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Cambrian fossils from Huckitta and Elkedra 4-mile
Sheets, Northern Territory

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by
Joyce Gilbert-Tomlinson
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Material. The collection was sent for palaeontological examination by the Resident Geologist, Alice Springs, and comprises (a) one sample of Upper Cambrian sandstone from Derry Downs, Huckitta Sheet; (b) 8 samples of cuttings from the Cherry Creek Bore, Ammaroo Station, Elkedra Sheet; and (c) surface samples from the vicinity of the Cherry Creek Bore -- (b) and (c) are both Middle Cambrian in age.

(a) Upper Cambrian sandstone from Derry Downs, Huckitta Sheet

Photo Locality: Huckitta Run 5, Photo 5080, 3.5 in. north, 1.7 in. east of south-western corner.

Three fossils can be identified:

Mollusca - Hyolithid, genus unknown, circular section
Crustacea? - Ribcirioid gen. B (see Casey & Tomlinson, 1956)

Trilobita - Genus indet., free Cheek with small eye and advanced genal spine.

The ribcirioid determines the age as middle Upper Cambrian (Franconian). The genus occurs at Utopia (Alcoota Sheet) and at Casey's H 24 (Huckitta Sheet). At Utopia it is associated with a species of the trilobite Prosaukia, close to P. missa (Hall) the genotype, which is an index fossil for the type Franconian of the Mississippi Valley; at H 24 it forms part of a large assemblage, including ribcirioid genus A (Casey & Tomlinson, loc. cit.). Ribcirioid genus A has a wide geographical distribution in central Australia: in addition to H 24, it is found at H 6 and Jones' H 1 and H 2 all on Huckitta Sheet; Jones' LC 10 (border of Huckitta and Tobermory Sheets);



(Toburny Sheet)

Casey's T 5 and Reiner's locality on northern end of Tarlton Range; and Joklik's lower horizon on Ross River (Alice Springs Sheet). All these localities may be correlated, and Casey's H 25 on Huckitta is probably also of the same age. Jones' LC 2 and Joklik's upper horizon on the Ross River are younger, i.e. Trempealeauian, and Jones' LC 3 cannot be dated on its contained fossils.

The hyolithid is of interest for two reasons. First, no opercula are present in this sample, whereas at H 24 hyolithid opercula of an unusual shape, which would fit the Derry Downs specimens, are very common in some bands, although no ^{hyolithid} shells are present: apparently some sorting has occurred, and this may help to explain the varied trilobite assemblages associated with the ribeirioids. Secondly, a very similar shell was collected in a recrystallized limestone near Cockroach Waterhole ^(Toburny Sheet) by Casey in 1954; this sample was provisionally dated as Ordovician, but it now seems that the possibility of an Upper Cambrian age must be seriously considered. The shell bears a superficial resemblance to the lower Middle Cambrian Biconulites, but can be distinguished by its more rapid taper.

The Derry Downs sample is on the line of strike with the sandstone at Huckitta and suggests that outcrops of upper Cambrian sandstone may be continuous between Huckitta and Utopia, although partly concealed by sand-dunes ^{between Derry Downs and Utopia}.

(b) Cuttings from Cherry Creek Bore, Ammaroo Station, Elkedra Sheet.

The lithology is similar throughout. Fragments of fossils, mostly phosphatic brachiopods, were recovered from the following samples: over 120/130 feet (drain), 0-120/130 (drain), 140-160, 182-185, 185-190, and "drain (mixed)". The only identifiable fossils are Lingulella (Westonia) at 0-120/130, and Lingulella at 185-190.

The age is probably lower Middle Cambrian and is discussed in more detail under (c) (below).

(c) Surface samples from vicinity of Cherry Creek
Bore, Ammaroo Station, Elkedra Sheet

The collection consists of fourteen numbered samples from the vicinity of Cherry Creek Bore, and one unnumbered sample. No photo points are given, but the position of the ^{unnumbered} samples is shown on a map accompanying a report by MacKay and Jones (file 106 NT/1).

Unnumbered specimen. The trilobite is probably Eurostina; the other fossil is an archaeocyathid similar to forms occurring in the Ranken Limestone (lower Middle Cambrian).

511(Rubble). Brachiopoda: Lingulella

Gastropoda: "Helcionella" (cf. Alexandria-Gallipoli track, but not the form from the Daly River)

Trilobita: Eurostina (common), Xystridura.

512 (leached siliceous shale)

Brach.: Acrothele, Lingulella

Mollusca: Hyolithes (including opercula)

Tril.: Xystridura

Spongia: spicules indet.

(silicified rock)

Brach.: gen. indet.

Tril.: Redlichia, Peronopsis cf. elkedraensis

I.B. This is the first known occurrence of Redlichia between Gum Ridge (east of Tennant Creek) and the Yorke Peninsula.

513 (rubble) Spong.: Chancelloria

Brach.: gen. indet.

Moll.: Hyolithes (abundant), Biconulites
"Helcionella"

Tril.: Eurostina?

514(massive limestone with fluorite)

Brach.: phosphatic, indet.

Echinodermata: cystid plates

Spongia: Chancelloria

Moll.: Hyolithes Tril.: indet. Xystridura

do. (chert overlying limestone)Brach.: Acrothele, other forms indet.Tril.: Xystridura, Eurostina.515 (pebbles)

a. 100-200 yards west of bore

Brach.: indet.

Gast.: Scenella?Tril.: Eurostina?, other fragments indet.

b. 100-200 yards north-east of bore

Tril.: Pagetia, Eurostina?, Xystridura?

c. 100-200 yards south-east of bore

Brach.: Acrothele?Moll.: HyolithesTril.: Xystridura516 (white siliceous shale)Echinod.: EocystisBrach.: Lingulella (Westonia), LingulellaMoll.: Hyolithes, "Helcionella" (not 511, but the Gallipoli/Daly River form)Tril.: Pagetia, Peronopsis spp., Eurostina (common), Xystridura n. sp (same as that collected by Brunnenschweiler).517 (white siliceous shale)Brach.: Acrothele?, LingulellaTril.: Pagetia, Peronopsis cf. elkedraensis.518 (massive limestone, eastern end of hill)Spong.: ChancelloriaBrach.: Lingulella (Westonia) (large)Moll.: Hyolithes, Biconulites

Tril.: indet.

do. (massive silicified rock, north-west of hill)

Brach.: indet.

Tril.: Xystridura, Eurostina.519 (limestone partly replaced by silica)

Echinod.: Eocystis

Brach.: Lingulella (Westonia)

Moll.: Hyolithes

Tril.: Eurostina?

520 (massive limestone)

Brach.: Paterina, Lingulella, Acrothele

Moll.: Hyolithes, Biconulites

Tril.: indet.

521 (rubble just below sandstone, top of section)

Brach.: n.gen (large syntrophoid, cf. Ranken limestone)

Moll.: Hyolithes, Biconulites.

522 (bituminous limestone)

fine-grained

Brach.: Lingulella

Crustacea: Conchostracan with spines

coarse-grained

Echinod.: Cystid fragments

Brach.: Acrotreta, other forms indet.

The fossil content suggests no stratigraphical difference between the two types of limestone; the difference is probably environmental.

523-

524(rubble from limestone ridge)

Moll.: Biconulites, Hyolithes (common, with well-preserved surface ornament)

Tril.: Kootenia, Eurostina

Problematicum: Hyolithellus.

525(siliceous shale)

Brach.: indet.

Tril.: indet.

Crust.: conchostracan (large, pustulose)

do. (rubble)

Brach.: Acrotreta

Tril.: Eurostina, another trilobite, almost complete (pustulose) is probably the same genus.

Age. The age is lower Middle Cambrian. For the lower half of the Middle Cambrian of Queensland, Öpik & (1956b) has proposed a provisional time-scale, as follows/ (ascending order): Time of Redlichia; Time of Xystridura and Dinesus; Time of Ptychagnostus gibbus; Time of Ptychagnostus atavus. The ranges of the index fossils overlap with those of adjacent horizons, and the ~~present-collection~~ oldest sample from the present collection apparently represents the overlap of Redlichia and Xystridura. The rest of the collection ~~covers-th~~ represents the Time of Xystridura and Dinesus, and may possibly range into the time of the overlap of Xystridura and Pt. gibbus, but this cannot yet be proved conclusively, as Pt. gibbus is not known to occur in the Northern Territory. The collection is definitely older than the Time of Pt. atavus, which is represented by Casey's H 4 (Huckitta), a black bituminous limestone with an entirely different fauna, including the nominate species.

Lithologically the collection is of interest in disclosing a hitherto-unsuspected amount of limestone in the Sandover beds (Öpik, 1956a). From the palaeo²³⁰geographical standpoint, the collection increases our knowledge of the geographical range of Redlichia and the gastropods (Helcionella).

References

- Casey, J.N., & Tomlinson, J. Gilbert-, 1956 - Cambrian geology of the Huckitta-Marcia region, N.T. 20th Intern. geol. Congr., Cambrian Symposium (in press).
- Öpik, A.A., 1956a - Cambrian geology of the Northern Territory. Ibid.,
- _____ ? 1956b - Cambrian geology of Queensland. Ibid.

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