

News and Views

First Conference of the Palaeontological Society of Southern Africa

from Dr C. K. Brain

This new society came into being in 1977 and currently has 67 members. Its first symposium was held at the National Museum, Bloemfontein from 2–5 July this year, the meeting being organised by Dr J. van Heerden, palaeontologist at the museum. The symposium attracted 23 delegates from various parts of South Africa, and two from the United States.

The proceedings began with a Presidential Address by Dr C. K. Brain entitled 'Taphonomy as an aid to African palaeontology', which sketched the scope of this relatively new science concerned with the 'laws of burial'. Unlike palaeontology, which often deals with individual fossil specimens, taphonomy usually considers assemblages of fossils and tries to reconstruct a living community from them. The trouble is that fossil relics are no more than distorted shadows of their parent communities and any reconstruction must take into account the many biases that operated during the conversion of such a living community into a fossil assemblage.

The 20 papers that followed dealt with a broad spectrum of palaeontological topics. Of these, two were concerned with broad concepts: Dr Elisabeth Vrba gave 'Some thoughts on the relationship between changes in time, morphology and effective environment' in which she considered whether evolution ever occurs in the absence of environmental change. She described the two presumed 'modes' of evolution—phyletic gradualism and punctuated equilibrium—and showed how the two alternatives can be tested by palaeontological data.

In the sound general-topic paper, Dr Eva Kovacs-Endrödy expressed her grave reservations about a tendency among palaeobotanists to make use of 'broad sense specific circumstances'—omnibus categories into which a variety of related forms are dumped. She pleaded for the retention of carefully defined specific taxa in the study of fossil plants.

The largest group of papers dealt with studies of groups of animals or sedimentary series. Dr Herbert Klinger used his research on fossil ammonites to illustrate 'Transgressive events in the Cretaceous sediments of Southern Africa', while Dr André Keyser presented 'A biostratigraphic subdivision of the Beaufort Group in the western part of the Karoo basin'.

Dr Jim Hopson of the University of

Chicago read two papers, one dealing with the implications of tooth function and replacement in dinosaurs from the Stormberg Series. It had previously been suggested that these ornithischian dinosaurs aestivated, or went to sleep, during the long dry seasons, when they rapidly replaced their entire dentitions. Hopson concluded that there was no good evidence for this bizarre concept, which is a pity, as it would be fun to think of dinosaurs spitting out their teeth during their fitful summer sleep.

Also on the topic of dinosaurs, Dr Jacques van Heerden spoke on classificatory problems of the Saurischia, pointing out that the 'prosauropods' can no longer be regarded as ancestral to the later sauropods.

Papers on mammal-like reptiles brought several interesting facts to light. Dr Chris Gow expressed his reservations about the generally held belief that *Diarthognathus* was intermediate between advanced cynodonts and mammals in respect of its double jaw articulation, while Juri van den Heever reported on the experimental use of photoelasticity to determine possible jaw function in early theriocephalians. He was able to conclude that forms such as *Lycosuchus* were adapted to tearing food with its anterior teeth, a fact suggestive of a scavenging way of life. In two papers, Fred Grine presented results of his allometric analyses of mammal-like reptile skulls. In the case of the Permian anomodont *Aulacephalodon*, he was able to show that crania previously assigned to several species were more likely to represent a growth series within a single species, *A. baini*, which showed sexual dimorphism. He reached a similar conclusion following his analysis of skulls assigned to the therapsid genus *Diademodon* and suggested that all the material available from South Africa and Zambia should be referred to *D. tetragonius*, an animal apparently more reptilian than mammalian if such characters as prolonged ontogenetic growth, polyphyodont tooth replacement, prismless enamel and the probable possession of salt glands are taken into account.

For some time there has been discussion about the direction of movement of the Dwyka ice-sheets which laid down the tillite in the southern Cape. The tillite was found to contain blocks of distinctive limestone containing coral-like archaeocyathid fossils which were previously thought to have had their origin in Antarctica. In a paper submit-

ted to the conference by Roy Oosthuizen, the suggestion was made that the distinctive limestone could have been transported, not from Antarctica, but from outcrops of Nama rocks in South Western Africa.

Two further papers were concerned with botanical topics—that of Colin MacRae, who discussed fossil spores and pollen from a borehole in the Soutpansberg coalfield, and a paper by Dr E. van Dijk, who described remarkably well-preserved remains of plants and insects from an important site near Pietermaritzburg.

From time to time, individual fossils of sufficient interest are found to warrant detailed descriptions at a symposium such as this. Dr James Kitching provided such a description of a cluster of six dinosaurian eggs from the Red Beds of the Elliot Formation in the Orange Free State. Each egg was found to contain a fully developed embryo but a great deal of painstaking preparation will be necessary before Kitching is able to put a name to his unique find.

It is extremely unusual for the cartilaginous skeletons of sharks to be preserved as fossils yet the meeting heard from Dr Burger Oelofsen about a perfectly preserved shark neurocranium found in a nodule above the Dwyka tillite. The specimen must surely rate among the most complete and unusual in the world. The same is true of the first record of a fossil cephalochordate—a small *Amphioxus*-like creature intermediate in its evolutionary position between invertebrates and vertebrates. It was described by Dr Oelofsen and J. C. Loock and came from the White Band shales in the Karoo, to represent the first record of the fossil of this subphylum. The fossil animal appears to have been pelagic in its habits, in contrast to the modern burrowing forms like *Amphioxus*, a point which makes one wonder whether the burrowing habit is really as primitive in these animals as is generally believed.

Technical aspects of palaeontology were touched on by three speakers: Dr Chris Gow and M. Levinson reported on the use of wax in controlled acid preparation of fossils; Professor M. A. Raath described a system for the registration and documentation of research projects at the Bernard Price Institute of Palaeontology, while Dr A. S. Brink reported on progress with his illustrated bibliographic catalogue of the Synapsida—an ambitious project being undertaken at the Geological Survey.

This first symposium of a new society served to confirm the prominence of palaeontology in South African science. The country has a wealth of fossil treasures but is also fortunate in having an active band of scientists to study them. □

The purpose of this workshop session, organised by the Department of Archaeology at the University of Stellenbosch, was to provide a forum for the comparison of results from late Pleistocene sites in sub-Saharan Africa, with particular emphasis on Southern Africa. This was facilitated by researchers bringing comparative collections of artefacts from key sequences, which were on display throughout the meeting, enabling delegates to study and discuss them with the excavators. A post-conference excursion lasting five days took about 30 of the 80 participants to excavated sites in the southern Cape, allowing further practical appreciation of the context of material discussed at the meeting. A highlight of the entertainment programme in Stellenbosch was a dinner consisting entirely of foods indigenous to sub-Saharan Africa and including such delicacies as mopani worms, shellfish, venison, watsonia corms, waterblommetjies, nara seeds and cake, and mongongo and marula nuts. The ingredients were gathered from far and wide and provided a delicious variety of tastes and conversation topics.

The time period covered by the late Pleistocene is from about 125 000 to 10 000 years before the present and included the technological stages of the Middle Stone Age (MSA) and the early part of the Later Stone Age (LSA). It was during this time that archaic human populations were replaced by physically modern people and modern behaviour patterns become discernible in the archaeological record. The period was broadly coeval with the last interglacial and last glacial cycles of the higher latitudes, with marked shifts in temperature and rainfall in Southern Africa and adjustments in the distribution of faunal and floral resources and the people who relied on them. The recent increase in the number of long-sequence sites covering this time period which have been excavated warranted an assessment of our current state of knowledge to facilitate inter-regional comparisons and to integrate cultural and palaeoenvironmental data.

It was clear from the first morning, after the presentation of a review paper by C. K. Cooke (Umtali) on the late Pleistocene industries in Zimbabwe-Rhodesia, that the artefact sequence north of the Limpopo has no exact counterpart to the south. The main differences lie with industries dated between about 20 000 and 12 000 B.P. and with the lack of a Howiesons Poort-type phase in Zimbabwe-Rhodesia. The Rhodesian Tshangula (dating between 20 000 and 12 000 B.P.) contains both Middle Stone Age elements in the form of bifacial points and Later Stone Age microliths, while in South Africa the contemporary Robberg-type industries lack bifacial points and include fewer retouched microliths. In the case

of the Howiesons Poort, a penultimate phase of the MSA tradition with large backed blades, only those assemblages which Cooke has described as 'blade intrusions' within the Bambata could be considered as similar in time and technology.

Anomalies were also noted between sequences in the north-east of South Africa and those in the south and west, particularly with respect to the dating of the final MSA

The late Pleistocene in Africa

A workshop with the title 'Towards a better understanding of the late Pleistocene in sub-Saharan Africa' was held at the end of June under the auspices of the Southern African Association of Archaeologists. Janette Deacon of the University of Stellenbosch reports here on what was achieved.

and the earliest LSA. At Apollo II in Namibia, the final MSA is dated to c. 25 000 and the earliest LSA to c. 20 000 B.P., at Boomplaas in the southern Cape the final MSA dates to c. 32 000 and the earliest LSA to c. 16 000 B.P., and at Nelson Bay Cave the earliest LSA dates to c. 18 000 B.P. In the eastern Transvaal, however, at Bushman Rock Shelter the interface is dated between 12 500 B.P. and 12 000 B.P., while at Henuigneskrans only a few kilometres away, the MSA is absent and the earliest LSA is estimated at about 30 000 B.P. At Border Cave, on the other hand, on the border between Swaziland and KwaZulu, the LSA is poorly represented but an early phase is dated to c. 38 000 with the final MSA beyond the range of radiocarbon dating at c. 50 000 B.P. There is thus a wide range of radiocarbon dates for the MSA/LSA interface and with similar anomalies in the dating of the much older Howiesons Poort-type assemblages it is clear that all radiocarbon dates for this time period should be critically examined before being accepted. The possibility that similar assemblages should not necessarily be considered to have been contemporary should also be kept in mind.

At the other end of the MSA time scale, there was little or no discussion of the ESA/MSA interface. The base of the MSA is shown to be older than 125 000 B.P., with assemblages overlying beach deposits of the last interglacial high sea-level considered as typologically more recent than the oldest MSA. The latter has been estimated at c. 150 000 by some and as much as 180 000 B.P. by others.

Part of the final discussion was devoted to the establishment of a number of generalizations about the cultural record of the late Pleistocene. It is evident, for example, that items of material culture which have modern

ethnographic counterparts do not occur with artefact assemblages of MSA tradition. The ostrich eggshell beads, decorated ostrich eggshell and most bone tools are restricted to the LSA. Furthermore, the late Pleistocene hunting pattern was relatively ineffectual when compared to that of the terminal Pleistocene and Holocene and, while shellfish were collected by MSA and LSA people, active fishing and fowling is obvious only from Holocene sites. Evidence for the use of plant foods is very limited in levels older than 20 000 B.P., but grindstones are known from several MSA sites as are seeds of edible fruits.

During a discussion on terminology, the desirability of using type names to designate technological stages and industries within the continuum of stone tool manufacture was debated at length. Although some people argued that such labels are unnecessary and confusing, others maintained that, given a large number of observations, the labelling of technologically similar assemblages which are clearly patterned in time and space is a useful method of summarizing regularities. Although no final agreement was reached, it was accepted that the names proposed for industries of restricted geographic distribution as, for example, the Robberg and Albany, should not be extended to other regions.

Papers and discussion on palaeoenvironmental data and interpretation brought out the need for more reliable, well-dated geomorphological field observations to complement attempts to model the climatic changes of the late Pleistocene. While the deep-sea core record of temperature changes is providing the best-dated basis for the correlation of palaeoenvironmental changes as, for example, in the studies of small and large mammal remains, the need to establish a sound terrestrial record was stressed. This will take a long time but was regarded as of top priority. The faunal associations of the cooler late Pleistocene are demonstrably different from the Holocene, not only in including some taxa which became extinct prior to the Holocene, but in indicating different ranges from the present for extant taxa. Here again the building up of samples that will be necessary to enable discussion of the late Pleistocene mammal fauna associations on more than a local basis is a daunting task.

As several people remarked, the theme of the meeting was 'Towards a better understanding of the late Pleistocene in sub-Saharan Africa' and the solving of these problems was not envisaged. It was generally agreed, however, that the positive attitude of participants and the lively discussion went a long way towards highlighting the more interesting aspects and potential of the subject. We are now well placed to consider the direction and planning of future research.