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NEW MATERIAL OF LATE CAMBRIAN TRILOBITE FAUNA FROM THE YEHLI AREA, KAIPING BASIN, HOPEI

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(Summary)

At Changshankou and Yehli in Kaiping Basin, the late Cambrian stratigraphy and palaeontology was first studied by Prof. Y. C. Sun in 1920. The following two formations were then sectioned:

2. Fengshan formation characterized by *Ptychaspis subglobosa, Mansuyia orientalis*
1. Changshan formation yielding *Changshania conica,* etc.

In 1929, Y. T. Chao, T. F. Hou and C. Y. Lee went to Yehli for a detailed mapping of the Fengshan-Weishan section, but they failed to obtain any other late Cambrian fossil remains. Therefore they grouped the two formations together into the "Fengshan Series" to represent the whole upper Cambrian series of the Kaiping area.

Since then, this area has been repeatedly visited by the field parties of Peking Geological College, and abundant Cambrian fossils have been obtained at Changshankou, but few at Yehli.

The present material of Yehli collected in 1959 by the members of the Palaeontological Training Team under the auspices of Ministry of Geology includes *Blackwelderia, Bergeronites, Kaolishania,* etc., evidently indicating that both the Kushan stage and the Changshan stage of the early Upper Cambrian definitely occur in the type locality (Fengshan).

The stratigraphical succession in descending order is given as follows:

Lower Ordovician: Yehli formation

.....Yehli uplifting.....

Upper Cambrian

(3) Fengshan stage

Composed of grey or yellowish-brown thin-bedded marly limestone and intraformational conglomerate (Wurmkalk) interbedded with purple shale containing *Ptychaspis subglobosa* ..... 25 m

(2) Changshan stage

Composed of purple and reddish-purple shale interbedded with grey and yellowish-purple or greyish purple intraformational conglomerate and thin-bedded limestone yielding *Changshania, Kaolishania,* etc... ..... 75 m

(1) Kushan stage

Consisting of grey or greenish-grey limestone and reddish purple wurmkalk interbedded with greyish-purple and grey oolitic limestone, purple shale and calcareous shale containing *Blackwelderia, Bergeronites,* etc. ..... 35 m

.....conformity.....

Middle Cambrian: Changhsia formation

In fact, three stages and seven zones of the Upper Cambrian of North China, es-

tablished by Sun in 1935, have been adopted by the majority of stratigraphers and palaeontologists. Hence, the new discovery of both the Kushan and Changshan stages in this type locality is worth while mentioning in the present article.

The new material of the Kaiping Basin comprises six genera and nine species of trilobites, of which one genus and three species are new.

DESCRIPTION OF NEW SPECIES

Genus *Blackwelderia* Walcott, 1906

Blackwelderia fengshanensis Kuo (sp. nov.)

(Pl. I, fig. 1)

Material: This species is represented by two cranidia, one of which represents an external mold.

Description: Cranidium subquadratic. Glabella moderately convex, slightly tapering forward, nearly cylindrical in outline, rounded in front and marked by two pairs of distinct glabellar furrows, anterior pair short, posterior one a little longer and extending obliquely inward. Dorsal furrow deep. Occipital furrow broad and shallow; occipital ring broad. Fixed cheek narrow about one third the width of the glabella, and elevated toward the palpebral lobe; postero-lateral limb short and broad. Palpebral lobe small and elevated. Brim deeply concave. Frontal border strongly reflected upward and narrowing at both sides. Surface marked by granules.

Comparison: This new species is similar to *B. paronai,* but differs from the latter in the cylindrical glabella, the narrow fixed cheek, the short postero-lateral limb, the narrow and deeply depressed brim and the strongly reflected frontal border.

Horizon and Locality: Late Upper Cambrian, Kushan stage; Fengshan, near Yehli, Kaipin, Hopei.

Blackwelderia kaipinensis Kuo (sp. nov.)

(Pl. I, fig. 2)

Material: This species is represented by one well preserved cranidium.

Description: Cranidium nearly quadratic in outline, moderately convex. Glabella wide, truncato-conical, or tapering forward, marked by a pair of glabellar furrow at the basal part of the glabella and extending obliquely backward. Dorsal furrow broad and shallow. Occipital furrow arching forward at both sides; occipital ring uniform in breadth. Fixed cheek flat and narrow, less than one half the width of the glabella; postero-lateral limb long and narrow. Palpebral lobe broad, extending forward to form a distinct eye ridge. Brim narrow and deeply concave. Frontal border broad, strongly reflected upward with marked transverse fine lines.

Comparison: This new form resembles *B. paronai,* but differs from the latter in the glabella wider at the base, the flat and narrow fixed cheek, the shallow dorsal furrow, a little broader palpebral lobe extending forward to form a prominent eye ridge, the deeply concave brim and the broad frontal border, which is strongly reflected, and ornamented by fine lines.

Horizon and Locality: Same as the preceding.

Genus *Bergeronites* Sun (nom. nov.)

Genotype: *Drepanura ketteleri* Monke, 1903

Diagnosis: Cranidium subtrapezoidal. Glabella broad and short, subovate in outline, with two or three pairs of distinct glabellar furrows. Fixed cheek narrow; posterolateral limb long and narrow. Palpebral lobe situated opposite the middle of the glabella. Anterior course of facial suture short, convergent in front of the palpebral lobe; posterior course divergent almost transversely outward. Pygidium transverse, with one pair of long lateral spines and several pairs of short lateral spines.

Remarks: In 1937, the genus *Bergeronia* based on *Drepanura ketteleri* was established by Sun. *Drepanura kettlerei* resembles *D. premesnili* (Genotype of the genus *Drepanura*) in general outline, yet it differs from the latter in its subelliptical or subovate glabella instead of being flask-shaped, in the position of palpebral lobe placed more posteriorly, and in the character of marginal spines of the pygidium. On the other hand, the name of *Bergeronia* was adopted long ago by Matthew in 1895. Therefore the writer agrees with Sun's proposal that the new name *Bergeronites* is here erected to replace the name of *Bergeronia* Sun (1937), which was already occupied by Matthew in 1895. Accordingly, the following species should be referred to this new genus.

1. *Drepanura ketteleri* Monke (Monke, 1903, taf. 6, figs. 1—13)
2. *Drepanura eremita* Westergärd (Westergärd, 1947, pl. 3, figs. 9—11)
3. *Drepanura mina* Resser et Endo (Endo and Resser, 1937, pl. 50, fig. 16, non pl. 49, figs. 33—34)
4. *Drepanura ingens* Poletaeva (Poletaeva, 1960, pl. III, figs. 3—6)
5. *Bergeronites kaipinensis* (sp. nov.)

Bergeronites kaipinensis Kuo (sp. nov.)

(Pl. I, fig. 8)

Material: This species is represented by two rather well preserved cranidia.

Diagnosis: *Bergeronites* with subquadratic glabella, nearly straight frontal rim and pronouncedly deeper glabellar furrows.

Comparison: This new species agrees fairly well with *Bergeronites ketteleri* in certain respects, but it is easily distinguished from the latter by the glabella relatively short and straight in front, the presence of three pairs of glabellar furrows, of which the posterior pair is long and almost joined with occipital furrow, the occipital furrow narrow at the middle, arching forward and forming deep pits at both sides, the fixed cheek narrowed at the position of the eye ridge, the large and strongly curved palpebral lobes and the smooth surface. It also differs from *B. eremita* and *B. ingens* in flat cranidium, subovate glabella, three pairs of glabellar furrows not bifurcated, fixed cheek narrowed at the position of eye ridge, large palpebral lobe uniform in breadth, prominent eye ridge and frontal border.

Horizon and Locality: Same as the preceding species.

图 版 说 明

本文內所描述的标本保存在地质部地质科学院

图 版 I

图 1. *Blackwelderia fengshanensis* Kuo (新种)
头盖, ×3 正型标本 (182)

图 2. *Blackwelderia kaipinensis* Kuo (新种)
头盖, ×3 正型标本(183)

图 3. *Blackwelderia sinensis* (Bergeron)
尾部,原大 (184)

图 4. *Blackwelderia* sp.
头盖, ×3 (185)

图 5. *Blackwelderia octaspina* Kobayashi
尾部, ×3 (186)

图 6, 6a. *Dorypygella hsihsienensis* Chu
头盖, 6.原大, 6a. × 3 (187)

图 7. *Kazelia* cf. *speciosa* Walcott et Resser
头盖,原大 (188)

图 8. *Bergeronites kaipinensis* Kuo (新种)
头盖, × 6 正型标本 (189)

图 9. *Teinistion*? sp.
尾部, ×3 (190)

图 10. Gen. et sp. indet.
头盖, × 2 (191)

图 11, 11a. *Kaolishania pustulosa* Sun
尾部, 11. ×2, 11a. ×4 (192)

Explanation of plate

The specimens described in this paper are kept in the Academy of Geological Sciences, Ministry of Geology, Peking.

Plate I

Fig. 1. *Blackwelderia fengshanensis* Kuo (sp. nov.)
Cranidium, ×3, Holotype (182)

Fig. 2. *Blackwelderia kaipinensis* Kuo (sp. nov.)
Cranidium, ×3, Holotype (183)

Fig. 3. *Blackwelderia sinensis* (Bergeron)
Pygidium, natural size (184)

Fig. 4. *Blackwelderia* sp.
Cranidium, ×3, (185)

Fig. 5. *Blackwelderia octaspina* Kobayashi
Pygidium, ×3, (186)

Fig. 6, 6a. *Dorypygella hsihsienensis* Chu
Cranidium, 6. natural size, 6a. ×3, (187)

Fig. 7. *Kazelia* cf. *speciosa* Walcott et Resser
Cranidium, nature size, (188)

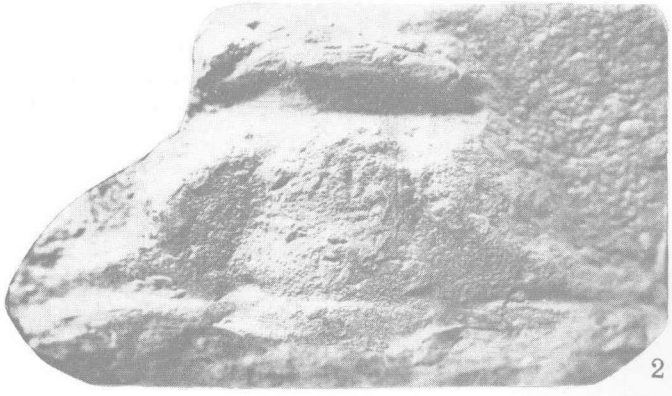
Fig. 8. *Bergeronites* kaipinensis Kuo (sp. nov.)
Cranidium, ×6, Holotype (189)

Fig. 9. *Teinistion*? sp.
Pygidium, ×3, (190)

Fig. 10. Gen. et sp. indet.
Cranidium, ×2, (191)

Fig. 11, 11a. *Kaolishania pustulosa* Sun
Pygidium, 11. ×2,11a. ×4, (192)


1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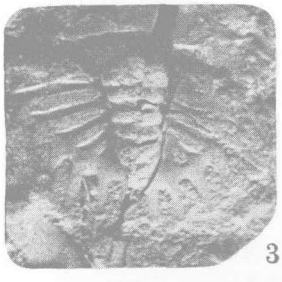
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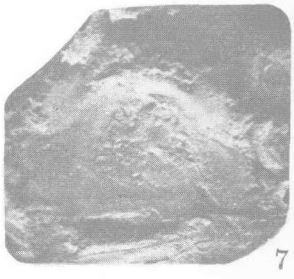
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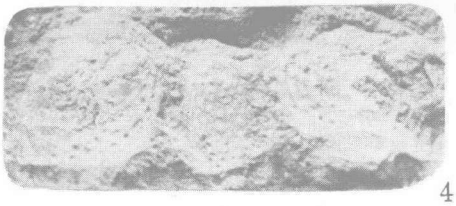
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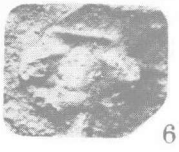
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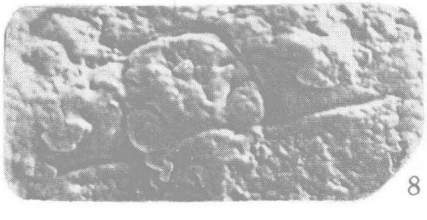
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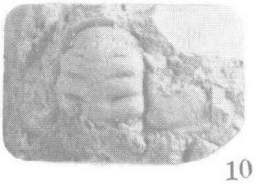
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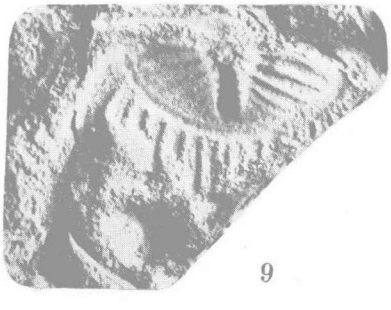
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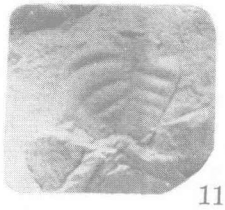
11


11a

描述：头盖近三角形。头鞍宽大，前后宽度几乎相等，中等凸起，前端浑圆，鞍沟四对，最前一对短而浅紧靠背沟，第二对稍深靠近头鞍中轴部位，成一对浅坑状，第三及第四对鞍沟特别深长且微向内斜伸，而靠近背沟处则变浅变狭。背沟深凹，两侧近于平行。固定颊狭。后侧翼短。眼叶小，具有眼脊。前边缘狭，宽度均匀，成弓形，向前上方翘起，上面带细横条纹。表面具大小不同的点状小坑。

比较：我们的标本与 *Cheiruroides orientalis*（R. et E.）很相似，主要区别为头鞍前端较浑圆，四对鞍沟中第二对紧靠头鞍中轴处成小坑，第三及第四对鞍沟较深宽，第四对鞍沟左右不相通。前边缘呈弓形并向前上方強烈翘起并带有横条纹状构造，壳面具大小不等的浓泡状小坑。

产地及层位：同前。

属 *Kaolishania* Sun 1924

Kaolishania pustulosa Sun

（图版 I，图 11，11a）

1924　*Kaolishania pustulosa* Sun，中国古生物志乙种第一号，第四册，52 页，图版 3，图 8a—h。

1957　*Kaolishania pustulosa* 卢衍豪，中国标准化石无脊椎动物第三分册，275 页，图版 143，图 14—16。

描述：尾部近似四方形，尾轴中等凸起向后渐变狭成锥形，七个轴节。肋部从前对肋脊位置附近伸出一对大侧刺。壳面带有细小瘤点。

产地及层位：河北开平冶里乡凤山（F. 8），上寒武统长山阶。

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