Author

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Pal. F6/68

DEPARTMENT OF MINES
SOUTH AUSTRALIA

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N.H. LUDBROOK

D.M.1663/67

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ABSTRACT

Samples from five quarry faces and one outcrop on the Transcontinental Railway are classified into 6 types of material, probably representing at least four generations from Nullarbor Limestone to superficial material from the surface.

PURPOSE OF INVESTIGATION

The rock samples were collected by M.N. Hiern during a survey of existing and potential sources of ballast for the Transcontinental Railway. Five localities are represented between Watson in South Australia and Loongana in Western Australia, a distance of about 270 miles. Petrological descriptions are contained in AMDEL report MP2654-68. Thin sections prepared by AMDEL were used in the present study.

TYPE OF MATERIAL

Six variants or derivatives of the Nullarbor Limestone are represented. All the collected specimens now in the Palaeontology Collection have been marked with the appropriate number prefixed by the initial letter of thelocality for future reference. They are

1. Nullarbor Limestone, highly fossiliferous, hard of Lower Miocene age.
2. Calcarenite, poorly fossiliferous, friable, presumably Nullarbor Limestone.
3. Fragmental limestone consisting of fragments of Nullarbor Limestone as 1 in a matrix of fine grained limestone crowded with microfossils. It is difficult to assign an age to the matrix. It may be Miocene age, little different from the Nullarbor Limestone fragments.

4. "Pudding stone", consisting of white or dark grey pebbles and fragments of fossiliferous limestone or other material, in a pelletal calcareous or clayey matrix.

5. Infilling of solution cavities in which most of the microfossils have been destroyed andthe matrix is clayey, usually reddish brown, with scattered quartz grains.

6. Concretionary material with concentric layers formed around pelletal matrix of 4.

These types are distributed between the localities as under:

Watson	1	2	3	4	5	
Cook	1	2	3	4		
Reid	1	-	-	4	5	6
Loongana	1	2	-	4	-	6
Denman	1	-	-	4	-	6

Types 3 and 4 constitute the "cap rock" of Hiern (G.S.3961, 9th April, 1968) A notable feature of 4 is that the dark grey pebbles are not necessarily kunkar. They may be highly fossiliferous limestone, either of type 1 or the matrix of type 3. These limestone pebbles have been reconstituted in the matrix along with concretionary kunkar pebbles which have much the same appearance in the hand specimen as the fossiliferous limestone. There is no fossil evidence inthe matrix of the age of the material.

DESCRIPTIONS OF SAMPLES FROM VARIOUS LOCALITIES

Watson Quarry F8/68 AMDEL P99/68 TS20550A-F

W1 Hard dense Nullarbor Limestone with abundant mollusc casts and moulds

T.S. 20550A: Coral, Marginopora vertebralis, ?Notorotalia miocenica (Cushman), ?Carpenteria sp., discorbids, miliolids, nodosariids.

T.S. 20550B: has a clay patch devoid of foraminifera; the limestone contains Marginopora vertebralis (Common),

Pararotalia sp., Triloculina collinsi Carter, miliolids, polymorphinids, Carpenteria sp, Discorbis sp.

W2 Calcarenite, fine grained, with a few small foraminifera, ostracodes.

W3 Fragmental limestone with recrystallized Nullarbor Limestone in a matrix which is pelletal in places and carries small polymorphinids and miliolids. There is little if any faunal distinction between the fragments and the matrix.

T.S. 20550C: includes Nullarbor Limestone and matrix, but there is no faunal distinction between them. Fauna includes Pyrgo sp. miliolid, polymorphinid, ?Trochammina sp.

T.S. 20550D: (1) the coarse grained Nullarbor Limestone section contains Marginopora vertebralis, Pararotalia sp., ?Trochammina sp., Globigerina sp., ovoid and angular grains; (2) the fine-grained matrix has a microfauna of very small forms - polymorphinids, fragments of Marginopora, ?Carpenteria, ?Sigmoilina and other irregular microscopic fragments.

W4 "Pudding stone", with black limestone fragments in a calcareous matrix having scattered quartz grains. The black pebbles or fragments containing Marginopora vertebralis and very small miliolids are derived from Nullarbor Limestone.

T.S. 20550E: The black fragments are of two kinds (1) Nullarbor Limestone with foraminifera as above; (2) concretionary material

T.S. 20550F: An example of 20550D (2) - fine grained matrix material of type 3 set in mud. The type 3 material contains fragments of Marginopora, Pararotalia and other very small forms.

W5 Infilling of solution cavities in which quartz grains are common No fossils were observed.

Cook Quarry F9/68, AMDEL P100/68, T.S. 20551A-C

C1 Nullarbor Limestone, with solution cavities.

C2 Calcarenite, with a few small calcareous foraminifera.

C3 Fragmental limestone, one specimen of which is vughy.

T.S.20551A contains polymorphinids, miliolids, Brizalina ,

C4 "Pudding stone", consisting of black or white fossiliferous fragments in matrix which is somewhat pelletal or concretionary. T.S.20551C contained Brizalina and polymorphinids in the rock fragments.

Reid Quarry F10/68, AMDEL P101/68 T.S.20552

R1 Nullarbor Limestone, with some infilling of solution cracks by reddish-brown somewhat pelletal calcareous material with scattered quartz grains. Fossils include Marginopora vertebralis mollusc impressions and casts, corals

R4 "Pudding stone" has black fragments of various origins, some of which are fossiliferous limestone, brownish concretionary pebbles and brown pebbles of highly fossiliferous limestone with nodosariids polymorphinids, Elphidium, Marginopora

R5 Infilling of solution cavities, white limestone fragments in which most of the microfossils have been destroyed during recrystallization. The matrix is reddish brown, roughly pelletal in character, with scattered quartz grains.

R?6 T.S. 20552 Fine grained hard limestone crossed by two cavities which contain some fragmentary microfossils. It is difficult to place this in any of the other generations, but it appears to be the result of redeposition of calcite in the weathered zone of the Nullarbor Limestone.

Loongana Quarry Western Australia F11/68

L1 Nullarbor Limestone, with abundant mollusc casts and moulds including cf. Diastoma sp., Barbatia consutilis, cardiids, lucinids.

L2 Weathered Nullarbor Limestone, hard, porous, partially recrystallized, with foraminifera and molluscs.

L4 Fragmental limestone with Nullarbor Limestone in a pelletal matrix. The Nullarbor Limestone contains Flosculinella bontangensis, with Marginopora vertebralis which is not so abundant as in the material from the quarries to the east, miliolids.

L6 Fragmented brecciated material, the constituent pebbles of which are not fossiliferous but mostly concretionary kunkar.

Denman Surface material F12/68

D1 Weathered compact Nullarbor Limestone with abundant foraminifera.

D4 Nullarbor Limestone with Marginopora in a pelletal matrix

D6 Concretionary material with concentric layers formed around the pelletal matrix of D4

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NHL:OB
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