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Charles Kimberlin (Bob) Brain - a tribute

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CHARLES KIMBERLIN (BOB) BRAIN – A TRIBUTE

This volume of *Palaeontologia africana* comprising mainly papers presented at the tenth biennial conference of the Palaeontological Society of Southern Africa is dedicated to a remarkable person, a committed scientist, passionate naturalist, a leader in science, and dedicated family man and friend, who is an inspiration to all who know him.

Charles Kimberlin Brain was born on 7 May 1931 in what was then Salisbury, Rhodesia. From his earliest years he had close contact with natural history as his father was an entomologist, and his mother qualified as a botanist. At the time of his birth his father (also Charles Kimberlin) was Secretary for Agriculture in Southern Rhodesia, and his earliest memories were of accompanying his father on botanical outings as he was compiling a book on the flora of Southern Rhodesia. His independence of thought was manifested at an early age when he announced to his parents that his name was not Charles Kimberlin, but Bob, and this name has stuck ever since.

In the course of the Second World War his father retired from his position in the Department of Agriculture, and worked for two years at the National Museum in Bulawayo where the young Bob came into contact with Geoffrey Bond (later Professor of Geology and Vice-Principal of the University of Zimbabwe) and Neville Jones (retired missionary and pioneer in the study of Rhodesian prehistory). Both had inquisitive dispositions and had a strong influence in instilling a sense of questioning in young Bob's mind.

At the end of the war the Brain family relocated to South Africa and settled in Pretoria where Bob spent the last three years of his schooling, matriculating at Pretoria Boy's High School at the age of 16 in 1947. During these three years he began his association with the Transvaal Museum as he went there to learn to mount birds. On matriculating, Bob proceeded to the University of Cape Town to read for a BSc degree with geology and zoology as major subjects. This subject choice was made despite contrary advice by university staff, as they perceived it to be a senseless combination with poor prospects for job opportunities. However this particular combination of subjects was later to bring about great research possibilities for Bob. After completion of this degree, Bob wished to continue with an MSc in marine biology but a shortage of finance necessitated him taking a job in 1951 as a geologist with the National Building Research Institute at the CSIR in Pretoria. However, by 1954 he was keen to return to natural history research and this was the beginning of his professional association with the Transvaal Museum.

Although a great deal of international interest had been generated by the discovery of australopithecine ape-men fossils by Dart and Broom, the geological context of these discoveries was very poorly understood in the early 1950s. At the suggestion of John Robinson, then working at the Transvaal Museum, Bob began to apply sediment analysis techniques which he had learnt at the CSIR to the Transvaal cave deposits. He subsequently came up with the suggestion that ancient soils might be used as indicators of past climates and also undertook an investigation of the stratigraphy of the sites. This was the beginning of Bob's long and successful association with the Swartkrans fossil hominid site which has brought both him and the site international acclaim and fame. As a result of this initial geological work, and on the recommendation of Kenneth Oakley of the British Museum (Natural History), a substantial grant was made to the Palaeontology Department at the Transvaal Museum by the Wenner-Gren Foundation for Anthropological Research in New York. This made it possible for Bob to be employed as a Research Associate in the Palaeontology Department from 1954-1957. In this time he undertook the first systematic investigation into the stratigraphy of the fossil hominid-bearing cave deposits, and established that each cave deposit was of a different age and reflected a different climatic regime. An important consequence of this research was his discovery, for the first time, of stone artefacts associated with *Australopithecus* both



Figure 1. Early days – out in the field, where he loves to be.



Figure 2. Partners in all they do – Bob and his wife, Laura

at Makapansgat and Sterkfontein. In 1957 he obtained a PhD from the University of Cape Town for a thesis entitled "*The Transvaal ape-man-bearing cave deposits*" which was later published as a monograph by the Transvaal Museum.

In 1955 Bob married Laura (Kraan), who was then working as a geologist at the CSIR. This was a union made in heaven which has brought them great happiness and fulfilment. Together they have travelled southern Africa and the world, whether it be on research and collecting expeditions, to attend conferences, or to address different gatherings. Everything they have done they have done together and Bob's manifold achievements are Laura's too. Together they have established a warm, welcoming and peaceful atmosphere in their home in Irene, south of Pretoria

In the same year, at the second Pan-African Congress on Prehistory, Bob first heard Raymond Dart present his ideas on the bloodthirsty carnivorous origins of man. These ideas emanated from his research at the hominid-bearing site at Makapansgat where he analysed several thousand fossil bone fragments, and was particularly interested in how all these bones had accumulated in the ancient cave. Later, in a series of papers, Dart postulated that the fossilised bones of animals found in association with remains of *Australopithecus* had actually been used as tools by them. These ideas stimulated in Bob a desire to understand the behaviour of early hominids, a quest which was later to occupy a great deal of his research time.

At the end of his contract period in the Palaeontology Department in 1957, Bob was appointed curator of Lower Vertebrates, the only position then available at the Transvaal Museum. This position was previously occupied by Dr Vivian FitzSimons, the noted South African herpetologist, who was currently director of the Museum. Bob worked closely with FitzSimons in completing a major book, *The Snakes of South Africa*, and published several papers on frogs, snakes and lizards. One of the highlights of this period of his research career was in demonstrating that behaviour patterns of certain reptile species could be used as taxonomic criteria in the same way as morphological features are used.

In the early 1960s new exciting museum developments were taking place in Rhodesia as three new museums were about to be built. Keen to return to his country of birth, in 1961 Bob accepted appointment as Keeper of Zoology at the newly erected Queen

Victoria Museum in Harare and at the same time was Deputy Director of the National Museums of Rhodesia. These positions he held until1964. During this time he speculated on the nature and behaviour of early man and undertook pioneering comparative behavioural research on vervet and samango monkeys. He was also responsible for the planning and installation of the zoological display at this museum which remains virtually unchanged to this day.

At the invitation of Vivian FitzSimons, Bob returned to the Transvaal Museum in 1965 to take up the post of Curator in the Department of Palaeontology after John Robinson had left to take up a position at the University of Wisconsin. Three years later Bob was appointed Director of this museum, a position he held for twenty-three years. Being back in Pretoria, he now at last had the opportunity to research the fossils of the early man caves of the Transvaal, as he was convinced that these would provide new insights into the behaviour of early hominids. Because the existing fossil collections from Sterkfontein and Kromdraai seemed adequate for this purpose, his first objective was to accumulate a large and representative collection of fossil bones from Swartkrans. This was achieved by first sorting for seven years through the dumps of the lime miners, and later by extensive excavations and investigations. Wednesdays were set aside for fieldwork at Swartkrans, and for 21 years Bob assiduously kept this weekly appointment so that he could work with his technicians. In the process Bob discovered several hundred early hominid fossils, making him singly one of the greatest discoverers of early man in Africa. This broadly focussed model taphonomic study continued for twenty-eight years resulting in numerous publications and culminating in the publication of two milestone books, namely *The Hunters or the Hunted? An Introduction to African Cave Taphonomy* and *Swartkrans: a Cave's Chronicle of Early Man.*

With characteristic diligence and a multifaceted approach to solving scientific problems, Bob in addition collected and studied discarded bony food remains scattered around "Hottentot" (Nama) settlements along the banks of the Kuiseb River in Namibia in order to understand the effects of human behaviour on bone accumulations. This necessitated gathering every bone fragment lying around 15 villages. Because the skeletal representation from these accumulations was comparable to the fossil samples, Bob was able to deduce that only those skeletal parts which were robust enough to survive the feeding activities of humans and carnivores were the ones with the greatest chance of becoming fossilised. In addition, he studied the feeding behaviour of various carnivores, especially cheetahs which he kept in captivity, in order to establish the different ways in which fossil bone-accumulations occurred in cave deposits. Bob demonstrated that primate skeletons were more vulnerable to damage from chewing than those of antelope of equivalent body weight in that the postcranial skeletons of baboons tended to disappear while the heads survived, whereas most components of the antelope skeletons survived. This work showed that the disproportional representation of skeletal parts in bone assemblages that had originally been recognised by Dart at Makapansgat, and had been attributed by him to human activity, possibly had other explanations. This research led directly to the new discipline of cave taphonomy, a study which allows reconstruction of early hominid and other animal behaviour, and in which Bob established himself as an international leader.

Meticulous analysis by Bob of thousands of fossil remains as well as stone and bone artifacts from Sterkfontein, often with numerous international collaborators, produced the most detailed information available on the fauna of this part of Africa. Of particular significance were his findings relating to the cultural status of hominids at this time, 1.8 to 1 million years ago, as well as information on the importance of predation in early hominid life. He came to the conclusion that the australopithecine remains in the caves of the Sterkfontein valley had been taken to the caves by carnivores and eaten there, the fossils representing discarded food remains. One of the most dramatic findings during the later years of the Swartkrans excavation was the discovery of burnt bone through a vertical profile of six metres. After a great amount of careful histological and experimental work by Bob, with chemical confirmation by Andrew Sillen, these burnt bones were shown to provide the earliest evidence for the controlled use of fire by hominids, dating to about one million years ago, and suggested that fires were repeatedly made on the floor of the cave over a period of some thousands of years. An additional highlight was the discovery of bones with characteristic scratch marks and smooth tapering points that Bob considered had been used as digging tools, a conclusion confirmed by his son Conrad, who conducted digging experiments using modern bone flakes.

From this thorough work at the Swartkrans site Bob was also able to identify cycles of deposition within the Quaternary period. He linked habitat changes to global variability in temperature and correlated these, for the first time, with hominid evolutionary events in Africa. For the results of this multi-faceted research Bob was awarded a DSc by the University of the Witwatersrand in 1981.

Bob Brain, together with Bernard Carp, Vivian FitzSimons and Charles Koch was one of the founders and initiators of the Namib Desert Research Station in 1959 when they organised an expedition to the Gobabeb area to select a site for the station. As director of the Transvaal Museum, Bob was later responsible for guiding Gobabeb to becoming a research station of international repute for the work on desert ecology undertaken by its staff and collaborators. Several times a year he visited Gobabeb where he camped in the same spot under the acacia trees and always made a wood fire to give a homely atmosphere to his camp. Bob himself undertook research and wrote papers on various aspects of natural history of the Namib. These ranged from



Figure 3. The consummate communicator – Bob explains what happened at Swartkrans

taxonomic work on micro-organisms, the use of protozoans as palaeoecological indicators, through observations on the temperature balance of lizards, the description of new gecko species, speculations on the origin of sidewinding locomotion in adders, to taphonomic studies on "Hottentot" food remains.

During his term as Director, Bob established the Transvaal Museum as a happy and highly productive institution with an international reputation for its research endeavours. This he achieved by allowing his staff considerable personal freedom, provided that productivity was maintained. He strove to maintain the Transvaal Museum as a place of quiet scholarship staffed by committed people who derived real pleasure from working at the museum.

Apart from leading from the front with his own busy research schedule, Bob was in addition a dedicated museum educationalist. During his directorship the education department of the Museum was greatly expanded under the stimulating guidance of O.P.M. ("Proz") Prozesky. Bob also planned and co-ordinated the completion of three new display halls: The Austin Roberts Bird Hall, Life's Genesis I and Life's Genesis II. For the latter two exhibits he successfully experimented with a 'narrative concept' where visitors were treated to a series of displays depicting the development of life from its simplest beginnings to its present complexity. The advantage of this display technique is to provide the visitor with a unified experience rather than a set of disjointed displays.

In addition to all his other activities Bob has given long, loyal and distinguished service to the museum profession, has served on the Council of the Southern African Museums Association for many years and has been its President for two terms. In addition he has served on the councils of many professional societies and been president of the Southern African Archaeological Society, Zoological Society of Southern Africa, South African Biological Society, South African Society for Quaternary Research, Southern African Association for the Advancement of Science (President of section D - Zoology), and was the first President of the Palaeontological Society of Southern Africa. He has also inspired others to undertake research and has acted as supervisor to at least 18 masters and doctoral students.

When he retired as Director of the Transvaal Museum in 1991, Bob became Curator of Lower Invertebrates at the Museum and his research interest shifted to micro-invertebrates, where he gave particular attention to the fauna of saline and temporary water bodies in the arid western regions of South Africa. His attention was attracted to rotifers in particular, on which he undertook mainly taxonomic research. These simple multi-celled organisms led him to think about the origins of multicellularity and resulted in his pioneering search for ancestral multicellular micro-invertebrate fossils in limestones of the Neoproterozoic Nama Group. This has proved to be a very labour intensive project in which his wife Laura has played an important part, as she is responsible for cutting and grinding numerous rock samples and preparing hundreds of thin sections in the hopes that some prehistoric ancestral multicellular creature would be revealed. This research is now producing internationally significant results. Recognising the importance of predation to the evolution of animal sense organs and intelligence, Bob is currently investigating the roots of predation in these very early animal communities.

As is evidenced by the more than 150 scientific papers and several books he has published, Bob Brain has had and still pursues an extraordinarily diverse and productive research career. He is heralded as one of the foremost naturalists Africa has produced. Being a naturalist in the truest and best Darwinian tradition, all research projects undertaken by him have been well formulated, imaginative, innovative and have produced significant results with universal applicability. For his scientific pursuits he has received many awards including: One of the Four Outstanding Young South Africans (1966), Gold Medal of the Zoological Society (1978), Senior Captain Scott Memorial Medal of the South African Biological Society (1987), Achievement Award of the Claude Harris Leon Foundation (1992), John F W Herschel Medal of the Royal Society of South Africa (1991), and the South African Medal of the South African Association for the Advancement of Science for exceptional contributions to science (1997). He was categorised as an A-rated scientist of the Foundation for

Research Development (from its inception in 1984 till his formal retirement in 1997), and he holds honorary DSc degrees from the Universities of Cape Town, Natal, Pretoria, and Witwatersrand.

In all his research endeavours Bob always had the assistance of Laura and their delightful daughters, Rosemary (Mel) and Virginia (Ginny), and sons Tim and Conrad (Nad). While growing up each of them derived great enjoyment, personal involvement, fulfilment and commitment in the Brain family research endeavour. They have all played a role in the development of Bob's research visions and Bob once described his house as "children inter-stratified with rocks and fossils". The Brain home has always been one of love, laughter and enjoyment, and much banter amongst individuals of the family. The children lovingly tell the story that Bob had once collected a snake, and in order to preserve it before taking it to the museum, he had coiled it up in an opaque plastic bag and placed it in the freezer. You can imagine Laura's surprise, and the children's delight, when she removed the package from the freezer to prepare sausage for breakfast!

Bob has always stressed the importance of fun in research, and maintained that if this was in place then self-motivation, creativity and productivity would follow naturally. He warned against the dangers of obsession with performance and productivity to the detriment of creativity as he felt that scientists could become project driven to the point that they function badly as whole and integrated personalities.

This volume of palaeontological papers is dedicated by colleagues and friends in admiration of a truly great palaeontologist who has pursued science for the sake of enjoyment and fulfilment. This broad-minded and good-natured naturalist has many friends and the admiration of all his colleagues.

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