



Charles Kimberlin (Bob) Brain (1931–2023): Naturalist, scientific leader, and family man

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Bob Brain's career as a naturalist was almost predestined, as he was born into a family of scientists with an entomologist father and botanist mother. He devoted his life to science, and his multidisciplinary scientific pursuits gained international acclaim. Bob was born on 7 May 1931 in what was then Salisbury, Rhodesia, and matriculated at Pretoria Boy's High School at the age of 16 in 1947. He then proceeded to the University of Cape Town where he obtained his BSc degree in Zoology and Geology, and later a PhD as well.

While still a scholar at Pretoria Boy's High School, Bob began what was to become a lifelong association with the Transvaal Museum when he went there to learn how to mount birds.¹ Apart from a short spell as a geologist with the National Building Research Institute at the CSIR, he had a long and distinguished career at the Transvaal Museum. He started in the Palaeontology Department where he was employed on contract as a research associate from 1954 to 1957, with a grant from the Wenner-Gren Foundation for Anthropological Research in New York.² Here, at the suggestion of John Robinson, then curator of palaeontology at the Museum, he undertook the first systematic investigation into the stratigraphy of the South African fossil hominid-bearing cave deposits. Here he established that each deposit was of a different age and reflected a different climatic regime. An important consequence of this research at both Sterkfontein and Makapansgat caves, was the discovery, for the first time, of stone artifacts associated with *Australopithecus*.³ As his contract in the Palaeontology Department had come to an end, Bob was appointed curator of Lower Vertebrates in 1957, the only position then available at the Transvaal Museum, during which time he published on frogs, snakes and lizards. This position was previously occupied by Dr Vivian FitzSimons, the noted South African herpetologist who had taken up the directorship of the Museum. Bob worked closely with FitzSimons in completing the landmark book *The Snakes of South Africa*. A highlight of this period was demonstrating that species-specific behaviour patterns in reptiles could be used as taxonomic criteria in the same way as morphological features, and he applied this pioneering approach to chameleons and barking geckos.

In the early 1960s three new museums were being built in Zimbabwe (then Rhodesia) and Bob participated in this exciting development by simultaneously taking up the positions of Keeper of Zoology and Deputy Director of the Queen Victoria Museum in Harare from 1961 to 1964. Here he undertook pioneering comparative behavioural research on monkeys and was also responsible for the spectacular zoological display at this museum, which remains today. He returned to the Transvaal Museum in 1965 as Curator of the Palaeontology Department, and, 3 years later was appointed Director, remaining in this position for 23 years until his retirement in 1991.⁴ Here he planned and co-ordinated three major display halls and, through his own productive research example, established the Transvaal Museum as an internationally renowned research institution.

With a remarkable multidisciplinary approach, Bob undertook groundbreaking research at the Swartkrans fossil hominid cave over a 28-year period. He began by first sorting through the dumps left behind by the earlier lime miners over a period of 7 years and later continued with excavations which resulted in the cataloguing of at least 170 fossil hominid specimens, and 4800 faunal fossils, stone and bone artefacts. His broadly focused taphonomic study resulted in numerous publications and culminated in the production of two books: *The Hunters or the Hunted? An introduction to African Cave Taphonomy* and later *Swartkrans: A Cave's Chronicle of Early Man*. A dramatic finding from Swartkrans was the oldest evidence for the controlled use of fire by hominids dating to about one million years ago which was presented in a paper published in *Nature*.⁵

To determine the mode of accumulation of the Swartkrans bone assemblage, Bob collected and studied bony food remains scattered around Nama settlements in Namibia to gain an understanding of the effects of human behaviour on bone accumulations. Coupled with this he researched the feeding behaviour of different carnivores, especially cheetahs which were kept on a farm in Namibia. This work demonstrated that bone assemblages from Makapansgat that had originally been attributed by Raymond Dart to early hominid activity⁶, possibly had other explanations and were probably the result of carnivore activity. These innovative ideas led to the new discipline of African cave taphonomy, which enables the reconstruction of early hominid behaviour and palaeoenvironments. In this field Bob was an international leader.

From his palaeontological and geological research at Swartkrans, Bob was further able to identify cycles of deposition within the Quaternary period and linked habitat changes to global variability in temperature which he correlated with hominid evolutionary events in Africa.⁷ For the results of this multifaceted research, he was awarded a DSc by the University of the Witwatersrand in 1981.

Bob Brain was one of the founders of the Namib Desert Research Station at Gobabeb in 1959, together with Bernard Carp, Vivian FitzSimons and Charles Kock. Later, as Director of the Transvaal Museum, he was responsible for guiding Gobabeb to establish itself as a research station of international repute for work on desert ecology.⁸

Apart from his busy research and administrative schedule, Bob was also a dedicated museum educationalist, greatly expanding the education department of the Museum under the guidance of O.P.M. Prozesky. He also planned and co-ordinated the completion of three display halls which are still the backbone of the museum exhibits: Austin Roberts Bird Hall, Life's Genesis I and Life's Genesis II. In the latter two exhibits, he successfully experimented with a narrative concept leading visitors through a succession of displays depicting the development of life through the ages so that the visitor experienced a unified storyline rather than a set of disjointed displays.^{9,10}

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An inseparable partnership – Bob and Laura at their home in Irene, Pretoria

After retiring as Director in 1991, Bob shifted his research focus and was appointed Curator of Lower Invertebrates at the Museum. Initially he worked on the taxonomy of rotifers which led him to consider the origins of multicellularity and also predation as a mediator in the evolution of sense organs and intelligence in both prey and predators.¹¹ In the process, he undertook pioneering fieldwork which led to the discovery of a new fauna of early metazoan fossils from the Late Precambrian Otavi Group of Namibia.¹²

As a gifted public speaker, Bob was invited to present at many prestigious lectures: Alex du Toit Memorial Lecture (Geological Society of South Africa); Sidney Haughton Memorial Lecture (Royal Society of South Africa); Schonland Memorial Lecture (Royal Society of South Africa); Meester Memorial Lecture (Kaffrarian Museum); Sidney Rubidge Memorial Lecture (Graff-Reinet Training College); 70th James Arthur Lecture (American Museum of Natural History); Robert Broom Memorial Lecture (Ditsong Museum).

Bob belonged to numerous scientific organisations which he served with distinction: Royal Society of South Africa (Fellow); Museums Association of Southern Africa (Fellow; Life Member; President); Academy of Science of South Africa (Founder Member); Archaeological Society of South Africa (Founder Member; Councillor; President) Transvaal Branch (Patron); Zoological Society of Southern Africa (Founder Member; Councillor; President); South African Biological Society (Founder Member; Councillor; President); South African Association for Quaternary Research (Founder Member; Councillor; President); Palaeontological Society of Southern Africa (Founder Member; Councillor; first President, Honorary Life Member); South African Association for the Advancement of Science (Founder Member; Councillor; President); Royal Society of South Africa (Councillor; Vice-president); Speleological Association of South Africa; (Honorary Life Member); Zoological Society of London; Southern African Society of Aquatic Scientists (Member); Anatomical Society of Southern Africa (Member); Microscopy Society of Southern Africa (Member); Queckett Microscopical Club, London (Member); International Society of Protozoologists; International Society of Cryptozoology (Member); Spider Club of South Africa (Honorary Member).

Bob received many awards, including honorary DSc degrees from the Universities of Cape Town, Natal, Pretoria, and Witwatersrand; Gold medal of the Zoological Society; Honorary membership of the Palaeontological Society of southern Africa and the Geological Society of South Africa; Senior Captain Scott Memorial Medal of the South African Biological Society; Achievement Award of the Claude Harris Leon Foundation;

John FW Hershel Medal of the Royal Society of South Africa; one of the four outstanding young South Africans; and the South African Medal of the South African Association for the Advancement of Science for exceptional contributions to science (1997); Certificate of Merit from the Southern African Association for the Advancement of Science (2002); A-rated Researcher by the FRD (NRF) from inception in 1984 to 1997.

As is evidenced by more than 160 publications and several books, Bob Brain had an extraordinarily diverse and productive research career in which he was loyally supported by his wife Laura, and their four children. All research projects undertaken by him were imaginative and innovative, and produced significant results with universal applicability which have withstood the test of time. He inspired the younger generation to undertake research and supervised the theses of at least 18 local and international master's and doctoral students.

Bob's scientific pursuits have brought great honour to South Africa. While Director of the Transvaal Museum, he established a happy environment with staff who were passionate about their work. The institution gained an international reputation for its diverse natural history research endeavours, achieved through allowing staff considerable personal freedom, provided productivity was maintained. Bob stressed the importance of fun in research. He maintained that if this was in place, creativity and productivity would follow naturally. He constantly warned against the danger of obsession with performance to the detriment of creativity. Bob was naturally warm-hearted, and the welcoming Brain household was an extremely happy one with much fun and banter which Bob once described as "children inter-stratified with rocks and fossils". His wife Laura and their children Rosemary (Mel), Virginia (Ginni), Tim and Conrad (Nad) were all accommodated in the "Brain family research endeavour" from which they all derived great enjoyment and personal fulfilment.

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