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Micropalaeontological Report on Bore and Surface
Samples from the Muswellbrook Area, N.S.W.

by

I. CRESPIN.

MICROPALAEONTOLOGICAL REPORT ON BORE AND SURFACE
SAMPLES FROM THE MUSWELLBROOK AREA, N.S.W.

This report is based on the microexamination of samples from 13 bores and one surface sample from the Muswellbrook area received from M.A. Reynolds. A detailed description of the microfaunal content of the samples is given below.

1. Outcrop at Hebden

Foraminifera: Ammodiscus multincinctus
Hyperammina cf. clavata
Hyperamminoides acicula
Tolypammina undulata

2. B.M.R. 54 (T). Parnell's Creek
140'-146'10"

Foraminifera: Ammodiscus multincinctus
Thuramminoides sphaeroidialis
Trochammina sp.

3. B.M.R. 76 (T) Parnell's Creek
20-40 feet.

Foraminifera: Ammodiscus multincinctus
Glomospira aff. simplex

Ostracoda: Indeterminate

42 feet.

Foraminifera: Ammodiscus multincinctus
Trochammina sp.

40-60 feet.

Foraminifera: Glomospira aff. simplex
Hyperammina sp.

46-48 feet.

Foraminifera: Ammodiscus multincinctus
Frondicularia woodwardi
cf. Trochamminoides anceps

57-60 feet.

Foraminifera: Ammodiscus multincinctus (c)
Frondicularia woodwardi (microspheric)
Nodosaria cf. serocoldensis (forms A & B)
Nodosaria sp. nov.
Dentalina grayi

60-80 feet.

Foraminifera: Ammodiscus multincinctus
Dentalina grayi
Nodosaria cf. serocoldensis
Nodosaria sp.
Hyperamminoides acicula (large and common)
Thurammina cf. papillata

Ostracoda: Microkellinella aequivalvis

Pisces: Indeterminate fragments

70-80 feet.

Foraminifera: Nodosaria sp.
Tolypammina undulata

Ostracoda: Cavellina kulnursensis
Microkellinella aequivalvis

76 feet.

Foraminifera: Ammodiscus multinctus
Hyperamminoides acicula

80-100 feet.

Foraminifera: Ammodiscus multinctus
Hyperammina acicula

Ostracoda: Healdia chapmani

100-120 feet.

Foraminifera: Nodosaria sp.

Ostracoda: Microkellinella aequivalvis

121-122 feet.

Foraminifera: Dentalina cf. grayi
Hyperamminoides acicula

Ostracoda: Healdia chapmani
Microkellinella aequivalvis

120-140 feet.

Foraminifera: Dentalina grayi
Hyperamminoides acicula
Trochammina sp.

Ostracoda: Bairdia grayi

140-163 feet.

Plantae: Indeterminate

200-222 feet. No microfossils

240 feet.

Foraminifera: Hyperamminoides acicula

222-246 feet. No microfossils

4. B.M.R. 1(S). State Reserve. Ravensworth

713-734 feet.

Foraminifera: Ammodiscus multinctus

739-746 feet.

Foraminifera: Ammodiscus multinctus
Nodosaria sp.

5. B.M.R. 3(S) Pond's Creek

0-30 feet.

Foraminifera: Ammodiscus multinctus

6. B.M.R. 4(T) Pond's Creek

0-20 feet.

Foraminifera: Ammodiscus sp. Hyperamminoides acicula
Digitina recurvata Felosina hemisphaerica

20'-37'8"

Foraminifera: Hyperamminoides acicula
Felosina hemisphaerica
Trochammina pulvillus

7. B.M.R. 6(S). Pond's Creek

74 feet.

Foraminifera: Ammodiscus multieinctus
Fronicularia parri
Fronicularia woodwardi
Haplophragmoides sp.
Hyperamminoides acicula
Trochammina pulvillus

94 feet 6 inches

Foraminifera: Ammodiscus multieinctus

117 feet-119 feet 6 inches

Foraminifera: Ammodiscus multieinctus
Trochammina cf. pulvillus

157 feet.

Foraminifera: Ammodiscus multieinctus
Hyperamminoides acicula

217 feet 8 inches.

Foraminifera: Nodosaria sp.
Hyperamminoides acicula

8. B.M.R. 10(T). Pond's Creek

0-37'6"

Foraminifera: Ammodiscus multieinctus
Ammodiscus cf. milletianus
Crithionina teichertii
Digitina recurvata
Hyperamminoides acicula
Trochammina pulvillus

Ostracoda: Bairdia grayi

37'6"-60'.

Foraminifera: Ammodiscus multieinctus
Ammobaculites woolnoughi
Digitina recurvata
Hyperammina cf. spinescens
Trochammina sp.

60'-85'

Foraminifera: Digitina recurvata
Hyperammina cf. clavacoides
Hyperammina sp.

85'-101'6"

Foraminifera: Ammodiscus multieinctus
Fronicularia sp.
Hyperamminoides acicula
cf. Moorinella biserialis
Thuramminoides sphaeroidalis
Trochammina sp.

9. B.M.R. 11(T) Pond's Creek.

26-50 feet

Foraminifera:

Ammobaculites cf. woolnoughi
Ammodiscus cf. planoconvexus
Ammodiscus multicinctus
Ammodiscus nitidus
Digitina recurvata
Fronicularia woodwardi
Fronicularia parri

Hyperamminoides acicula
Nodosaria sp.
Pelosina hemisphaerica
Pelosina sp.
Reophax subaspera
Thuramminoides sphaeroidalis
Thurammina papillata
Trochammina pulvillus

50-77 feet

Foraminifera: Hyperamminoides acicula
Nodosaria sp.

77-99 feet.

Foraminifera: Ammodiscus sp.
Ammodiscus multicinctus
Fronicularia sp.
Hyperammina sp.

Ostracoda: Basslerella sp.

10. B.M.R. 12(T). Pond's Creek

111-154 feet

Foraminifera: Fronicularia woodwardi
Nodosaria sp.

11. B.M.R. 13(T). Pond's Creek

Indeterminate fossils

12. B.M.R. 14(T). Pond's Creek

53-75 feet.

Foraminifera:

Ammodiscus multicinctus
Ammodiscus nitidus
Digitina recurvata
Fronicularia cf. excavata
Hyperamminoides acicula
Elomospira aff. simplex

Hyperamminoides cf. expansus
Nodosaria aff. irwinensis
Nodosaria sp. nov.
Reophax tricameratus
Tolypammina undulata
Trochammina pulvillus

75-97 feet.

Foraminifera: Ammobaculites woolnoughi
Fronicularia woodwardi
Fronicularia sp.
Hyperamminoides acicula
Thuramminoides sphaeroidalis

80-97 feet.

Foraminifera: Hyperamminoides acicula

81 feet 6 inches

Foraminifera: Hyperamminoides acicula

Crinoidea: Crinoid ossicles

93 feet.

Foraminifera: Hyperamminoides acicula

94 feet. Fossil indeterminate

97 feet-105 feet 6 inches

Foraminifera: Fronicularia woodwardi
Hyperamminoides acicula
Hyperammina sp.
Textularia cf. eximia

13. B.M.R. 16(T). Fond's Creek

190-205 feet

Ostracoda: Microkellinella aequivalvis

236-259 feet.

Ostracoda: Ostracod indeterminate

259-271'9"

Ostracoda: Cavellina kulnuraensis
Basslerella australe
Healdia sp.

14. B.M.R. 2(S). Mt. Arthur

55-60 feet

Foraminifera: Ammodiscus multicinctus
Fronicularia woodwardi
Hyperamminoides acicula
Nodosaria sp.
Trochammina sp.

Stratigraphical Notes on the Samples based on the
evidence of the Microfauna

Thirty species of Foraminifera have been recognized in the above samples. Eleven of these including four probable new species, are calcareous and the remainder are arenaceous. Five species of Ostracoda have been determined.

It is difficult to get a complete stratigraphical picture of the microfaunal content of the bore samples because of the incompleteness of the bore sections sent for examination. The microfauna was picked out of the samples by M.A. Reynolds at Muswellbrook and in some cases microfossils were forwarded for examination from only one depth in a bore such as from 140'-146'8" in B.M.R. 54 (T) at Parnell's Creek. Fairly complete sequences of samples were received from B.M.R. 76(T) from 20 feet down to 241 feet, from B.M.R. 10(T) from the surface down to 109'6", from B.M.R. 11(T) from 26 feet down to 99 feet and from B.M.R. 14(T) from 53 feet down to 105'6". Evidence based on previous work on the foraminifera in the Hunter River Area (Crespin, 1947) suggests that some bores passed from the Mulbring Stage into the Branxton. The surface samples from Hebden is definitely correlated with the Mulbring Stage.

It is quite possible that the beds represented by samples from 53 feet down to 75 feet in B.M.R. 14 (T), from 26 feet down to 50 feet in B.M.R. 11(T) and from 30 feet down to 40 feet in B.M.R. 76(T), are the equivalent of the Mulbring, but the presence of such calcareous species as Frondicularia woodwardi and F.parri in samples below those depths suggest that the bores have penetrated the Branxton Stage.

The arenaceous species of foraminifera which dominate the assemblage, range throughout the Permian in New South Wales, in the Lower Marine and throughout the Upper Marine. Amongst these forms three species should be considered. These are Ammodiscus multicinctus Crespin and Parr, Hyperamminoides acicula Parr and Digitina recurvata Crespin and Parr. Ammodiscus multicinctus was described from beds in a large railway cutting about 4 chains west of the Farley Station (Allandale Stage). It occurs commonly in the Mulbring beds and less commonly in the Branxton and lower stratigraphical stages. It is common in the samples from B.M.R. 14(T) between 53 feet and 75 feet, in B.M.R. 11(T) between 26 feet and 50 feet and in B.M.R. 76(T) from 20 feet down to 40 feet. And it is for this reason that the beds in the upper part of these three bores are regarded as the equivalent of the Mulbring. Hyperamminoides acicula, a persistent species throughout the Permian of New South Wales and Western Australia was described by Parr from the Wandagee Beds in Western Australia and frequently it is the only form present whether the beds be Upper or Lower Marine in New South Wales. Digitina recurvata was described from the Victoria Pass Section, Mitchell Highway from beds regarded as the equivalent of the Branxton. It was especially common in sediments $\frac{1}{4}$ mile east of the Muswellbrook Station which are Branxton and it is common in the beds of the Allandale Stage of the Lower Marine in the Greta -Harper's Hill Section, and in the John Brown's Reservoir Section and in the sections west of Minimbah which are Mulbring.

As regards the calcareous foraminifera, in all previous work in the Hunter River Area, with one exception, they have not been found in beds stratigraphically higher than the Branxton. One specimen of Nodosaria serocoldensis Crespin was found in material from an outcrop at the Saw Mill, Mulberry Creek near Mulbring. This species was described from the Middle Bowen Beds near Springsure, Queensland, where, as in New South Wales it is usually associated with Frondicularia woodwardi Howchin and F.parri Crespin. F.woodwardi described by Howchin from the Irwin River, Western Australia occurs in many samples in the present collection and both microspheric and megalospheric forms are recorded. The species is common in beds referred to the Branxton at Wollong and in sediments at Fothanna Siding west of the railway cutting at Branxton. It is common in the beds in a cutting north side of the road along the railway opposite the bridge $\frac{1}{4}$ mile east of Muswellbrook where it is

associated with Fronicularia parri Crespin, described from the Kulnura Bore at 4,203 feet, A.multicinctus, H.acicula and D.recurvata. Both F.woodwardi and F.parri were well distributed in the sediments in the Kulnura Bore between the depths of 3,778 feet and 4,490 feet which are regarded as equivalent of the Branxton. Another calcareous species in the present samples is Dentalina grayi which was described by Crespin from the Middle Bowen, Springsure area, Queensland. The forms which are apparently new are tentatively referred to as Fronicularia sp. aff. excavata and F.sp. aff. fissicostata described by Cushman and Waters from the Upper Pennsylvanian of Texas.

None of the five species of ostracoda recognized in the samples have been recorded above the Branxton. Bairdia grayi, Healdia chapmani and Basslerella australe were described by Crespin from the Lower Bowen of Queensland and were found in the Kulnura Bore. Cavellina kulnuraensis and Microkellinella aequivalvis were described by Crespin from the depths of 3,865 feet and 3,894 feet respectively in the Kulnura Bore.

It is unfortunate that no bryozoa or brachiopoda are available in the bore samples to assist in determining the horizon of these beds. Because of the conflicting ideas of the field geologists who regards the beds as Mulbring and of the present evidence based on the foraminifera which suggests Branxton for the greater number of samples, it is suggested that systematic sampling be made of the type sections of the Mulbring and Branxton Stages, as well as systematic collecting in the Muswellbrook area.

J. C. C. C.