

NEOPROCOLOPHON ASIATICUS, A NEW COTYLOSAURIAN REPTILE FROM CHINA

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Recently a very interesting skull of a primitive reptile has been found by Miss H. H. Hsieh, a member of the 1956 expedition of the Laboratory of Vertebrate Paleontology, Academia Sinica to the Wuhsiang-Yueshe districts. As the second consecutive year of the excavations made in this area, more than eleven tons of fossil bones of Triassic Dicynodontian fauna has been brought to the Laboratory waiting for preparation, in addition to the rich finds including two nearly complete skeletons of Kannemeyeria-like remains excavated in 1955. But this tiny skull found in 1956 is so interesting that I should like to make a short note of it without any delay, because it represents the first discovery of Procolophonidae and consequently the Cotylosauria as a whole from China.

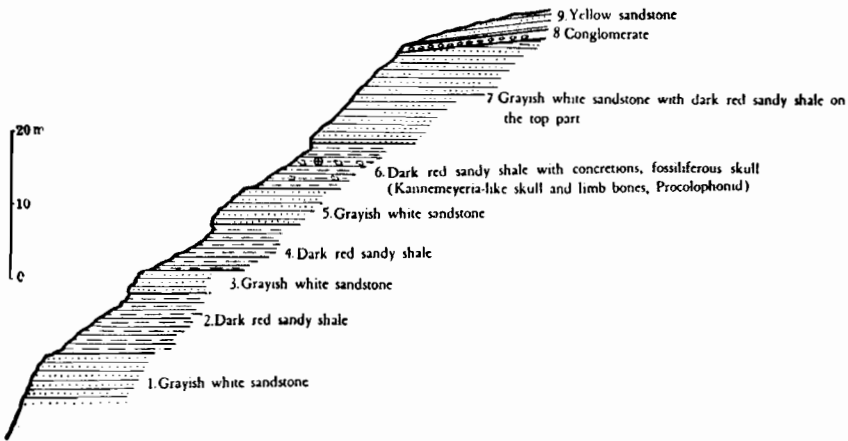


Fig. 1. Geological section near Ta-Yang-Po. Submitted by Miss A. L. Sun and Miss H. H. Hsieh.

The skull was found from the hill slope called Ta-Yang-Po about one kilometer N. W. of the village Ni-Ho-Chang, some 2.5 kilometers N. W. of the local town Ning-Chiao of the Yueshe District, S. E. Shansi. According to Miss A. L. Sun, the deputy field leader, and Miss Hsieh the specimen was found from the slope side right at the last member of the fossiliferous dark red sandy shales of the interbedded series of the grayish white sandstones and the dark red sandy shales. The whole series is unconformably followed by yellow sandstones as shown in the given section kindly submitted by Sun and Hsieh (fig. 1).

The skull is preserved in a concretion and rolled as a pebble but still shows the outline of a skull which attracted the attention of Miss Hsieh. Unfortunately she has broken it before it was brought to the Laboratory. Most part of the surface of the bone is worn and the posterior part of skull is damaged. Nevertheless, the skull is sufficiently well preserved for making a reliable study.

DESCRIPTION

Order Cotylosauria

Sub-order Procolophonia

Family Procolophonidae v. Huene

Neoprocolophon Young gen. nov.

Diagnosis as given in the type species *Neoprocolophon asiaticus*

Neoprocolophon asiaticus Young sp. nov.

Material: A skull with part of the lower jaws, Cat. No. L.V.P. V. 866.

Horizon and locality: Lower Triassic, Ta-Yang-Po, Ni-Ho-Chang, Ning-Chiao, Yueshe, S. E. Shansi¹⁾.

Diagnosis: Skull length and width subequal, the former being only slightly exceeds the latter. Maximum breadth of the skull lies somewhat to the middle point of the orbits,

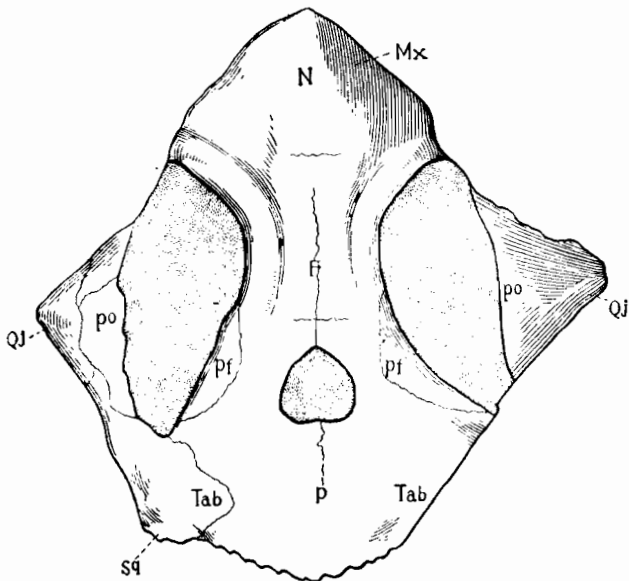


Fig. 2. *Neoprocolophon asiaticus*, gen. et sp. nov. Type skull in dorsal view natural size. Abbreviations from figures 1—4 as usually adopted.

1) 山西榆社縣銀郊泥河掌大羊坡。

and thus much anteriorly located than that in the true *Procolophon*. Muzzle extremely short and pointed. Orbits considerably large with narrow and pointed posterior extension, a little behind the large triangular pineal foramen. No spike developed at the quadrato-jugal region. Parietal and basisphenoid considerably elongated. Otic notch apparently less developed.

Description: The size of our specimen is considerably larger than the *Procolophon*. Due chiefly to the forward situation of the quadrato-jugal the outline of the skull looks almost subquadratic with the muzzle as a corner oriented anteriorly. The muzzle is very short and broad at the base. The orbits are very large and direct upwards and slightly laterally with a narrow posterior extension slightly behind the large triangular pineal foramen. The latter is situated entirely between the orbits somewhat similar in position as in *Leptopleuron*. The narrowest part between the orbits lies considerably forwards. There is no trace of any modification or spike like development of the quadrato-jugal region.

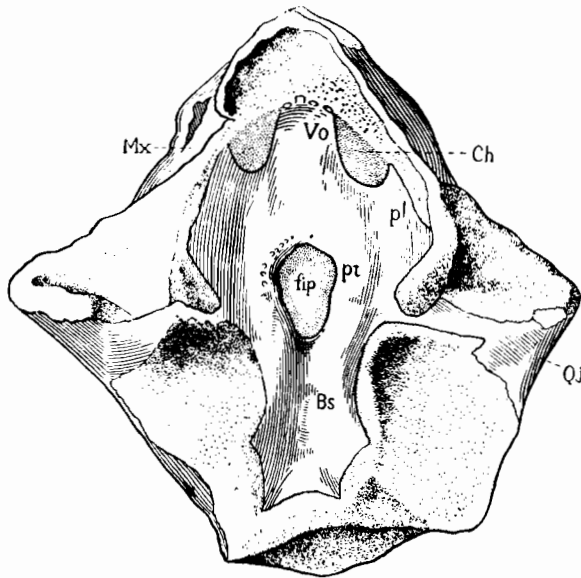


Fig. 3. *Neoprocolophon asiaticus*, gen. et sp. nov. Type skull in ventral view, natural size.

As much of the surface is worn before the preparation and the specimen belongs apparently to an adult individual, very few sutures of bones can be traced clearly. Nevertheless, some of them seem to be detectable as shown in the accompanying figures.

In ventral view, the skull is also tolerably well preserved. The posterior margin of the ventral side is however incomplete. It is therefore difficult to make sure the position of the basioccipital and the adjacent bones. The tabulars and the squamosals are also invisible in the ventral aspect of the skull. The part between the posterior end of the

basisphenoids and the posterior part of the vomers is well preserved. The basisphenoids are rather elongated with the lateral embayment very shallow. There is no trace of the basisphenoid process at the posterior part of the interpterygoid depression. The minute teeth can be clearly seen along the anterior border of this depression as well as the anterior part of the vomers. Four distinct long and large ones are especially well preserved. The total number of the pterygoid teeth are, however, difficult to say. The part in front of the four teeth above-mentioned and the lateral margin of the snout is concealed by the covering of the dental part of the lower jaw which pushes a little forward and fixed with the skull. Owing to the importance of this unique specimen, no risk is taken for removal of the lower jaws.

In the ventral aspect the fundamental structure of the skull is very similar to that of *Procolophon trigoniceps* Owen, except that the basisphenoids are comparatively longer.

In lateral view, the left side is better preserved. The unusual elongation of the orbits, the forward position of the quadrato-jugal, and the rather shallow embayment of the otic

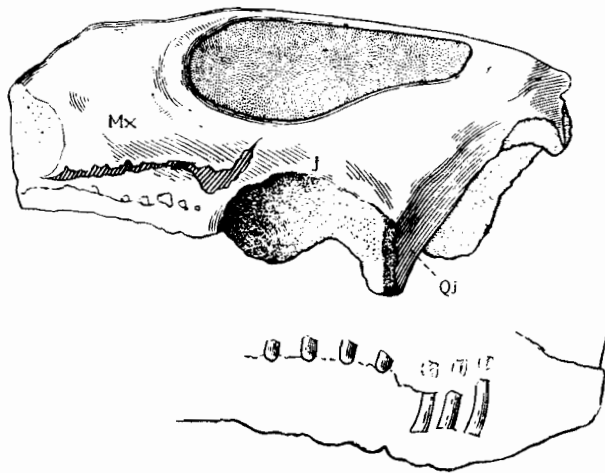


Fig. 4. *Neoprocophon asiaticus*, gen. et sp. nov. Type skull in lateral view. Natural size. Part of the right maxilla showing the damaged teeth. $\times 2$ natural size.

notch are especially significant. There are little to say about the anterior and posterior aspects of the skull.

The upper teeth are chiefly covered by the lower jaws but some of them can be seen from the lateral views, seven in the right side and six in the left side. At least two of the right side show part of the transversally expanded crown. The teeth are rather widely spaced. No teeth in the premaxillae could be observed. The number of the upper teeth is thus unknown on account of the unsatisfactory preservation.

The lower jaws are poorly preserved, only the upper part of the dental is fixed with the skull. The other elements of the jaw are broken away. It seems that even this part is pushed a little forward from the original position. In lateral views, some traces of teeth can also be visible, especially clear at the right side. Both the upper and the lower dentitions show that they are differentiated in size.

Measurements (in millimeters)

Length of the skull from the tip of the snout to the posterior margin of the parietal	75
Maximum breadth across the quadrato-jugals	73
Length from the tip of the skull to the middle point of the pineal foramen	50
Length from the middle of the pineal foramen to the posterior margin of the skull	25
Length and breadth of the orbits left, 36 and 21; right, 31 and 20	
Length and breadth of the pineal foramen	10.5 and 10

Determination: By the outline of the skull, by the relative position of the pineal foramen, by the general shape of the orbits, our specimen can only be compared with the genera *Procolophon* from the Karroo Formation of South Africa and *Koiloskiosaurus* from the

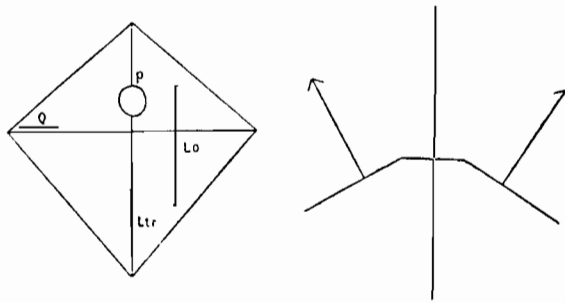


Fig. 5. Diagrammatic section of the skull to show the difference in angle of the orbit of the Chinese specimen (right and comparative diagram showing the relative length, breadth etc. of the Chinese skull (left). These two figures are drawn in the same way as given by Dr. Colbert (1946) in order to make a direct comparison with other forms described by the author. Abbreviations, Lo., length of the orbit; Ltr., Length of the upper teeth row; P. Position of the pineal foramen; Q, position of the quadrate-articular joint.

middle Buntsandstein of Coburg, Germany. But the stoutness of our skull, the unusual position of the quadrato-jugal and the largeness of the pineal foramen and other characteristics made it superfluous to compare closely with the mentioned genera. It is obvious that we have to deal with a new procolophonid first discovered in China and I like to propose the name *Neoprocolophon asiaticus*, new genus and new species, with the diagnosis given above.

SIGNIFICANCE OF THE DISCOVERY

So far we have only one single specimen and in addition it is not quite satisfactory in preservation from many points of view. It is therefore still premature to give the concret conclusion especially from the point of view of the phylogenetical position of our form and the Procolophonian group as a whole. Nevertheless, the following points can be regarded at present.

1. The present specimen represents the first discovery of the sub-order Procolophonia in China and certainly in whole Asia.

2. Recently, Colbert has made a very good review about the so far known Procolophonia and given a summary about the geographical and phylogenetical relationship of this group. Using this valuable data our form is certainly not younger than the level represented by *Koiloskiosaurus*. Although the definite geological age of the form has to be proved by the other fossils waiting for study, it seems quite certain to regard the level with *Neoprocolophon* as lower Triassic. If so, the age of *Sinokannemeyeria* is probably older than it was supposed.

3. The present form belongs certainly not to the spike-bearing forms such as *Sclerosaurus*, *Leptopleuron* and *Hypsognathus*. Nevertheless there seems no objection to derive those forms from the new asiatic species as suggested by the largeness and shape of the orbits and especially by the lateral position of the quadrato-jugal.

4. Our two years exploration made in Wuhsiang district with the result of many interesting discoveries proves that we are to deal with a very important Triassic reptilian fauna so similar to the Karroo of South Africa and that an intimate relationship of the both must be existed. The find of Procolophonids in China reinforces once more our idea repeatedly discussed before.

REFERENCES

- [1] Broili, F., & Schröder, J., 1936. Beobachtungen an Wirbeltieren der Karrooformation. XXI *Über Procolophon Owen*. Sitz. Ber. Akad. Wiss. München, No. 2, pp. 239—256.
- [2] Broom, R., 1936. A new type of cotylosaurian. *Ann. Transvaal Mus.*, **18**, 387—391.
- [3] ———, 1939. A new type of cotylosaurian, *Owenetta rubidgei*. *Ann. Transvaal Mus.*, **19**, 319—321.
- [4] Colbert, E. H., 1946. *Hypsognathus*, a Triassic reptile from New Jersey. *Bull. Am. Mus., Nat. Hist.*, **86**, Art. 5, 231—274, pls. 25—33.
- [5] Huene, F. R. von, 1911. Ueber die Procolophoniden, mit einer neue form aus dem Buntsandstein. *Centralbl. Min. Geol. Paläont.*, No. 3, pp. 78—83.
- [6] ———, 1939. Ein neuer Procolophonide aus dem deutschen Buntsandstein. *Neues Jahrb. Min. Geol. Paläont.*, suppl. **81**, div. B, pp. 501—511.
- [7] ———, 1956. Paläontologie und Phylogenie der Niedern Tetrapoden. Veb Gustav Fischer Verlag, Jena.
- [8] Seeley, H. G., 1905. On the primitive reptile *Procolophon*. *Proc. Zool. Soc. London*, pp. 218—230.

- [9] Watson, D. M. S., 1914. *Procolophon trigoniceps*, a Cotylosaurian reptile from South Africa. *Proc. Zool. Soc. London*, pp. 735—747. pls. 1—3.
- [10] Young, C. C., 1937. On the Triassic Dicynodonts from Shansi. *Bull. Geol. Soc. China*, **17**, (3 & 4), 393—411.

山西新發現的前稜蜥

(中文摘要)

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本文記述之標本爲一近於完整的頭骨，發現於山西榆社縣銀郊附近之大羊坡，與二齒獸類(可能爲中國肯氏獸)共生。由於頭骨性質表明爲近於前稜蜥的動物，但又不盡相同，故定名爲亞洲新前稜蜥(新屬新種)。特性是眼孔大，松果孔也很大，方顛骨靠前，故頭骨作斜四方狀。此動物歸於杯龍類，故爲原始爬行類在亞洲的初次發現。

EXPLANATION OF PLATE

Neoprocolophon asiaticus gen. et sp. nov.

1. Type skull (V. 866) in dorsal view. Natural size.
2. Type skull (V. 866) in ventral view. Natural size.
3. Part of the right lower jaw to show the teeth, $\times 5$ natural size.

