STUDIES ON NEW SPECIMENS OF THE GORGONOPSIA

By A. S. Brink and J. W. Kitching

Abstract

In this paper a list is given of all the described Gorgonopsian genera and species of Africa. The types are listed in a particular order according to dental formulae and age, but attention is drawn to the fact that the number of molars is unreliable for use as a basis for classification. The list also brings out that age or horizons can be very misleading unless localities are registered with greater accuracy.

The paper continues with the description of four specimens in the Rubidge Collection. *Broomicephalus laticeps* and *Dracocephalus scheepersi* are described as new genera and species, *Dinogorgon oudebergensis* as a new species, and the fourth is described as *Alopecorhinus rubidgei* Broom M.S.S., a name suggested by Broom but never used in publication.

Further descriptions are based on specimens in the Bernard Price Institute's collection. *Cyniscopoides broomi*, *Aloposauroides tenuis* and *Sycocephalus bigendens* are described as new genera and species; *Rubidgea majora*, *R. platyrhina*, *Prorubidgea robusta*, *Lycaenops alticeps*, *Aelurognathus minor* and *Arctops watsoni* are described as new species. In addition further information is given on the known genera and species *Rubidgea laticeps*, *Cyniscops longiceps*, *Cynarioides gracilis*, *Scylacocephalus watermeyeri*, *Lycaenoides angusticeps* and *Lycaenops ornatus*.

Dr. S. H. Rubidge of Wellwood, Graaff-Reinet, very kindly placed his entire collection of Gorgonopsids at the disposal of the Bernard Price Institute for comparison with the forms in its collection. After a recent visit to Graaff-Reinet, Kitching brought the specimens to the Institute, where they have been additionally cleaned at the request of Dr. Rubidge. The collection includes 20 type specimens and 7 recently collected undescribed specimens. We were asked to describe and establish the relationships of the latter specimens and we proceed to do so in this paper.

We would like to make use of this opportunity to express once again sincere thanks to Dr. Rubidge for so generously placing this valuable collection of specimens at our disposal.

In the collection of the Bernard Price Institute there are 32 specimens of Gorgonopsids, the majority of which are complete skulls, perfectly preserved and prepared. Six of these specimens have already been described (*Cyniscops cookei*, No. 12, Broom, R., 1948, Trans. Roy. Soc. Edinb., vol. lxi, pt. 2, p. 597, fig. 15 B; *Lycaenops pricei*, No. 4, Broom, R. and Robinson, J. T., Proc. Zool. Soc., 118, pt. 2, p. 400, figs. 5, 6; *Nanogorgon gracilis*, No. 3, idem, p. 398, figs. 3, 4; *Lemurosaurus pricei*, No. 13, Broom, R., 1949, Ann. Transv. Mus., xxi, p. 189, figs. 3, 4, 7c; *Tigrisaurus pricei*, No. 125, and *Leontosaurus vanderhorsti*, No. 126, Broom, R. and George, M., S. Afr. Journ. Sci., 46, 6, p. 188, 1950.)

In the past, authors have been inclined to rely to some extent on dental formulae in their descriptions of Gorgonopsids, but we consider that much weight cannot under all circumstances be attached to the number of post-canine teeth. The number of incisors may well form a sound basis for

distinguishing between different forms, but the molars are so degenerated that their number could easily differ even in specimens of the same species. However, we do not imply that within a species, or even within a genus, the number of molars can differ by more than one and a specimen with a certain number of large molars certainly belongs to a different form from a similar specimen with the same number of small insignificant molars. We do not intend relying on the number of molars as a basis for distinguishing between different forms, but we do find dental formulae in general very useful as a guide. We distinguish between Gorgonopsids with four and five incisors. In each category we distinguish between Gorgonopsids from different horizons, and lastly we use the number of molars, as well as their degree of degeneration, as a guide for additional distinction.

The following is a list of the described Gorgonopsian genera from this continent, roughly arranged according to their dental formulae and age. (In this list, the names of the zones in which the genera occur are indicated by the following abbreviations: Tap. for *Tapinocephalus* zone; End. for *Endothiodon* zone; Cist. for *Cistecephalus* zone.)

Gorgonopsids with 4 incisors

i4 — c1 — m9	Cist. —	*Galerhynchus.*
i4 — c1 — m7	Cist. —	*Cyonosaurus.*
i4 — c1 — m6	Cist. —	*Arctognathoides, Arctognathus, Cyniscopoides.*
i4 — c1 — m5	End. —	*Arctosuchus.*
i4 — c1 — m4	Cist. —	*Alopecorhynchus, Arctognathus, Ictidorhinus.*
	End. —	*Tetraodon.*
i4 — c1 — m3	Tap. —	*Eoarctops.*
i4 — c1 — m2	Tap. —	*Eriphostoma.*

Gorgonopsids with 5 incisors

i5 — c1 — m8	Cist. —	*Cyniscops, Galerhinus, Lemurosaurus.*
i5 — c1 — m7	Cist. —	*Aloposauroides, Cyniscops, Nanogorgon.*
i5 — c1 — m6	Cist. —	*Cyniscops, Cynarioides, Lycaenodon, Lycaenodontoides, Scylacocephalus.*
	End. —	*Cynarioides, Lycaenodontoides.*
i5 — c1 — m5	Cist. —	*Aelurognathus, Aelurosauropsis, Dinogorgon, Gorgonorhinus, Prorubidgea, Scylacognathus, Scylacops?, Sycosaurus.*
	End. —	*Aelurognathus, Aelurosaurus, Aloposaurus, Cerdorhinus, Cynarioides, Leptotrachelus?, Scymnognathus.*
	Tap. —	*Aelurosauroides, Cerdorhinus(?), Scylacognathus.*
i5 — c1 — m4	Cist. —	*Aelurognathus, Arctops, Broomicephalus, Dinogorgon, Dixeya, Genovum, Gorgonognathus, Leontocephalus, Lycaenoides, Lycaenops, Lycosaurus?, Prorubidgea, Scymnognathus.*
	End. —	*Aelurognathus, Arctops, Cynarioides. Cynariops, Gorgonops, Leptotrachelus?, Lycaenops, Lycosaurus, Scymnognathus, Tangagorgon.*
	Tap. —	*Galesuchus?, Lycosaurus(?), Pachyrhinos.*

i5 — c1 — m3	Cist. —	*Aelurognathus, Broomisaurus, Leontosaurus, Prorubidgea, Scylacops, Scymnognathus, Tigricephalus.*
	End. —	*Scymnognathus.*
	Tap. —	*Broomisaurus.*
i5 — c1 — m2	Cist. —	*Chiwetasaurus, Rubidgea, Sycocephalus, Smilesaurus.*
	End. —	*Smilesaurus.*
i5 — c1 — m1	Cist. —	*Pardocephalus, Rubidgea.*
i5 — c1 — m0	Cist. —	*Dracocephalus, Tigrisaurus.*
	End. —	*Clelandina.*

Gorgonopsids with uncertain dental formulae

Cerdognathus: Only the dental formula of the lower jaw is known: i4 — c1 — m5.

Cyniscodon: Only the lower jaw is known: i4 — c1 — m4.

Cynodraco: Five upper and four lower incisors.

Delphaciognathus: The dental formula of the lower jaw alone is known, which is given as i5 — c1 — m2. We doubt the presence of five incisors.

Hipposaurus:

While this paper was in preparation the genus *Hipposaurus* was very badly known. Specimens were described under this genus with three to seven molars and species were reported from *Tapinocephalus* to *Cistecephalus* zones. In the mean time, however, Boonstra prepared a paper on this genus which appeared after the present paper was ready for publication, so that his diagnosis could not effectively be incorporated in the above list. He distinguishes the following forms in the family Ictidorhinidae: *Hipposaurus boonstrai, H. major, Ictidorhinus martinsi, Lemurosaurus pricei, Hipposauroides rubidgei* and *Pseudohipposaurus kitchingi.* With this paper of Boonstra the genus *Hipposaurus* has now become one of the better known genera of the Gorgonopsia. (Boonstra, 1952, Tydskrif vir Wetenskap en Kuns. Deel XII, Nr. 1, April 1952.)

In the above list the genera *Burnetia, Megalesaurus, Megalesuchus* and *Rubidgina* are not mentioned, because they are quite distinct from the rest of the Gorgonopsians. A separate infra-order, the Rubidginoidea, was created for the latter three, while *Burnetia* used to be the single genus of another infra-order.

Broomicephalus laticeps gen. et sp. nov.

Perhaps the most interesting of the new specimens described in this paper is a complete skull with lower jaw, differing from any of the known Gorgonopsids to such a degree that it is difficult to ascertain its relationship within this family.

The skull is proportionately peculiarly short and broad. Apart from *Rubidgea laticeps*, this is the only Gorgonopsid in which the skull is broader than it is long. It is possible that the breadth of the skull is slightly exaggerated by the posterior portion being compressed antero-posteriorly; but if the posterior portion of the skull is distorted, it is only to a very slight extent. Certainly the posterior portion of the skull of *Rubidgea laticeps* is considerably more distorted and its breadth is definitely exaggerated to a great

extent. Although superficially it resembles the *Rubidgea* type of skull, it is less than half the size of *Rubidgea atrox*, but it appears as though it could have been, more reasonably than *Prorubidgea*, an ancestor to *Rubidgea*.

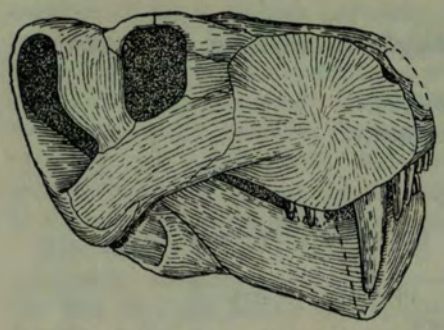

Fig. 1.—Side view of the skull of *Broomicephalus laticeps*, gen. et sp. nov. (x¼).

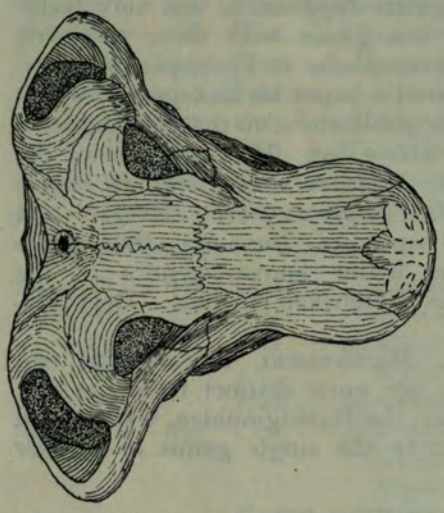

Fig. 2.—Dorsal view of the skull of *Broomicephalus laticeps*, gen. et sp. nov. (x¼).

The posterior portion of the skull is extraordinarily short, notwithstanding the possibility that it may be compressed anteroposteriorly. The temporal fossae are about three times as high as they are long. The snout is very broad, short and high. The anterior portion is considerably broader than in the region of the molars, and it is, contrary to the condition in almost all other Gorgonopsids, well rounded in all directions.

The symphysial region of the lower jaw is as broad as it is high (65 mm.). The incisors of the upper jaw form a crescent of much less than a quarter of a circle, in contrast with most other Gorgonopsids where the incisors form an arc of more than half of a circle.

There is a low longitudinal ridge medially between the orbits. Otherwise the dorsal surface of the skull is flat. The pineal foramen is situated on a very slight elevation which cannot be called a boss.

There are five incisors on each side in the upper jaw, and four in the lower jaw. The incisors of the upper and lower jaws are of the same size. The canine of the right side has fallen out and anteromedially in its socket a new canine is situated. This new canine has nearly reached its full length. On the left side there is a large canine situated postero-laterally in its socket, with room antero-medially for a new canine. The latter was apparently in the act of starting to replace the former, but was lost before fossilization. There are four molars on each side of which the second and fourth are preserved on the right, and the second and third on the left. We could not establish the number of molars in the lower jaw.

There is definitely no preparietal. The frontals are excluded from the margins of the orbits. The postfrontals are large and broad.

The skull is 210 mm. long, measured from the interparietal to the premaxillaries, and across the squamosals it is 260 mm. broad. The snout is 95 mm. broad anteriorly and in the middle of its length it is 85 mm. broad.

The interorbital and intertemporal breadths measure 72 mm. and 125 mm. respectively.

This specimen was discovered by Mr. Charles Rubidge on the farm Soetvlei in the Richmond district in upper *Cistecephalus* zone beds. We propose the name *Broomicephalus laticeps* gen. et sp. nov. and suggest that it be numbered 101 R.C., which follows on the list of numbered type specimens in the Rubidge Collection.

Dracocephalus scheepersi gen. et sp. nov.

The type of this new genus and species is also a skull and lower jaw differing from any of the known Gorgonopsids. In proportions it may be possible to compare with the other Gorgonopsids, but its dental characteristics, combined with some other general characteristics, separate this specimen so markedly from the other members of the family that it is difficult to establish its relationship. The skull is furthermore so distorted that it may be misleading to base conclusions on the skull proportions.

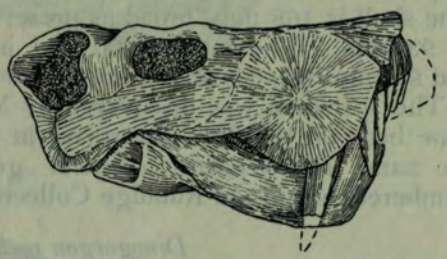

Fig. 3.—Side view of the skull of *Dracocephalus scheepersi*, gen. et sp. nov. (x¼).

There can, however, be little doubt that this new specimen had a snout not unlike that of *Broomicephalus*. It is much broader in front than in the middle of its length and was apparently as well rounded as in the previous specimen.

The roof of the skull appears to have been flat. The pineal foramen is situated on an elevation of slightly more prominence than in the previous specimen and there is a small depression in front. There is no longitudinal ridge or groove medially between the orbits.

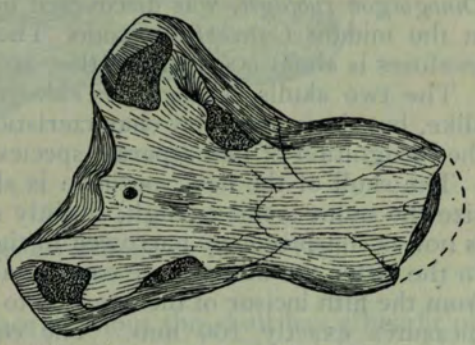

Fig. 4.—Dorsal view of the skull of *Dracocephalus scheepersi*, gen. et sp. nov. (x¼).

The skull is as long as that of *Broomicephalus*, but is much narrower posteriorly. The snout does not appear to have been narrower. The temporal region is half as high and the intertemporal region much narrower.

The symphysial region is very like that of *Broomicephalus*. It is 60 mm. broad and high. In both forms the splenials are large and form the ventral margin of the chin.

There is no Gorgonopsid other than *Broomicephalus* to which this new specimen shows even the slightest resemblance.

The dental characteristics are peculiar. There are five incisors on each side in the upper jaw and apparently four in the lower jaw. Of the five incisors in the upper jaw the first is the smallest and the fifth is by far the largest.

In most Gorgonopsids the distal incisors tend to be larger, but in this new specimen they are quite conspicuously so. On the left the canine is in the act of being replaced. On the right side the old canine has already fallen out and the new canine is practically fully grown. Most important is the fact that there are no molars in both the upper and lower jaws. In this characteristic this new skull can only be compared with *Clelandina* and *Tigrisaurus*, two forms which differ absolutely from the new form as well as from each other. While there may be some doubt as to whether the molarless Therocephalia belong to a natural monophyletic family, it is quite certain that the molarless Gorgonopsia do not belong to a monophyletic sub-family of the family Gorgonopsidae.

The skull is 194 mm. long, from the occipital condyle to the premaxillaries, as preserved. When reconstructed, it may have an actual length of 215 mm. The skull is 168 mm. broad as preserved. The snout has a maximum breadth of 93 mm. The interorbital and intertemporal breadths measure 57 mm. and 90 mm. respectively.

The specimen was discovered by Mr. S. C. Kitching in middle *Cistecephalus* zone beds on the farm Zuurplaas in the Graaff-Reinet district. We propose the name *Dracocephalus scheepersi* gen. et sp. nov. and suggest that it be numbered 102 in the Rubidge Collection.

Dinogorgon oudebergensis sp. nov.

The type of this new species of *Dinogorgon* was discovered on the Oudeberg plateau, fairly high in the middle *Cistecephalus* zone. The type species *Dinogorgon rubidgei*, was discovered on the farm Wellwood in beds very low in the middle *Cistecephalus* zone. The difference in height between the two localities is about 500 feet and they are 15 miles apart.

The two skulls, *Dinogorgon rubidgei* and the new species, are very much alike, but there are a few characteristics in which they differ, enough to justify the recognition of two separate species, disregarding their difference in age.

The skull of the new specimen is slightly smaller, but in proportion to its size the snout is not as high, slightly shorter and much narrower. The snout is not as conspicuously narrowed in the region of the molars as in *D. rubidgei*. In the latter the incisors are considerably larger; the distance straight across, from the fifth incisor of the one side to its fellow of the opposite side, inclusive, measures exactly 100 mm. The corresponding measurement in the new specimen is 75 mm.

The symphysial region, in anterior view, differs markedly in the two species. In *D. rubidgei* it is nearly as broad as it is high (82 mm. broad and 95 mm. high). In the new specimen it is 62 mm. broad and 100 mm. high.

The suborbital bar is 80 mm. high in *D. rubidgei* and 45 mm. in the new species.

There are five molars, somewhat smaller than the four of *D. rubidgei*.

The new specimen is a perfect skull, complete and undistorted. Only the left postorbital bar required restoration and the extreme anterior faces of the premaxillaries are damaged. The skull has a total length of 367 mm., measured from the premaxillaries to the posterior margins of the squamosals. Across the squamosals the skull has a breadth of 223 mm. From the ventral

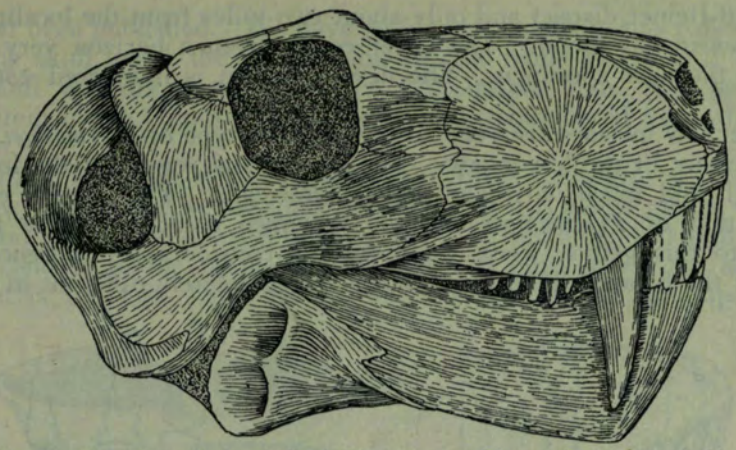

Fig 5.—Side view of the skull of *Dinogorgon oudebergensis*, sp. nov. (x¼).

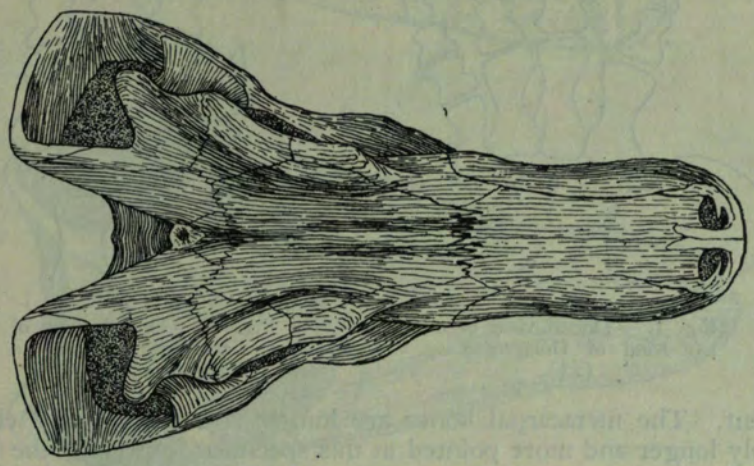

Fig. 6.—Dorsal view of the skull of *Dinogorgon oudebergensis*, sp. nov. (x¼).

margin of the dentary to the dorsal surface of snout the skull has a height of 206 mm. The snout is 89 mm. broad; the intertemporal and interorbital breadths measure 90 mm. and 100 mm. respectively.

For this specimen we propose the name *Dinogorgon oudebergensis* sp. nov., and suggest that it be numbered 103 in the Rubidge Collection.

Dinogorgon sp.

This specimen consists of the anterior portion of the snout, the symphysial portion with part of the left ramus of a mandible, a perfect left hand and a nearly perfect right foot. The specimen is slightly larger than *Prorubidgea*, slightly smaller than the lower *Cistecephalus* zone *Dinogorgon rubidgei* and of the same size as *Dinogorgon oudebergensis* described above. The new specimen was found by Kitching in middle *Cistecephalus* zone beds on the farm Ferndale

in the Graaff-Reinet district and only about two miles from the locality where *D. oudebergensis* was found. The latter comes from a horizon very slightly lower than the new specimen. The new specimen is numbered 250 in our collection.

The upper jaw incisors are very large, as in the type of *D. rubidgei*. There are four incisors in the lower jaw. The symphysial region of the lower jaw is very high and much narrower than in *Rubidgea*. This region compares well with that of *Prorubidgea* and the specimen could easily be taken as belonging to this genus, were it not for the considerable difference in the structure of the hands. The carpal bones are completely different in size and

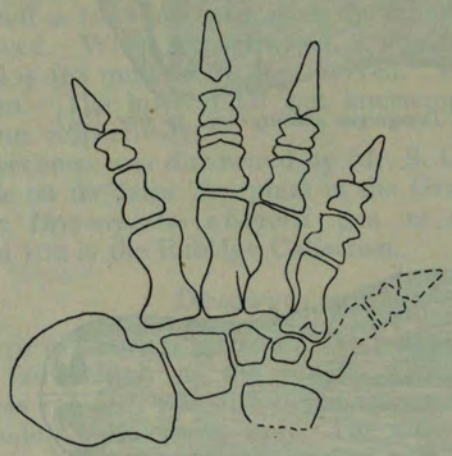

Fig. 7. — Dorsal view of the left hand of *Dinogorgon* sp. (x¼).

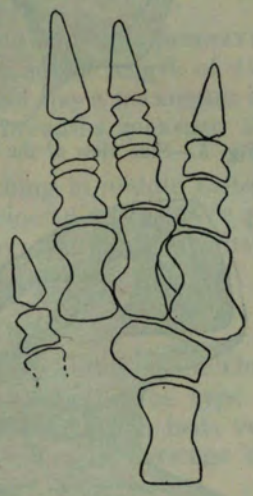

Fig. 8. — Dorsal view of the right foot of *Dinogorgon* sp. (x¼).

arrangement. The metacarpal bones are longer and the terminal claws are considerably longer and more pointed in this specimen, especially the terminal claws of the foot (compare figures 7, 8 and 18). The hands show the difference between *Dinogorgon* and *Prorubidgea*, although these forms are contemporaries, of about the same size and fairly similar in skull structure. Even in dental formulae the two forms agree. In skull proportions, however, they differ quite considerably. *Dinogorgon* has a long, high and narrow skull, whereas the skull of *Prorubidgea* is shorter, broader and not very high. The anterior portion of the snout of *Dinogorgon* is also larger, much higher and better defined than in *Prorubidgea*. In the former, too, the incisors are much larger.

The type specimen of *D. rubidgei* has only four molars, but *D. oudebergensis* has five molars. It is possible that the larger type specimen could have lost a molar on each side.

Alopecorhynchus rubidgei Broom MSS.

The name *Alopecorhynchus rubidgei* was given by Broom to a specimen in the Rubidge Collection, but as far as we can establish a description of the specimen

has not yet been published. We have decided to include in this paper a description of the skull under the generic and specific name given to it by Broom.

The skull was discovered in upper *Cistecephalus* zone beds on the farm Patrysfontein in the Graaff-Reinet district and is numbered 51 in the Rubidge Collection.

We do not know on what characteristics Broom recognised this specimen as a distinct genus, but we are quite satisfied that it is a new genus. The skull is long and slender, and exceptionally flat. It measures 187 mm. from the occipital condyle to the premaxillaries and 110 mm. across the squamosals. The snout is 102 mm. long and 40 mm. broad. It does not taper forward

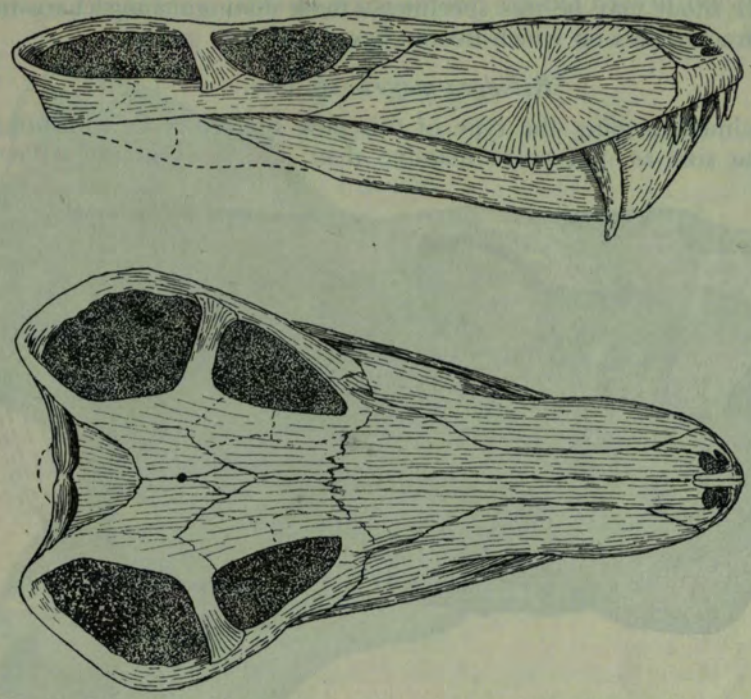

Fig. 9.—Side view of the skull of *Alopecorhynchus rubidgei* Broom MSS (x½).
Fig. 10.—Dorsal view of the skull of *Alopecorhynchus rubidgei* Broom MSS (x½).

and is not narrower in the region of the molars. The interorbital breadth is 35 mm. and the intertemporal breadth 40 mm. The orbits are larger 37 mm. in length, and the postorbital bars and zygomatic arches are slendel. The pineal foramen is large and is situated well forward, at the level of the posterior margins of the postorbital bars. It is difficult to trace sutures over the roof of the skull, as it is much cracked and weathered. The preparieta, can, however, be recognised as a small bone lying well forward, almost between the orbits, and it has a long slender backward extension reaching to the pineal foramen. The interparietal is largely situated on the dorsal surface, but not quite at the same level as the parietals. Posteriorly it curves down and inward into a deep depression where it meets the supraoccipital.

The external nares are small and the whole premaxillary region is delicate. There are four incisors on each side. The fourth on the left is being replaced by another tooth, only the tip of which shows antero-medially in the socket. On the right side the fourth incisor is also being replaced, but the replacing tooth is situated posteriorly in the socket. The incisors are well spaced.

The canine is large and extends below the level of the ventral side of the dentaries. It points slightly forward. The anterior margin of the canine is 36 mm. behind the tip of the snout, and is placed unusually far back in the maxilla. There are four small molars on each side, also well spaced.

The presence of only four incisors, the distance between the teeth, and the long slender snout may be this specimen's most distinguishing characteristics, and the characteristics on which Broom based this new genus.

Rubidgea majora sp. nov.

The specimen forming the type of this new species is an enormous skull, of the same size as, but more massive than, the skull in the collection of

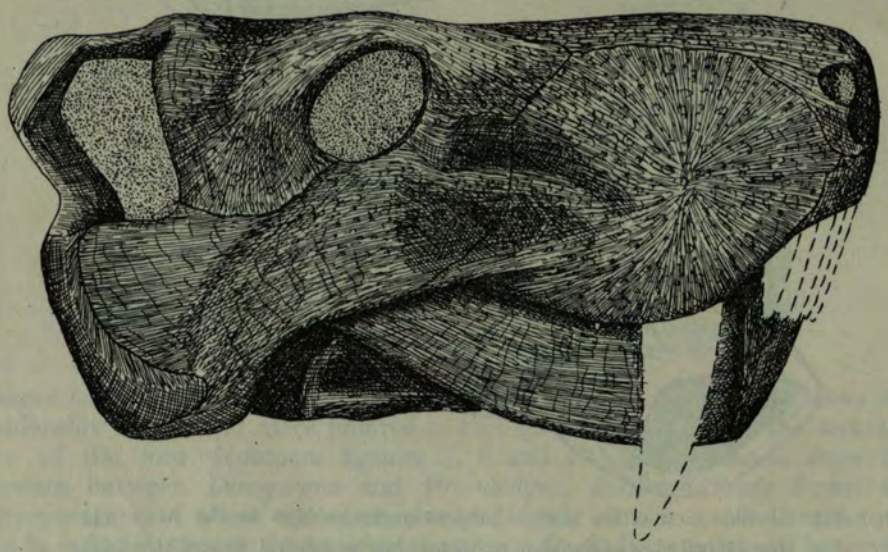

Fig. 11.—Side view of skull of *Rubidgea majora* sp. nov. (x¼).

Dr. S. H. Rubidge described by Broom in 1939 as *Rubidgea atrox* (Proc. Zool. Soc., 108 B, p. 527, figs. 1, 2.) This skull was collected by Mr. B. J. Kitching on the farm Coetzeeskraal in the Murraysburg district in upper *Cistecephalus* zone beds. It is numbered 246 in the collection of the Bernard Price Institute.

If the distance from the locality where *Rubidgea atrox* was found and the difference in horizon of the two localities (*Rubidgea atrox* was found in middle *Cistecephalus* zone beds) could be disregarded this new specimen could possibly be mistaken for a male of the latter species, but there are some structural differences.

The most striking differences are the heavier, more massive posterior

portion of the skull and the shorter snout in the new specimen. The snout of *Rubidgea atrox* is very distinctly longer and more slender. The breadth of the skull is 430 mm. in both specimens. The total length of the skull of *R. atrox* is 490 mm.; in the new specimen it is 470 mm. The breadth of the snout is 145 mm. in the new specimen and 135 mm. in *R. atrox*.

The postorbital arches of the new specimen are heavier and broader and the temporal vacuities somewhat differently shaped. The interorbital and intertemporal breadths of the new skull are appreciably greater.

The roof of the skull in both species is depressed to the same extent, but the dorsal margins of the orbits of the new specimen are more massive. The pineal foramen is situated on a fairly prominent boss, which is entirely absent in *R. atrox*. It is impossible to trace sutures on the roof of the skull.

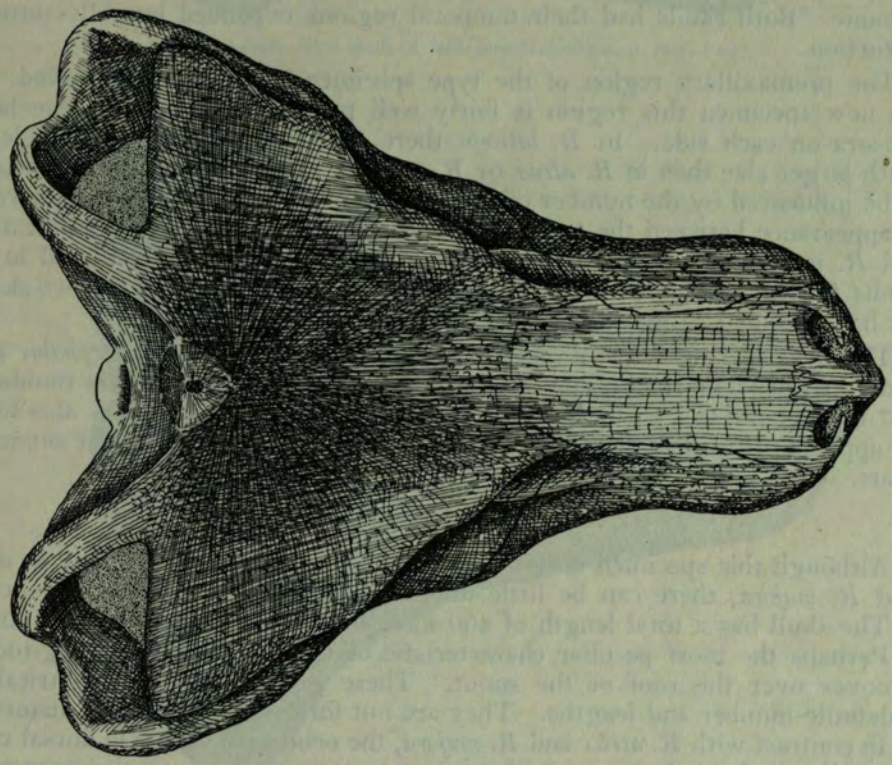

Fig. 12.—Dorsal view of skull of *Rubidgea majora* sp. nov. (x¼).

There are five incisors on each side, one large canine and, as in *R. atrox*, only a slight trace of a tiny molar on the right side. Both canines are broken off but, judging from their diameters, it is certain that they extended to well below the level of the ventral sides of the dentaries, another characteristic in which the new specimen agrees with *R. atrox*.

We consider that this new specimen represents a new species of *Rubidgea* and we propose the name *Rubidgea majora* sp. nov.

Rubidgea laticeps Broom

Included in the collection of the Bernard Price Institute is a specimen of exactly the same size and proportions, with even the same condition of preservation and degree of distortion, as the specimen in the Rubidge Collection described by Broom as *Rubidgea laticeps* (1940, Ann. Transv. Mus., xx, p. 173, fig 15). In the length and breadth of the skull, the breadth of the snout, the interorbital and intertemporal breadths, and the size of the orbits, the two skulls agree. In both specimens the pineal foramen is situated on a fairly prominent boss.

Both skulls have their posterior portions distorted to the same degree, as if pushed in from behind. It is more obvious from the new specimen that the breadth of the skull as reconstructed by Broom (op. cit.) is not quite genuine. Both skulls had their temporal regions expanded laterally through distortion.

The premaxillary region of the type specimen is perfectly preserved. In the new specimen this region is fairly well preserved and shows five large incisors on each side. In *R. laticeps* there are two molars on each side, of much larger size than in *R. atrox* or *R. majora*. Although we are not inclined to be influenced by the number of molars, their size and the general difference in appearance between the two skulls of *R. laticeps* and the skulls of *R. atrox* and *R. majora* induce us to regard the former two as wrongly placed in the genus *Rubidgea*. However, on account of the bad preservation of the two skulls, we have decided to leave them provisionally in this genus.

The new specimen was discovered by Kitching in upper *Cistecephalus* zone beds on the farm Hoeksplaas in the Murraysburg district and is numbered 247 in the collection of the Bernard Price Institute. The type was also found in upper *Cistecephalus* zone beds, but the two localities are about 50 miles apart.

Rubidgea platyrhina sp. nov.

Although this specimen differs to a very considerable extent from *R. atrox* and *R. majora*, there can be little doubt that it belongs to the same genus.

The skull has a total length of 400 mm. and a total breadth of 350 mm.

Perhaps the most peculiar characteristic of this species is the longitudinal grooves over the roof of the snout. These grooves are asymmetrical, of indefinite number and lengths. They are not formed as a result of distortion.

In contrast with *R. atrox* and *R. majora*, the orbits are visible in dorsal view. Immediately behind the orbit there is a prominent boss on the postorbital bar. This boss is also found in *R. atrox* and *R. majora*, but it is not so conspicuous in *R. laticeps*.

The pineal foramen is situated on a boss of slightly less prominence than that of *R. laticeps* and *R. majora*.

The snout is longer and more slender than in the other species and, in contrast, tapers forward. The external nares are dorso-ventrally flattened and extend far laterally. The septomaxillaries form prominent bridges dividing the external nares nearly completely in two. The external nares spread ventrally and laterally below these bridges to cover large areas of the

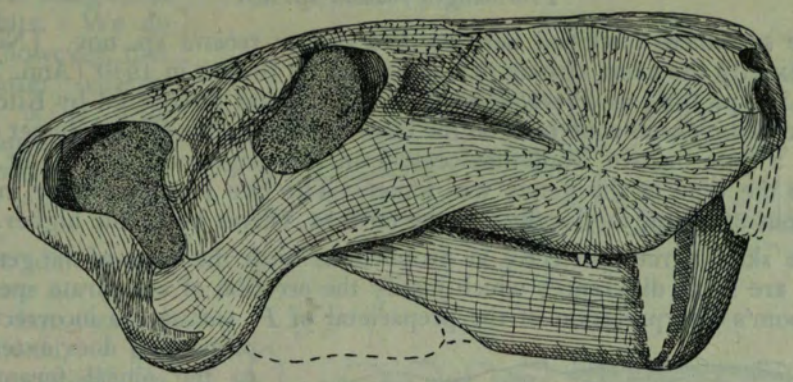

Fig. 13.—Side view skull of *Rubidgea platyrhina* sp. nov. (x¼).

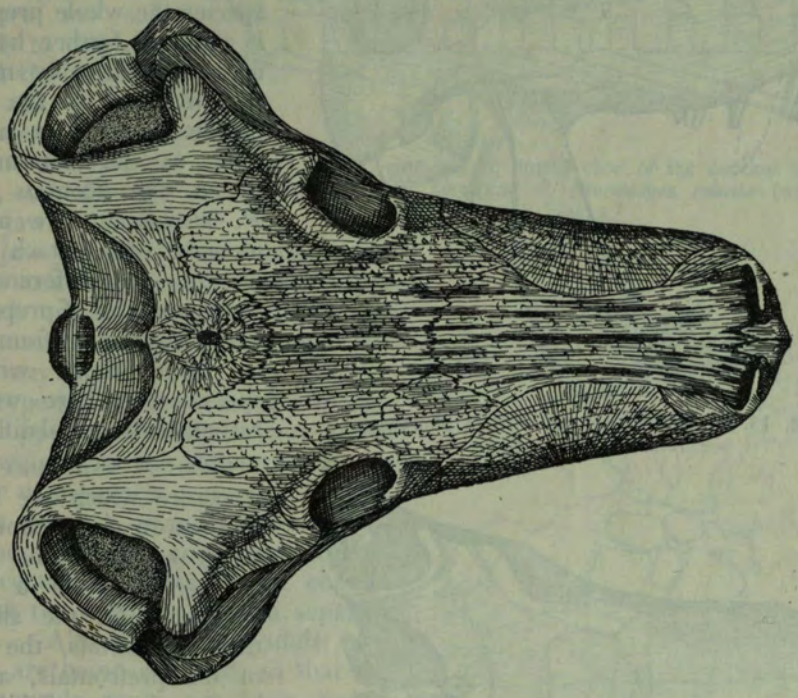

Fig. 14.—Dorsal view of the skull of *Rubidgea platyrhina* sp. nov. (x¼).

premaxillaries. The dorso-ventrally flattened characteristic of the external nares is so markedly different from the more upright type of nares of the other species that we have decided to name this specimen *Rubidgea platyrhina* sp. nov. It was discovered by Kitching in upper *Cistecephalus* zone beds on the farm Doornberg in the New Bethesda district and is numbered 248 in the collection of the Bernard Price Institute.

Prorubidgea robusta sp. nov.

The specimen described here as *Prorubidgea robusta* sp. nov. (No. 249) is of exactly the same size as that described by Broom in 1940 (Ann. Transv. Mus. xx, p. 169) as *Prorubidgea maccabei*. It was discovered by Kitching in middle *Cistecephalus* zone beds on the farm Poortjie in the Graaff-Reinet district, about a mile or two from the locality on the neighbouring farm St. Olives where the type of the genus was found. The two localities differ in height by about 300 feet, the locality on the farm St. Olives being the higher.

The skull agrees perfectly in proportions with the type of the genus, but there are some differences which justify the erection of a separate species.

Broom's interpretation of the preparietal of *P. maccabei* is incorrect. The preparietal does extend back to the pineal foramen and forms part of the latter's margin, but in the new species the whole preparietal is situated farther back and forms considerably more of the margin of the pineal foramen. It does not extend as far forward between the frontals as in *P. maccabei*. We are not inclined to attach much weight to differences in shape and size of preparietals as we have often found them to differ much within a species, but here we have rather a substantial difference.

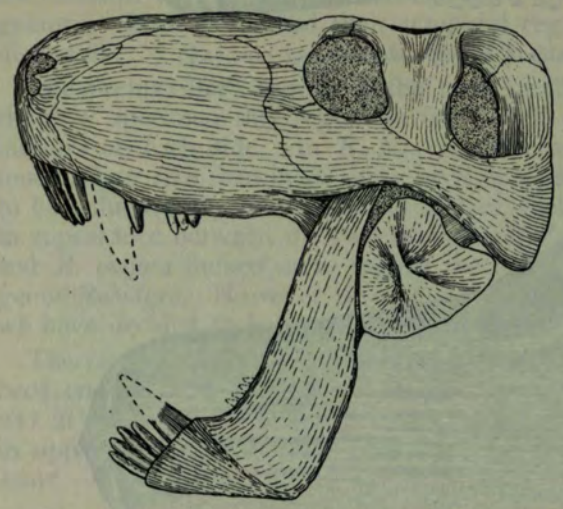

Fig. 15.—Side view of the skull of *Prorubidgea robusta* sp nov. (x¼).

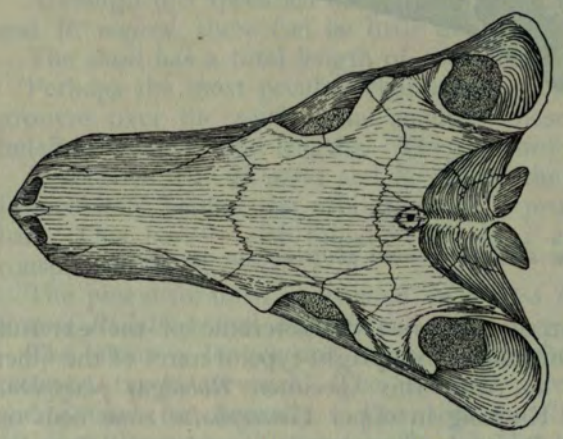

Fig. 16.—Dorsal view of the skull of *Prorubidgea robusta* sp. nov. (x¼).

Other differences in structure which are reasonably more conspicuous than those we have thus far encountered within a species are found in the shape of the postfrontals, the length of the prefrontals, and the level of the fronto-nasal suture relative to the anterior margins of the orbits. In addition the frontals are excluded from the margins of the orbits in the new specimen, whereas in the type of the genus narrow extensions of the frontals still

reach the margins of the orbits. We do admit, however, that the latter characteristic is of little importance and that both conditions may occur within one species.

Other differences, which are not structural, but rather proportional, are found especially in the orbital and temporal regions and they are too substantial to be considered the result of sex or age.

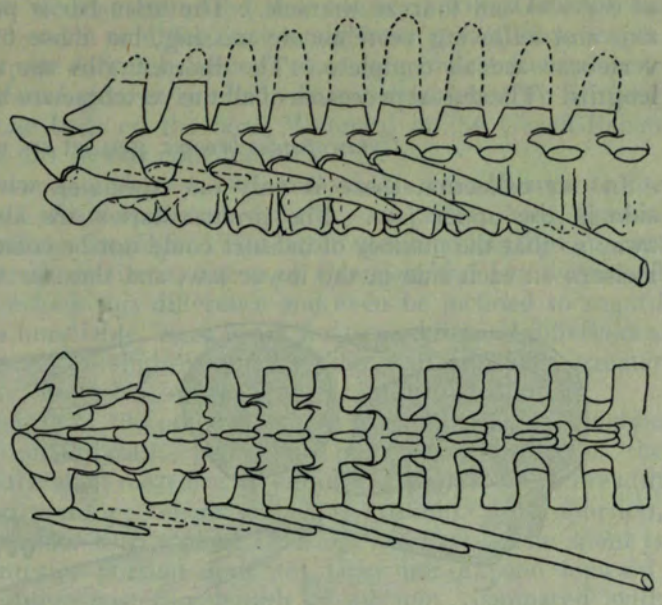

Fig. 17.—A, side and B, dorsal view of the cervical and anterior thoracic vertebrae of *Prorubidgea robusta* (x¼).

The dental formula of the new species is i5, c1, m3 for the upper jaw. In the lower jaw there are four incisors, one canine and apparently four molars of which one is preserved on the left and two on the right. In the upper jaw there may have been four molars. In the type species there are five molars in the upper jaw. We do not attach much weight to the difference in the number of molars as a generic feature, but the number of molars considered with their size and degree of degeneration certainly are significant enough to allow the dinstinction of a separate species. Although fully adult, the canines are being replaced, so that the Gorgonopsids could not have had a single dental succession like the higher Cynodonts.

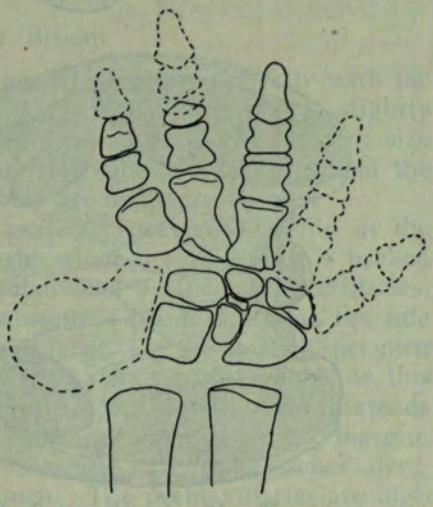

Fig. 18.—Dorsal view of the left hand of *Prorubidgea robusta* (x¼).

In addition to the perfectly complete, undistorted and marvellously prepared skull, the specimen includes a nearly perfect left hand with the distal ends of the radius and ulna, a complete humerus, clavicle, precoracoid and coracoid and the lower portion of the scapula. Furthermore, the specimen includes the proatlas, atlas and axis, and eight vertebrae of which four are regarded

as cervical and four as thoracic. The atlas rib is perfect. The ribs of the axis and following vertebra are missing, but those of the rest of the cervical vertebrae are all complete. The thoracic ribs are not present in their full lengths. The dorsal processes of all the vertebrae are broken off. (See fig. 17.)

Cyniscopoides broomi gen. et sp. nov.

In our collection there is only one specimen with four incisors on each side in the upper jaw. The premaxillaries are almost completely broken away so that the number of incisors could not be counted; but there are three incisors on each side in the lower jaw, and thus far we have not encountered

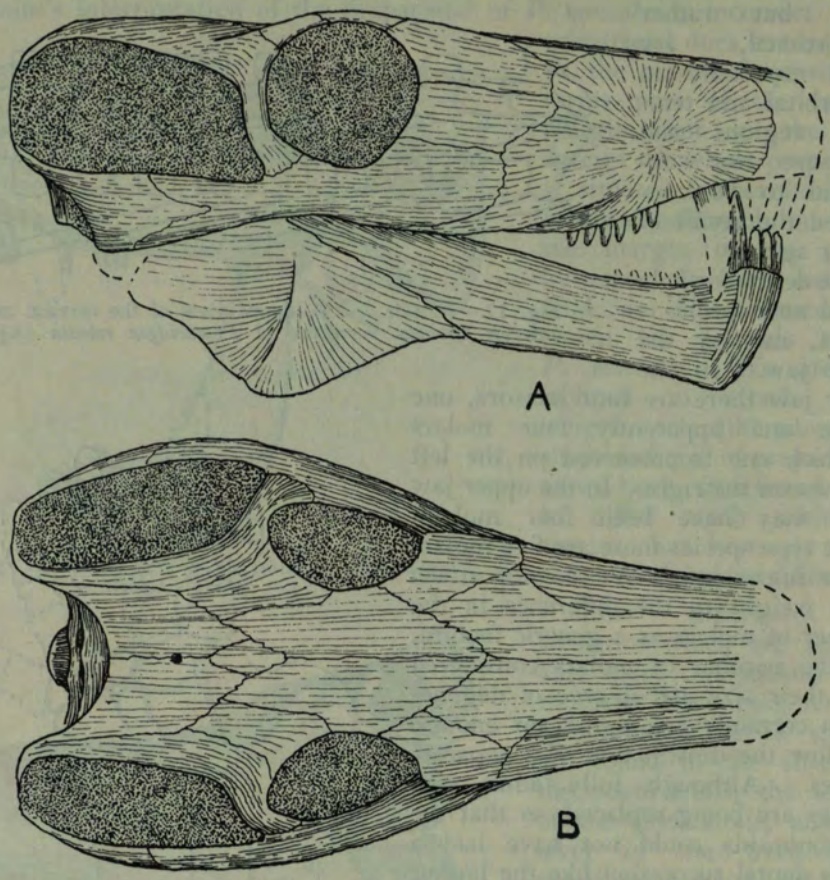

Fig. 19.—A, side and B, dorsal view of the skull of *Cyniscopoides broomi* gen. et sp. nov., with lower jaw placed in position (x½).

a Gorgonopsid in which the number of incisors in the upper jaw does not count one more than in the lower jaw.

There is one canine on each side with six small molars. From the list given above it will be seen that this new specimen can only be compared with *Arctognathoides* and *Arctognathus*, but keeping in mind that the number of

molars may be deceptive we also compared this specimen with *Galerhynchus* and *Arctosuchus*, but we found it to differ completely from any of these forms. This specimen therefore quite definitely belongs to a new genus and we propose the name *Cyniscopoides broomi* gen. et sp. nov. It was discovered by Kitching in upper *Cistecephalus* zone beds on the farm Waterval in the Graaff-Reinet district and is numbered 251 in our collection.

Both the skull and lower jaw show a very remarkable resemblance to the specimen in the Rubidge Collection described by Broom (1941, Ann. Transv. Mus., xx, p. 197) as *Cyniscops longiceps*. The latter specimen has five incisors and seven molars, of the same size as those of *Cyniscopoides*, but we would have been inclined to overlook this difference and even be inclined to regard the number of incisors as unreliable, were it not for two additional differences. Although *Cyniscops longiceps* is slightly smaller, the dentary has a greater vertical height. Secondly, the orbits of the latter are much smaller.

The skull has a total length of 200 mm., measured from the occipital condyle to the reconstructed premaxillaries. From the posterior margins of the squamosals the length of the skull measures an additional 10 mm. The breadth of the skull, measured across the zygomatic arches, is 110 mm. In proportion, this skull is somewhat broader than that of *Cyniscops longiceps*. The snout is 43 mm. broad. The anterior portion does not taper nor expand forward. The orbit has a total antero-posterior length of 42 mm., compared with 34 mm. in *Cyniscops longiceps*, while the latter skull is only 10 mm. shorter. The interorbital and intertemporal breadths are also, proportionally, less in *Cyniscops longiceps*.

Cyniscops longiceps Broom

There are three specimens in our collection which agree perfectly with the type of *Cyniscops longiceps* in the Rubidge Collection. The one is slightly smaller, the second is slightly larger, and the third is of exactly the same size as the type. The former two have a dental formula of i5, c1, m7 and the latter may also have seven molars, but only six are distinctly visible.

All three specimens have their snouts perfectly preserved, while in the type the snout is considerably crushed and the whole dorsal surface is broken away. The external nares are high, well subdivided by the septomaxillaries, which cover large areas on the sides of the snout. The foramen on the side of the snout, below the septomaxillary, is very large. In the smaller specimen only a very tiny portion of the septomaxillary extends backward below this foramen. In the intermediate specimen a portion of the septomaxillary extends backward for about half of the length of the foramen, along its ventral margin, and in the larger specimen, on the right side, this extension reaches along the whole of the ventral margin of the foramen. The premaxillaries are high anteriorly and form a narrow bridge between the nares.

The roof and sides of the skull, the orbital and temporal regions, and the posterior face of the skull, of all three specimens, agree perfectly with the type. The ventral surface of the type skull is unknown, due to the lower jaw being in position, but in each of the new specimens the ventral surface of the skull is perfectly preserved and cleaned. The intermediate specimen has the right half of the lower jaw preserved in position, but the palate could

nevertheless be cleaned perfectly. Figures 20A, B and C show the build of the skull of *Cyniscops longiceps*, as illustrated by the three skulls.

We do not know the exact horizon of the locality whence the type came; the three specimens in our collection come from middle *Cistecephalus* zone beds in the Murraysburg district. The smaller specimen (No. 252) was found on the farm Ringsfontein; the intermediate specimen (No. 253) was found on the farm Hoeksplaas immediately north of Ringsfontein, and the larger specimen (No. 254) was found on the farm Milton, about 15 miles north of Hoeksplaas.

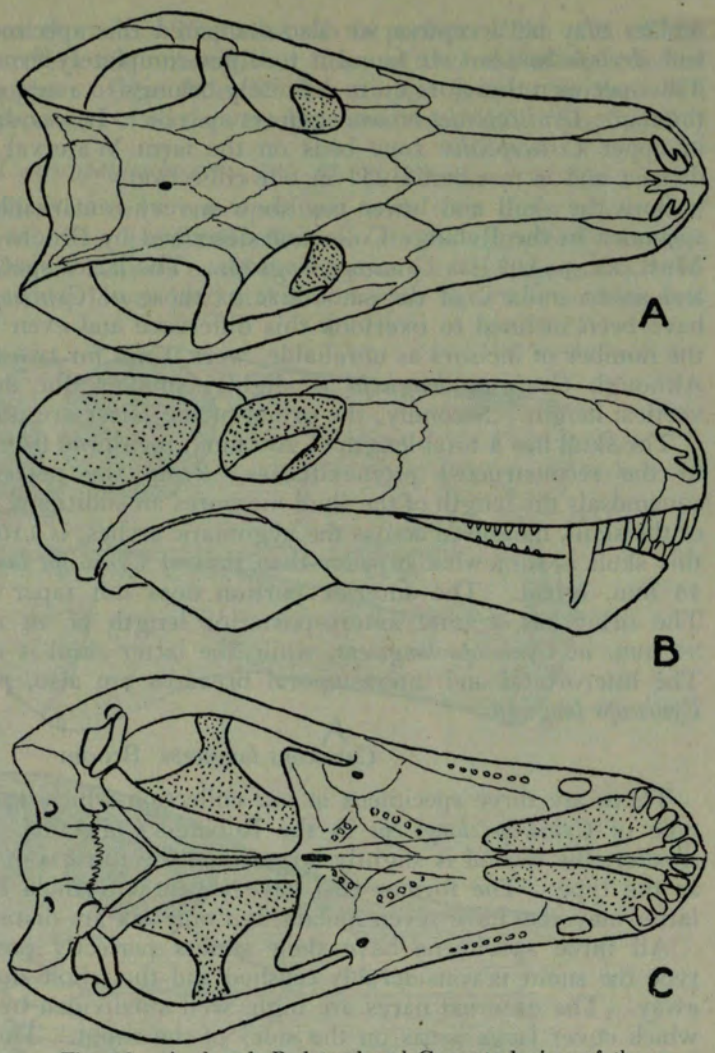

Fig. 20.—A, dorsal, B. lateral and C, ventral view of the skull of *Cyniscops longiceps*, restored (x½).

The following are some measurements of the three skulls:

	252	253	254
	mm.	*mm.*	*mm.*
Length of skull to occipital condyle	170	175?	203
Length to posterior margin of squamosals ...	173	180	210
Breadth across zygomatic arches	75?	90	103
Intertemporal breadth	35	40	46
Interorbital breadth	29	31	34
Diameter of orbit	34	36?	28?
Breadth of snout	35?	40	46
Length of snout from anterior margin of orbit...	91	96	111

Cynarioides gracilis Broom

In 1930 Broom (Phil. Trans. Roy. Soc., Ser. B, vol. 218) described a specimen as *Cynarioides gracilis*, but the type was cut into sections. Now we have in our collection a complete specimen of exactly the same size as this type, which we are positive belongs to the same genus and species. It was discovered by Mr. S. C. Kitching in middle *Cistecephalus* zone beds on the farm Vleiplaas in the Murraysburg district. The type was found in upper *Endothiodon* beds. The difference in age may justify the recognition of the new specimen as a distinct species, but it agrees so well with the type that we consider it unnecessary to do so. It is numbered 255 in our collection.

According to Broom (op. cit.) the type has five molars, but he stated that an older specimen could have had six molars. Our specimen has five molars on the right side and six on the left side.

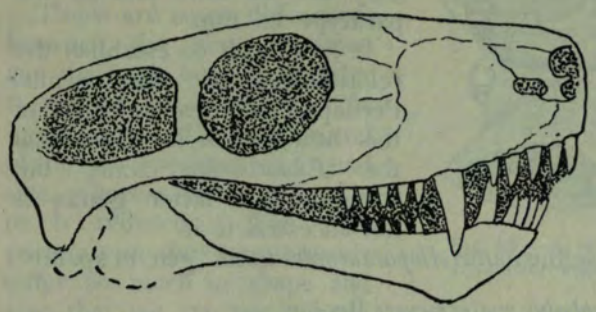

Fig. 21.—Side view of the skull of *Cynarioides gracilis* Broom, distortion corrected (natural size).

The posterior portion of the skull is distorted and the roof of the skull is not very well preserved. In side view the premaxillary bridge between the external nares extends more forward than shown in Broom's figure 46 (Mammal-like Reptiles of South Africa, 1932, p. 131) and appears more angular where it meets the nasals. The lower jaw also has an angular chin, which apparently Broom's specimen did not have. Otherwise the new specimen agrees very well with the type and could serve as an example of this genus and species in the absence of the complete type.

Aloposauroides tenuis gen. et sp. nov.

There are two specimens in our collection belonging to this new genus and species. The one has a total skull length of 133 mm. and is the better preserved of the two. We make this specimen the type. It was discovered by Mr. S. C. Kitching in middle *Cistecephalus* zone beds on the farm St. Olives in the Graaff-Reinet district and is No. 256 in our collection. The second skull is 122 mm. long and although it is less distorted it is more cracked and the structure more difficult to establish. We have no record of the locality of this specimen. It is No. 257 in our collection.

There is a large diamond shaped preparietal, the posterior angle of which does not reach the parietal foramen. The frontals form much of the dorsal margins of the orbits. The postorbital is slender and overlaps the equally slender jugal laterally, where it is in contact with the squamosal. The postfrontal extends down in front of the postorbital so that the latter forms very little of the orbital margin.

The skull is very slender and delicate. There are five incisors, one canine

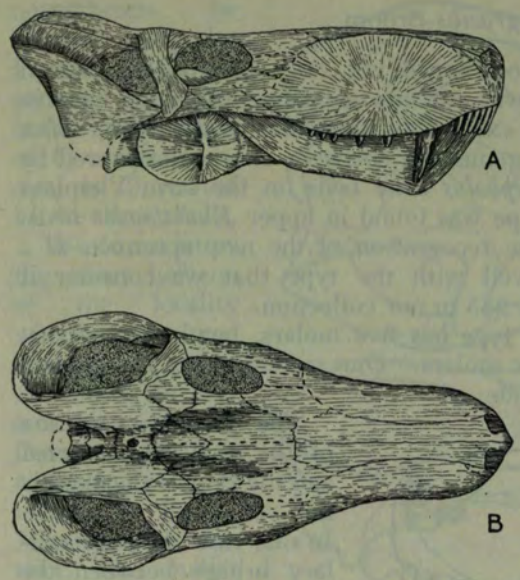

Fig. 22.—A, side and B, dorsal view of the skull of *Aloposauroides tenuis* gen. et sp. nov., distortion corrected (x½).

and apparently seven molars. It is very difficult to ascertain whether the second specimen also has seven molars. The two specimens agree perfectly in all their skull characteristics.

Both skulls are much distorted and it is advisable not to rely on any measurements other than their lengths, the interorbital and intertemporal breadths. In both specimens the latter two measurements are the same. In the type they are 26 mm. and in the paratype 25 mm.

It is difficult to establish the relationship of this genus. Perhaps the nearest ally of this new genus is *Aloposaurus* the *Endothiodon* zone, but certainly the latter genus is not ancestral to it.

For this new genus we propose the name *Aloposauroides tenuis* gen. et sp. nov.

Scylacocephalus watermeyeri Broom

There is in our collection a small skull 100 mm. long, which agrees with a skull in the Rubidge Collection, described by Broom as *Scylacocephalus watermeyeri* (1940, Ann. Transv. Mus., xx, p. 79). The latter skull is larger, approximately 135 mm. long. The anterior portion of the snout of the type is missing but, judging from the four incisors in the lower jaw, there must have been five in the upper jaw. In the new specimen there are five incisors and five molars. It appears as though there was a sixth tooth posteriorly on the right side. In the type there are also five on the left and apparently six on the right side.

The frontals contribute to the margins of the orbits in the new specimen, but in the type they are excluded. This is the only difference between the two skulls.

The snout does not taper nor expand forwards, and anteriorly it is fairly blunt.

The new specimen was discovered by Mr. B. J. Kitching in middle *Cistecephalus* zone beds on the farm Ringsfontein in the Murraysburg district. The type comes from the same horizon, but the two localities are eight miles apart. The new specimen is No. 258 in our collection.

Lycaenoides angusticeps Broom (figs. 23 A and B)

We have in our collection a very fine specimen of *Lycaenoides angusticeps*. It was discovered by Kitching in upper *Cistecephalus* zone beds on the slopes

of a koppie about two miles west of Richmond. It is No. 259 in our collection.

The skull is slightly smaller than the type. From the occipital condyle to the premaxillaries the skull measures 265 mm. and the preorbital portion measures 152 mm. The snout is 59 mm. broad as preserved and the interorbital and intertemporal breadths both measure 64 mm. The orbit measures 46 mm. antero-posteriorly.

There are some differences between the new specimen and the type, but we consider them not to be of specific importance. The preparietal of the new specimen is of usual size, whereas in the type it is much reduced. The preparietals in the Gorgonopsids differ so much in shape and size that we are not inclined to take the difference in characteristics between the preparietals of the new specimen and the type as being important.

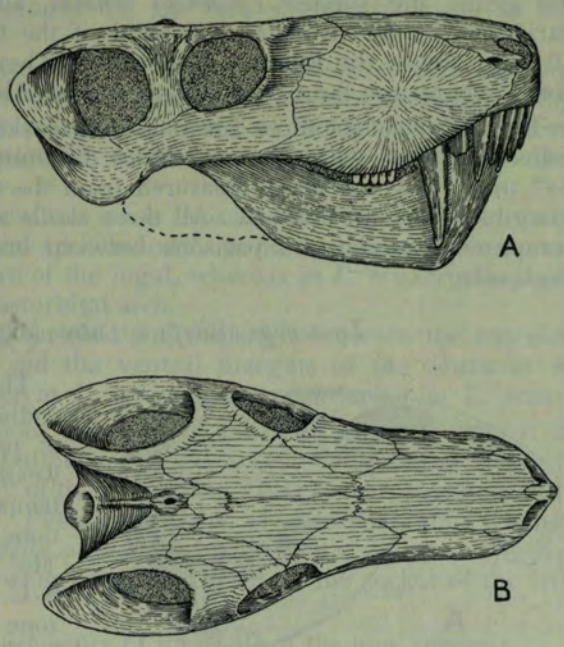

Fig. 23.—A, side and B, dorsal view of the skull of *Lycaenoides angusticeps* Broom, distortion corrected (x¼).

The parietal foramen is large and situated on a small boss. A fairly prominent ridge, in places quite 5 mm. high, extends from this boss down to the foramen magnum.

Due to the large preparietal, the parietals do not extend as far forward between the frontals as in the type. The frontals appear to be excluded from the margins of the orbits, but they reach to within a millimeter of the latter.

The zygomatic arch of the new specimen is somewhat more slender than in the type. Otherwise, in structure, the two skulls agree perfectly.

There are five molars in the new specimen, whereas in the type there are only four. As the type is a larger and older specimen, the latter could have lost a molar on each side.

Lycaenops ornatus Broom

We have in our collection a specimen of *Lycaenops ornatus* but, as the type is so well known and the new specimen reveals no additional information on this species, it is not worth describing. The new specimen comes from high in the middle, or rather low in the upper, *Cistecephalus* zone. It was discovered by Kitching on the farm Waterkrans on the border between the Graaff-Reinet and Richmond districts, and is No. 260 in our collection.

There are two specimens borrowed from Mr. Rubidge, which we refer to

the genus and species *Lycaenops ornatus*, although there are some minor variations in the structure and build of the two skulls. We number them 301 and 302 in the Rubidge Collection. They come from lower *Cistecephalus* zone beds on the farm Matjiesfontein near Aberdeen.

The lengths of the three *Lycaenops ornatus* skulls, Nos. 301 and 302 (Rubidge collection) and 260 (Bernard Price Institute) are respectively 210 mm., 247 mm., and 226 mm., measured from the premaxillaries to the posterior margins of the squamosals. All three skulls are to different extents laterally compressed so that comparisons between breadth measurements would be misleading.

Lycaenops alticeps sp. nov. (figs. 24 A and B)

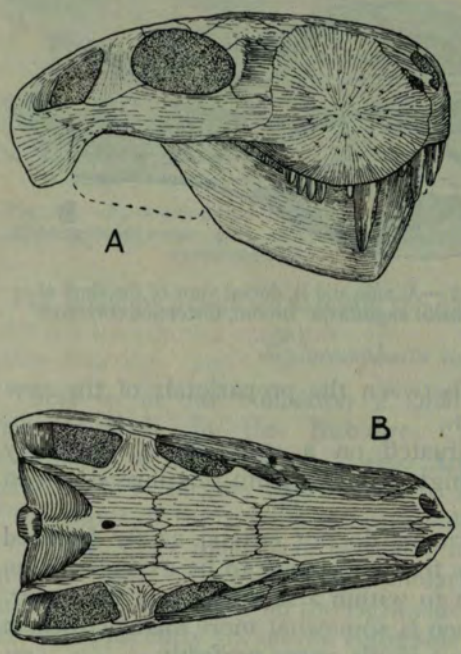

Fig. 24.—A, side and B, dorsal view of the skull of *Lycaenops alticeps* sp. nov. (x¼).

The type of this new species is an undistorted skull in fair condition of preservation. It suffered some weathering along the margins of the temporal vacuities, but reconstructions can be carried out accurately. The skull was discovered by Mr. S. C. Kitching in middle *Cistecephalus* zone beds on the farm Hoeksplaas in the Murraysburg district and is numbered 261 in our collection.

Superficially, in structure and general build, the skull of the new species agrees very well with *L. pricei* and *L. ornatus*, but in proportions it differs so remarkably that it cannot be confused with either of those two species. The snout has a considerable height and, in side view, the anterior portion is well rounded.

The differences between the three species are the following: The skull of *L. pricei* is low and broad. In *L. ornatus* the skull is somewhat higher, but much narrower. In *L. alticeps* the skull is as narrow, but much higher. The squamosals extend well back on each side of the occipital region in *L. ornatus*, while this region is more shallow in *L. pricei* and *L. alticeps*. In *L. ornatus* the nasals extend back on each side of the anterior ends of the frontals. In the other two species the fronto-nasal suture runs straight transversely. The preparietal is large in *L. ornatus* and small in the other two species. In all three species the preparietal lies well in front of the parietal foramen.

The nasals of *L. ornatus* are much broader posteriorly than anteriorly. In *L. pricei* they are very slightly broader posteriorly, and in *L. alticeps* they

are as broad anteriorly as posteriorly but are very slightly narrower in the middle.

There are four molars in *Lycaenops* and as the molars are large and not much degenerated, this number may be considered as characteristic of the genus. In *L. pricei* the molars are quite as long as the incisors, but more slender. In the other two species the molars are slightly shorter than the incisors, as well as more slender.

The postorbital arch of the new species is broader than in the two already described species. In both the new species and *L. pricei* the postorbital extends down to well over the lateral face of the jugal, whereas in *L. ornatus* the jugal tends to form a portion of the postorbital arch.

The chin of *L. alticeps* is well forward and the angle between the anterior face of the symphysial region and the ventral margins of the dentaries is nearly 90°. This angle is larger in *L. ornatus* and much larger in *L. pricei.*

A very interesting feature about the skull of the new specimen is that it demonstrates most clearly a continuous dental succession for the canines. On the right side, anteromedially of the canine and in its socket, there are still traces of the previous canine. Postero-medially of the functioning canine the tip of another canine is already appearing, in the same socket. The tip of a replacing canine is also showing postero-laterally in the socket of the left canine.

The following are some measurements of the skull of the new species:

Length of skull, squamosals inclusive	240 mm.
Length of skull to occipital condyle	231 mm.
Distance from premaxillaries to pineal foramen	186 mm.
Distance from premaxillaries to anterior margin of orbit	127 mm.
Distance between preparietal and pineal foramen ...	12 mm.
Interorbital and intertemporal breadths	53 mm.
Breadth across squamosals	130 mm.
Breadth of snout	70 mm.
Maximum height of snout	92 mm.

Aelurognathus minor sp. nov. (figs. 25 A and B)

The type of this new species of *Aelurognathus* is a nearly complete skull and lower jaw, discovered by Kitching in upper *Cistecephalus* zone beds near Bethesda Road Station. It is No. 262 in our collection.

The posterior portion of the skull is dorso-ventrally compressed and bent down. The margins of the temporal fossae have weathered away, but their impressions on the matrix made accurate reconstruction possible. The posterior half of the skull is restored in the figures.

Specimen No. 303 in the Rubidge Collection is a skull and lower jaw of nearly the same size, but it has suffered considerable lateral compression so that hardly any transverse proportional measurements of the skull can be compared. The only measurements that can be compared with safety are the lengths of the skulls and the lengths of the snouts. The skull is 180 mm. long in our specimen, and 170 mm. in Dr. Rubidge's specimen. In both the measurements are taken from the premaxillaries to the dorsal margin of the foramen

magnum. In the former the snout is 102 mm. long, measured from the anterior margins of the orbits, and in the latter the snout is 98 mm. long.

The occipital region is very open; the squamosals do not extend much backward on each side. Due to lateral compression, the occipital region of Dr. Rubidge's specimen appears more depressed.

In structure, the two skulls agree very well with that of *Lycaenops* and these two genera may be fairly closely related. The main differences between *Lycaenops* and *Aelurognathus* appear to be the following: In the former the preparietal is well separated from the pineal foramen. In the latter the preparietal is only a few millimeters in front of the parietal foramen. In *Aelurognathus* the four molars are much smaller than in *Lycaenops*, apparently more degenerated, so that the occurrence, occasionally, of three molars, as in *Aelurognathus sollasi*, should not be considered abnormal. *Aelurognathus* further differs from *Lycaenops* in that the "chin" projects ventrally well below the level of the ventral margins of the dentaries.

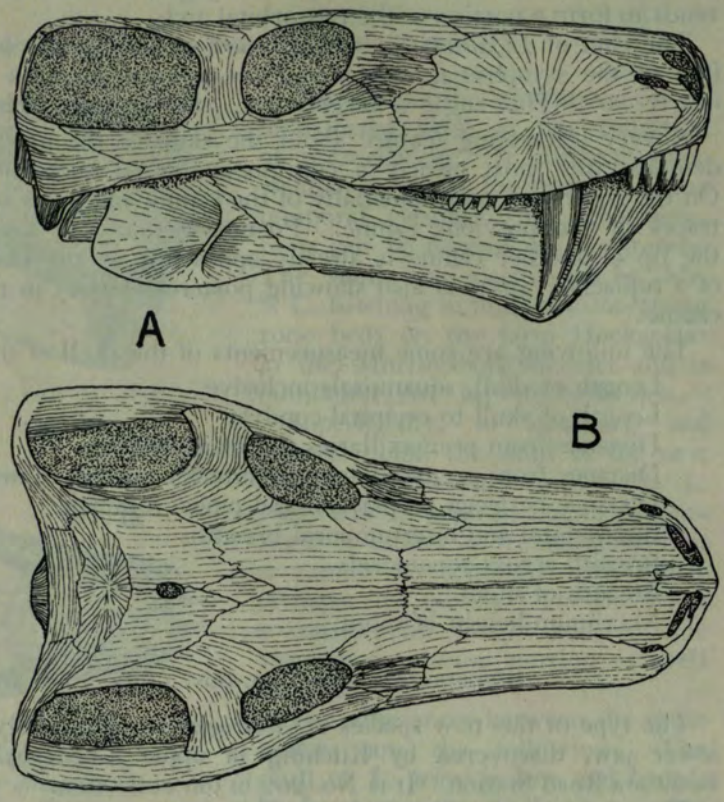

Fig. 25.—A, side and B, dorsal view of the skull of *Aelurognathus minor* sp. nov., with distortion of posterior portion corrected (x½).

Aelurognathus occurs in upper *Endothiodon* and lower *Cistecephalus* beds. This new specimen is therefore peculiar in being an upper *Cistecephalus* form. It differs reasonably from *A. microdon*, *A. serratidens*, and *A. tigriceps*, and compares rather well with *A. sollasi*, but it is a much later form than the latter and is smaller than the already described species.

As our specimen (No. 262) is the better preserved of the two and the structure more easily determinable on this skull, we make it the type, and Dr. Rubidge's specimen the paratype.

We have two additional specimens, Nos. 264 and 265, which agree perfectly in structure with the above two skulls. It is difficult to compare their proportions as these two additional skulls are also distorted to different extents. The skull is 169 mm. long in No. 264 and 164 mm. in No. 265; in both the measurement is taken from the premaxillaries to the dorsal margin of the foramen magnum. From the premaxillaries to the anterior border of the orbit the snout measures 95 mm. in the former and 93 mm. in the latter. The two specimens were found by Kitching in middle *Cistecephalus* zone beds on the neighbouring farms Mishoek (No. 264) and Leeufontein (No. 265) in the Murraysburg district. Specimen No. 265 appears to have had four molars, but specimen No. 264 definitely has only three molars on each side.

Arctops watsoni sp. nov. (figs. 26A and B)

Specimen No. 263 in our collection is a skull, without lower jaw, considered as belonging to the genus *Arctops*. It was discovered by Mr. B. J. Kitching in middle *Cistecephalus* zone beds on the farm Aasvogelkrans in the Murraysburg district.

Unfortunately the dental characteristics of the type of *Arctops willistoni* are not known, and although the posterior two-thirds of the skull compares perfectly with our specimen, it is nevertheless unsafe to refer the latter with absolute certainty to this genus, especially as we have not yet had the privilege of investigating the type.

In proportions the skulls agree perfectly, and in structure very reasonably. The only differences between the skulls are the following: The postorbitals are longer and narrower in the new species. The parietals of *A. willistoni* extend forward on each side of the preparietal to nearly level with the anterior margin of the latter, whereas in our specimen the parietals extend not nearly half way on each side of the preparietal. The interparietal of the new species is not as broad, so that consequently the tabulars are broader. Furthermore in our specimen the posterior molars reach to well behind the level of the posterior margins of the choanae. In *A. willistoni* these margins are included in the specimen, but molars are not included in the portions of the maxillaries as preserved.

These differences, in addition to the considerable difference in age (*A. willistoni* being of *Tapinocephalus* zone age) make us confident in distinguishing the new specimen as a distinct species. Otherwise, in structure and proportions, even in size, the skulls agree so well, that we are bound to consider it as belonging to the genus *Arctops*. Especially in the palatine and pterygoid region of the palate there is a most remarkable resemblance. In most Gorgonopsids the teeth-bearing ridges extend postero-laterally over the palatines and postero-medially over the pterygoids, with definite intervals where they cross the palatino-pterygoid sutures. In the new species the condition is perfectly similar to that in *A. willistoni*. The ridges in this genus do not rise near the midline anteriorly, but are well separated from each other. They reach their greatest height on the palatino-pterygoid sutures, where they come very close to the midline. Posteriorly over the pterygoids they separate again, and gradually smooth out, but before doing so they curve

inward again slightly, towards a long, narrow, interpterygoid fossa. This fossa was not demonstrated for *A. willistoni*, but perhaps it has been overlooked.

The transverse bones of the new specimen taper forward and extend well between the palatine and maxillary of each side. The condition in *A. willistoni* is somewhat different.

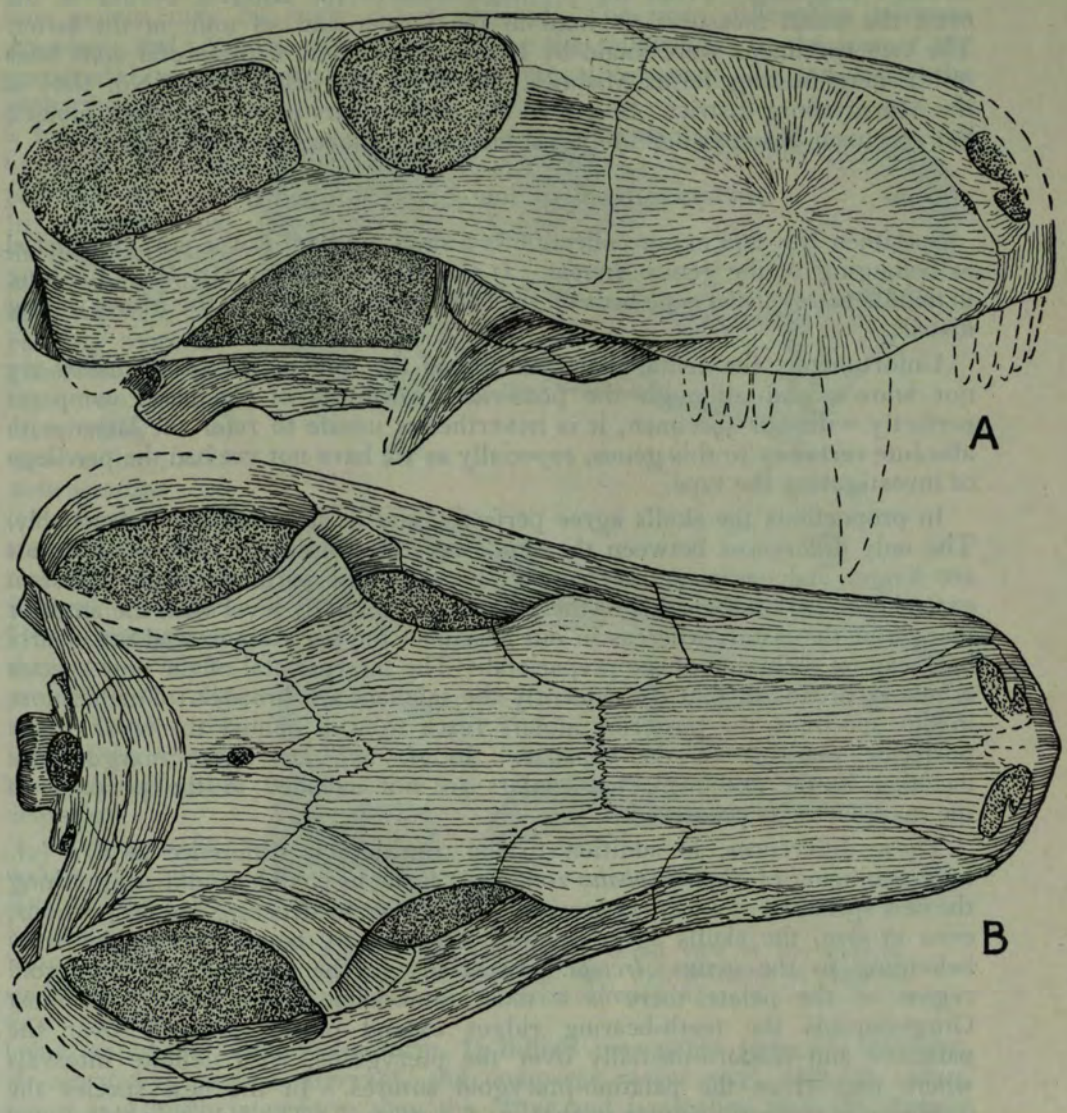

Fig. 26.—A, side and B, dorsal view of the skull of *Arctops watsoni* sp. nov. (x½).

If the new specimen is actually an *Arctops*, we now know the dental characteristics of this genus. There are five incisors and four molars. In

the specimen only the sockets of all the teeth are preserved. The sockets of all the molars are as large as those of the incisors, so that the molars could have been as large, proportionally, as in *Lycaenops*, but the incisor sockets show that the incisors were rather small for a Gorgonopsid.

The following are some measurements of the new skull:

Total length from premaxillaries to squamosals	278 mm.
Length from premaxillaries to occipital condyle	272 mm.
Length from premaxillaries to parietal foramen	210 mm.
Length of snout to anterior border of orbit	142 mm.
Length of orbit	47 mm.
Breadth of snout	77 mm.
Interorbital breadth	67 mm.
Intertemporal breadth	79 mm.
Height of snout	90 mm.

Sycocephalus bigendens gen. et sp. nov. (figs. 27A and B)

The type of this new genus is a skull comparable in proportions and structure

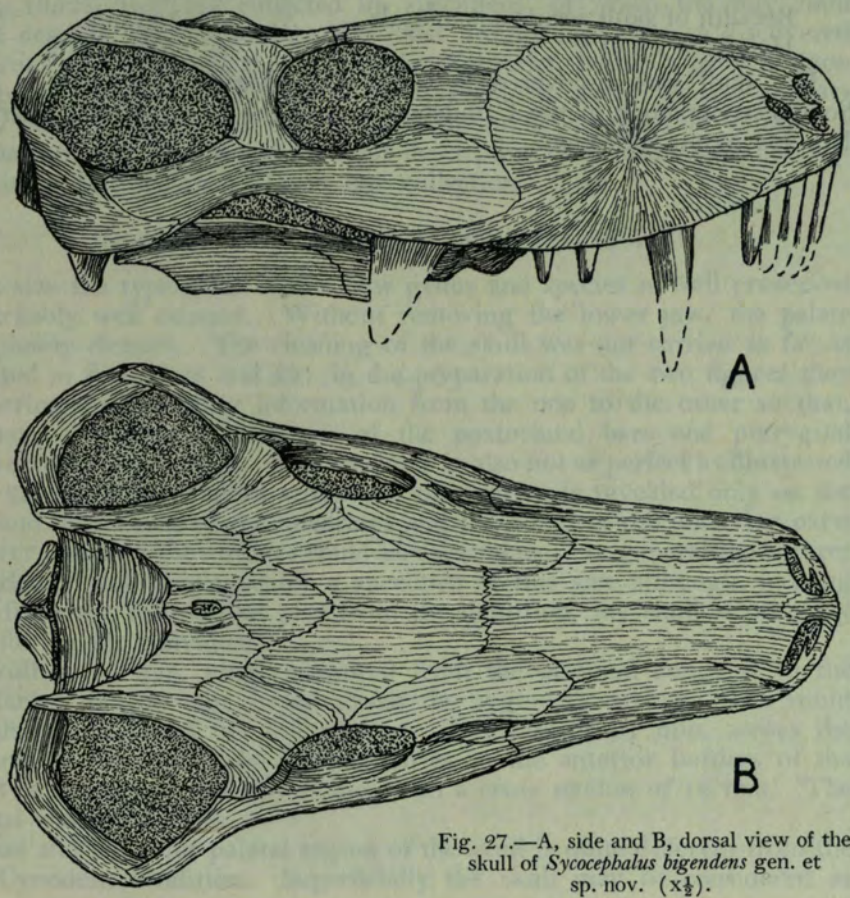

Fig. 27.—A, side and B, dorsal view of the skull of *Sycocephalus bigendens* gen. et sp. nov. (x½).

with *Cyniscops longiceps* or *Cyniscopoides broomi*. The new skull is, however, very slightly larger and proportionally somewhat broader over the squamosals. The preparietal and parietal foramen are very large and the frontals contribute very little to the margins of the orbits. Otherwise the three skulls agree perfectly and if their dental characteristics were not known they could easily be mistaken as belonging to the same species. However, *Cyniscops* has five incisors and *Cyniscopoides* only four. The former has seven tiny molars and the latter six, equally small. The new specimen is well separated from these two genera on account of having only two large molars, half the size of the incisors, and the incisors are fairly large. There are five incisors on each side.

The following are some measurements of the new skull:

Length of skull, squamosals inclusive	219 mm.
Length to occipital condyle	217 mm.
Length to parietal foramen	169 mm.
Length of snout to anterior margin of orbit ...	112 mm.
Breadth of snout across canines	54 mm.
Breadth of skull across orbits	98 mm.
Breadth of skull across squamosals	136 mm.
Height of snout	60 mm.

The skull was discovered in lower *Cistecephalus* zone beds on the farm Sondagsriviershoek in the Camdeboo area of the Graaff-Reinet district and is No. 266 in our collection.