

BULLETIN

OF THE

AMERICAN MUSEUM OF NATURAL HISTORY.

VOL. XXV, PART II.

CATALOGUE OF TYPES AND FIGURED SPECIMENS OF FOSSIL
VERTEBRATES IN THE AMERICAN MUSEUM OF
NATURAL HISTORY.

II.—PERMIAN, TRIASSIC AND JURASSIC REPTILES OF
SOUTH AFRICA.

By R. BROOM.

JANUARY 4, 1915.

(Continued from 3d page of cover.)

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ETHNOGRAPHICAL ALBUM.

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- Ethnographical Album of the North Pacific Coasts of America and Asia. Part 1, pp. 1–5, pl. 1–28. August, 1900. Sold by subscription, price, \$6.00.

BULLETIN.

The matter in the 'Bulletin' consists of about 24 to 36 articles per volume, which relate about equally to Geology, Palaeontology, Mammalogy, Ornithology, Entomology, and (in former volumes) Anthropology, except Vol. XI, which is restricted to a 'Catalogue of the Types and Figured Specimens in the Palaeontological Collection of the Geological Department,' and Vols. XV, XVII, and XVIII, which relate wholly to Anthropology. Volume XXIII and the later volumes contain no anthropological matter, which is now issued separately as 'Anthropological Papers.'

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AMERICAN MUSEUM JOURNAL.

The 'Journal' is a popular record of the progress of the American Museum of Natural History, issued monthly, from October to May inclusive. Price, \$1.50 a year. Volumes I–XIII, 1900–1913.

*The Anatomy of the Common Squid. By Leonard Worcester Williams. Pp. 1–87, pl. i–iii, and 16 text figures. 1909.

*Chinese Pottery of the Han Dynasty. By Berthold Laufer. Pp. 1–339, pl. i–lxxv, and 55 text figures. 1909.

For sale at the Museum.

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ERRATA.

This paper was printed without the proof being submitted to the author, who was absent from America and could not be easily reached. He has since forwarded the following list of errata.

Page 106, line 5 from bottom, for *Rhinesuchus* read "*Myriodon*."

" 107, " 21, for Dromasaurians read Dromasauria.

" 107, " 25, for probably the oldest known primitive Chelonian read possibly a form allied to the ancestral Chelonians.

" 107, " 3 from bottom, for *Dicyondon* read *Dicynodon*.

" 108, " 6, for *Atherstonia* read *Atherstonia*.

" 115, " 7, for Joubert read Rev. Mr. Joubert.

" 115, after line 7, insert "These Dromasaurians are fully figured in connection with my Croonian Lecture, Phil. Trans. Royal Soc., 1914.

" 116, line 11 from bottom, for relatively small and slender read moderately well developed.

" 116, " 7 from bottom, add There may have been 7 molars.

" 117, " 13, for J. T. R. Scholtz read T. J. R. Scholtz.

" 117, " 16, for regions read region.

" 118, " 15 from bottom, insert elsewhere at end of line.

" 118, " 14 " " for Mek read Nek.

" 119, " 15, for mandibles read mandible.

" 120, after line 8, insert Locality, Beaufort West. Collector, J. H. Whaits.

" 120, line 11, for small read fair sized.

" 124, legend for Fig. 10, add slightly restored.

" 126, line 12, for Neiuweveld read Nieuweveld.

" 136, lines 4 and 5, *dele* Amer. Mus. Journ. reference.

" 136, legend for Fig. 23, add to first line and made a little too large posteriorly.

" 136, between lines 7 and 8 from bottom, insert following:

Topotype A skull and nearly complete skeleton of *D. platyceps*. All
5635 (Fig. 27) the skeleton except the skull and remains of the fore limb were found in association and as mounted, except that the left hind limb lay almost directly backwards. The type skull and that mounted with this skeleton were found in the same stratum as the skeleton and each about a dozen yards from it, and about 10 yards from each other. Either may be the skull belonging to the skeleton. The front limb remains were also got in the same stratum but some yards away.

Figured in Amer. Mus. Journ., Vol. XIV, p. 136, Apr. 1914. Locality, ~~13~~ New Bghesda. Horizon, *Cistecephalus* zone. Collector, R. Broom.

Page 138, legend for Fig. 27, for Type No. 5542 read Topotype No. 5635.

" 142, line 5 from bottom, for Nieuwveld read Nieuweveld.

" 145, " 4, for Graaf Reinnet read Graaff Reinnet.

" 147, " 15, add Figured in Croonian Lecture, Phil. Trans. Roy. Soc., 1914.

" 147, over marginal number 5632, insert Figured.

" 157, " " " 5622, *dele* Figured.

" 157, legend for Fig. 44, for No. 5622 read Figure of the type in the S. African Museum. Slightly restored.

" 157, lines 9 and 10 from bottom, *dele* the two lines.

" 157, " 8 and 2 from bottom, for Winnarsbaken read Winnaarsbaken.

" 159, " 1, for **Lycognathus** read **Lycochampsa**.

" 159, " 5, add under the name *Lycognathus ferox*. As this generic name is preoccupied (Dumeril, 1853) it has been changed to *Lycochampsa*.

" 159, legend for Fig. 46, for *Lycognathus ferox* read *Lycochampsa ferox*.

" 159, over marginal number 5517 *dele* Figured.

" 159, last line, *dele* the line.

" 159, legend for Fig. 47, for Topotype No. 5517, read Restoration of the nearly perfect type skull in A. Brown's collection.

" 160, line 17, for PHYTOSAURIA read PELYCOSIMIA.

" 160, last line, for R. Broom read unknown.

" 161, line 14, for ?PSEUDOSUCHIA read EOSUCHIA.

" 161, " 15, for **Youngina gracilis** gen. et sp. nov. read **Youngina capensis** Broom 1914.

~~" 161, over marginal number 5561, *dele* Type.~~

" 161, line 16, for This new genus and species is founded on the read A.

" 161, " 4 from bottom, for 15 mm. read 17 mm.

" 161, last line, for squamosal read tabular.

" 162, line 5, for much read had.

" 162, " 10, for delighted read pleased.

" 162, after line 15, insert SAUROPODA (as a center heading), and transfer **Algoasaurus bauri** (lines 6 to 10 from bottom) from THEROPODA to SAUROPODA.

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BY R. BROOM.

PREFACE.

Nearly all the specimens listed in this section of the Catalogue are included in the private collection of Doctor Robert Broom, acquired by the Museum in 1913. Dr. Broom devoted over six months in 1913-14 to the cataloguing and study of this collection and supervision of its preparation and installment, and the records have the unusual advantage of being revised by an authority of preeminent standing in this field and thoroughly familiar with the locality and history of practically every specimen listed. Manuscript and illustrations have also been checked over and revised by Mr. Walter Granger, and a few omissions corrected. Departing somewhat from the limitations of the first section of the Catalogue it has been thought better here to include all of the more important specimens and not to limit it strictly to the types and figured fossils. For obvious reasons also it is more descriptive, a number of genera and species making here their first appearance.

W. D. MATTHEW,
Curator.

INTRODUCTION.

The reptiles found fossil in the Karroo rocks of South Africa are among the most important forms met with in the whole range of geological history. The Karroo formation of South Africa is the only known deposit which yields an almost uninterrupted record of land animals for the two or three million years represented by the Permian and Triassic periods. And this portion of the world's history is about the most interesting one we could desire, for during this time we had the birth of not only all modern types of reptiles but also of the dinosaurs, the mammals and possibly the birds.

Almost all the specimens of South African fossil reptiles that have been discovered are found in five collections. The British Museum collection which contains almost all of Owen's types and most of Seeley's is by far the best known. The majority of the specimens were fully figured and described by Owen. Later they were catalogued by Lydekker, and Seeley has reexamined most of them, besides describing a large number of other specimens in a series of papers in the Philosophical Transactions of the Royal Society. The British Museum collection contains about one third of the known types, a good skeleton of *Pareiasaurus*, two good skeletons of *Dicynodon*, and the best collection of Cynodonts.

The South African Museum has a fairly large number of types, the best collection of Pareiasaurians, including four nearly complete skeletons, a mounted imperfect skeleton of *Endothiodon*, some good specimens of *Mesosaurus*, a good collection of Therocephalians, and by far the best collection of Dinosaurs.

The Albany Museum, Grahamstown, has a small number of types, a number of good skulls of Cynodonts, an almost perfect skeleton of *Lystrosaurus*, and an almost perfect skeleton of a small species of *Dicynodon*. In the Museum is also by far the best collection of specimens of *Procolophon*.

The private collection of Mr. Alfred Brown, of Aliwal North, contains besides the best collection of fossil plants a considerable number of very valuable types of Cynodonts and some beautiful skeletons of the Pseudosuchian *Euparkeria*, and a very fine collection of fossil fishes.

There are a few less important specimens in other museums, especially those of Bloemfontein, Pretoria, Port Elizabeth, and Kimberley. In Pretoria Museum are the very fine skeletons of the Stegocephalian *Rhinesuchus*.

The only other important collection is that of the American Museum, which in importance closely rivals that of the British Museum and of which the following is a catalogue of the more important specimens.

The Karroo system occupies the greater part of the interior of Cape Col-

ony, the whole of Basutoland, most of the Free State, and much of the Transvaal and Natal. The whole thickness of the deposit, excluding the volcanic beds of the Drakensberg, is probably not less than 18,000 ft. though probably in no single locality are all the beds developed to the maximum thickness.

The lowest beds form the Dwyka series which is composed of the glacial tillite which is in places 1000 ft. thick and below and above which are 600 or 700 ft. of shales. Near the top of the upper shales is a band which contains the oldest known Karroo fossils (*Mesosaurus* and *Noteosaurus*), interesting from their close resemblance to species of the same genera in Brazil.

Above the Dwyka series we come to about 2600 ft. of shales and sandstones which form the Ecca series. This group of rocks is almost entirely unfossiliferous, only a very few forms having been obtained. *Archæosuchus* and *Eccasaurus* are the only known reptiles though it is possible that *Moschops* also comes from the upper Ecca beds.

Above the Ecca we come to the first moderately rich fossil-bearing strata, the *Pareiasaurus* zone of the Beaufort series. In this zone which is probably about 1000 ft. thick are, besides *Pareiasaurus* which is the typical form a number of Dinocephalians (*Tapinocephalus*, *Pelosuchus*, *Taurops*), large carnivorous reptiles of unknown affinities (*Titanosuchus*, *Scapanodon*), the small mammal-like reptiles which form the suborder Dromasaurians (*Galechirus*, *Galepus*, *Galeops*), a large number of Therocephalians (*Lycosuchus*, *Glanosuchus*, *Alopecodon*, *Pristerognathus*, *Pardosuchus*, *Hyenosuchus*), the first of the known Anomodonts (*Dicynodon*), some little lizard-like forms (*Heleosaurus*, *Heleophilus*), and what is probably the oldest known primitive Chelonian (*Eumotosaurus*).

Above the *Pareiasaurus* zone we come to about 1500 or 2000 ft. which form the *Endothiodon* zone. In these beds small species of *Dicynodon* are numerous and large Anomodonts called *Endothiodon* are common in the lower part of the zone. The carnivorous reptiles for the most part belong to the suborder Gorgonopsia (*Gorgonops*, *Scymnognathus*, *Ælurosaurus*, *Aloposaurus*), but there are also other carnivorous types, some of which may be true Therocephalians (*Scaloposaurus*, *Ictidognathus*, *Ictidosuchus*). The Pareiasaurians of this zone belong to the genus *Propappus*.

Above the *Endothiodon* zone we come to the *Cistecephalus* zone, which is probably 1500 to 2000 ft. thick. The lower beds are characterized by the presence of a peculiar small Anomodont *Cistecephalus*. The large *Endothiodons* no longer occur and their place is taken by large species of *Dicynodon*. The carnivorous types mostly belong to the Gorgonopsia (*Scymnognathus*, *Scylacops*, *Ictodorrhinus*, *Cynosuchus*, *Tigrisuchus*, *Arctosuchus*). Small Diaptosaurian reptiles occur (*Youngina*).

All the above mentioned beds from the Dwyka to the *Cistecephalus* zone probably belong to the Permian period.

Above the *Cistecephalus* zone we come to deposit possibly 1500 ft. in thickness in which land animals are extremely rare, the only common fossils being the amphibious Anomodont *Lystrosaurus* and Palæoniscid fishes (*Atherstonia*).

The upper part of the *Lystrosaurus* zone runs into a narrower zone which is characterized by the presence of the remarkable little Corylosaurian *Procolophon*. *Lystrosaurus* still occurs in association with *Procolophon* but as the *Procolophon* beds are apparently a land formation and as land forms are not uncommon it seems well to keep the *Procolophon* zone distinct. Besides *Procolophon* we have the Cynodont *Nyctosaurus* and the Pseudosuchian *Proterosuchus*. The *Procolophon* zone is probably comparatively thin, perhaps about 400 or 500 ft.

Above the *Procolophon* zone we have the *Cynognathus* zone which forms the upper part of the whole series and corresponds closely with the upper Triassic beds of Europe. The beds are characterized by the presence of a large number of different kinds of Cynodont reptiles, of which the best known are *Cynognathus*, *Lycognathus*, *Galesaurus*, *Gomphognathus*, *Diademodon*, *Trirachodon*, *Sesamodon*, *Melinodon*, and *Bauria*. Small Anomodonts are extremely rare but a large form of Dicynodont (*Kannemeyeria*) is not uncommon. A considerable number of small Diaptosaurians are known, some of which (*Euparkeria*, *Browniella*) are Pseudosuchians, and others (*Mesosuchus*, *Howesia*) are possibly more allied to the Gnathodonts. Stegocephalians are fairly common in some of the beds and mostly belong to the European genera (*Cyclotosaurus*, *Capitosaurus*, *Trematosaurus*), though other genera, not at present known outside of Africa, also occur (*Batrachosuchus*, *Micropholis*, *Bothriceps*). In the lower part of the zone there occurs the large primitive Phytosaur *Erythrosuchus*, though not fully adapted for amphibious habits like the typical Phytosaurs it agrees with them in all essential points of structure, except such as relate to the aquatic life.

Above those beds which represent the upper Triassic of Europe, we meet with a well developed zone of 2000 ft. of sandstones, shales, and mudstones, which are remarkable for the great abundance of plant remains and the almost entire absence of animal remains. These form the Molteno beds. By Seward the Molteno beds are regarded as being of Rhætic age.

Above the Molteno beds we have a series of reddish shales and sandstones which have been called Red beds. In these we have the remains of a large number of different species and genera of dinosaurs (*Euskelesaurus*, *Massospondylus*, *Thecodontosaurus*, *Gryponyx*, *Ætonyx*, *Geranosaurus*, *Plateosaurus*). Two Cynodonts are known from fragmentary remains and the primitive

mammal, *Tritylodon*. A small Crocodilian genus, *Notochampsia*, also occurs. The Red beds in places are 1600 ft. thick.

Above the Red beds occurs a deposit of soft sandstone 600 or 800 ft. thick called the Cave Sandstone. In it fossils are very rare but a few dinosaur and crocodiles occur fairly similar to those of the Red beds.

There is little doubt that the Red beds and Cave Sandstone correspond in age with the lower Jurassic of Europe. This is rendered pretty certain by the fact of the Molteno beds being identified with the Rhætic and from the fact that *Notochampsia* is a true crocodile with the pubis not entering the acetabulum.

In the accompanying map is roughly indicated the position occupied by the various life zones. In the north part of Cape Colony and in the greater part of the Free State it has not been possible so far to trace the limits of the zone as fossils are extremely rare. The large majority of fossils are from the southern border of the basin.

CATALOGUE OF THE BROOM COLLECTION.

COTYLOSAURIA.

Pareiasaurus acutirostris Broom 1913.

- 5568 Imperfect skull of a small Pareiasaurian which may be referred with much probability to *P. acutirostris* Broom. It has been compared with the type which is in the Albany Museum, and agrees fairly satisfactorily.
- Locality, ?. Horizon, *Pareiasaurus* zone. Collector, J. H. Whaits.

Pareiasaurus whaitsi Broom 1914. (Fig. 1.)

- Type This species is founded on a fine skull found at Fraserburg
5567 Road by Mr. J. H. Whaits after whom the species is named.
- In general proportions it agrees pretty closely with *P. serridens* and *P. bairni*, but differs from both of these in the much larger size of the orbit and in the lower jaw having two horn-like processes instead of only one. In *Propappus omocratus* there are also two horn-like processes but they are quite differently arranged.
- The teeth are badly preserved, those of the front of both upper and lower jaws being lost, and those further back

broken. Six maxillary teeth near the posterior end of the series measure 70 mm.

The following are some of the principal measurements:

Length of skull from front to middle of "cheek".....	455	mm.
" " " " " " " " "occiput.....	405	"
" from snout to front of orbit.....	180	"
Distance between tabular bosses.....	220	"
Anteroposterior diameter of orbit.....	115	"
Back of orbit to middle of "cheek".....	162	"



Fig. 1. *Pareiasaurus whaitsi* Broom. Type, No. 5567. $\times \frac{1}{4}$. (From Amer. Mus. Journ.)

A preliminary description, with a figure, was given in Amer. Mus. Journ., XIV, p. 138, April, 1914.
Locality, Fraserburg Road. Horizon, *Pareiasaurus* zone.
Collector, J. H. Whaits.

Propappus rogersi Broom 1912.

- Type Cast of humerus, femur, radius, ulna and tibia of *Propappus*
(Casts) *rogersi* Broom. The originals are in the S. African Mu-
5604 seum, Cape Town.
Described and figured in Ann. S. Afr. Mus., Vol. VII, Pt. V,
1912, p. 323, pll. xix-xxi.
Locality, Hoedemaker's Kraal, Beaufort West dist. Horizon,
probably *Cistecephalus* zone. Collector, A. W. Rogers.

DINOCEPHALIA.

Moschognathus whaitsi Broom 1914.

- Type The greater part of both mandibles and much of the upper jaws
5602 with teeth of a Dinocephalian allied to *Moschops*. There
are also present parts of the back of the skull, a large
series of vertebræ and most of the ribs of the right side,

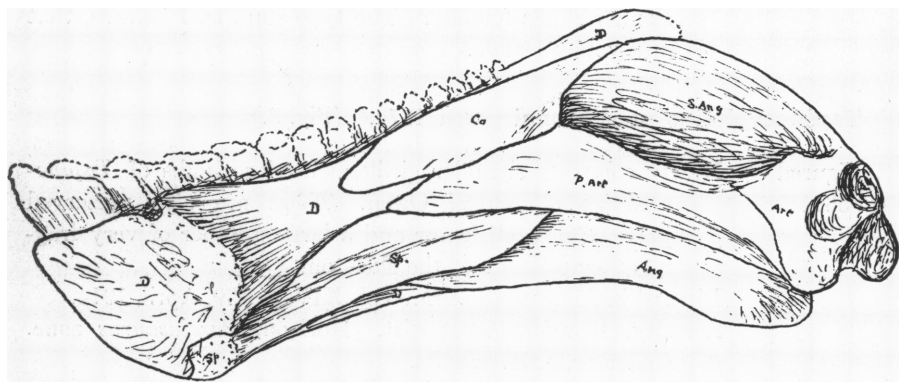


Fig. 2. *Moschognathus whaitsi* Broom. Type, No. 5602. $\times \frac{2}{3}$. (From Bull. Amer. Mus. Nat. Hist.)

much of both sides of the pelvis and both femora, besides other fragmentary remains.

The jaw has been figured and briefly described in Bull. Amer. Mus. Nat. Hist., Vol. XXXIII, 1914, p. 137, fig. 2.

Locality, Beaufort West dist. Horizon, upper *Pareiasaurus* zone. Collector, J. H. Whaits.

Moschops capensis Broom 1911.

- Type** Nearly complete skull, with mandible which probably belongs
5550 to same individual.
 The skull has been figured and described in Proc. Zool. Soc.,
 1911, p. 1073, pl. xii, fig. 1.
 Locality, Spitzkop, Moordenaar's Karroo. Horizon, not im-
 probably Upper Ecca series. No other determinable
 remains have been discovered in the neighbourhood, and
 it seems probable that were it in the *Pareiasaurus* zone
 some remains of *Pareiasaurus* would occur. Collector, R.
 Broom.
- Topotypes** Within an area of about a rood there were found the remains of
5551-5557 eight skeletons, all apparently belonging to the same
 species. The skulls differ mainly in the degree of thicken-
 ing of the bones around the temporal fossa, while the
 limb bones and girdles differ only in size. I therefore
 conclude that the differences are due to age and sex,
 the larger thick-skulled forms being males, the more
 slender skulls females. The type skull is, I believe, that
 of a young female.

Tapinocephalus atherstonei Owen 1876. (Fig. 3.)

- Figured** Nearly complete shoulder girdles with fore limbs of *Tapino-*
5611 *cephalus atherstonei* Owen. There are also preserved
 portions of each femur and a large number of very frag-
 mentary remains of the skeleton.
 Figured in Am. Mus. Journ., Vol. XIV, p. 139, April, 1914.
 Locality, Beaufort West dist. Horizon, *Pareiasaurus* zone.
 Collector, J. H. Whaits.

Taurops macrodon Broom 1912.

- Type** Snout of a very large Dinocephalian.
5610 Described and figured in Proc. Zool. Soc., 1912, p. 859, pl. xc,
 fig. 1.
 Locality, Komsberg, Sutherland dist. Horizon, ? *Pareiasaurus*
 zone. Collector, J. H. Whaits.



Fig. 3. Shoulder girdle and front limb of *Tapinocephalus atherstonei* Owen. No. 5611.
 $\times \frac{1}{10}$. Partly restored. (From Amer. Mus. Journ.)

DROMASAURIA.

Galechirus scholtzi Broom 1907.

Topotype. Impression of the left arm and leg with most of the tail, and
5516 other remains. The carpus and tarsus are beautifully shown, and the scapula and pelvis fairly well shown.

Locality, Victoria West, Cape Colony. Horizon, probably *Pareiasaurus* zone. Collector, T. J. R. Scholtz.

Galeops whaitsi Broom 1912.

Type Skull and anterior half of skeleton of a toothless Dromasaurian.
5536 The skull was described and figured in Proc. Zool. Soc., 1912, p. 860, pl. xci, fig. 6.

The following are some of the principal measurements: —

Length of skull about.....	60 mm.
“ “ mandible.....	47 “
“ “ humerus.....	50 “
“ “ ulna.....	37 “
“ “ radius.....	31 “

Locality, “La-de-da,” Beaufort West dist. Horizon, *Pareiasaurus* zone, upper beds. Collector, J. H. Whaits.

5536 Counter slab, which shows much of the skull.

Galepus jouberti Broom 1910. (Figs. 4, 5.)

Type An almost perfect skeleton of a small Dromasaurian. The
5541 bones have completely disappeared and left in nearly

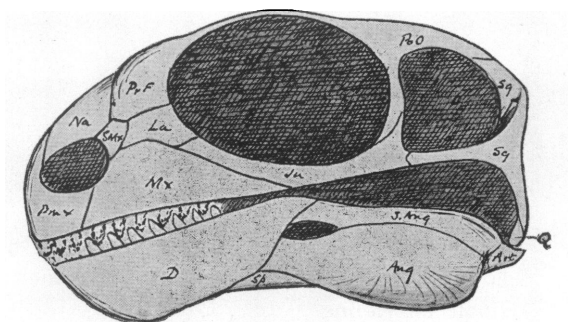


Fig. 4. *Galepus jouberti* Broom. Type, No. 5541. $\times \frac{5}{8}$. Slightly restored. (From Bull. Amer. Mus. Nat. Hist.)

every case perfect impressions. The right manus is only partly preserved and most of the left arm is missing, but with these exceptions the skeleton is complete.



Fig. 5. *Galepus jouberti* Broom. Type, No. 5541. $\times \frac{1}{2}$. (From Amer. Mus. Journ.)

Described and figured in Bull. Amer. Mus. Nat. Hist., Vol. XXVIII, 1910, p. 204, fig. 3.

Locality, Near Richmond Road, Cape Colony. Horizon, probably *Pareiasaurus* zone. Collector, Joubert.

THEROCEPHALIA.

Alopecodon priscus Broom 1908.

5569 This specimen is the antorbital portion of a skull which is badly weathered. It shows, however, very satisfactorily the unusually large number of incisors. In front of the large canine are 9 teeth, 8 of which are incisors and one a small 1st canine.

Locality, Fraserburg Road. Horizon, *Pareiasaurus* zone. Collector, J. H. Whaits.

***Alopecognathus angusticeps* gen. et. sp. nov.**

Type This new genus and species is founded on a beautiful complete
5559 skull of a large Therocephalian from the upper *Pareiasaurus* zone.

Though the skull is nearly perfect unfortunately owing to the nature of the bone it is almost impossible to make out any of the sutures.

The whole skull is narrow and deep. The orbits are placed near the middle and are relatively small. The frontal region is unusually small and the parietal region forms a narrow crest. From the orbit to the front of the snout is 143 mm. The greatest length of the skull is 276 mm. The greatest width is probably about 140 mm.

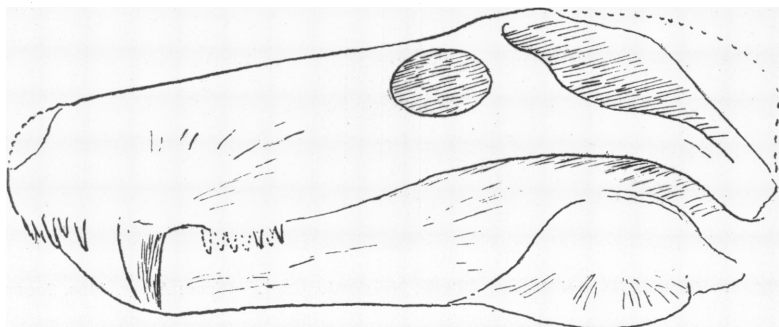


Fig. 6. Skull of *Alopecognathus angusticeps* Broom. Type, No. 5559. $\times \frac{2}{3}$.

There are 6 incisors of which the posterior one at least is much flattened. Probably all, certainly most, are serrate behind. They occupy a space of 33 mm. Between the 6th incisor and the canine is an unusually short diastema of only 7 mm. The canine is relatively small and slender. It has an antero-posterior measurement of 12 mm. and a height of about 30 mm. What is probably the 1st molar is situated 15 mm. behind the canine and the whole series of 6 molars occupies a space of 30 mm.

The angular is a large oval bone as it shows on the outer side and though somewhat corrugated lacks the peculiar cross bar of the Gorgonopsians.

Locality, Grootfontein, 13 miles S. W. of Beaufort West. Horizon, upper part of *Pareiasaurus* zone. Collector, J. H. Whaits.

***Alopecorhinus parvidens* Broom 1912.**

- Type Imperfect front portion of skull.
 5503 Described and figured in Proc. Zool. Soc., 1912, p. 864, pl. xci, fig. 9.
 Locality, Beaufort West Commonage. Horizon, *Endothiodon* zone. Collector, J. H. Whaits.

***Arnognathus parvidens* Broom 1907.**

- Natural Natural cast of dentary of *Arnognathus parvidens* Broom.
 Cast of The dentary is in the S. African Mus. Collection.
 Type Described and figured in Trans. S. Afr. Phil. Soc., 1907, Vol.
 5619 XVIII, Pt. 1, p. 38, pl. iii, fig. 6.
 Locality, Victoria West. Horizon, *Pareiasaurus* zone. Collector, J. T. R. Scholtz.

***Eriphostoma microdon* Broom 1911.**

- Type An imperfect skull, much weathered and lacking a part of the
 5524 middle regions. *Eriphostoma* being the oldest known Therocephalian in which the occiput is shown, the condition calls for some note. There is certainly a large median supraoccipital situated between the foramen magnum and the interparietal. The interparietal, though apparently single, has some evidence from the direction of the bony fibres of having been formed from two centres of ossification. External to the supraoccipital is a bone which appears to be part of the squamosal. A small tabulare may be present by the side of the interparietal but if so it is very small if the lower bone be correctly identified as squamosal.
 Described and figured in Proc. Zool. Soc., 1911, p. 1078, pl. lxiii, fig. 12.
 Locality, Fraserburg Road. Horizon, *Pareiasaurus* zone. Collector, J. H. Whaits.

***Ictidognathus hemburyi* Broom 1912.**

- Type Middle and front portion of skull, with mandibles in good
 5520 preservation. The incisor teeth are well shown, but the molars badly.
 Described and figured in Proc. Zool. Soc., 1912, p. 865, pl. xci, figs. 10, 11.

Locality, Beaufort West. Horizon, lower part of *Endothiodon* zone. Collector, H. J. Hembury.

- Topotype 5521 Anterior half of skull, with mandibles showing most of the dentition, the canine very beautifully. The snout has been broken across and shows the paired prevomers distinct but in fairly close contact. Each is curved as if to lodge Jacobson's organ. The condition is interesting for its close resemblance to the condition in *Ictidognathus parvidens*, from which it only differs in that in the latter the prevomers are fused. This difference suggests that the two types may be generically distinct, but as they are certainly closely allied it will probably be more convenient till further material is obtained to keep them in the same genus.

Locality, Beaufort West. Horizon, lower part of *Endothiodon* zone. Collector, H. J. Hembury.

***Ictidognathus parvidens* Broom 1911.**

- Type 5522 Anterior half of skull, with mandibles attached. Described and figured in Proc. Zool. Soc. 1911, p. 1078, pl. lxii, fig. 5 and pl. lxiii, fig. 11. Since then the snout has been broken across and shows the prevomers fused but scroll-like. They are being figured.
- Locality, Mek, at Kuilspoort, Beaufort West dist. Horizon, lower beds of *Cistecephalus* zone. Collector, R. Broom.

***Ictidosaurus angusticeps* Broom 1908.**

- 5527 A fairly well preserved specimen of the antorbital portion of the skull with the mandibles attached. It shows the teeth much better than does the type which is the only other known specimen of the species. There are evidently 9 small pointed molars, and the canine is remarkably long and slender. The length from the base to the tip of the canine is probably as much as 40 mm., though the antero-posterior length of the base of the tooth is only about 11.5 mm.
- Locality, Beaufort West. Horizon, near base of the *Endothiodon* zone. Collector, J. H. Whaits.

***Ictidosuchus primævus* Broom 1900.**

- Type 5529 Portion of skeleton of small Therocephalian. The remains include much of the upper part of the skull, but the front of the snout and much of the left side are lacking. The left dentary is present in fairly good condition. The left scapula, coracoid and precoracoid are well preserved, and much of both humeri, with a tibia and some of the posterior bones of the jaw. When first described a description was given of what was believed to be the left femur. A re-examination of the specimen afterwards showed that this supposed femur is really the left humerus. *Ictidosuchus* is one of the most remarkably aberrant Therocephalians known, quite unlike any other known genus except perhaps *Arnognathus* which is only known by the dentary. Described and a figure given of the mandibles in Ann. Mag. Nat. Hist., Vol. VI (7th ser.) No. xxxiii, 1900, p. 314. A fuller description of the remains with figures of all the important bones was published in Trans. S. Afr. Phil. Soc., Vol. XI, pt. 3, 1901, p. 177, pll. xxvi, xxvii, figs. 1-9. Locality, 10 miles N. E. of Pearston, Cape Colony. Horizon, probably upper *Endothiodon* zone. Collector, R. Broom.

***Pristerognathus platyrhinus* Broom 1912.**

- Type 5502 Greater part of front half of skull with mandibles in position. Described and figured in Proc. Zool. Soc., 1912, p. 863, pl. xci, fig. 8. Locality, Grootfontein, Beaufort West dist. Horizon, probably upper part of *Pareiasaurus* zone. Collector, J. H. Whaits.

***Scylacoides ferox* gen. et sp. nov. (Fig. 7.)**

- Type 5558 This new genus and species is founded on the preorbital portion of a medium sized skull. It is so considerably crushed that any drawing of it will give a misleading idea. It differs from *Ælurosaurus* in having 6 molars and in being much more heavily built. There are 5 incisors which occupy a space of 23 mm. followed by a diastema of 11 mm.

The canine has an antero-posterior measurement of 11 mm. followed by a diastema of 6.5 mm. There are 6 molars which occupy a space of 24 mm.



Fig. 7. Dentition of *Scylacoides ferox* Broom. Type, No. 5558. Natural size.

The length from the orbit to the tip of the snout is about 102 mm.

The specimen is too imperfect to enable one to say whether it is a true Therocephalian or a Gorgonopsid, more probably the former.

Scylacorhinus falkenbachi gen. et sp. nov. (Fig. 8.)

Type
5560

This new genus and species is founded on an imperfect skull of a small Therocephalian. The specimen includes the maxillaries, premaxillaries and dentaries, with small portions of a few other bones. The jaws and teeth are in fairly good condition.

The new genus has a dental formula of I^7, C^2, M^8 , and its nearest affinities are with *Alopecodon* which has a formula of I^8, C^2, M^8 and *Scylacosaurus* which has a dental formula of I^6, C^2, M^7 or 8 , and is practically intermediate between these two genera. *Alopecodon* has six large incisors and two small ones; *Scylacosaurus* has five large incisors and one small one; *Scylacorhinus* has five large incisors and two small ones.

The first five incisors are apparently all somewhat flattened and with serrated posterior borders. They occupy a space of 22 mm. The last two incisors are so small that they occupy practically the same space as does the fifth incisor alone. The whole incisor series measures 27 mm. Following the incisors is a diastema of 8 mm., behind which is the small 1st canine about equal in size to the 7th incisor. The second canine is long and slender. It has an antero-

posterior measurement of about 9 mm., and is probably about 30 mm. in height. The 1st molar lies 8 mm. behind the canine and the eight molars occupy a space of 33 mm. The whole dental series occupies a space of 84 mm. in a straight line.

Below the nostrils are a couple of moderate sized oblong foramina, one on each side, such as I have not previously

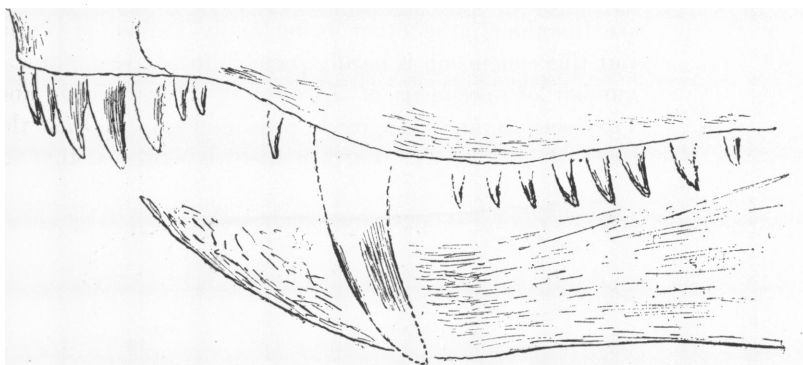


Fig. 8. Dentition of *Scylacorhinus falkenbachii* Broom. Type, No. 5560. Slightly enlarged.

noticed in Therocephalians though not improbably they are of common occurrence.

I have much pleasure in naming this new specimen after Mr. Charles Falkenbach who has devoted so much time and care to the preparation of the South African collection.

Locality, Beaufort West dist. Horizon, probably Upper *Parerasaurus* zone. Collector, J. H. Whaits.

Trochosuchus major sp. nov. (Fig. 9.)

Type 5543 This new species is founded on an imperfect skull obtained at Rietfontein, Prince Albert dist., Cape Colony. It consists of the great part of the skull, lacking the whole of the occiput and with the surface of the bone much weathered. The nasals are broad in front and posteriorly narrow to a sharp point, the two passing between the frontals. The posterior end of the nasal is about 20 mm. in front of the plane of the front of the orbit. The premaxilla is largely overlapped by the maxilla. It bears 5 incisors. These are large roundish teeth with an outer and posterior ridge

which is strongly serrated. The 5 incisors occupy a space of 38 mm. as against 24 mm. in *Trochosuchus acutus* Broom. The maxilla is moderately large and carries two large canines and three molars. The two canines together measure 29 mm. The thought has frequently occurred to me and possibly to others, may it not be possible that one of the large canines is a replacing tooth, and this seems not unlikely because very often only one of the two teeth are functional, the other being badly broken or worn. But this conclusion is hardly possible for we now know a number of specimens of *Lycosuchus*, *Hyenosuchus* and *Trochosuchus*, and all agree in having always at least the roots of both teeth. Further there is evidence that at

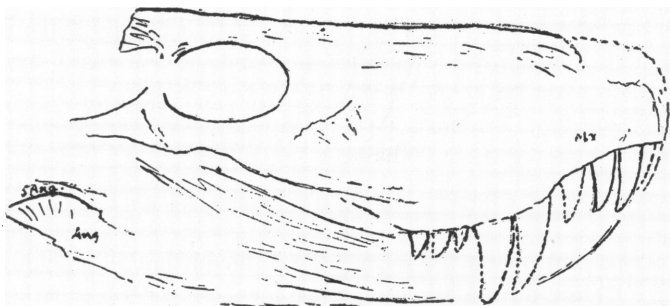


Fig. 9. Skull of *Trochosuchus major* Broom. Type, No. 5543. $\times \frac{2}{3}$. The canines are partly restored from the other side.

least the posterior of the two teeth is replaced by a new tooth behind it and that the anterior tooth is not a tooth replacing the second canine. We may thus assume that these three genera have two large canines in each maxilla probably each of which is indefinitely replaced. There are three molars in the lower jaw and though they are not preserved in the upper there have probably also been three. The three molars measure about 17 mm.

The lacrymal and prefrontal are both large. The distance from the orbit to the front of the snout is about 113 mm. *Trochosuchus* is allied to *Lycosuchus* and like it a typical Therocephalian with narrow intertemporal region and no preparietal. There is a distinct postfrontal bone.

Locality, Rietfontein, Prince Albert dist. Horizon, *Pareiasaurus* zone, probably lower beds. Collector, ?.

GORGONOPSIA.

***Ælurosaurus felinus* Owen 1881.**

- Probably Anterior half of skull with mandible in position, in very good
 Topotype condition.
 5514 Locality, Beaufort West, Cape Colony. Horizon, *Endothiodon*
 zone. Collector, J. H. Whaits.

?*Ælurosaurus felinus* Owen 1881.

- 5607 Both hind limbs and much of both sides of the pelvis with some
 vertebræ and a humerus of a small Gorgonopsian, probably
Ælurosaurus felinus Owen.
 The pelvis and ischium are plate-like in type and the ilium is
 remarkable for the low development of the post-acetabular
 portion of the crest.
 Locality, Beaufort West. Horizon, *Endothiodon* zone. Col-
 lector, J. H. Whaits.

***Ælurosaurus striatidens* Broom 1912.**

- Type Imperfect snout, showing most of the teeth.
 5506 Described and figured in Proc. Zool. Soc., 1912, p. 863, pl. xci,
 fig. 7.
 Locality, Kuilspoort, Beaufort West dist. Horizon, *Endo-*
thiodon zone, about 500 ft. above Beaufort West township.
 Collector, R. Broom.

***Ælurosaurus tenuirostris* Broom 1911.**

- Type Most of preorbital portion of skull.
 5504 Described and figured in Proc. Zool. Soc., 1911, p. 1077, pl.
 lxiii, fig. 9.
 Locality, Nek at Kuilspoort, Beaufort West dist. Horizon,
 lowest beds of *Cistecephalus* zone. Collector, R. Broom.

***Ælurosaurus whaitsi* Broom 1911.**

- Type Front of mandibles and fragments of snout.
 5528 Described and figured in Proc. Zool. Soc., 1911, p. 1077, pl.
 lxiii, fig. 8.
 Locality, Beaufort West. Horizon, lower part of *Endothiodon*
 zone. Collector, J. H. Whaits.

- Topotype** Anterior half of skull, with jaws in position, somewhat weathered but showing the incisors very satisfactorily and the canines fairly.
5513
- Locality, Beaufort West. Horizon, *Endothiodon* zone. Collector, J. H. Whaits.

***Aloposaurus gracilis* Broom 1910.**

- Type** Nearly perfect skull with mandibles attached.
5317 Briefly described and illustrated by a slightly restored side view in Bull. Amer. Mus. Nat. Hist., Vol. XXVIII, 1910, p. 208, fig. 7.
- The following are a few further details:—The five incisors measure 14 mm. followed by a diastema of 10 mm. From the front of the replacing canine to the back of what is believed to be the 6th molar is 23 mm. The greatest length of the skull is 120 mm. The frontal width is about

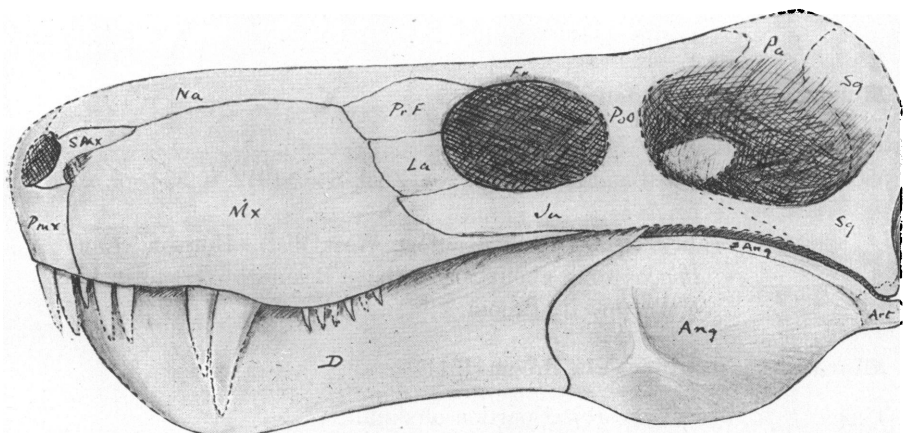


Fig. 10. *Aloposaurus gracilis* Broom. Type, No. 5317. Slightly under natural size. (From Bull. Amer. Mus. Nat. Hist.)

26 mm. and the intertemporal measurement about 30 mm. The parietal region is typically Gorgonopsid, there being a distinct preparietal. As the parietal region and the occiput are crushed the exact structure cannot be very clearly made out. There is certainly a large well preserved interparietal and a large squamosal but whether the squamosal articulates with the interparietal or whether there is between them a distinct tabulare is not quite clear.

There is a very deep median plate formed by the basi-sphenoid.

Locality, Kuilspoort, Beaufort West dist. Horizon, *Endothiodon* zone, about 1500 ft. above Beaufort West horizon.

Collector, R. Broom.

***Asthenognathus paucidens* gen. et sp. nov.**

Type
5562

This new genus and species is founded on a remarkable Gorgonopsian mandible found by Mr. Whaits at Witte Hart in the Nieuweveld. Though only the mandible is known we can be quite certain that it is quite a new type, as no Gorgonopsian has hitherto been discovered with two molars.

The jaw has the canine nearly perfectly preserved and though the crowns of the other teeth are lost the bases of all are preserved and their relations and sizes can be clearly seen.

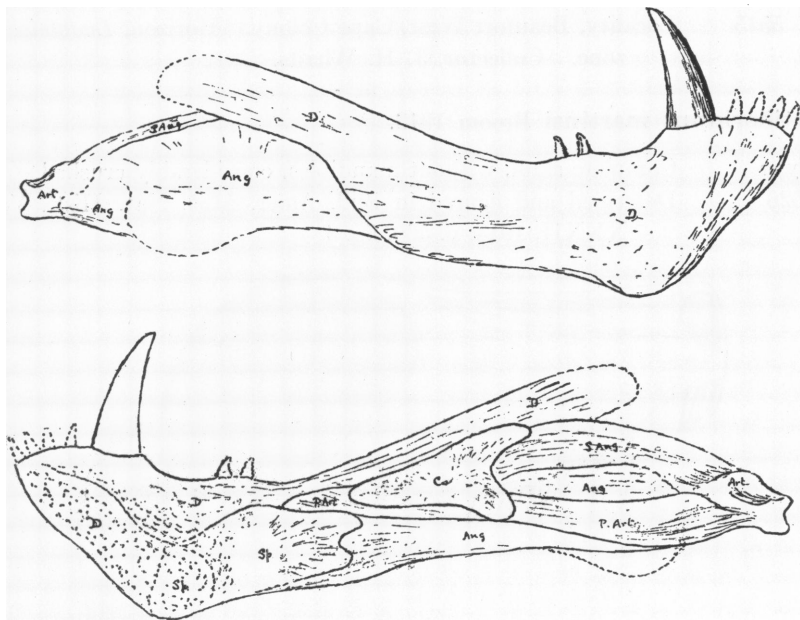


Fig. 11. Jaw of *Asthenognathus paucidens* Broom. Type, No. 5562. $\times \frac{1}{2}$.

The two mandibles are closely united by a large deep symphysis which slopes much more than in *Scymnognathus*. There

are 4 lower incisors which are each nearly round in section at the base. They occupy a space of 22 mm. The canine has an antero-posterior measurement of 12 mm. and a height of about 38 mm. Behind the canine is a diastema of 20 mm., followed by 2 molars which occupy a space of 11 mm. The total length of the dental series is in a direct line 66 mm.

The structure of the jaw will be best understood by the drawing. It will be seen to agree essentially with the previously known jaw of *Scylacops*. The total length of the jaw is 217 mm.

Locality, Wittekop, Neiuweveld. Horizon, *Cistecephalus* zone. Collector, J. H. Whaits.

Gorgonops torvus Owen 1876.

Probably Almost perfect skull without the mandible. It shows very
Topotype satisfactorily that there is a fair sized temporal opening.
5515 Locality, Beaufort West, Cape Colony. Horizon, *Endothiodon*
zone. Collector, J. H. Whaits.

Ictidorhinus martinsi Broom 1913.

Type Complete skull, without mandibles, considerably crushed.
5526 Described and figured in Bull. Amer. Mus. Nat. Hist., Vol.
XXXII, 1913, p. 560, fig. 4.

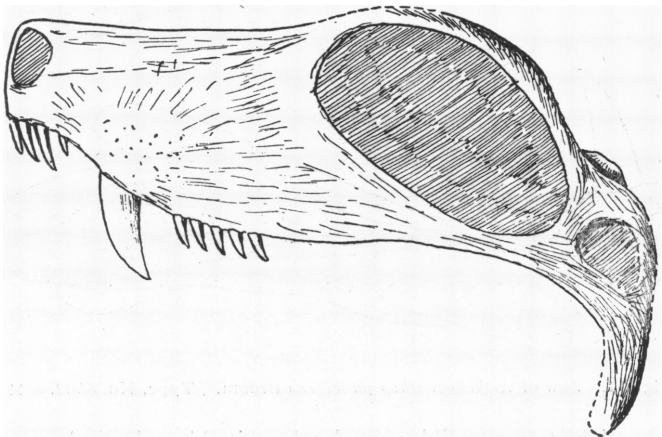


Fig. 12. *Ictidorhinus martinsi* Broom. Type, No. 5526. Natural size. (From Bull. Amer. Mus. Nat. Hist.)

Locality, Wilgebosch, near New Bethesda, Cape Colony.
 Horizon, *Cistecephalus* zone, about 1000 ft. above horizon
 of New Bethesda. Collector, J. H. Martins.

***Scymnognathus angusticeps* Broom 1913.**

Type Complete skull, with jaws in position, slightly crushed.
 5537 Described and figured in Bull. Amer. Mus. Nat. Hist., Vol.
 XXXII, 1913, p. 558, fig. 2.

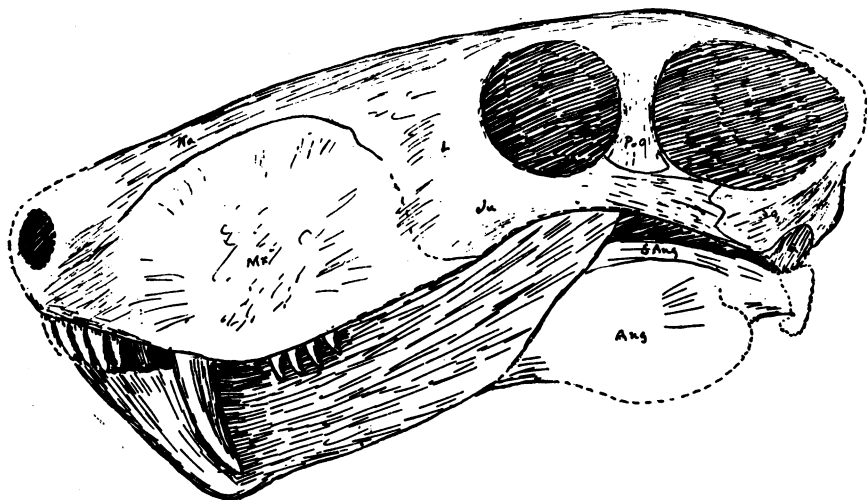


Fig. 13. *Scymnognathus angusticeps* Broom. Type, No. 5537. $\times \frac{2}{3}$. (From Bull. Amer. Mus. Nat. Hist.)

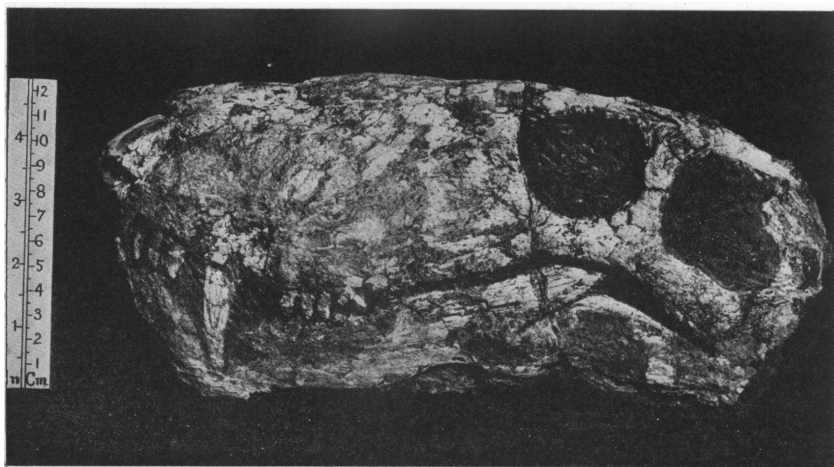


Fig. 14. *Scymnognathus angusticeps* Broom. Type, No. 5537. (From Amer. Mus. Journ.)

Locality, Wilgebosch, near New Bethesda, Cape Colony.
 Horizon, *Cistecephalus* zone, about 600 ft. above horizon
 of New Bethesda. Collector, R. Broom.

Scymnognathus minor Broom 1913.

- Type 5535 Greater part of skull and much of the skeleton, in a much crushed and rather badly weathered condition. Described and figured in Bull. Amer. Mus. Nat. Hist., Vol. XXXII, 1913, p. 559, fig. 3.
 Locality, New Bethesda.
 Horizon, probably middle region of *Cistecephalus* zone.
 Collector, R. Broom.

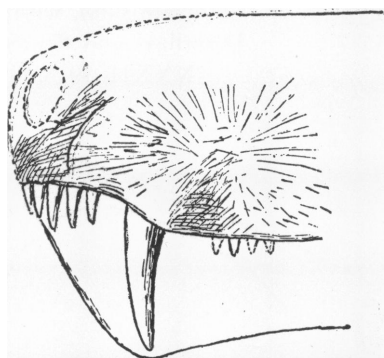


Fig. 15. *Scymnognathus minor* Broom. Type, No. 5535. $\times \frac{2}{3}$. From Bull. Amer. Mus. Nat. Hist.

Scymnognathus whaitsi Broom 1912.

- Type 5530 Nearly complete skull with part of left mandible. Described and figured in Proc. Zool. Soc., 1912, p. 861, pl. xc, fig. 4.
 Locality, Beaufort West commonage. Horizon, lower *Endothiodon* zone. Collector, J. H. Whaits.
- 5531 Greater part of the skull of *Scymnognathus whaitsi*, somewhat crushed from above downwards. The specimen shows the relations of the squamosal to the occiput, and reveals the fact that there is a large tabulare overlying the occipital part of the squamosal.
 Locality, Beaufort West commonage. Horizon, lower *Endothiodon* zone. Collector, J. H. Whaits.
- Topotype 5544 A much crushed but fairly complete skull.
 Locality, Beaufort West commonage. Horizon, lower beds of *Endothiodon* zone. Collector, J. H. Whaits.
- Topotype 5546 Snout of *Scymnognathus whaitsi* showing incisors and canines.
 Locality, Beaufort West. Horizon, *Endothiodon* zone. Collector, J. H. Whaits.

ANOMODONTIA.

Cistecephalus microrhinus Owen 1876.

- 5318 Complete skull without mandible.
 Locality, Nek at Kuilspoort. Horizon, *Cistecephalus* zone,
 near base. Collector, R. Broom.

Diælurodon whaitsi Broom 1911.

- Type Nearly perfect skull, with mandibles attached.
 5507 Described and figured in Proc. Zool. Soc., 1911, p. 1075, pl.
 lxiii, figs. 6, 7.
 Locality, Beaufort West commonage. Horizon, *Endothiodon*
 zone. Collector, J. H. Whaits.

- Paratype A badly weathered skull which shows the structure of the teeth
 5606 better than any other known specimen. One tooth shows
 very beautifully the serrations of both the anterior and
 posterior borders.
 Locality, Beaufort West. Horizon, *Endothiodon* zone. Col-
 lector, J. H. Whaits.

Dicynodon bolorhinus (Broom) 1911.

- Type Imperfect snout of small female.
 5505 Described and figured in Proc. Zool. Soc., 1911, p. 1076, pl.
 lxiii, fig. 10 (*Oudenodon*).
 Locality, Nek at Kuilspoort, Beaufort West dist. Horizon,
 lowest beds of *Cistecephalus* zone. Collector, R. Broom.

Dicynodon ?bolorhinus Broom.

- Figured Cast of brain case, vestibule, and cranial nerves of a species of
 6156 *Dicynodon*, probably *D. bolorhinus*. The specimen has
 been described and figured in Proc. Zool. Soc., 1912, p.
 419, pl. lvi, fig. 1-3.
 Locality, Kuilspoort, Beaufort West dist. Horizon, *Ciste-*
cephalus zone, lower beds. Collector, R. Broom.

Dicynodon feliceps Owen 1876.

- 5327 A complete but considerably crushed skull with a number of
 cervical vertebræ and the right shoulder girdle.

Locality, Kuilspoort, Beaufort West. Horizon, *Endothiodon* zone, about 400 ft. above Beaufort West township. Collector, R. Broom.

5583 Skull of *Dicynodon feliceps* Owen in fair condition with lower jaw in position.

Locality, Beaufort West. Horizon, *Endothiodon* zone. Collector, J. H. Whaits.

5584 Snout of *Dicynodon feliceps* Owen showing section of anterior part of palate, with the relations of the prevomer and vomer. (Figured in Croonian Lecture, Phil. Trans., 1914.)

Locality, Kuilspoort. Horizon, *Endothiodon* zone. Collector, R. Broom.

5585-5590 Skulls of *Dicynodon feliceps* Owen, all in fairly good condition. Locality, Beaufort West. Horizon, *Endothiodon* zone. Collector, J. H. Whaits.

5533 Nearly complete skeleton of a small specimen of *Dicynodon feliceps*. Though the matrix is not very satisfactory the proportions of the animal can be very well seen.

The skull is well preserved though crushed. The right limb and shoulder girdle are underneath the somewhat confused mass of bones in the shoulder region. The left humerus, radius and ulna are placed by the side with the top of the humerus close to the glenoid cavity. The hind limbs are doubled on themselves but in natural relations to the pelvis.

The specimen is of value as showing not only the proportions of the head, body and limbs but as showing the position of the shoulder girdle and to some extent of the hind limbs.

The following are the principal measurements:

Probable total length from snout to tip of tail.....	500	mm.
Length of skull.....	113	"
" " humerus.....	53	"
" " radius.....	35	"
" " femur.....	63	"

Locality, Beaufort West commonage. Horizon, lower beds of *Endothiodon* zone. Collector, J. H. Whaits.

Dicynodon ictidops Broom 1913.

Type Complete skull with mandibles in position.
 5510 Described and figured in Bull. Amer. Mus. Nat. Hist., Vol.
 XXXII, 1913, p. 446, figs. 5, 6.

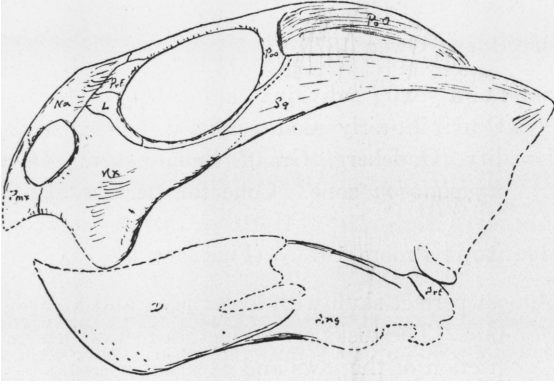


Fig. 16. *Dicynodon ictidops* Broom. Type, No. 5510. Natural size. (From Bull. Amer. Mus. Nat. Hist.)

Locality, Beaufort West commonage. Horizon, *Endothiodon* zone. Collector, J. H. Whaits.

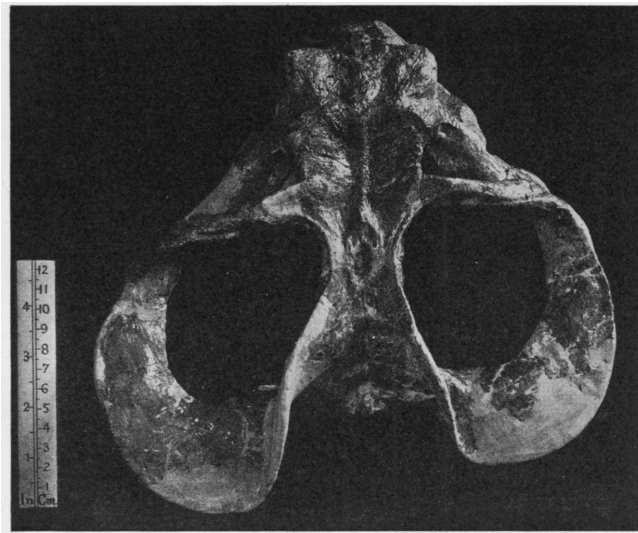
Dicynodon laticeps Broom 1912.

Fig. 17. *Dicynodon laticeps* Broom. Type, No. 5564. (From Amer. Mus. Journ.)

- Type 5564 A finely preserved skull of a male, with the tusks broken off. Described and figured in Proc. Zool. Soc., 1912, p. 868, pl. xcii, figs. 12, 13. Also figured in Amer. Mus. Journ., Vol. XIV, p. 142, April, 1914.
- Locality, Nieuwveld. Horizon, ?. Collector, J. H. Whaits.

Dicynodon leoniceps Owen 1876.

- 5304 Skull of a young individual, apparently of *Dicynodon leoniceps* Owen, in fairly good condition.
- Locality, Oudeberg, Graaff Reinet dist. Horizon, top of *Endothiodon* zone. Collector, R. Broom.

Dicynodon leontops Broom 1913. (Figs. 18, 19.)

- Type 5582 Almost perfect skull with lower jaws and a series of 10 vertebrae. The tusks are perfect and show internal wearing by friction of the jaws and external wearing by friction with the ground.

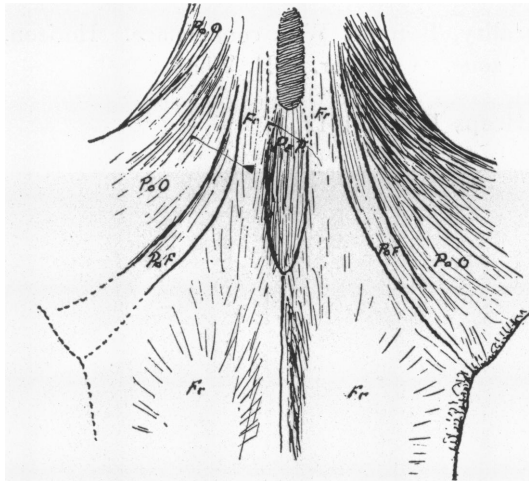


Fig. 18. Preparietal region in *Dicynodon leontops* Broom. Type, No. 5582. $\times \frac{4}{3}$. (From Bull. Amer. Mus. Nat. Hist.)

Described and figured in Bull. Amer. Mus. Nat. Hist., Vol. XXXII, 1913, p. 451, fig. 12. Also Amer. Mus. Journ., Vol. XIV, p. 143, April, 1914.

Locality, Bethulie, Orange Free State. Horizon, top of *Cistecephalus* zone. Collector, R. Broom.

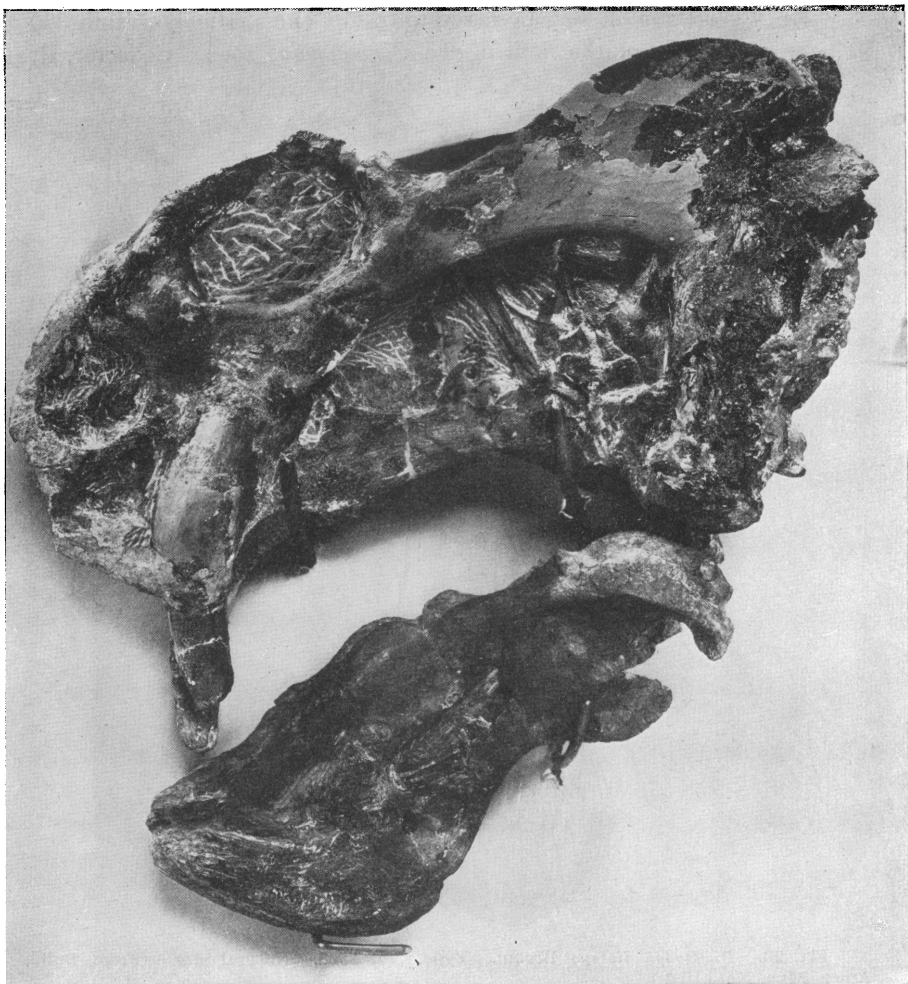


Fig. 19. *Dicynodon leontops* Broom. Type, No. 5582. About one-third natural size.
(From Amer. Mus. Journ.)

***Dicynodon lissops* Broom 1913. (Fig. 20.)**

Type 5508 A nearly complete but somewhat crushed skull.
Described and figured in Bull. Amer. Mus. Nat. Hist., Vol. XXXII, 1913, p. 450, fig. 11.
Locality, Wilgebosch, near New Bethesda, Cape Colony.
Horizon, *Cistecephalus* zone, about 900 ft. above the hori-

zon of New Bethesda township, and probably within 300 ft. of the limit of the *Cistecephalus* zone. Collector, R. Broom.



Fig. 20. *Dicynodon lissops* Broom. Type, No. 5508. Natural size. (From Bull. Amer. Mus. Nat. Hist.)

***Dicynodon lutriceps* Broom 1912.**

- Type** Nearly complete skull but lacking mandible and arches. The occiput, though the contact with front of the skull is lost, is of the same individual.
- 5501** Described and figured in Proc. Zool. Soc., 1912, p. 870, pl. xcii, figs. 14-16.
- Locality, Kuilspoort, 2 miles east of house. Horizon, *Endothiodon* zone, about 300 ft. above Beaufort West. Collector, R. Broom.

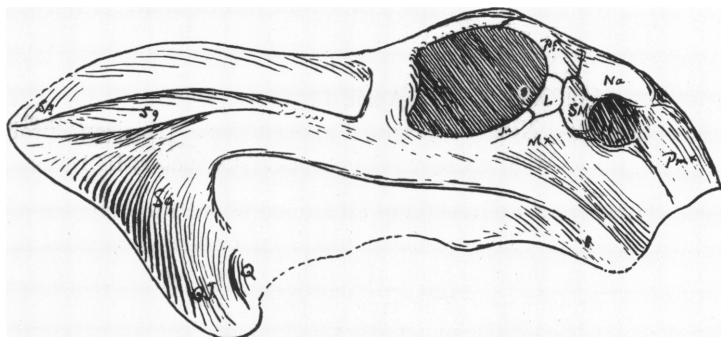
Dicynodon moschops Broom 1913. (Figs. 21, 22, 23.)

Fig. 21. *Dicynodon moschops* Broom. Type, No. 5325. $\times \frac{3}{2}$. (From Bull. Amer. Mus. Nat. Hist.)

Type 5325 A nearly complete skull of a female.

Described and figured in Bull. Amer. Mus. Nat. Hist., Vol. XXXII, 1913, p. 447, figs. 7, 8. Also in Amer. Mus. Journ., vol. XIV, p. 141, April, 1914.

Locality, Oudeberg, Graaff Reinet district. Horizon, ?. Collector, R. Broom.

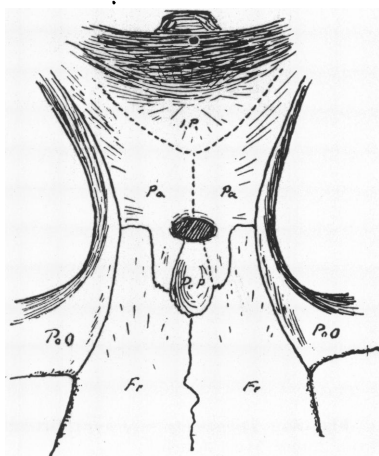


Fig. 22. The pineal foramen and its relations in *Dicynodon moschops* Broom. Type, No. 5325. About $\frac{1}{2}$ nat. size. (From Bull. Amer. Mus. Nat. Hist.)

Dicynodon planus Broom 1913. (Figs. 24, 25.)

Type 5549 Complete skull, without mandibles, of moderate sized broad-headed *Dicynodon*. Described and figured in Bull. Am. Mus. Nat. Hist., Vol. XXXII, 1913, p. 452, figs. 13, 14.

Locality, Kuilspoort, Beaufort West dist. Horizon, *Endothiodon* zone, near top. Collector, R. Broom.

Dicynodon platyceps Broom 1913. (Figs. 26, 27.)

Type 5542 Complete skull, with mandibles, of a moderately large *Dicynodon*. The sutures are very beautifully shown. The

occiput shows the small tabulare. The specimen is a female and no trace of a tusk can be seen.

Described and figured in Bull. Amer. Mus. Nat. Hist., Vol. XXXII, 1913, p. 444, fig. 4. Also Amer. Mus. Journ., Vol. XIV, p. 136, April, 1914.

Locality, New Bethesda, Cape Colony. Horizon, probably the Middle *Cistecephalus* zone. Collector, R. Broom.

Topotype Greater part of a skull of an animal about the same size as the
5545 type. The specimen has been broken across in various directions to show the structure of the vomer and fused prevomers. The true vomer is seen to be present as a long trough-like bone lying above the large fused prevomers.

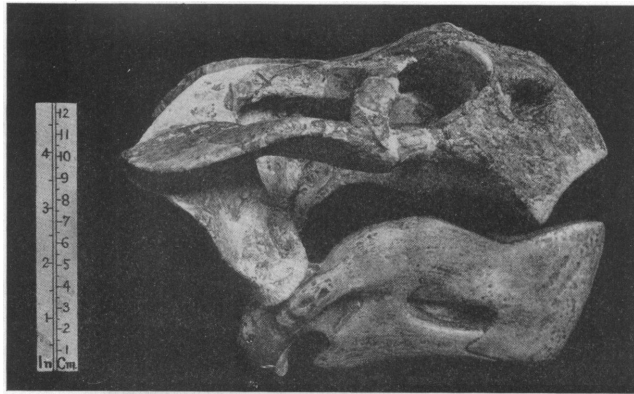


Fig. 23. *Dicynodon moschops* Broom. Type, No. 5325. The lower jaw is restored. (From Amer. Mus. Journ.)

The specimen is being figured in my Royal Society Croonian Lecture.

Locality, New Bethesda. Horizon, *Cistecephalus* zone. Collector, R. Broom.

5575 A perfect skull of a flat-headed *Dicynodon* which is probably a young *D. platyceps*. It was obtained in the same locality and from the same stratum as the type.

It measures 140 mm. in greatest length and 106 mm. in greatest width. There is a pair of small tusks which project mainly forwards, though this may be due to crushing in part.

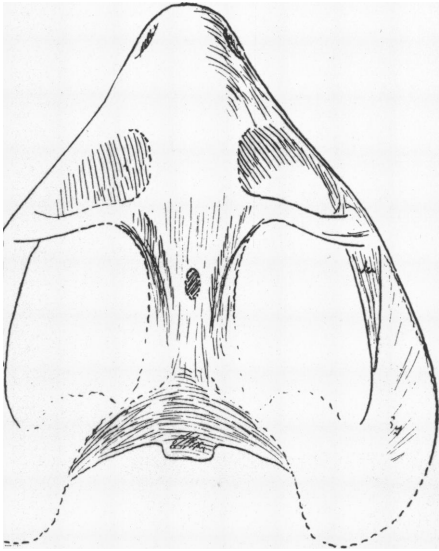


Fig. 24.

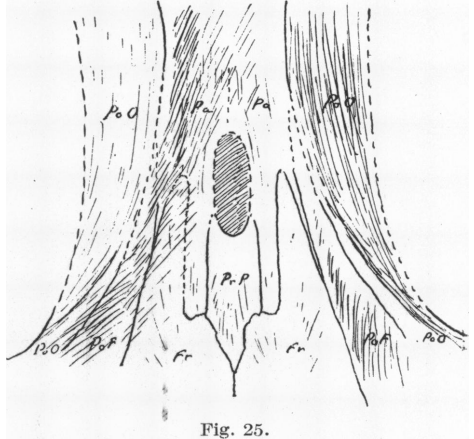


Fig. 25.

Fig. 24. Skull of *Dicynodon planus* Broom. Type, No. 5549. \times about $\frac{2}{3}$.

Fig. 25. Preparietal region of same specimen. Natural size. (From Bull. Amer. Mus. Nat. Hist.)

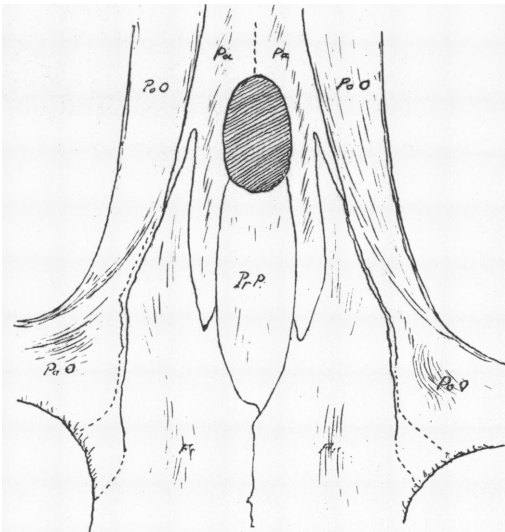
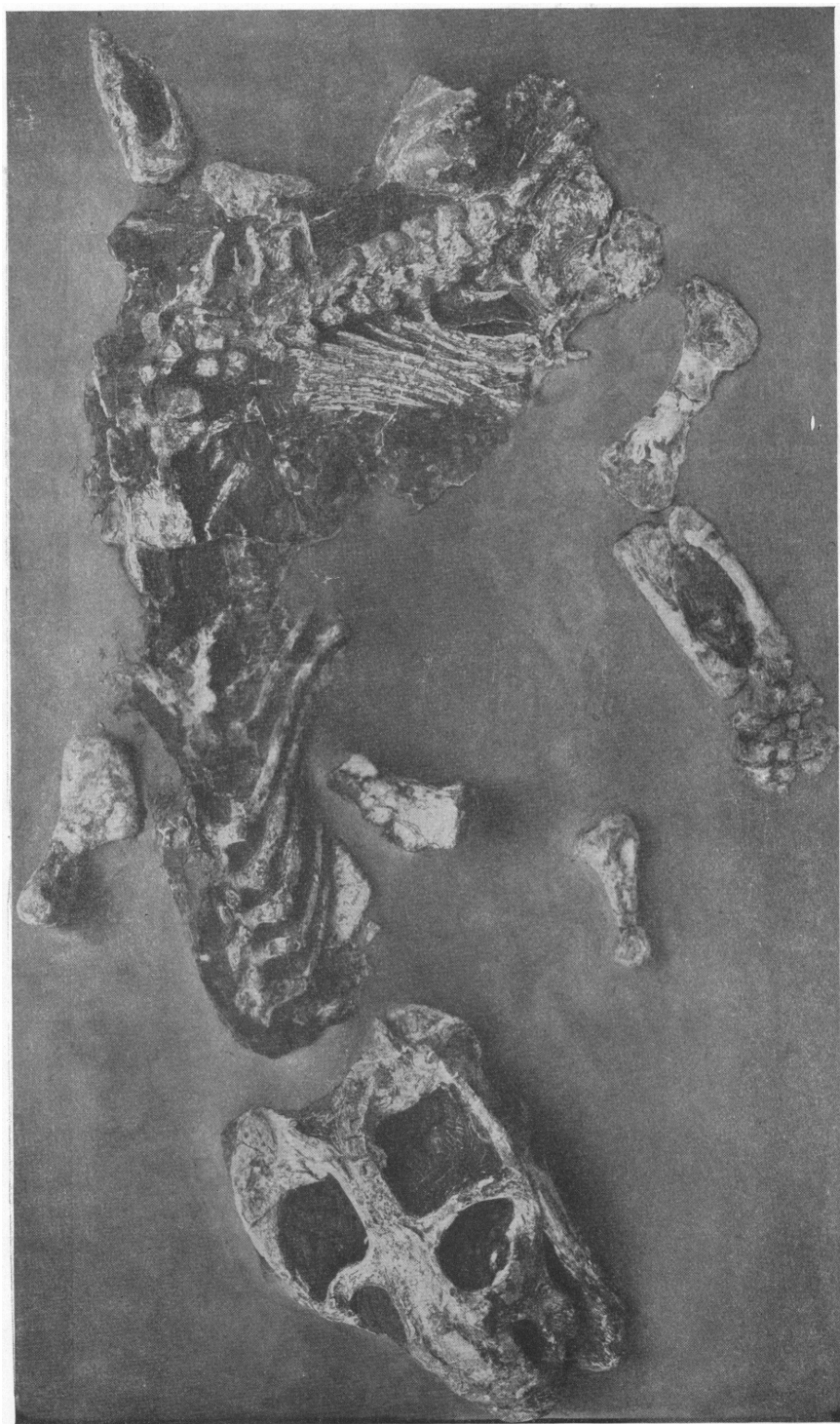


Fig. 26. The relationships of the preparietal in *Dicynodon platyceps* Broom. Type, No. 5542. Natural size. (From Bull. Amer. Mus. Nat. Hist.)



The preparietal is relatively rather wider than in the type, but in other respects the agreement of the bones is close. Locality, New Bethesda. Horizon, *Cistecephalus* zone. Collector, R. Broom.

5576 Somewhat crushed but nearly complete skull of a small *Dicynodon*, probably *D. platyceps*. It has a pair of fairly well developed tusks.

The greatest length of the skull is about 105 mm.
Locality, New Bethesda. Horizon, *Cistecephalus* zone. Collector, R. Broom.

Dicynodon psittacops Broom 1912.

Type Nearly complete skeleton of a small *Dicynodon*. As the
5534 girdles and skull are all in undisturbed position the natural

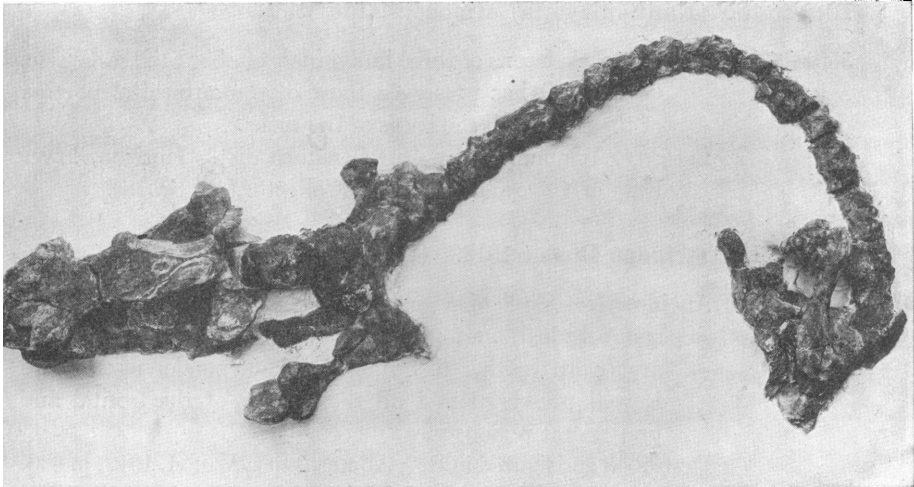


Fig. 28. *Dicynodon psittacops* Broom. Type, No. 5534. About one-third natural size. (From Amer. Mus. Journ.)

relations of these parts is clearly indicated. The left arm is bent much to the front and disarticulated.

The following are the principal measurements of the specimen.

Probably total length from snout to tip of tail.....	490	mm.
Length of skull.....	102	"
" " humerus.....	about 47	"
" " femur.....	57	"

The skull has been described and figured in Proc. Zool. Soc., 1912, p. 869, pl. xcii, fig. 17. Also Amer. Mus. Journ., vol. XIV, p. 141, April, 1914.

Locality, Beaufort West. Horizon, *Endothiodon* zone. Collector, J. H. Whaits.

Dicynodon ?psittacops Broom.

5609 A nearly complete skeleton of a small *Dicynodon*. The skull agrees so closely with *D. psittacops* that I hesitate to make it a different species, still the skull is relatively distinctly larger in the present specimen, and the horizon from which it comes is lower.

Locality, Grootfontein, Beaufort West dist. Horizon, lower *Endothiodon* zone. Collector, J. H. Whaits.

Dicynodon (Kannemeyeria) simocephalus Weithofer 1888.

5591-93 Portions of skeletons of three individuals of about the same size. One (5591) has preserved most of the antorbital portion of the skull with the bases of the tusks.

Locality, Winnaarsbaken Burghersdorp dist. Horizon, lower beds of *Cynognathus* zone. Collector, R. Broom.

Dicynodon strigops Broom 1913. (Fig. 29.)

Type 5581 An imperfect skull of a small *Dicynodon*. The front of the snout is lost, and much of the occiput and zygomatic arches are weathered off but the middle portion of the skull is well preserved and all the sutures of the frontal and preparietal regions clearly seen.

Described and figured in Rec. Albany Mus., Vol. II, 1913, p. 400.

Locality, Harrismith, Orange Free State. Horizon, doubtful but probably Triassic. Collector, unknown.

Dicynodon tylorhinus Broom 1913. (Figs. 30, 31.)

Type 5511 Front half of skull, somewhat crushed from above, with much of occiput.

Described and figured in Bull. Amer. Mus. Nat. Hist., Vol. XXXII, 1913, p. 448, figs. 9, 10.

Locality, Wilgebosch, near New Bethesda. Horizon, upper part of *Cistecephalus* zone probably about 900 ft. above

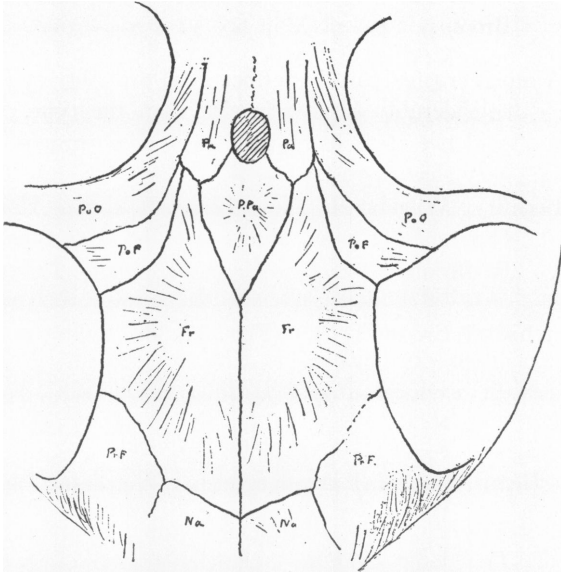


Fig. 29. Top of skull of *Dicynodon strigops* Broom. Type, No. 5581. Natural size.

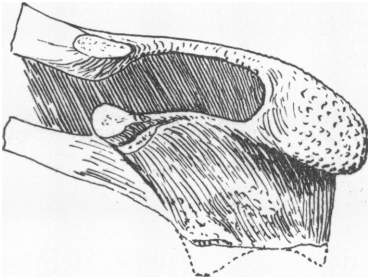


Fig. 30.

Fig. 30. Side view of snout of *Dicynodon tylosrhinus* Broom. Type, No. 5511. $\times \frac{1}{2}$.

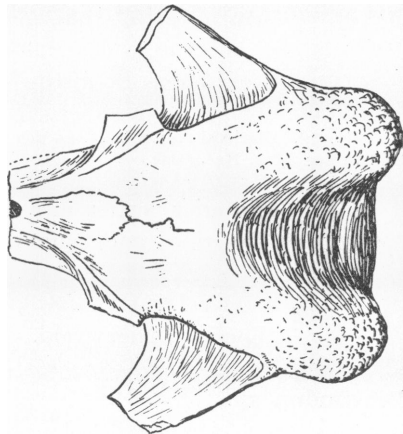


Fig. 31.

Fig. 31. Upper view of same specimen. $\times \frac{1}{2}$. (From Bull. Amer. Mus. Nat. Hist.)

the horizon of New Bethesda township. Collector, R. Broom.

5580

A much crushed and imperfect skull probably of *D. tylorhinus*, considerably smaller in size than the type. There is no evidence of tusks and the caniniform processes come to a very sharp point.

Locality, Wilgebosch, New Bethesda dist. Horizon, upper *Cistecephalus* zone, about same level as type. Collector, R. Broom.

Dicynodon whaitsi Broom 1913. (Figs. 32, 33.)

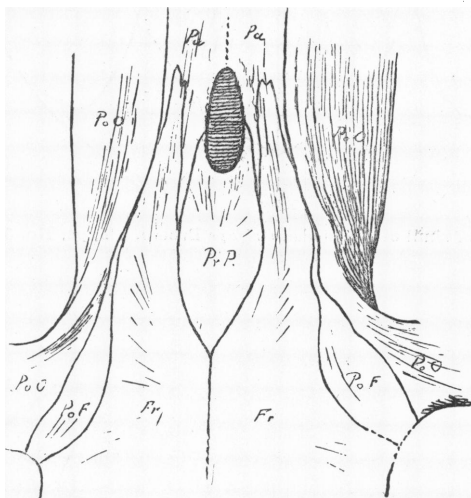


Fig. 32. Parietal region in *Dicynodon whaitsi* Broom. Type, No. 5566. $\times \frac{1}{2}$. (From Bull. Amer. Mus. Nat. Hist.)

Type

Anterior portion of a skull and mandible in fine preservation.

5566

Described and figured in Bull. Amer. Mus. Nat. Hist., Vol. XXXII, 1913, p. 443, fig. 3. Also Amer. Mus. Journ., Vol. XIII, p. 343, December, 1913.

Locality, Nieuwveld. Horizon, ?. Collector, J. H. Whaits.

Dicynodon sp. (Fig. 34.)

Figured
5532

Nearly complete skeleton of a small *Dicynodon*. The skull is not in a very satisfactory condition, the front part having been in such a rotten condition that it was impossible to

save it, and the bone of the top does not show the sutures satisfactorily, so that the species must for the present remain in doubt. Possibly it may be a young specimen of *Dicynodon planus*. As preserved there has been much

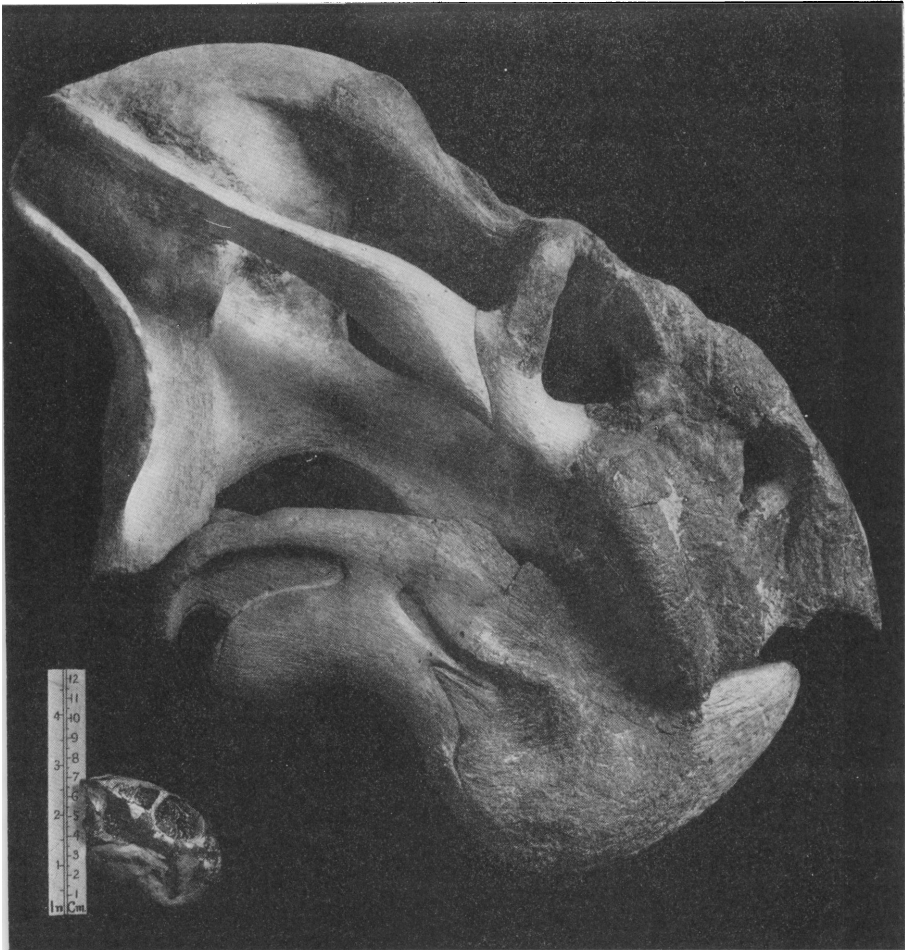


Fig. 33. Larger skull, *Dicynodon whaitsi* Broom. Type, No. 5566.
Smaller skull, *Diictodon galeops* Broom. Type, No. 5308. (From Amer. Mus. Journ.)

crushing of the skull so that the tusk is curved considerably backwards. The frontal region is fairly wide and the parietal nearly as wide.

There are 28 presacral vertebræ, and the photograph shows them as they were found in the shale. The specimen thus gives a good idea of the general proportions of at least one species of *Dicynodon*.

The following are some of the chief measurements.

Probably greatest length of skeleton from snout to tip of tail	..600	mm.
Length of skull115	"
Vertebral column (1st to 28th)390	"
Length of humerus58	"
" " radius38	"
" " femur73	"
" " tibia56	"

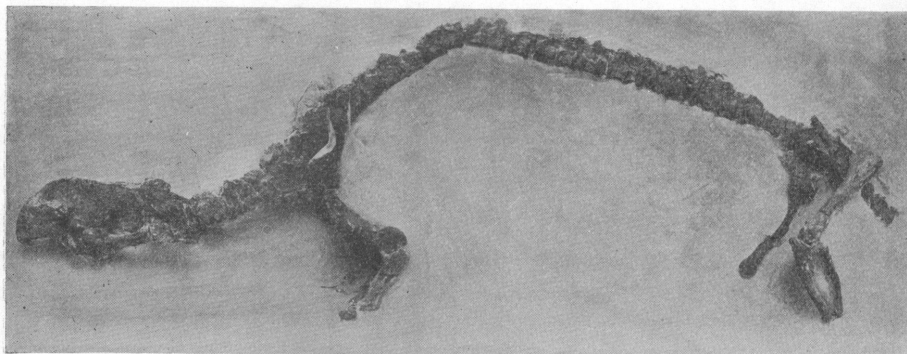


Fig. 34. *Dicynodon ?planus*. No. 5532. About $\frac{1}{4}$ natural size. (From Amer. Mus. Journ.)

Figured in Amer. Mus. Journ., Vol. XIV, p. 142, April, 1914.

Locality, Nek at Kuilspoort, Beaufort West dist. Horizon, lower beds of *Cistecephalus* zone. Collector, R. Broom.

5302

Portion of skeleton of small Anomodont. There is seen the back half of the skull, the greater part of the cervical and dorsal region with most of the left shoulder girdle and arm, and also much of the left pes. The specimen is of value through showing the scapula, coracoid and precoracoid, with the clavicle and cleithrum in position, being, so far as I am aware, the only specimen of *Dicynodon* which shows the latter. The cleithrum is a slender bone which lies along the anterior border of the scapula and extends from the upper end to narrowest part of the scapula above the acromion. The clavicle in the specimen extends

upwards to the acromion and lying along the upper edge of the acromion reaches almost to the lower end of the cleithrum.

Locality, unknown, possibly Graaf Reinet dist. Horizon, unknown. Collector, unknown.

5601 Imperfect preorbital portion of skull of large flat-headed *Dicynodon*, very probably a new species.

Locality, New Bethesda. Horizon, *Cistecephalus* zone. Collector, R. Broom.

Diictodon galeops Broom 1913. (Figs. 33, 35.)

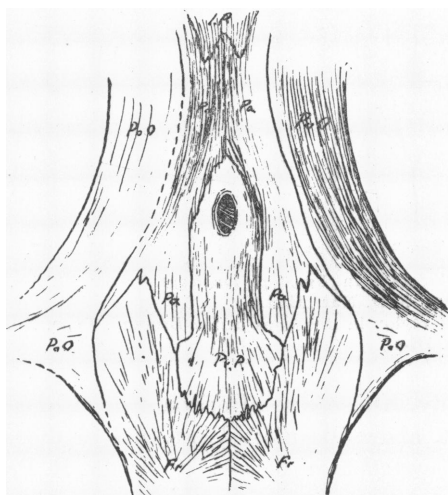


Fig. 35. Parietal region in *Diictodon galeops* Broom. Type, No. 5308. Twice natural size. (From Bull. Amer. Mus. Nat. Hist.)

Type Complete skull without mandible.

5308 Described and figured in Bull. Amer. Mus. Nat. Hist., Vol. XXII, 1913, p. 453, fig. 15. Also Amer. Mus. Journ., Vol. XIII, p. 343, December, 1913.

Locality, Slachter's Nek, Cape Colony. Horizon, probably upper part of *Endothiodon* zone. Collector, R. Broom.

Emydops longiceps Broom 1913. (Fig. 36.)

Type Nearly perfect skull which forms the type of *E. longiceps*.

5578 Described and figured in Bull. Amer. Mus. Nat. Hist., Vol. XXXII, 1913, p. 455, fig. 17.

Locality, Lemoenfontein, Beaufort West dist. Horizon, upper *Endothiodon* zone. Collector, J. H. Whaits.

***Emydops minor* Broom 1912. (Figs. 37, 43.)**

Type 5525 Nearly complete but somewhat crushed skull with mandibles in position.
Described and figured in Proc. Zool. Soc., 1912, p. 871, pl. xciii, fig. 20. Bull. Amer. Mus. Nat. Hist., Vol. XXXII, 1913, p. 454, fig. 16. Also Amer. Mus. Journ., Vol. XIII, p. 342, December, 1913.

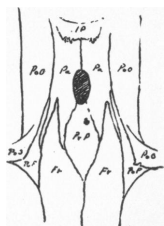


Fig. 36.

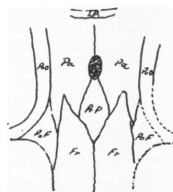


Fig. 37.

Fig. 36. Parietal region in *Emydops longiceps* Broom. Type, No. 5578. Natural size. (From Bull. Amer. Mus. Nat. Hist.)

Fig. 37. Parietal region in *Emydops minor* Broom. Type, No. 5525. $\times \frac{5}{8}$. (From Bull. Amer. Mus. Nat. Hist.)

Locality, Kuilspoort. Horizon, *Endothiodon* zone, about 1000 ft. above Beaufort West, and in the same beds occurs *Taognathus megalodon*. Collector, R. Broom.

***Emydorhynchus palustris* Broom 1913. (Fig. 38.)**

Type 5512 Complete skull without mandibles, somewhat weathered.
Described and figured in Bull. Amer. Mus. Nat. Hist., Vol. XXXII, 1913, p. 456, fig. 19.
Locality, New Bethesda, Cape Colony. Horizon, *Cistecephalus* zone. Collector, R. Broom.

5539 Considerable portion of anterior half of skeleton, showing the feebly ossified condition of the shoulder girdle and bones of fore limb.
Locality, New Bethesda. Horizon, *Cistecephalus* zone, probably about middle beds. Collector, R. Broom.

5540 Portion of a second skeleton showing portions of pelvis and hind limbs. This specimen was found about a yard from specimen No. 5539 and is possibly of the same individual.
Locality, New Bethesda.
Horizon, *Cistecephalus* zone. Collector, R. Broom.

5632 Skull of *Emydorhynchus palustris* Broom cut into thin slices and showing beautifully the internal structure.
Locality, New Bethesda.
Horizon, *Cistecephalus* zone. Collector, R. Broom.

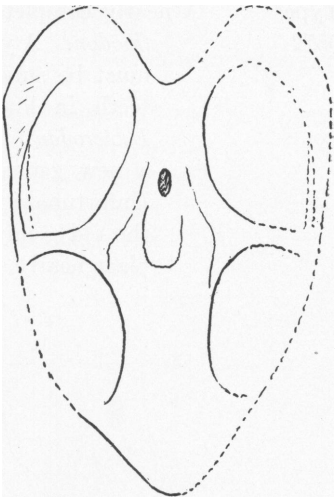


Fig. 38. *Emydorhynchus palustris* Broom. Type, No. 5512. Natural size. (From Bull. Amer. Mus. Nat. Hist.)

Endothiodon bathystoma Owen 1876.

5614 Nearly perfect skull with mandibles attached and the upper cervical vertebræ. In the general structure of the skull the agreement with Owen's type is such as to render it probable that the present is the same species. On the other hand there is considerable difference in the dentition. In the mandible there are 4 teeth well forward which occupy 26 mm. These are followed by a space of about 72 mm. in which there is no trace of teeth, and behind this are 3 small teeth. It seems not improbable that the condition may be due to age. In the upper jaw the teeth are also in part lost from the middle of the dental series though one or two remaining are fairly large and show a fair agreement with those of Owen's type.

The principal measurements of the skull are: —

Basal length.....	300 mm.
Interorbital width.....	118 "
Orbit to front of snout.....	160 "
Dental series.....	about 120 "

Locality, Beaufort West. Horizon, upper *Endothiodon* zone.
Collector, J. H. Whaits.

Endothiodon paucidens sp. nov.Type
5572

A nearly complete skull, without mandible, of a large *Endothiodon*. A year ago I showed that the genus *Endothiodon* must be subdivided as there are very different types of teeth in known species, and accepted Seeley's genus *Esoterodon* for *Endothiodon uniseries* Owen, and proposed a new genus *Emydochampsia* for *Endothiodon platyceps*. Unfortunately it will be necessary for a time to go back to the old genus *Endothiodon* for two reasons. In the first place nearly every specimen of *Endothiodon* has the crown

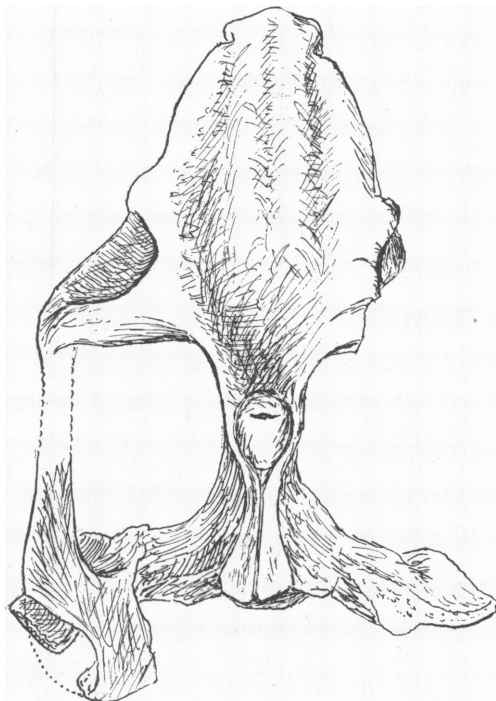


Fig. 39. Skull of *Endothiodon paucidens* Broom. Type, No. 5572. $\times \frac{1}{4}$.

of the teeth broken off and it is thus impossible to place such types as *Endothiodon whaitsi* or the present species, and secondly the teeth of *Endothiodon bathystoma*, the type species, are unknown. Seeley described and figured (Q. J. G. S., Vol. XLVIII, 1892, p. 476, figs. 1, 2) a lower jaw which he believed to be *Endothiodon bathystoma* and

as this showed the crown of the teeth the characters were taken from Seeley's account. On examining this jaw which is now in the British Museum I came to the conclusion that it is a very different species from Owen's *E. bathystoma*, and as it is quite unlike any other known forms I have much pleasure in calling it *Endothiodon seeleyi*.

The skull which I make the type of *Endothiodon paucidens* differs from *E. uniseries* and *E. whaitsi* in being broad and moderately flat. The snout has the three longitudinal ridges seen in all known species. The postorbital arches pass outwards and slightly downwards as in the flat-headed Dicynodons and from the outer end of the arch the zygoma passes nearly directly backwards. The parietal crest is very narrow and only slightly elevated from the frontal surface. The pineal foramen is small and situated in the middle of a large oval boss which is possibly all formed by the preparietal.

The teeth are mostly lost from the specimen but the sockets show that there have been 9 large teeth in a single row. The whole series measures 80 mm.

The greatest length of the skull is.....	350 mm.
“ “ width “ “ “ “.....	290 “
“ basal length “ “ “ “.....	320 “
“ interorbital width “ “ “.....	110 “

Locality, Beaufort West. Horizon, *Endothiodon* zone. Collector, J. H. Whaits.

5573

A fairly good skull of *Endothiodon paucidens* which lacks mandibles, the parietal region, and most of the occiput and arches of the right side.

Four large teeth are preserved, two on each side but the crowns are lost. There are evidences of 9 teeth and the space occupied by them is 73 mm.

The interorbital width is 98 mm.

Though this skull is smaller than the type the proportions agree so closely as to have little doubt that it is either a younger specimen or a female.

Locality, Beaufort West. Horizon, *Endothiodon* zone. Collector, J. H. Whaits.

- 5574 An imperfect skeleton which shows the palate in fairly good condition. Much of the occiput is also preserved and most of the parietal crest.

The following are some of the principal measurements:—

Basal length.....288 mm.

Dental series..... about 75 "

Locality, Beaufort West. Horizon, *Endothiodon* zone. Collector, J. H. Whaits.

***Endothiodon* (*Emydochampsia*) *platyceps* Broom 1912.**

- Type Nearly perfect skull with mandibles attached, somewhat
5570 weathered. The bones of the skull are remarkably spongy
and where the surface is gone the bone appears to have
weathered rapidly.

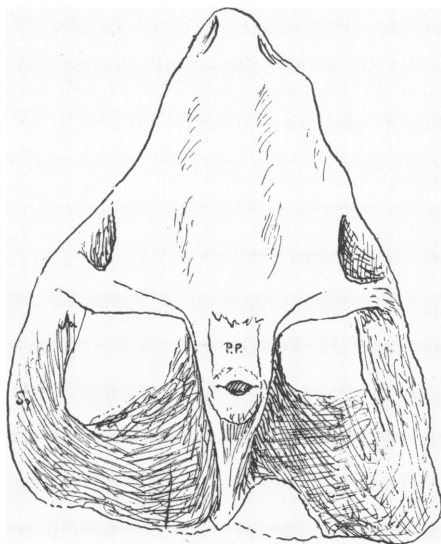


Fig. 40. Skull of *Endothiodon* (*Emydochampsia*) *platyceps* Broom. Type, No. 5570.
 $\times \frac{1}{4}$.

Described and figured in Proc. Zool. Soc., 1912, pp. 867, 875,
pl. xciii, fig. 19.

Locality, Beaufort West. Horizon, *Endothiodon* zone. Collector, J. H. Whaits.

- Paratype 5571 Nearly complete skull which shows most of the nasal and frontal regions which are lost from the type, but does not show the teeth so satisfactorily.
 Locality, Beaufort West. Horizon, *Endothiodon* zone. Collector, J. H. Whaits.

***Endothiodon ?seeleyi* Broom.¹**

- 5615 Nearly perfect mandibles of a broad-headed *Endothiodon*. The species is very doubtful but the large number of small teeth arranged irregularly in more than one row suggests that it may be identical with the jaw described by Seeley as *E. bathystoma* but which is, in my opinion, not *E. bathystoma* Owen but a distinct species.
 Locality, Beaufort West dist. Horizon, middle *Endothiodon* zone. Collector, J. H. Whaits.

***Endothiodon uniseries* Owen 1879. (Figs. 41, 42.)**

- Figured 5612 (Fig. 41) A beautiful skull in almost perfect condition but lacking one side of the occiput. The mandibles are in contact and nearly perfect.
 Figured in Amer. Mus. Journ., Vol. XIII, p. 341, December, 1913.
 Locality, Beaufort West. Horizon, *Endothiodon* zone. Collector, J. H. Whaits.
- Figured 5613 (Fig. 42) The greater part of the skeleton of an *Endothiodon uniseries* Owen. The skull is imperfect and considerably crushed but almost all of the palate is preserved and the contact complete from the premaxilla to the occiput. The frontal region is preserved and the left mandible is in perfect condition. All the vertebræ are preserved from the axis to the sacrum, the total presacral number with the atlas being 28. Almost all the ribs of the left side are preserved but owing to the heads being in contact with the vertebræ and the vertebræ being considerably distorted by crushing it has been necessary to mount the body with the ribs considerably flattened. In life the body must have been at least as broad as deep, perhaps broader. The left

¹ See p. 149.

scapula is of the same individual but the precoracoid is from another individual as are also the humerus and femur. The left ilium is restored from the right which is mounted in position. Parts of both femora belonging to the individual have been preserved, but so badly crushed that it seemed better to place in the skeleton the uncrushed complete thigh bone of another specimen of the same spe-

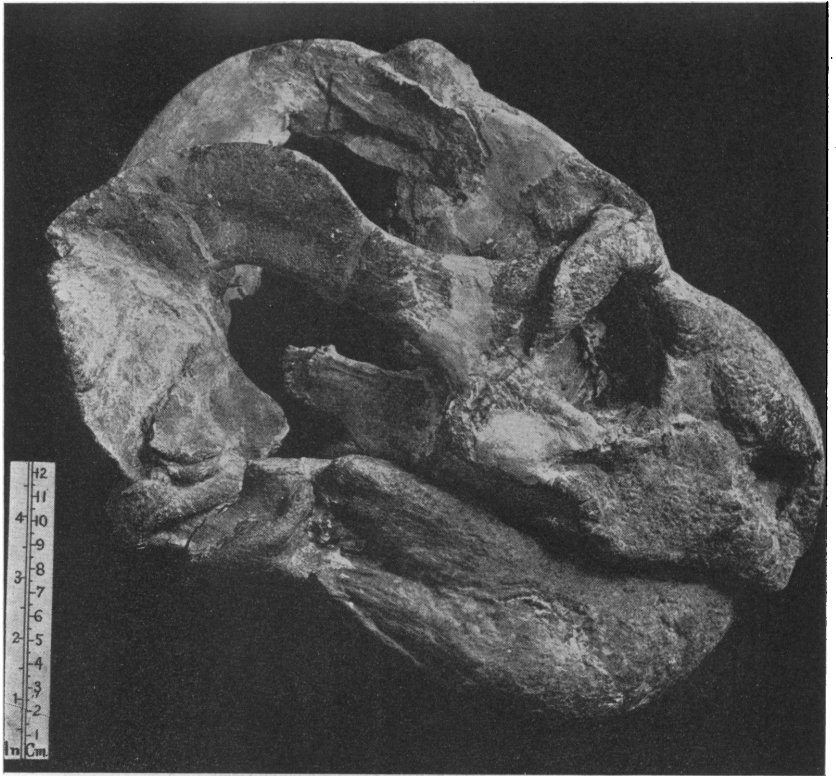


Fig. 41. *Endothiodon uniseriatus* Owen. No. 5612. (From Amer. Mus. Journ.)

cies. The radius and ulna are of the same individual but belong to the right side as, however, they are extremely crushed the fact of their being of the right side does not make much difference. The bones of the front and hind feet each belong to one foot but there is no absolute certainty as to the positions of the relative bones.

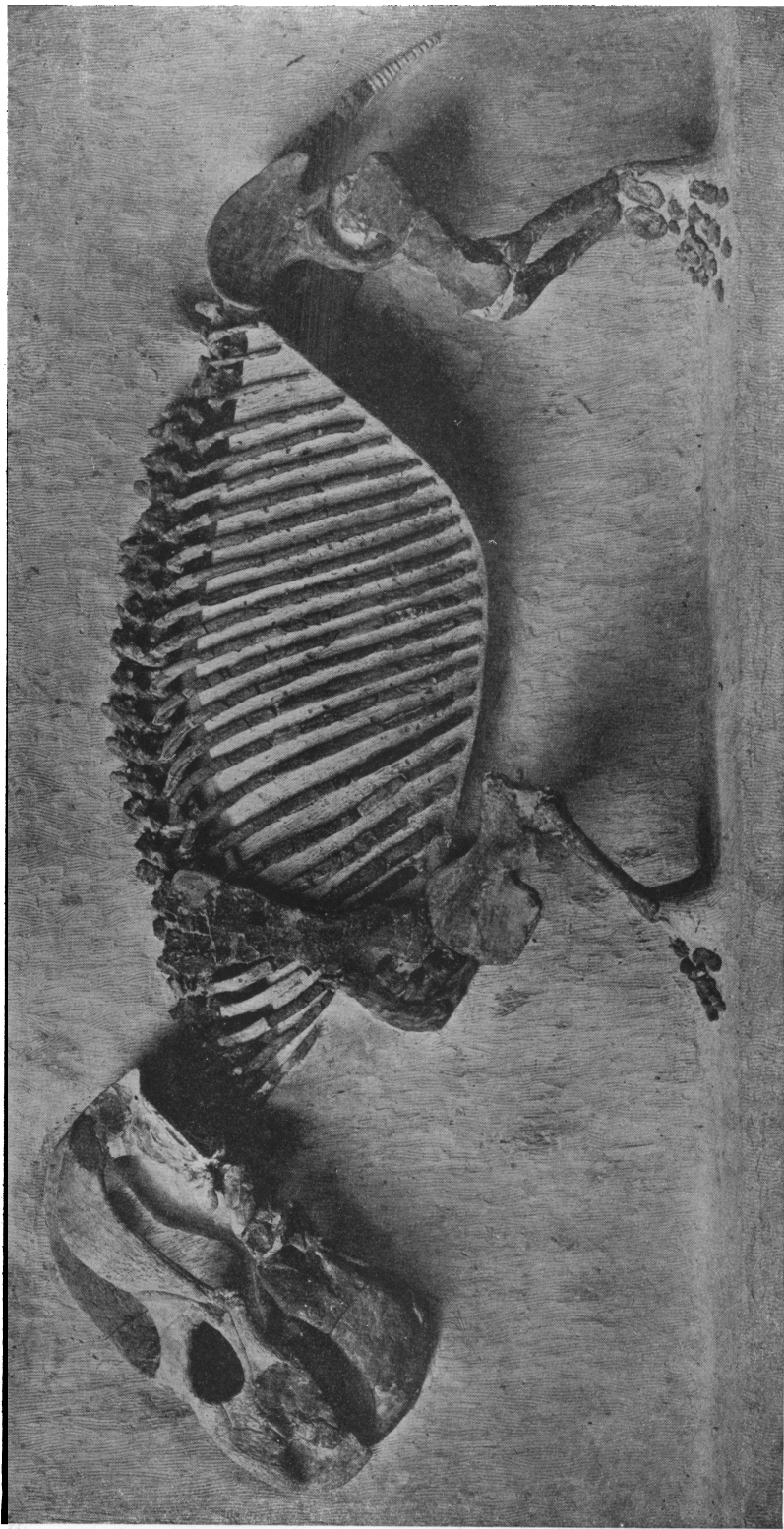


Fig. 42. *Endothiodon uniseriatus* Owen. No. 5613. $\times \frac{1}{2}$. (From Amer. Mus. Journ.)

Figured in Amer. Mus. Journ., Vol. XIII, p. 340, December, 1913.

Locality, Beaufort West. Horizon, *Endothiodon* zone. Collector, J. H. Whaits.

- 5334 Nearly complete skeleton with skull of *Endothiodon uniseries* Owen. The skull and skeleton are both much crushed but otherwise most of the remains are in good condition. Locality, Beaufort West. Horizon, *Endothiodon* zone. Collector, J. H. Whaits.

***Endothiodon whaitsi* Broom 1912. (Fig. 43.)**

Type 5565 A finely preserved skull and mandible with a few vertebræ, ribs and limb bones in association.

Described and figured in Proc. Zool. Soc., 1912, p. 866, pl. xciii, fig. 18. Also Amer. Mus. Journ., Vol. XIII, p. 342, December, 1913.

Locality, Beaufort West. Horizon, *Endothiodon* zone. Collector, J. H. Whaits.

***Endothiodon* sp.**

- 5603 The greater part of the skeleton of a species of *Endothiodon*. The skull is much crushed and imperfect in front and the matrix so impregnated with lime as to make it difficult to separate it from the bones. Most of the vertebræ and ribs are preserved and much of the girdles and limbs.

Locality, Beaufort West. Horizon, *Endothiodon* zone. Collector, J. H. Whaits.

- 5616 Mandible of a very large *Endothiodon* which probably belongs to a new species. The whole mandible measures 385 mm. in length. It seems to agree pretty closely with *E. paucidens* Broom in having only a single row of teeth and in other respects. The teeth, however, are smaller and further apart and it is possible that the specimen may be an aged *E. paucidens*.

Locality, Beaufort West. Horizon, *Endothiodon* zone. Collector, J. H. Whaits.

- 5618 Occiput of a large species of *Endothiodon*, probably *E. paucidens* Broom.



Fig. 43. Larger skull, *Endothiodon whatisi* Broom. Type, No. 5565.
Smaller skull, *Emydops minor* Broom. Type, No. 5525. (From Amer. Mus. Journ.)

Locality, Beaufort West. Horizon, *Endothiodon* zone. Collector, J. H. Whaits.

- 5617 Considerable part of the skull of a small, probably half grown, *Endothiodon uniseries* or *E. whaitsi*.
Locality, Beaufort West. Horizon, *Endothiodon* zone. Collector, J. H. Whaits.

***Lystrosaurus latirostris* (Owen) 1860.**

- 5600 Crushed but excellent skull of a species of *Lystrosaurus*, probably *L. latirostris* Owen, with shoulder girdle and many vertebrae and ribs.
Locality, Smithfield, Orange Free State. Horizon, *Lystrosaurus* zone. Collector, D. R. Kannemeyer.

***Lystrosaurus ?latirostris* (Owen).**

- 5627 Fairly good skull of a young individual of probably *L. latirostris* Owen.
Locality, Harrismith. Horizon, *Lystrosaurus* zone. Collector, A. van der Poel.

***Lystrosaurus ?murrayi* (Huxley) 1859.**

- Figured 5629 Snout of a small *Lystrosaurus*. The specimen though imperfect is of historical interest as being that which first revealed the structure of the beak and of the front of the palate.
Described and figured in Trans. S. Afr. Phil. Soc., Vol. XI, 1900, p. 169, pl. xxv, figs. 1, 2 (*Ptychosiagum*).
Locality, unknown. Horizon, *Lystrosaurus* zone or possibly *Procolophon* zone. Collector, unknown.

***Pristerodon mackayi* Huxley 1868.**

- 5307 Complete skull with lower jaw.
Locality, Victoria West, Cape Colony. Horizon, probably *Pareiasaurus* zone. Collector, T. J. R. Scholtz.

***Prodicynodon beaufortensis* Broom 1912.**

- Type 5509 Front half of a much crushed skull.
Described and figured in Proc. Zool. Soc., 1912, p. 867, pl. xciii, fig. 21.

Locality, Kuilspoor, Beaufort West dist. Horizon, *Endothiodon* zone, probably about 1000 ft. above the horizon of Beaufort West township. Collector, R. Broom.

Taognathus megalodon Broom 1911.

- Type Imperfect middle portion of skull with mandibles attached.
 5523 A remarkable type of Anomodont with broad powerful mandibles which have a few large teeth.
 Described and figured in Proc. Zool. Soc., 1911, p. 1076, pl. lxii, figs. 2-4.
 Locality, Kuilspoor, Beaufort West dist. Horizon, ?. Collector, R. Broom.

CYNODONTIA.

Bauria cynops Broom 1909.

- Figured Nearly perfect skull of *Bauria cynops* Broom with a few associated limb bones.
 5622

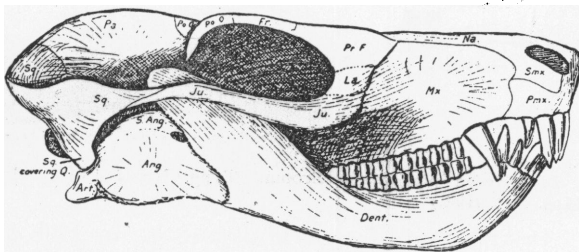


Fig. 44. *Bauria cynops* Broom. No. 5622. \times about $\frac{1}{2}$. (From Amer. Mus. Journ.)

Figured in Amer. Mus. Jour., Vol. XIII, p. 346, December, 1913.

Locality, Winnarsbaken. Horizon, Lower *Cynognathus* zone. Collector, R. Broom.

Diademodon browni Seeley 1894.

- 5621 Nearly perfect skull with associated remains of a species of *Diademodon* which agrees sufficiently with *D. browni* Seeley to be provisionally referred to that species.
 Locality, Winnarsbaken. Horizon, lower *Cynognathus* zone. Collector, R. Broom.

Diademodon platyrhinus Broom 1913.

Type Middle and anterior part of skull, with considerable part of
5518 lower jaw, of nearly mature *Diademodon*, showing evidences of a dental succession in the incisors, canines and premolars.

Described and figured in Bull. Amer. Mus. Nat. Hist., Vol. XXXII, 1913, p. 467, fig. 1.

Locality, Winnaarsbaken, Burghersdorp dist., Cape Colony.
 Horizon, probably low down in the *Cynognathus* zone.
 Collector, R. Broom.

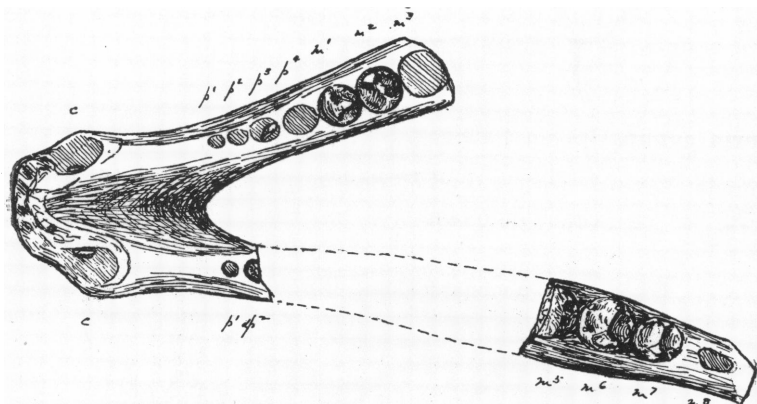


Fig. 45. *Diademodon platyrhinus* Broom. Type, No. 5518. \times almost $\frac{5}{4}$. (From Bull. Amer. Mus. Nat. Hist.)

5519 Middle portion of skull of *D. platyrhinus*, showing a number of molars and premolars.
 Locality, Winnaarsbaken, Burghersdorp dist., Cape Colony.
 Horizon, probably low down in *Cynognathus* zone. Collector, R. Broom.

Ictidopsis elegans Broom 1912.

Type Complete skull of small Cynodont with the teeth well shown.
5630 Described and figured in Proc. Zool. Soc., 1912, p. 872, pl. xciii, fig. 22.

Locality, Harrismith. Horizon, *Cynognathus* zone. Collector, A. van der Poel.

***Lycognathus ferox* Broom 1913.**

Type Nearly complete skull with mandibles in position, but badly
 5538 weathered on top.
 Described and figured in Bull. Amer. Mus. Nat. Hist., Vol.
 XXXII, 1913, p. 557, fig. 1.

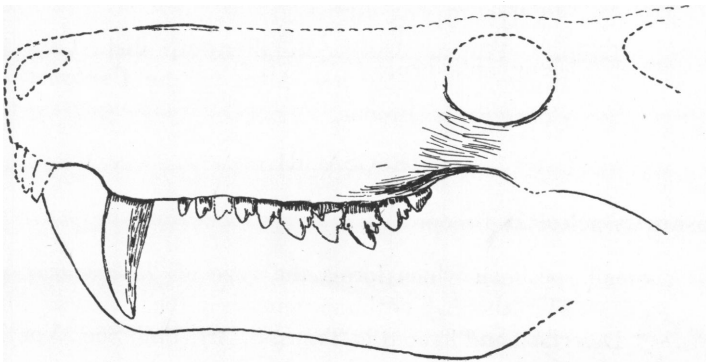


Fig. 46. *Lycognathus ferox* Broom. Type, No. 5538. $\times \frac{1}{3}$. (From Bull. Amer. Mus. Nat. Hist.)

Locality, Winnaarsbaken, Burghersdorp dist., Cape Colony.
 Horizon, lower beds of *Cynognathus* zone. Collector,
 R. Broom.

***Sesamodon browni* Broom 1905.**

Topotype Anterior half of skull, much weathered. Shows the structure
 Figured of the molar dentition fairly well.
 5517 Figured in Amer. Mus. Jour., Vol. XIII, p. 346, December, 1913.

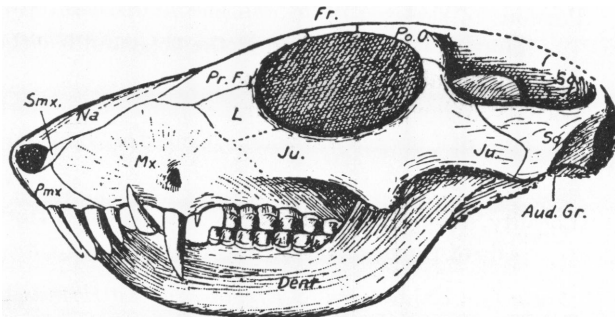


Fig. 47. *Sesamodon browni* Broom. Topotype, No. 5517. (From Amer. Mus. Journ.)

Locality, Aliwal North. Horizon, probably lower part of *Cynognathus* zone. Collector, Alfred Brown.

Trirachodon kannemeyeri Seeley 1895.

5320 Imperfect preorbital portion of skull, with mandible in position, showing many of the upper molars, and lower incisors and canines.

Locality, Burghersdorp. Horizon, *Cynognathus* zone. Collector, unknown.

?MESOSAURIA.

Heleosaurus scholtzi Broom 1907.

Type Small specimen which forms the type of *Heleosaurus scholtzi*.

5321 The other half of the specimen is in the S. African Museum. Described and figured in Trans. S. Afr. Phil. Soc., Vol. XVIII, Pt. 1, 1907, p. 39, pl. iv, figs. 7-11.

Locality, Victoria West. Horizon, *Pareiasaurus* zone. Collector, T. J. R. Scholtz.

PHYTOSAURIA.

Erythrosuchus africanus Broom 1906.

5594 Portions of skull of *Erythrosuchus africanus* Broom. Locality, Winnaarsbaken, Burghersdorp dist. Horizon, lower beds of *Cynognathus* zone. Collector, R. Broom.

5595 Portions of skeleton of *Erythrosuchus africanus* Broom. The humerus is smaller than in the type and is either a young individual or a distinct species. Locality, Winnaarsbaken, Burghersdorp dist. Horizon, lower beds of *Cynognathus* zone. Collector, R. Broom.

5596 Scapula and coracoid of *Erythrosuchus africanus* Broom. Locality, Winnaarsbaken, Burghersdorp dist. Horizon, lower beds of *Cynognathus* zone. Collector, R. Broom.

5597 Lower half of humerus of *Erythrosuchus africanus* Broom. Locality, ?Rouxville dist., Orange Free State. Horizon, ?lower part of *Cynognathus* zone. Collector, R. Broom.

PSEUDOSUCHIA.

Euparkeria capensis Broom 1913.

- Type 5547 Counter slab from the type specimen showing practically the complete set of abdominal ribs.
 Locality, Aliwal North. Horizon, *Cynognathus* zone, probably rather low down. Collector, Alfred Brown.
- Topotype 5548 Anterior portion of the tail showing about a dozen vertebræ, with chevrons, and a few dermal ossifications. The dermal ossifications along the spines of the vertebræ are paired. There appears to be also a row of ossifications along the ventral side.
 Locality, Aliwal North. Horizon, *Cynognathus* zone. Collector, Alfred Brown.

? PSEUDOSUCHIA.

Youngina gracilis gen. et sp. nov.

- Type 5561 This new genus and species is founded on the nearly perfect skull with many vertebræ and a few other skeletal fragments of a primitive Diaptosaurian reptile from the Upper Permian beds.
- The skull which measures about 62 mm. in greatest length is somewhat intermediate in appearance between that of a Pseudosuchian and a modern crocodile. The snout is long and pointed and though somewhat crushed is probably rather broader than deep. There is a long row of very crocodile-like rounded teeth along the maxillary. In the specimen 16 are seen, but allowing for developing teeth in spaces between mature teeth the full number is probably 20 or 21.
- There is no antorbital vacuity.
- The orbits are large and look upwards and outwards. The distance between the orbits is about 8 mm. The preorbital portion of the skull is probably about 30 mm., and the antero-posterior diameter of the orbit is 15 mm.
- There is a large pineal foramen. The supratemporal fossa is nearly half the size of the orbit and is bounded by the postfrontal, postorbital, squamosal, and parietal.

The occiput is remarkably archaic in having a large interparietal, possibly paired, and a pair of large tabulars.

A full description of the specimen with figures will be published later.

I have much pleasure in naming this extremely important primitive Diaptosaurian genus after John Young LL.D., Under Curator of the Hunterian Museum, Glasgow University, under whose kind assistance I first became enamoured of palæontology. When but a boy of 16 or so, Mr. Young was always so delighted to name for me the Carboniferous fossils collected on my Saturday rambles, and it is a delight to be able to lay even such a small stone on the cairn of this most remarkable man.

Locality, New Bethesda. Horizon, *Cistecephalus* zone. Collector, R. Broom.

THEROPODA.

***Ætonyx palustris* Broom 1911.**

- | | |
|--------|--|
| Type | Cast of humerus of type individual. |
| (Cast) | Locality, Fouriesberg, Orange Free State. Horizon, Red beds. |
| 5623 | Collector, A. R. Walker. |
| 5624 | Shoulder girdles, vertebræ, manus and numerous other bones of possibly the same species. |
| | Locality, Fouriesberg, Orange Free State. Horizon, Red beds. |
| | Collector, R. Broom. |

***Algoasaurus bauri* Broom 1904.**

- | | |
|------|---|
| 5631 | Ungual phalanx of <i>Algoasaurus bauri</i> Broom. Part of the type individual. |
| | Locality, Despatch near Port Elizabeth. Horizon, Uitenhage series. Collector, R. Broom. |

***Plateosaurus stormbergensis* sp. nov. (Figs. 48, 49.)**

- | | |
|------|---|
| Type | Portions of the skeleton of a large Carnivorous dinosaur from the top of the Stormberg. The remains are very weathered and most of the bones were too imperfect to be worth collecting. The best remains are a perfect right femur, a |
| 5605 | |

nearly perfect right 1st metacarpal, portions of a number of vertebræ and portions of the pubes.

It is fortunate that the 1st metacarpal is known as this element is known in most of the medium size South African Theropoda and we can thus be quite certain that this Stormberg

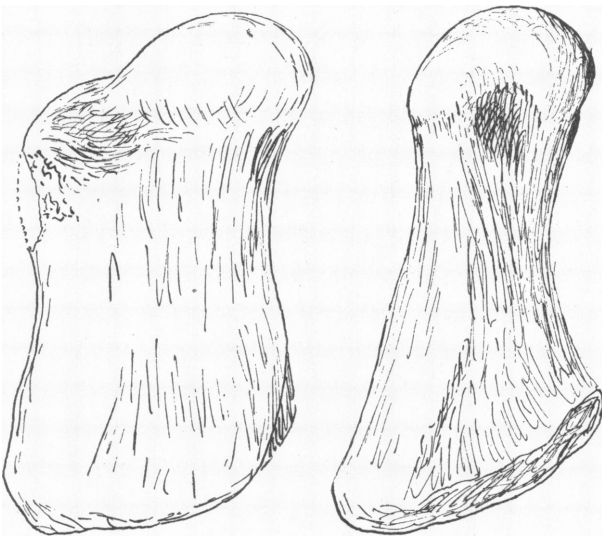


Fig. 48. Right first metacarpal of *Plateosaurus stormbergensis* Broom. Type, No. 5605. $\times \frac{3}{4}$.

dinosaur is quite distinct from any of the previously known forms. It cannot be *Euskelesaurus browni* as in that form the femur is quite unlike that in the present type besides being very much larger. On the other hand it agrees so closely with some of the European species of *Plateosaurus*, especially *P. reiningeri*, that we may safely refer it to this genus.

The 1st metacarpal differs from that of *Massospondylus* and agrees with that of *Plateosaurus* in being much longer than broad. It measures in greatest oblique length 104 mm., and in direct length 99 mm. The width across the distal articulation is 56 mm.

The femur resembles so closely the well known femora of the European species of *Plateosaurus* that besides giving

figures it will be unnecessary to do more than give the principal measurements.

The greatest length of the femur is	554 mm.
Width of distal end	152 "
Length from head to top of median trochanter	232 "



Fig. 49. Right femur of *Plateosaurus stormbergensis* Broom. Type, No. 5605. About $\frac{1}{3}$ natural size.

The pubis is remarkable for the great width of the anterior portions, in this differing from *Massospondylus* and its allies and resembling *Plateosaurus reiningeri*.

Locality, Witkop, Stormberg mountains. Horizon, probably base of Red beds (Lower Jurassic). Collector, R. Broom.

(Continued from 4th page of cover.)

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