology of Bats*. London, Academic Press. pp. 27–64.
- MCQUAID, C.D. 1996a. Biology of the gastropod family Littorinidae. I. Evolutionary aspects. *Oceanography and Marine Biology: an Annual Review* **34**: 233–262.
- MCQUAID, C.D. 1996b. Biology of the gastropod family Littorinidae. II. Role in the ecology of intertidal and shallow marine ecosystems. *Oceanography and Marine Biology: an Annual Review* **34**: 263–302.
- MCQUAID, C.D. & FRONEMAN, P.W. 2004. The Southern Ocean group at Rhodes University: seventeen years of biological oceanography in the Southern Ocean reviewed. *South African Journal of Science* **100**: 571–577.
- NORVAL, R.I.A. 1985. Ticks (Ixodoidea) and tick-borne diseases in southern Africa. Unpublished DSc thesis, Rhodes University.
- O'KEEFFE, J.H., DAVIES, B.R., KING, J.M. & SKELTON, P.H. 1989. The conservation status of southern African rivers. In Huntley, B.J. (Ed.) *Biotic Diversity in Southern Africa – Concepts and Conservation*. 17. Oxford University Press, Oxford. pp. 266–289.
- OMER-COOPER, J. & WHITNALL, A.B.M. 1945. An arsenic-resistant tick. *Nature* **156**: 450–451.
- PAKHOMOV, E.A. & FRONEMAN, P.W. 1999. The Prince Edward Islands pelagic ecosystem, South Indian Ocean: a review of achievements, 1976–1990. *Journal of Marine Systems* **18**: 355–367.
- PERISSINOTTO, R. 1995. Marine productivity. *Encyclopedia of Environmental Biology* **2**: 507–521.
- POPLER, W. & EWER, D.W. 1958. Studies on the myoneural physiology of Echinodermata. III. Spontaneous activity of the pharyngeal retractor muscle of *Cucumaria*. *Journal of Experimental Biology* **35**: 712–730.
- RECHAV, Y., WHITEHEAD, G.B. & KNIGHT, M.M. 1976. Aggregation response of nymphs to pheromone(s) produced by males of the tick *Amblyomma hebraeum* (Koch). *Nature* **259**: 563–564.
- RIBBINK, A.J. 1977. Cuckoo among lake Malawi cichlid fish. *Nature* **267**: 243–244.
- VAN HILLE, J.C. 1979. Obituary. Joyce Omer-Cooper 19 October 1899 – 1 June 1979. *Journal of the Entomological Society of Southern Africa* **42**: 405–408.
- VAN HILLE, J.C. 1984. Monograph of *Aulacoderus* la Ferté, a subgenus of *Anthicus* Paykull (Coleoptera: Anthicidae). *Annals of the Cape Provincial Museums* **15**: 1–171.
- VAN HILLE, J.C. & WHITNALL, A.B.M. 1973. Obituary. Joseph Omer-Cooper (1893–1972). *Journal of the Entomological Society of southern Africa* **36**: 183–184.
- WHITEHEAD, G.B. 1973. Resistance to acaricides in ticks in the Eastern Cape Province. *South African Medical Journal* **47**: 342–344.
- WHITFIELD, A.K., ALLANSON, B.R. & HEINECKEN, T.J.E. 1983. Report No. 22: Swartvlei. In Heydorn, A.E.F. & Grindley, J.R. (Eds.) *Estuaries of the Cape, Part II: Synopses of Available Information on Individual Systems*. Pretoria, CSIR Research Report 421, 62 pp.
- WHITNALL, A.B.M. 1954. The resistance of some species of ticks to chemical insecticides and supporting papers. Unpublished DSc thesis, Rhodes University.
- WHITNALL, A.B.M., THORBURN, J.A., WHITEHEAD, G.B., MCHARDY, W.M. & MEERHOLZ, 1949. A tick resistant to γ -benzene hexachloride. *Nature* **164**: 956.
- ZIMMERMANN, H.G. & MORAN, V.C. 1982. Ecology and management of cactus weeds in South Africa. *South African Journal of Science* **78**: 314–320.