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PAL NEWS NUUS

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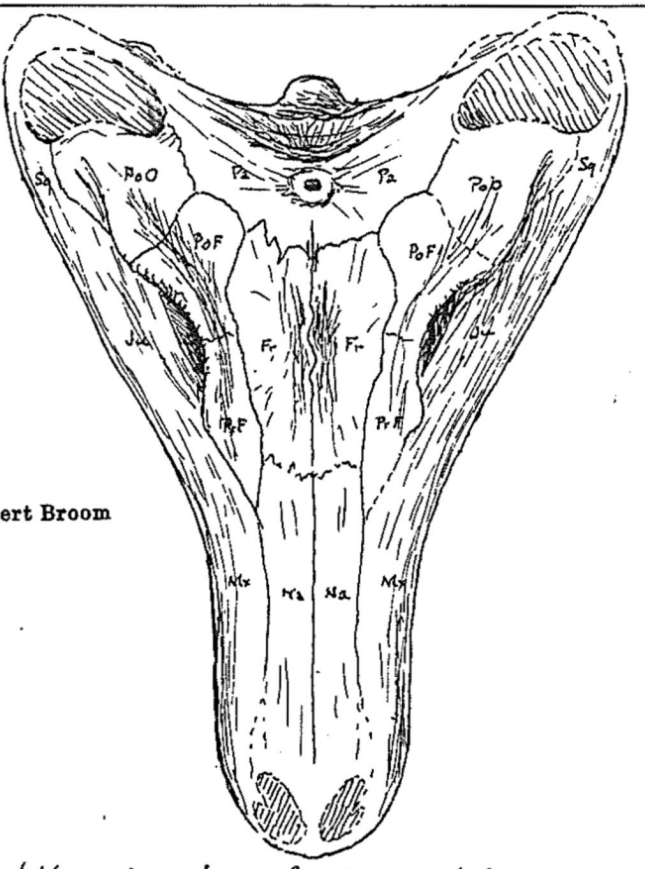

A drawing by Robert Broom

Fig 1. Upper view of skull of Tigrisaurus pricei B.&G. 1/3 nat. size.

(from original in possession of Dr J W Kitching)

PAL NEWS
PAL NUUS

Vol./Bd 4 (1)
November 1984

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Pal News is printed by the University of the Witwatersrand and published by the Palaeontological Society of Southern Africa for its members. The views expressed are not necessarily those of the Society or its Officers.

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EDITORIAL

For those of us from the parched north few sights could have been more appealing than the spouts of rainwater gushing from hillsides and rushing in torrents down the storm channels beside the roads. This was the fantasy world of the Cape – verdant, lush and inviting – to which we came for the Third Conference of our Society. Down the du Toit's Kloof Pass (past the breathtaking but halted roadworks of the du Toit's Kloof Tunnel, victim of the economic recession and government expenditure cutbacks), past Paarl and on into the historic University town of Stellenbosch. What a lovely way to heighten anticipation of the conference that was to come.

Burger Oelofsen organised the conference in his own inimitable style – no trumpeting, no ballyhoo; everything calm, efficient, and above all, *relaxed*! Everything worked, in the right way, at the right time. The venue was comfortable – in the subterranean Koos Gericke Building that houses the University library. Stellenbosch students have been quick to note the significance of the initial letters of the name of this building, and also to note that it is situated at the centre of a large red brick-paved plaza which, inevitably, they have called "Red Square"! So, each day we congregated for our "underground" meetings in the KGB building below Red Square! (I had better hope that a copy of this issue of *Pal News* doesn't fall into the hands of the Security Police – I don't know if they would catch the joke!).

The spirit of the conference was high even if the number of participants was rather low. I'm sure we all hope that the Fourth Conference – to be held in Cape Town in 1986, if all goes according to plan – will be particularly well attended. It rather depends on whether or not the extensions to the South African Museum will be completed by then.

This issue of *Pal News* is devoted to matters relating to the Third Conference. The first issue next year will be for general Society news. Why not start on *your* report *now*?

Mike Raath
EDITOR

MINUTES OF P.S.S.A. GENERAL MEETING HELD IN STELLENBOSCH

on 16th JULY 1984

1. **PRESENT**

P. Haarhof	– S.A. Museum
H. Klinger	– S.A. Museum
E. Kovacs-Endrödy	– Geological Survey
R. Smith	– S.A. Museum
A.W. Keyser	– Geological Survey
A.S. Brink	– Geological Survey
C.E. Gow	– B.P.I.
J. Durand	– B.P.I.
B.S. Rubidge	– Nasionale Museum
C.S. Macrae	– Geological Survey
A. Scholtz	– University of Stellenbosch
M.A. Raath	– B.P.I. (Editor)
J.W. Kitching	– B.P.I. (Secretary–Treasurer)
C.K. Brain	– Transvaal Museum
L.H. Brain	–
A. Cadman	– B.P.I.
M. Coventry	– B.P.I.
B. Oelofsen	– University of Stellenbosch
J.H. van den Worm	– University of Stellenbosch
M.A. Cluver	– S.A. Museum (President)
D.E. van Dijk	– University of Natal
I.M. Chesselet	– Transvaal Museum

APOLOGIES: E. Vrba; A. Turner; J. Maguire; J. v.d. Heever.

2. **MINUTES**

Professor Raath proposed the acceptance of the minutes of the meeting held on 08/07/82. Dr. Oelofsen seconded this proposal. Carried.

3. **MATTERS ARISING FROM MINUTES** – None.

4. **PRESIDENT'S REPORT**

Dr. Cluver presented his report covering the period from the second conference in Pretoria until July 1984. He said the Biannual conference

and the society's newsletter were important for the viability of the society. The newsletter should incorporate articles to stress the importance of palaeontology. More material was needed and members were urged to respond.

Dr. Cluver announced the deaths of two of the society's members: Prof. G. Bond and Mr. B. Maguire. He requested the members to stand in silence in their memory.

Dr. Cluver paid tribute to the Office Bearers of the Society for their efforts on its behalf and for their support for him as President during his extended term of office.

The Presidents Report was *adopted.*

5. HON. TREASURERS REPORT

Dr. Kitching appealed to members to pay subscriptions to the society. The society was still solvent although the accounts had not been audited as no auditors had been appointed at the last General meeting. The audited accounts would be circulated to members once auditors were found who were willing to audit the books. The Hon. Secretary/ Treasurer's Report was *adopted.*

6. EDITOR'S REPORT

Professor Raath thanked members who had sent in copy to the newsletter and appealed to members for more. He asked for members to express opinions, as well as writing reports and cartoons. He invited Dr. Cluver to write an article expressing his views on the importance of palaeontology. As there were two deadlines for the newsletter – June and December – copy should be sent in by the 1st of April or the 1st October. Last year two issues had been combined. The proceedings, minutes, etc. of this meeting were to be published in the next issue. Prof. Raath stressed that the newsletter was only as effective as the members make it.

The Hon. Editor's report was *adopted.*

7. ELECTION OF OFFICE BEARERS

7.1 PRESIDENT

Dr. Brain nominated *Prof. Raath,* seconded by Dr. Gow. No fur-

ther nominations were made. Prof. Raath was declared duly elected.

7.2 VICE PRESIDENT

Prof. Raath nominated *Dr. Oelofsen,* seconded by Mr. Macrae. There were no further nominations made. Dr. Oelofsen was declared duly elected.

7.3 HON. EDITOR

Dr. Brain nominated *Prof. Raath,* seconded by Dr. Keyser. No further nominations were made. Prof. Raath was declared duly elected.

7.4 HON. TREASURER

Dr. Keyser proposed *Dr. Kitching,* seconded by Prof. Raath. No further nominations were made. Dr. Kitching was declared duly elected.

7.5 HON. SECRETARY

Prof. Raath proposed *Mrs. Chesselet,* seconded by Mr. Rubidge. No further nominations were made. Mrs. Chesselet was declared duly elected.

8. SOCIETY EMBLEM

This issue had been discussed in Pretoria and further entries had been received; the question was how to proceed.

After considerable discussion it was agreed to appoint a small working group of Dr. Brink, Mrs. Chesselet and Prof. Raath to investigate the whole matter and report back.

9. GENERAL

9.1 Dr. van Dijk drew attention to the fact that whereas it was illegal for private individuals to collect and keep fossils, Mining companies and prospectors were not subject to legal restraint in this respect. He considered that should palaeontological material be in the possession of any such group or individual, documenta-

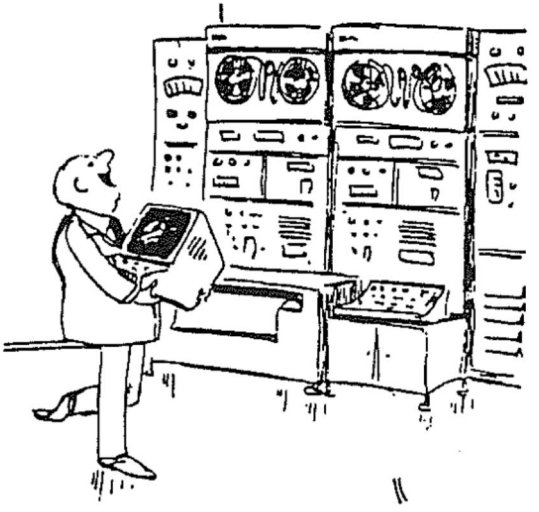
tion at least should be obligatory, and that the society should ultimately press for legislation that would require the possessor of any fossil to deposit it in a recognised institution if the possessor wished to dispose of it, i.e. that it should not be legal for it to be transferred to any third party other than a recognised institution.

Dr. Cluver suggested that as this was an important issue it should be discussed again at the end of the conference, and that members should give the matter their consideration during the conference.

9.2 Dr. Brain, on behalf of the Association, wished to record his thanks to Dr. Cluver for acting as president of the society for two terms. Carried with acclaim.

The meeting closed at 10.15 a.m.

The meeting reconvened on 18th July at 4.30 p.m. Dr. van Dijk's proposal was discussed again. It was decided that a subcommittee consisting of Dr. Brain, Dr. Keyser and Prof. Raath be formed to investigate the problem of exclusion of mining and agricultural companies from legislation protecting fossils.



"Guess what? You're being replaced!"

THE "ANCESTORS" EXHIBITION IN NEW YORK

C.K. Brain and M.A. Cluver

Transvaal Museum, Pretoria; South African Museum, Cape Town.

ABSTRACT

In an ambitious undertaking, the American Museum of Natural History in New York has gathered about 40 original hominid fossils from all over the world and put them on display from April 13th – September 9th 1984. South Africa is represented by 12 specimens from four institutions (Witwatersrand University 3 fossils, Transvaal Museum 7, National Museum Bloemfontein 1 and South African Museum 1) so that our local contribution to the undertaking is considerable. The opening of the public exhibition was preceeded by four days of study sessions when invited palaeoanthropologists had the opportunity of studying and comparing the original fossils in small groups. This was followed by a five-day symposium, *Palaeoanthropology : the hard evidence*, where a total of 45 papers was delivered, five of them by palaeontologists from South Africa. In addition, Professor P.V. Tobias participated in a public forum entitled *Searching for our ancestors.*

AGE RELATIONSHIPS OF THE GONDWANA GLACIAL AND FLUVIOGLACIAL DEPOSITS

C.S. MacRae

Geological Survey, Pretoria

ABSTRACT

The theory of the apparent migration of the Palaeozoic ice centres across the Gondwana supercontinent is reconsidered and a fresh approach to the climatic, biological and geological processes operative due to this phenomenon explored. The aim of the presentation is to provide an alternative frame to that traditionally accepted with which to test the results of Gondwanaland-wide geological correlations.

Theoretical considerations include:

i) The production of a polar ice-cap track and parallel climatic belts due to the migration of the pole and its basically concentric climatic zones in time;
ii) The sedimentological character and sequence of accumulation is dependent upon the position of the site in relation to the polar migration path. This is demonstrated by three theoretical localities at three different times;
iii) Chronological inferences cannot automatically be made from similar lithological sequences;
iv) Biostratigrpaphic correlations need to be carefully examined as many plants and animals migrate in response to the shifting of their climatic regime. Similar floral and faunal assemblages may be time-transgressive on a Gondwana scale.

Evidence in support of these ideas includes:

i) Reliable fits of the present continents into a Gondwana landmass based on a computer fit of the 500 fathom isobath and supported by extensive geological evidence;
ii) Palaeomagnetic studies indicating the different positions of the palaeopole across this landmass during the Palaeozoic and early Mesozoic and the broad co-incidence of the apparent curves (linking these data) produced by various workers;
iii) Palaeontological evidence supportive of a general west-to-east younging of Gondwana glacial and associated sediments;
iv) Geological evidence indicating numerous glacial depositional events over a long period for localities adjacent/lateral to the polar wander curve e.g. South America and Australia, and a single major event for those sited on the curve, e.g. South Africa.

Constructive criticism by fellow palaeontologists and stratigraphers of the ideas presented will be welcomed.

MEMORABLE CHARACTERS IN PALAEONTOLOGY

B.H. Newman

South African Museum, Cape Town

In my experience of people from the various disciplines of natural history, the most colourful characters were in the sphere of palaeontology.

Because these characters often disappear into posterity, only known at large by their scientific publications or their necessarily brief obituaries, I thought it worthwhile to retell some of the anecdotes about them to the PSSA Conference Some of these anecdotes are merely known to me whilst others are from personal experiences concerning some of the many people I met, for the most part, during the period when I worked in the department of palaeontology at the British Museum, from 1954 to 1969.

I consider myself extremely privileged to have met personally, such great people as Prof. A.S. Romer, Dr. Robert Broom, Prof. Raymond Dart, Dr. L.D. Boonstra, Prof. D.M.S. Watson, Arthur Rixon and many others. I was fortunate enough to work as assistant to Dr. W.E. Swinton, Keeper of Fossil Reptiles for more than eight years and to serve under Dr. E. I. White who was the head of the department for as long. The museum's director during part of this time was the brilliant, but, at time, irrascible, Sir Gavin de Beer. Who would have thought that small-statured Sir Gavin could reduce the uniformed staff manning the front desk in the main hall to a jelly? He terrorised them. Who would believe that Prof. Al Romer would sing English folk songs, and once did so publicly in the *Prospect of Whitby,* a famous Dickensian pub. On one occasion I had to assist colleagues to physically pry apart two palaeontologists who were about to come to blows over the issue as to whether or not *Australopithecus* walked upright!

Dr. Eroll White was a somewhat stern-looking man who gave the impression of being without humour to those who didn't know him. Yet he had one of the keenest senses of humour which he did not hesitate to use in official memoranda.

On the occasion of Dr. Broom's lecture to the entire staff of the B.M. (N.H.) Dr. Broom himself could not be found. On being dispatched to find him I eventually located him – where? – in the typists' office, "chatting up" the girls. He was then in his 80's!

They were all extremely interesting and unusual people, most of them brilliant in their fields. However, like us all, they were only human, they lost their tempers, showed their weaknesses, and were frequently very amusing.

It seems only fitting that their more human side should go down to posterity. To this end I intend committing my many memories of these palaeontological characters to paper in the near future.

THE AMMONITE FAMILY PLACENTICERATIDAE HYATT 1900 IN SOUTH AFRICA : SYSTEMATIC AND IMPLICATIONS

H.C. Klinger

South African Museum, Cape Town

ABSTRACT

The ammonite family Placenticeratidae has a world wide distribution from the Albian to the Maastrichtian. Theoretically it should thus be ideal for global correlation. Unfortunately the extreme range of variation in this group has resulted in a plethora of incomprehensible generic and specific names, rendering the group virtually useless for biostratigraphic purposes.

Careful analysis of the Zululand faunas has shown that the group can be utilized to some extent, once the nature and the extent of the variation have been identified. Variation is due mainly to the following factors: 1) extreme ontogenetic changes; 2) fluctuations in the rates at which ontogenetic changes take place and even omission of one or two stages; 3) dimorphism which manifests itself either in size differences or ornamentation or a combination of both; 4) intraspecific variation *per se* which is especially prominent in the adult stage and in the shape of the whorl section; and 5) an extremely slow rate of phylogenetic change which is totally overshadowed by the other factors of variation.

THE EARLIEST KNOWN VASCULAR PLANT IN THE FLORA OF THE LOWER SILURIAN CEDARBERG FORMATION

Eva Kovács-Endrödy

Geological Survey, Pretoria

ABSTRACT

The non-vascular *Eohostimella* Schopf and the vascular *Promissum pulchrum* gen. et sp. nov. from the Cedarberg Formation offer evidence of the initial penetration of land by plants. *Eohostimella* is known till now only from the early Silurian. The South African *Eohostimella* is described as a new species, *E. parva.* The excellently preserved specimens of *Promissum* made it possible to evaluate the characters systematically and interpret them as adaptive to land-life.

The fossil plants were discovered by Dr. J.N. Theron and his team, of the Geological Survey, Bellville, Cape Province.

MESOSAURUS AS A FILTER FEEDER; COMPARISON WITH MODERN FILTER FEEDERS

B.W. Oelofsen

Dept. of Zoology, University of Stellenbosch

The prerequisites for filter feeding are reviewed and *Mesosaurus*, as a possible filter feeder, is compared with modern filter feeders.

PHYLOGENETIC SYSTEMATICS AND THE REPTILE-MAMMAL CLASS BOUNDARY

C.E. Gow

Bernard Price Institute for Palaeontological Research

ABSTRACT

Many phylogeneticists from Hennig onwards have cautioned that the phylogenetic system universally known as cladistics and its terminology can only be strictly applied to species. Loose talk of Class apomorphies does violence to this principle as stem species at this level are unknowable. Little wonder that, for many, cladistic procedures "continue to be a riddle wrapped in a mystery inside an enigma". The problem is discussed with reference to the reptile/mammal Class boundary.

SOME THOUGHTS ON THE GENUS DICYNODON AND IT'S DESCENDANTS

*A.W. Keyser and **A.R.I. Cruickshank

*Geological Survey, Pretoria; **Open University, U.K.

ABSTRACT

A series of skulls which obviously belong to the genus *Dicynodon* was examined. It was concluded that the type species of the genus, *Dicynodon lacerticeps*, is the senior synonym and that *Dicynodon leoniceps* (formerly *Daptocephalus leoniceps*) is one of the junior synonyms.

In the light of the definition of the genus by Cluver and King 1983 there is no morphological criterion by which the genera *Shansiodon* Yeh, *Jimusaria* Sun and *Vinceria* Bonaparte can be separated from the genus *Dicynodon*. Some photographs of some beautifully prepared specimens of *"Shansiodon" wangi* Yeh were kindly shown to one of the authors (AWK) by Dr. Cheng Zheng Wu at the IV Gondwana Symposium in Wellington, New Zealand in 1982. These photographs clearly showed that it would be very difficult to separate the two species *Shansiodon wangi* Yeh and *Vinceria andina* Bonaparte on the specific level. The inclusion of the genera *Dinanomodon* Broom and *Odontocyclops* Keyser in the genus *Dicynodon* Owen by Cluver and King 1981 is debatable because of large morphological differences.

The genus *Dolichuranus* Keyser differs from *Dicynodon* in having a shorter intertemporal region and in having the interpterygoid vacuity placed behind and out of the choanae. The postorbitals are shortened and in some specimens do not reach the squamosal. It was also demonstrated that this feature can vary in an individual skull from left to right.

The genus *Dinodontosaurus* von Huene differs from *Dolichuranus* in the further shortening of the temporal fossae with concomitant shortening of the postorbital bones that never reach the squamosal.

The genera *Dicynodon, Tetragonias, Dolichuranus* and *Dinodontosaurus* form a perfect morphological series which can be regarded as evolutionary lineage. In this arrangement *Dicynodon wangi* (Yeh) is morphologically intermediate between *Dicynodon lacerticeps* Owen and *Dolichuranus primaevus* Keyser. Since there are no morphologically significant features that can be used to distinguish the genus *Shansiodon* from *Dicynodon* Cox's family Shansiodontidae then has to be regarded as a junior synonym of the family Dicynodontidae.

Cox 1965 and Cox and Li Jin-Ling 1983 place the genera *Dolichuranus* Keyser and *Dinodontosaurus* von Huene in the family Stahlekeriidae. The characters used by these authors to define the family are however not shared by the type species of the genus, *Stahlekeria potens* von Huene. Cox and Jin-Ling 1983 state that *Stahlekeria* has a short broad intertemporal bar and a broad robust snout It was demonstrated on slides of the type specimen of *Stahlekeria* that both these regions of the skull are reconstructed in plaster and that these authors were misled by published illustrations. There is therefore no logical reason for including genera like *Dinodontosaurus* and *Dolichuranus* in the family Stahlekeriidae since there are very few characters that these taxa hold in common. It is therefore suggested that the subfamily Dinodontosaurinae be retained for dicynodonts with a square tipped snout, where the postorbitals do not meet the squamosal bones and in which the interpterygoid vacuity does not occur within the choanae.

Whether the subfamilies of Kannemeyeriidae, namely Kannemeyeriinae and Dinodontosaurinae, ought to be included as subfamilies in the Dicynodontidae, or whether the Stahlekeriinae deserve separate familial status, is a question that will have to be addressed in future.

A REASSESSMENT OF THE BIOZONATION OF THE BEAUFORT GROUP

J.W. Kitching

Bernard Price Insititute for Palaeontological Research

ABSTRACT

The subdivision of the Beaufort Group into Assemblage Zones and the use of colloquial or non-formal and specific names by Keyser and Smith (1979), followed by a subdivision on a world-wide basis by Cooper (1982), caused some confusion as to which of the existing biozonations should be followed to specify the provenance of known and newly discovered fossil forms from the Group.

Cooper (1982) introduced the *Robertia* Zone to replace the *Tapinocephalus* or "Dinocephalian" Zone. The genus *Robertia* is morphologically not as well known, has a limited stratigraphical range and is most difficult to identify in the field. In his subdivision he also includes the *Lystrosaurus* Zone in the Upper Permian beds of South Africa, implying a hiatus or unconformity between the accepted *Lystrosaurus* and *Cynognathus* Zone succession. His division also transgresses the upper part of the *Daptocephalus* or *Dicynodon/Whaitsia* Assemblage Zone. This scheme is not consistent with our knowledge of the succession of the sediments and in view of its failure to find acceptance by workers on Karoo vertebrates and biostratigraphy it need not be considered further.

Keyser and Smith (1979), proposed the following biozonation for the Beaufort Group from the bottom upwards: (1) "Dinocephalian", (2) *Pristerognathus/Diictodon*, (3) *Tropidostoma/Endothiodon*, (4) *Aulacephalodon/Cistecephalus*, (5) *Dicynodon lacerticeps/Whaitsia*, (6) *Lystrosaurus/Thrinaxodon*, and (7) *Kannemeyeria/Diademodon* Assemblage Zones. The name "Dinocephalian" is colloquial or non-formal while *Dicynodon lacerticeps* is a specific name. In an effort to formalize the subdivision, the overall stratigraphic distribution of the abovementioned genera together with others occurring in the same horizons, the known numbers of each form and the morphological features of the genera concerned were carefully assessed and on this basis the following biozonation is proposed. (1) *Tapinocephalus/Bradysaurus*, (2) *Cistecephalus/Aulacephalodon*, (3) *Dicyno-*

don/Whaitsia, (4) *Lystrosaurus/Thrinaxodon*, and (5) *Cynognathus/Diademodon* Assemblage Zones.

RESEARCH INVOLVED IN RECONSTRUCTIONS OF MAMMAL-LIKE REPTILES AND AUSTRALOPITHECUS ROBUSTUS

I.M. Chesselet

Transvaal Museum, Pretoria

ABSTRACT

Questions asked by an artist making reconstructions of extinct animals need more exact answers than are usually supplied by palaeontologists because the artist has to make an unequivocal statement.

The skeleton and musculature have usually been worked out satisfactorily by the scientists, but they are not prepared to commit themselves as to the nature of the integument.

No skin impression has been found in association with therapsids. However it is possible to arrive at a logical conclusion regarding the skin by studies of modern skin structure in mammals and reptiles in combination with a consideration of the tree of relationships.

Principles of coloration in modern vertebrates provide clues as to the probable coloration of therapsids.

Conclusions on the density and nature of the hair in *Australopithecus* can be reached by studies of a corresponding life-style and tendencies of hair growth in modern mammals.

Techniques to promote a high standard of accuracy in reconstructions are being developed, and new materials exploited.

IS THE ECCA GROUP LOWER PERMIAN IN AGE?

Eva Kovács-Endrödy

Geological Survey, Pretoria

ABSTRACT

The Lower Permian (originally Permo-Carboniferous) age of the Ecca Group was based on fossil plants at the turn of the century. This age-determination was postulated by the intercontinental correlation of Transvaal floras. Handbook 8 of the Geological Survey, *Stratigraphy of South Africa* (1980) quotes only palaeobotanists in connection with the above-

mentioned (and still accepted) conclusion. The fossil plants, however, do not indicate such an age. The majority of the sterile and fertile (i.e. with fructifications) *Glossopteris* leaves, *Palaeovittaria kurzi,* etc., imply a correlation with the southern Upper Permian. The descriptive part of publications, thus, are in contradiction with the stratigraphic conclusion. The explanation of this peculiar situation is found in two papers written in the previous century. Biostratigraphic conclusions are still in conformity with a premature correlation based on fossil plants of uncertain and erroneous localities; and with unacceptable reasoning according to which a well in the Transvaal was made the type-locality of Ecca and also of Beaufort floras for future correlation. The double error was not discovered, and affected further palaeobotanical, palynological, biostratigraphical and lithostratigraphical conclusions in South Africa, and also in other Gondwana continents.

What is certain is that a South African horizon is time-equivalent with the Raniganj and Kamthi Stages of India, and with the Illawarra, Newcastle Coal Measures of Australia Recently there are two possibilities to consider, both contradicting the accepted premises: the Vereeniging flora is of Beaufort age in the local stratigraphic succession, or the Ecca flora is southern Upper Permian in age. It is, however, not impossible that future studies will disclose that even these two considerations belong to the erroneous framework.

NEW INFORMATION ON THE SEQUENCE OF DEPOSITS IN THE SWARTKRANS AUSTRALOPITHECINE CAVE

C.K. Brain

Transvaal Museum, Pretoria

ABSTRACT

The continuing excavations at Swartkrans have further clarified the very complex stratigraphy in this cave. The original fossil sample obtained by Robert Broom and J.T. Robinson between 1948 and 1953 came almost exclusively from a large mass of pink, Member 1 breccia (the 'hanging remnant') subsequently found to be clinging to the cave's north wall with an erosional surface below it. Beneath this and further to the south, a complex arrangement of fossiliferous deposits rest on the cave's floor, each separated by an erosional unconformity. The lowest deposit thus far identified is referred to as the "orange member" and is thought to be the stratigraphic equivalent of the hanging remnant. Above it is the "brown mem-

ber" (previously referred to as the main mass of Member 2), while the cave also contains at least two more recent deposits, referred to as the Early Stone Age and Middle Stone Age members. Remains of *Australopithecus robustus,* together with bone and stone tools have come from excavations in the orange and brown members. Since January 1984 excavations have been conducted in the Early Stone Age member and have produced bones that have apparently been deliberately burnt as well as bone pieces showing hominid-induced cut-marks. It is clear that during the accumulation period of the Early Stone Age member, hominids were eating meat in the cave, an activity for which we have no evidence in the earlier two deposits. The faunal and cultural contents, as well as age-relationships, of the various members are now being investigated.

A FAUNAL ANALYSIS OF THE FLORISBAD FOSSIL MAMMAL BONES: A COMPARISON BETWEEN THE OLD AND NEW FINDS

James Brink

National Museum, Bloemfontein

ABSTRACT

The old fossil collections from Florisbad have been studied and compared with new finds from a MSA occupation unit at the site. The old collections comprise finds from earlier excavations carried out in the "spring eye" area, which contrasts with bones found associated with MSA artefacts to the north of the spring eyes. These assemblages represent two independent samples of the palaeoenvironment.

FOSSIL PREPARATION WITH TUNGSTEN AIR HAMMER BITS

*J.A. v.d. Heever and **B.S. Rubidge

*South African Museum, Cape Town; **National Museum, Bloemfontein

ABSTRACT

Recently a number of institutions around South Africa have installed pneumatic preparation equipment. This has greatly enhanced the quality and speed of preparation, especially of specimens imbedded in very hard matrix. To obtain maximum efficiency from the equipment the tungsten air hammers in the handpieces had to be modified. A number of problems were encountered and solved in this respect. It is felt that an informal dis-

cussion of the pitfalls experienced during installation will not only be of benefit to institutions where the equipment is already in use, but to prospective purchasers as well.

TOWARDS A MINIMUM DOCUMENTATION STANDARD FOR SOUTH AFRICAN PALAEONTOLOGICAL COLLECTIONS

M.A. Raath

Bernard Price Institute for Palaeontological Research

ABSTRACT

The Documentation Group of the Southern African Museums Association (SAMA) is engaged in a campaign to improve documentation standards in the museum collections of southern Africa. Part of this campaign has been the fomulation of "minimum standards" for specimen documentation in each discipline covered by the sections of SAMA. Draft proposals for such minimum standards in palaeontological collections were circulated for comment to curators of South African collections in 1983. The results of this survey were reported, and revised proposals put forward for discussion.

The proposals are based in large measure on those proposed by a committee that reported in 1973 to the Society of Vertebrate Paleontology (*SVP Bulletin* 97:61–69).

A NEW SPECIES OF DICYNODONT FROM THE ECCA GROUP

B.S. Rubidge

Nasionale Museum, Bloemfontein

ABSTRACT

The first dicynodont from the Ecca of South Africa, *Eodicynodon oosthuizeni,* was described by Barry as being the most primitive dicynodont yet found, showing characteristics in common with pelycosaurs and the primitive Russian forms *Venjukovia* and *Otsheria.*

Since then more of these primitive dicynodonts have been found and their cranial morphology is better understood.

An account of our present understanding of the genus *Eodicynodon* is given and a possible new species of Ecca dicynodont is presented.

THE MICROFLORAL BIOSTRATIGRAPHY AND DATING OF CRATER LAKE DEPOSITS ASSOCIATED WITH PIPES OF THE SOUTHERN AFRICAN CRETACEOUS/EARLY TERTIARY KIMBERLITE PROVINCES

A. Scholtz

Department of Archaeology, University of Stellenbosch

ABSTRACT

A brief review of the location of the various kimberlite provinces and of the distribution of pipes with epiclastic sediments was given.

The available radiometric dates and palynological analysis has been used to estalbish a tentative palynomorph biostratigraphy for these deposits. Problems with contamination with Permian material have been encountered but the pipes are considered to range in age from lower Cretaceous to Eocene. At least 9 major types of palynomorph assemblages are encountered in this time range and the general trend of ages younging towards the southwest is clearly observed palynologically.

A SOUTH AFRICAN CRETACEOUS CRATER LAKE DEPOSIT : SEDIMENTATION AND FOSSILS

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ABSTRACT

A thick (120m) sequence of epiclastic Kimberlite was recently cored by a De Beers exploration team near Kenhardt, Cape Province, South Africa. The 120 mm diameter core is made up of alternating mudstone, siltstone and conglomerate beds, many of which contain fossils.

Sedimentological logging and systematic fossil search of the core revealed two distinct sediment/fossil associations:

1. A chaotic conglomerate with sharp basal surface grading upward into wavy-laminated siltstone and mudstone beds containing abundant plant-

trash partings and occasional layers of disarticulated non-marine bivalves. Spectacular slump structures are common, caused by loading and dewatering of argillaceous sediments beneath the conglomerate layer. These sequences are interpreted as the deposits of episodic subaqueous debris flows.

2 Horizontally laminated "varved" mudstone and siltstone beds with isolated "dropstone" lapilli interbedded with lapilli-strewn layers. Numerous ostracod-rich partings with burrows, spores and pollen, well preserved fish and frog (*Eoxenopoides*) fossils and isolated gastropods occur in these deposits which are attributed to low energy vertical accretion in a lacustrine setting with intermittent ash-fall events.

The cored epiclastic sequence is interpreted as having accumulated in the central portion of a restricted circulation lake situated within a volcanic crater. Periodic seismic disturbance triggered rapid mass movement of segments of the peripheral tephra cone into the crater lake resulting in sub-aqueous debris flow sedimentation on the lake bottom.

SOME INTERESTING ASPECTS OF THE PALYNOLOGY AND INTERPRETATION OF MICRO-FLORAL ASSEMBLAGES FROM CRETACEOUS CRATER LAKE DEPOSITS

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ABSTRACT

The palynological analysis of the upper sediments of the Arnot Pipe, Banke, Namaqualand was summarised. Comparisons have been drawn between assemblages from this site, considered to be of Paleocene age, and those of similar age from tropical Africa and Australasia. Of considerable biogeographic importance is the observation that a number of ancestral fynbos taxa were present in the early Tertiary, growing on eutrophic soils on the relatively dry western interior margins of the present day fynbos area.

One consistent problem encountered in the palynological analysis of the range of crater lake deposits is the extreme variation in the content and representation of the spore component. Analysis of this variation can provide much data on the local climatic setting and surface morphology of the pipes.

Finally some palynomorphs unique to deposits of late Cretaceous age of the southern African subcontinent have been described. One of these,

provisionally named *Fenestriorites*, is probably of peculiar significance to theories about the evolution of angiosperm pollen in this time range.

THE MAXILLO-SEPTOMAXILLARY FORAMEN IN THE PRISTEROGNATHIDAE

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ABSTRACT

The maxillo-septomaxillary foramen is a unique feature of mammal-like reptiles. Absent in captorhinomorphs and mammals, its specific function has not been definitely established although various authors have advanced different theories. Associated with the foramen is the peculiar nature of the septomaxillary bone, the organ of Jacobson and the possible development of a tactile region in the anterior portion of the snout. The possible function of this complex is discussed in the Pristerognathidae.

A BRIEF PROGRESS REPORT ON THE ILLUSTRATED BIBLIOGRAPHICAL CATALOGUE OF THE SYNAPSIDA

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SUMMARY

Altogether 2302 specific names have to date been proposed for synapsid specimens. The majority of these names have become redundant as junior synonyms and those that enjoy recognition today tend to number in the region of 600 depending on measures of, as yet unsettled, 'splitting' and 'lumping'.

Greatest measures of 'lumping' occur, in the catalogue, under the anomodonts where mostly one species is recognised for a number of genera which have thus far included dozens of species, let alone many other genera – e.g. *Dicynodon, Oudenodon, Diictodon, Rhachiocephalus, Pristerodon, Cistecephalus, Emydops, Aulacephalodon, Endothiodon* etc. For some of these genera two or three additional species are provisionally recognised.

A policy adopted with the catalogue is not to include any original

information; it is supposed to compute only existing knowledge to date. In two major respects I could not adhere to this resolution of not including original information:

Firstly the classification tentatively proposed is original in the sense that it reflects my own personal feeling for a general consensus of opinion – an endeavour to please everybody as nearly as possible. The Synapsida is tentatively regarded as a class, mainly for the sake of convenience, but also for some additional reasons clearly explained. The whole idea of issuing the catalogue in loose-leaf instalments is to allow for taxonomic adjustments to be made in subsequent instalments, to bring the overall classification systematically closer to actual consensus of opinion. This can only happen if other palaeontologists are willing to submit their opinions to me while I work on the following instalments.

Secondly Many of the illustrations amount to improvements on those originally published. Figures from different publications, based on different specimens, could be combined. Fresh material could be taken into consideration. All the illustrations are fairly idealistic, mostly four views of an existing skull in standard layout – side, dorsal, ventral and posterior views are arranged for direct comparison, all side views facing in the same direction. One set of four views of a best specimen accompanies a species entry, but there are many species entries with four-view illustrations of up to half-a-dozen specimens, especially in cases of extensive 'lumping'.

In these illustrations distortion is corrected to proper symmetry and they suggest that the specimens are more complete, or display more structural detail, than the case may be in actual fact, while using information freely gleaned from duplicate material.

In certain cases diagnoses are updated, using information derived from fresh material, or compiled from various publications. These improved diagnoses also amount to new information.

It was decided, after consulting some overseas palaeontologists, not to publish the catalogue in an endless series of smaller loose-leaf instalments, but in only three to four instalments of roughly 200 species entries per instalment. The first, now already type-set and virtually ready for printing, will include an introduction relevant to the catalogue as a whole, with an overall classification to serve as a general index. The body of the catalogue comprises six 'chapters', for the pelycosaurs, dinocephalians, anomodonts, gorgonopsids, therocephalians and cynodonts, each with its own detailed classification serving as a more precise index and accounting for all the genera and species, as well as all synonyms. Each chapter includes a random selection of species entries – those that are best known from most adequate material – 200 altogether for the six chapters. Then there

follows a complete list of genera and species in alphabetical order, including synonyms once again and referenced to the chapter indices. Finally there is a bibliography in alphabetical order according to authors, each indicating the genera and species handled, accounting again for synonyms.

This author's bibliography is extensive. Under each literature reference a list is given of the genera and species handled – not only new, but also existing species elaborated upon – under names recognised today, with names originally used in brackets.

A second instalment of 200 species entries is already roughly laid-out, mostly still in manuscript. A last instalment of 200 species is also roughly laid-out, but still with much missing information. Finally a fourth instalment will round up those species based on very fragmentary information, mostly postcranial material where illustrations will obviously not conform to the standard pattern. It is likely that this last instalment will be accompanied by an updated preamble, revised classifications, an expanded list of genera and species, and the authors bibliography, to replace their counterparts issued with the first instalment.

Thereafter the completed loose-leaf catalogue can be kept up to date by the issuing periodically of smaller instalments of improved entries, adjustments in terms of 'splitting' and 'lumping', and new entries for new species.

The hope is expressed that others will also contribute species entries in the same style, especially of those species featuring in their current research work. Each entry can be regarded as a substantial publication in the contributor's own name.

SOME NEW SPECIMENS OF *SCALENODON ANGUSTIFRONS* – (SYNAPSIDA: TRAVERSODONTIDAE)

A.S. Brink

Geological Survey, Pretoria

The purpose of this contribution is to introduce some new material of *Scalenodon angustifrons* so that it will not pass for original information when included in the first instalment of the forthcoming catalogue of the Synapsida (Brink, in prep).

Parrington (1946) described some cynodont material from the Middle Triassic (Anisian) Manda Beds of Tanzania as a new species of *Thrinaxodon – T. angustifrons.* Crompton (1955) recognised this material as belonging to a new genus, *Scalenodon,* along with other material also from

the Manda Beds, which he introduced as *Aleodon brachyrhamphus* and *Cricodon metabolus.*

Keyser (1973) briefly announced the discovery of some Middle Triassic (Anisian) synapsids at Etjo Mountain in South West Africa. He named one large, badly preserved *Diademodon*-like specimen *Titanogomphodon crassus,* later to be substantiated with two good skulls, one with a nearly complete skeleton. He named *Dolichuranus primaevus* and *Rhopalodon etionensis,* the latter subsequently synonymised to the former by Keyser and Cruickshank (1979). Other *Diademodon* material could later be referred to *Diademodon rhodesiensis* from the Middle Triassic (Anisian) N'tawere Formation of the Luangwa Valley in Zambia, which also yielded the traversodontid *Luangwa drysdalli.* Keyser further recognised a *'Sesamodon'* like skull which he and I (Keyser & Brink 1979) described as *Herpetogale marsupialis.* He also recognised a skull as that of *Kannemeyeria cristarhynchus.* Among all this material there was also a small skull which he provisionally recognised as *Trirachodon* sp. This specimen, along with additional material acquired subsequently, is here presented as belonging to *Scalenodon angustifrons.*

The other *Scalenodon* material, besides these from the Manda beds in Tanzania and Etjo Mountain in S.W.A., is a single tooth from the Donguz Suite, Orenburg District, Southern Cisuralia described by Tatarinov (1974) as *Scalenodon borcus.* The same locality also yielded the gomphodontosuchid *Anteosuchus ochevi* and the bauriids *Nothogomphodon danilovi* and *Dongusaurus shepetovi.*

Crompton and Ellenberger (1957) added a close relative – *Scalenodontoides macrodontes* – based on a lower jaw found in Middle Triassic Molteno beds in Southern Lesotho (Turner 1972 placed these deposits in the lower part of the Elliot Formation).

MATERIAL

The new material from the Middle Triassic (Anisian) Omingonde Formation at Etjo Mountain, Kalkfeld, SWA, housed in the Geological Survey of South Africa, comprises the following:

R327 GSO Small skull, complete with lower jaw occluded, and some post cranial elements.
R569 GSO Medium sized skull with lower jaw partly occluded, badly preserved and damaged, with some post cranial elements.
R570 GSO Medium sized snout, no teeth, badly preserved.
R571 GSO Medium sized right posterior portion of the skull, little more than a good orbit and zygomatic arch.
R572 GSO Large skull, distorted with dislocated lower jaw, all upper

teeth missing, a few lower teeth with damaged crowns, and some post cranial elements.

EXISTING INFORMATION

Parrington (1946) used three fragments to visualise a reconstructed skull and noted that the snout is broad and markedly constricted behind the canines. The orbits are large; the temporal vacuities relatively small. He interpreted the skull as unusually narrow. The frontals extend farther forward than the lachrymals. All the sutures in the interorbital region are raised as distinct ridges. There is a boss on the lachrymal in front of the orbit. There are two pits on the maxillary, one dorsally where the snout is constricted, and one anteroventrally to the orbit. He gave the dental formula as I 4/3 : C 1/1 : PC 8+ /9.

Crompton (1955) extracted from further reserve material originally collected dozens of fragmentary specimens consisting mostly of dental material.

These he could arrange in a growth series featuring only the jaws, upper and lower, of about eight stages. He expanded Parrington's diagnosis by observing that this creature is "a fairly large gomphodont cynodont with fundamentally different mandibular and maxillary postcanine teeth; the crown pattern of the transversely ovate maxillary teeth consist(s) of three main cusps arranged upon the same transverse plain, a deep pit in the anterior region of the crown medial to the labial cusp and a crenulate margin to the labial cusp; the crown pattern of the mandibular postcanines consists of two high anterior cusps followed by a posterior heel upon the edge of which there are various numbers of cuspules in the unworn state" (Crompton, 1955).

According to Crompton's eight growth stages there are 5 postcanines in the youngest, increasing to 7 in the second and third stages; 8 in the fourth, 9 in the fifth, 10 in the sixth and 11 in the seventh and eighth stages.

NEW INFORMATION

Although the present material represents three growth stages, the smallest with seven postcanines is not as juvenile as Crompton's smallest specimen, while the largest with nine postcanines appears to be not fully adult compared to Crompton's largest stage with eleven postcanines.

Parrington did not observe, even in his illustration of the palatal view, that the posterior postcanines are included at an angle to the axis of the tooth row. Neither did Crompton point specifically to this phenomenon, but he did show it in his illustrations. In the new material the largest speci-

men shows this peculiarity quite clearly, even where all the teeth are missing. The transversely ovate sockets nevertheless turn progressively at an angle to the axis of the tooth row posteriorly. There is evidence also of the posterior postcanines being double-rooted transversely.

According to the new material the skull is slightly broader than as visualised by Parrington. Parrington was also very uncertain about much of the structural detail in the posterior half of the skull. The new material supplies many of these details.

The zygomatic arch is slender as in *Trirachodon* and the traversodontids, and not as well developed as in *Diademodon*. There is a modest jugal bulge and the squamosal fold covers the auditory meatus only very slightly.

The coronoid process of the dentary reaches farther back than the level of the articulation. The anterior margin of the coronoid process bends sharply laterally to join a distinct and prominent ridge running down the lateral face of the dentary towards the ventral margin and the level of the symphysis. Thus a depression is formed above and along the length of the postcanines, matching a depression on the maxillary, to form jointly a cheek pouch, not as conspicuous as, but yet reminiscent of, the condition in the bauriids.

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(Poster)

PALYNOLOGICAL INTERPRETATIONS OF MAKAPANSGAT BRECCIA : FOSSIL OR FANTASY?

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ABSTRACT

An analysis of the fossil pollen of Makapansgat breccia, Member II, is currently being undertaken, with a view to correlation of strata and a palaeoclimatic interpretation. To date the results show that no definite statement can be made on a mere analysis of the pollen extracted. The reason for this uncertainty hinges on the identification of the pollen as either fossil or contaminant material. It seems clear that the material being analysed must be compared to a recent pollen assemblage for the Makapansgat area. Only if a significant difference in the assemblages, i.e. "fossil" and recent, can be found, will it be possible to make any positive palaeoclimatic assessment.

(Poster)

SOME FOSSIL PLANTS AND CUTICLE FROM THE LOWER CRETACEOUS KIRKWOOD FORMATION (South Eastern Cape Province)

Marion Coventry

Bernard Price Institute for Palaeontological Research

The geological background of the area and fossil localities is reviewed. The macroplants are briefly described and illustrated; some examples are *Zamites, Onychiopsis, Sphenopteris Cladophlebis,* and coniferous wood. Cycad cuticle preparations are shown. In conclusion the age of the formation is discussed.

(Poster)

THE WHAITSIID BRAIN STUDIED BY MEANS OF AN ENDOCAST OF THE BRAINCASE

J.F. Durand

ABSTRACT

The morphology of the whaitsiid brain has been until now a total enigma The morphology of the brain is deduced from silicone rubber endocasts of the prepared braincase.

PLESIOSAURUS CAPENSIS ANDREWS 1911

B.H. Newman

131, 5th Avenue, Rondebosch East, Cape Town

In 1900 a plesiosaurian was discovered by a Geological Commission Field Officer, Mr. Schwartz, at a place called Picnic Bush in the cliffs above the Swartkops River 'between Uitenhage and the sea'. From certain invertebrate fossils collected by other local collectors it would seem that Picnic Bush is more specifically located opposite Redhouse on the Swartkops river close to Port Elizabeth. The deposit in which the plesiosaur was found is of the 'Sundays River' series and is correlated with the Neocomian of the upper Lower Cretaceous.

The specimen was sent to Professor Seeley in London for description but he died before he could examine it and so it was passed on to Dr. C.W. Andrews of the department of Geology at the British Museum (Natural History).

Andrews published his paper in the *Annals of the South African Museum* for 1911. The material comprised the skull, which lacked the right zygomatic and temporal bar, the two articulars with some portions of the lower jaw rami, the distal portion of the right femur with its tibia and fibula, the mid upper portion of the left femur with its fibula. There were twenty one cervical and fifteen dorsal vertebrae. Finally there was what is probably the right capitulum, a part of what may be an ulna, and numerous indeterminate fragments.

Andrews mentions in his paper that the skull was partly obscured by six dorsal vertebrae which would indicate that he had the specimen prepared at the British Museum (NH) for he figures the skull without these vertebrae, and there is a cast of the skull in the collection of the BM (NH) that dates from this time.

This specimen is unique in Southern Africa being the only plesiosaurian that is in anyway near complete with a skull. Further the skull is unique to the whole continent of Africa in having a relatively uncrushed braincase and rostrum and indeed is a rarity in the world.

Andrews described this material in a quick short paper and – with the crude techniques for developing fossils available to him at that time – could not do justice to describing this very unusual specimen with its complete cranium and rostrum. Even today this skull is unusual and is surely worthy of being developed with modern techniques and further description.

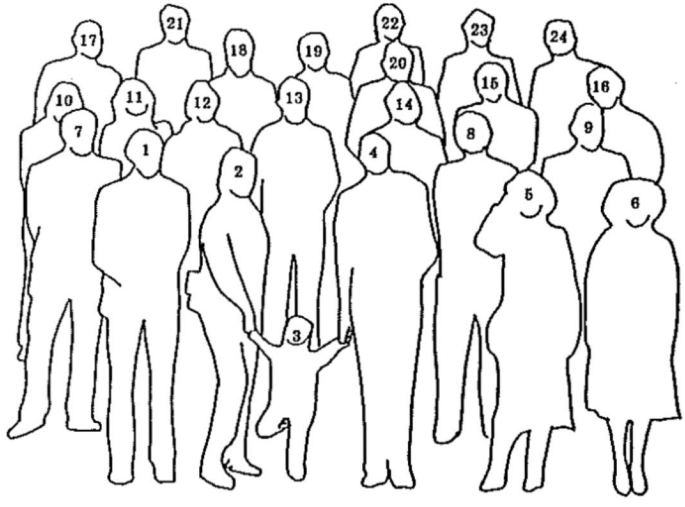
Andrews, in his paper, mentions the unusual morphology of the anterior cervical vertebrae. The rocks that *P. capensis* was found in were laid

down in estuarine conditions. Back in the 1960's I collected some plesiosaurian remains from the 'Lower Estuarine Series' of the Jurassic rocks of the Isle of Eigg, Western Scotland. The cervical vertebrae I collected there showed remarkable similarity to those of *P. capensis* and it is noteworthy that they are both from an estuarine habitat.

The *P. capensis* skull possesses large orbits which indicate that it had large eyes, perhaps adapted to seeing through the murky waters of the tidal estuary much as modern day seals.

It seems likely that these small plesiosaurians occupied a similar ecological niche in their day as do the modern river dolphins of today, only relying on their eyesight instead of sonar to catch their prey.

Palaeontological Society of Southern Africa
Paleontologiese Vereniging van Suider Afrika
THIRD CONFERENCE – STELLENBOSCH, 16–19 July, 1984



(see caption below photo on p 29)

(photo by Laura Brain)

1: A. Scholtz; 2: I. Chesselet; 3: A. robustus; 4: E. van Dijk; 5: A. Cadman; 6: M. Coventry; 7: J. Brink; 8: H. Klinger; 9: C. MacRae; 10: B. Newman; 11: M. Newman; 12: P. Haarhof; 13: C. Gow; 14: M.Raath; 15: M. Cluver; 16: B. Oelofsen; 17: A. Keyser; 18: F. Durand; 19: J. van den Worm; 20: J. Kitching; 21: C.K.Brain; 22: R. Smith; 23: B. Rubidge; 24: A.S.Brink.

(see p 28 for key)

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