

APPENDIX I

APPENDIX I.

i

CONTENTS

ii

Appendix I.1.	Blank and representative completed geological data-recording (logging) sheets.	iii - vi
Appendix I.2.	Index card system for ichnotaxonomic studies.	vii - x
Appendix I.3a.	Consolidated index of field samples, field sample numbers, and relevant Macquarie University catalog numbers, location details and other information about the samples.	xi - xv
Appendix I.3b.	Tabulation of Macquarie University catalog sample numbers of specimens from the study area and related field sample numbers.	xvi - xviii
Appendix I.4.	Statistical discrimination of vertical cylindrical burrows of <u>Skolithos</u> sp? (201/MU.44386) from Turimetta Head and <u>Skolithos linearis</u> from the Lower Cambrian Bradore Formation of Labrador (Pemberton & Frey, 1984), on the basis of distance-to-nearest-neighbour data.	xix - xxii
Appendix I.5.	Summary information regarding data samples of burrow form and orientation measured on burrows of the new ichnotaxon <u>Barrenjoeichnus mitchelli</u> at outcrop 1, Barrenjoey Head (area 1), GR. 4520,8277 Broken Bay (9130-I-N). Details of burrow form (geometry) and orientation (inclination angle) (θ) and azimuth or trend angle (ϕ) are tabulated in Appendixes I.5a - I.5y.	xxiii - xlv
Appendix I.6.	Summary information regarding data samples of burrow form and orientation measured on burrows of the new ichnotaxon <u>Barrenjoeichnus mitchelli</u> at outcrop 2, Barrenjoey Head (area 1), GR. 4502,8275 Broken Bay (9130-I-N). Details of burrow form (geometry) and orientation (inclination) angle (θ) and azimuth or trend angle (ϕ) are tabulated in Appendixes I.6a - I.6f.	xlvi - xlix
Appendix I.7.	Azimuth of burrow bifurcation/branching from main burrow in <u>Barrenjoeichnus mitchelli</u> at outcrop 1 (GR.4520,8277 Broken Bay (9130-I-N) between TF1 and TF4 (T7.5 - T12.0).	I
Appendix. 1.8.	List of trace fossils present in the study area with interpretation in terms of their ethology, trophic level, possible producer organism(s) and ichnofacies affinities (body fossils of both animals and plants are included for completion).	li - liii

LITHOLOGY

BEDDING CONTACT

INTERNAL STRUCTURE

BODY FOSSILS

TRACE

Fossils

OTHER FEATURES

[illegible]

SECTION 1A

APPENDIX 1.1b

SECTION 1.1.1

LITHOLOGY

BEDDING CONTACT

INTERNAL STRUCTURE

BODY FOSSILS

TRACE

FOSSILS

OTHER FEATURES

LOCATION / BORE:
Barrenjary H'nd
South Wall
(Section 1b of
Condon 1985)
4520-8277

SHEET 1 OF 2

DATE: 23-8-85

Breccia / Diamictite	Sandstone quartzose	Mudstone (non-fissile)	Coal (d = dull) (b = bright)
Rudite/ Diamictite (mixed clasts)	Sandstone, quartzose - lithic / labile	Shale (fissile)	Coaly mudstone
Conglomerate	Sandstone lithic / labile	Siltstone	Carbonaceous mudstone
Pebbly Sandstone	Sandstone calcareous	thin inter- beds (40:60)	Coal spar
Extracast	Sandstone arkose	igneous intrusions	concretions
Intracast	Tuff	Carbonates	Ooids (< 2mm)
			Pisoliths (> 2mm)

Sharp, planar	Struct- ureless	Ripple cross laminated
Sharp, irregular	Flat/ undulose bedding	Flaser / lenticular bedding
Gradational	Parallel lamination	wavy lamination
e. c. erosional relief demonstr- able	Cross bedded (planar)	Disturbed (convoluted) bedding
b. f. bedding truncation demonstr- able	Cross bedded (trough)	Inclined (low angle) lamination

brachs. 10/1	bryozoon 10/1	fossil log Si c
pelecypod 10/1	crinoids 10/1	tree stumps c Si
gastropod 10/1	echinoids 10/1	roots
shell undifferentiated u	solitary corals b	plant frags
shells broken f	vertebrate bones	fossil leaves

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2
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4
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10

Size grading (specify size)	Ice wedge casts	Cracks: desicc'n cry.
Symmetrical ripples	Stone roll	Cracks: cryogenic
Asymmetrical ripples	Cryotur- bations	Cracks: synthesis
Founder structures	Erratic (specify size)	Flutes
Clastic dykes	Glenoidites	Grooves
Organic matter	Intensive bioturbation	Prod. marks
		H ₂ O escape
		Scours
		Growth fault (x=)
		Stylolites

Stratigraphy	Core details		Film / Frame		Sample	Munsell colour	Scale (2cm = 1m) (m)	Lithology	Modal grain size										BEDDING FEATURES		% Erratic grains / clasts and size range (mm)	Body fossils	TRACE					FOSSILS					Percent bioturbation	Other features	Energy index	Palaeocurrents (sample #) and other remarks																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	Box #	Depth	Black and White	Colour	Sample # thickness (cm) and depth to floor (m)				coal	clay	silt	vf sand	f sand	m sand	c sand	vc sand	gravel	External form and internal grading	Internal structure	1			2	3	4	5	6	7	8	9	10																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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SECTION 1.1.1

DATE : 23.8.85

	Breccia / Diamictite		Sandstone, quartzose		Mudstone (non-fissile)		Coal (d = dull) (b = bright)
	Rudite / Diamictite (mixed clasts)		Sandstone, quartzose - lithic / labile		Shale (fissile)		Coaly mudstone
	Conglomerate		Sandstone, lithic / labile		Siltstone		Carbonaceous mudstone
	Pebbly Sandstone		Sandstone, calcareous		thin inter- beds (40:60)		Coal spar
	Extraclast		Sandstone, arkosic		Ooids (< 2mm)		concretions
	Intraclast		Palaeosol		Igneous intrusions		Pisoliths (> 2mm)
	Tuff		Carbonates				

[illegible]

SECTION 1.1.2

LITHOLOGY

BEDDING CONTACT

INTERNAL STRUCTURE

BODY FOSSILS

TRACE

FOSSILS

OTHER FEATURES

LOCATION: FORE:	Breccia / Diamictite	Sandstone quartzose	Mudstone (non-fissile)	Coal (d = dull) (b = bright)	Sharp, planar	Structureless	Ripple cross laminated	brachs. b ta/i	bryozoon b	fossil log Si c	1 Third Vert. tubes (NVT)	6	Size grading (specify size)	Ice wedge casts	Cracks: desiccation
	Rudite / Diamictite (mixed clasts)	Sandstone, quartzose - lithic / labile	Shale (fissile)	Coaly mudstone	Sharp, irregular	Flat / undulose bedding	Flaser / lenticular bedding	pelicypod ta/i	crinoids ta/i	tree stumps c Si	2 Narrow Vert. tubes (NVT)	7	Symmetrical ripples	Stone roll	Cracks: cryogenic
	Conglomerate	Sandstone lithic / labile	Siltstone	Carbonaceous mudstone	Gradational	Parallel lamination	Wavy lamination	gastropod b	echinoids b	roots b	3	Asymmetrical ripples	Cryotur-bations	Grooves	
SHEET 1 of 1	Pebbly Sandstone	Sandstone calcareous Sandstone arkose	thin interbeds (40:60)	Coal spar concretions	erosional relief demonstrable	Cross bedded (planar)	Disturbed (convoluted) bedding	shell undifferentiated u	solitary corals b	plant frags b	4	Founder structures	Erratic (specify size)	H ₂ O escape	
DATE: 24-8-85	Extraclast	Palaeosol	Igneous intrusions	Ooids (< 2mm)	bedding truncation demonstrable	Cross bedded (trough)	Inclined (low angle) lamination	shells broken b	vertebrate bones b	fossil leaves b	5	Clastic dykes	Glendonites	Growth fault (x)	
	Intraclast	Tuff	Carbonates	Psaloliths (> 2mm)	b. t.							10	Organic matter	Intensive bioturbation	Stylolites

[illegible]

APPENDIX 1.2.

A	B	C	D	E	F	G	H	I	J	K	L	M	Mc	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A.	E.	I.	O.	U.
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APPENDIX I.2

EXPLANATION OF THE KEY SYSTEM FOR THE TRACE FOSSILS IDENTIFICATION CARDS

- SYSTEM (1)** Vertical series (top).
A - Z Alphabetical order of generic names of the trace fossils. (Mc is not used, only 26 holes).
- SYSTEM (2)** Vertical series (top).
A-E-I-O-U vowels holes are used for the possible animal or animals that produced the trace fossils (producers). Five holes are available for groups of animals that produced similar traces.
A. Worms or worm-like animals (polychaete, oligochaete etc.).
E. Arthropods (trilobites, eurypterids etc.).
I. Mollusca and brachiopoda.
O. Echinoids, corals, bryozoans and sponges.
U. vertebrate tracks, gastroliths, coprolites and faecal pellets.
(Nb. vertical holes from 1 - 5 can be used for more unknown producers).
- SYSTEM (3)** Horizontal series (right side).
(Environment 6 - 19)
This area is for the specific environment that trace fossils are confined to, but there are also some trace fossils that are independent of facies; one has to cut out several holes to take account of such variations.
6. Terrestrial (non-marine, fluvial, lacustrine or in soils).
7. Deltaic.
8. Lagoon.
9. Backshore.
10. Beach.
11. Tidal flats.
12. Foreshore.
13. Shoreface.
14. Barrier bars
15. Nearshore.
16. Upper offshore.
17. Lower offshore.
18. Bathyal.
19. Abyssal, Hadal.
20 - 24 free for additional environments.
- SYSTEM (4)** Vertical series (bottom).
(Ethological and preservational).
Part one. Based on ethological and behavioural characters classified by Seilacher (1953) and Ekdale et al., (1984).
25. Cubichnia - lying or resting-traces.
26. Domichnia - dwelling-traces.
27. Fodinichnia - feeding-traces.

- 28. Pasichnia - grazing-traces.
- 29. Repichnia - crawling-traces.
- 30. Fugichnia - escape-traces.
- 31. Agrichnia - farming-traces.

Part two. Based on preservational and toponomic characters classified by Martinsson (1970).

- 37. Epichnia - upper surface traces (+,-).
- 36. Endichnia - inside traces (in main casting medium).
- 35. Hypichnia - undersurface traces or sole traces (+,-).
- 34. Exichnia - outside traces (outside of main casting medium).
- 33 - 32. additional holes for other preservational traces.

SYSTEM (5)

Vertical series (bottom).
(Taxonomical).

Identification of ichnotaxonomic characters.

- 46. Boring - in hard shells, and rocks of substratum.
- 45. Tracks - biped, quadruped vertebrate tracks and arthropod tracks.
- 44. Coprolites - coprolites, gastroliths and faecal pellets.
- 43. Trails - crawling and creeping patterns.
- 42. Burrows - full-relief (infaunal).
- 41. - orientation vertical.
- 40. - orientation horizontal.
- 39. - branching and bifurcating - trifurcating.
- 38. - other patterns.

SYSTEM (6)

Horizontal series (left side).
(Geographical).

Geographical extension of trace fossils.

- 58. North America.
 - 57. South America.
 - 56. Europe.
 - 55. Russia and China.
 - 54. Africa and Middle East.
 - 53. South East Asia and Japan.
 - 52. Australia and Pacific Islands.
 - 47 - 51. Free for other geographic categories.
- Nb. Alternatively, holes 47 - 58 can be allocated to stratigraphic categories of either local or regional or global scale.

SYSTEM (7)

Horizontal series (left side).

Classification on the basis of ichnofacies.

- 66 - 70. Free for other ichnofacies (e.g., Teredolites ichnofacies).
- 65. Scoyenia ichnofacies.
- 64. Skolithos ichnofacies.

- 63. Glossifungites ichnofacies.
- 62. Cruziana ichnofacies.
- 61. Zoophycos ichnofacies.
- 60. Nereites ichnofacies.

SYSTEM (8)

Internal series.

Genus - ichnogeneric name.

Species - ichnospecies name.

Variety - intra-ichnospecific or ichnovarietal
name.

Family - group name above generic level

Reference -

General -

(Nb. If there is not enough space for more than
one reference used the reverse side of the card or
an additional card.)

Appendix I.3a. Tabulation of collected field sample number from the study area and relevant Macquarie University catalogue number, collected area, grid location, trace fossil interval, subinterval, index trace fossils and other features.

Field sp. no.	Macq. Cat. no. (MU. no.)	Uni. code no.	Area collected area.	Location in grid co-ordinates.1	Strat. code.	Stratigraphy (Formation & Member).	Trace fossil Zones (intervals & sub-intervals).	Index trace fossils, fossils, and other features in the sample.	Remarks and logged section numbers.
101	44368	1	Barrenjoey Head	4520,8277	Tr2n3	Up. Newport Mbr.	IF1	<u>Barrenjoeichnus mitchelli</u> ichno. gen. sp. nov.	1.1.1, 1.1.2 & 1.1.3.
102	44369	"	"	"	"	"	"	"	"
103	44370	"	"	"	"	"	"	"	"
104	44371	"	"	"	"	"	"	"	"
105	44372	"	"	"	"	"	"	"	"
106	44373	"	"	"	"	"	"	"	"
107	44374	"	"	"	"	"	"	"	"
108	44375	"	"	"	"	"	"	"	"
109	44376	"	"	"	"	"	"	"	"
110	44377	"	"	"	"	"	"	"	"
111	44378	"	"	"	"	"	"	"	"
112	44379	"	"	"	"	"	"	"	"
113	44380	"	"	"	"	"	"	"	"
114	44381	"	"	"	"	"	"	"	"
115	44382	"	"	"	"	"	"	"	"
116-									" (loose in plastic bags).
128	44383	"	"	"	"	"	"	"	"
129	44384	"	"	"	"	"	"	"	"
130	44385	"	"	"	"	"	"	"	"
201	44386	2	Turimetta Head	4520, 6996	Tr2n1	Lr. Newport (Garie) Mbr.	ID1	<u>Skolithos</u>	2.1.1
202	44387	"	"	4355,7000	Tr2g	"	"	Rhizoliths (rootlets)	2.2.1
203	44364	"	"	4345,6996	Tr1b	Bald Hill Claystone.	IC3/4	<u>Ophiomorpha</u>	2.1.1
204	(see 802)								
205	(see 803)								
206	44388	"	"	"	Tr2n1	Lr. Newport (Garie) Mbr.	ID1	Plant remains	2.1.1
207	44389	"	"	"	Tr2g	Bald Hill Claystone.	IC	Intraclast angular mudstone.	"
208a	44358	"	"	4355,7000	"	"	IC2	<u>Thalassinoides</u> (large cylindrical-shaped).	2.2.1
208b	44360	"	"	"	"	"	"	<u>Thalassinoides</u> (large Y-shaped).	"
208c	44360	"	"	"	"	"	"	<u>Thalassinoides</u> (cylindrical-shaped).	"
209a	44356	"	"	"	"	"	"	<u>Turimettichnus webbyi</u> ichno. gen. sp. nov.	2.2.1 (holotype)
209b	44355	"	"	"	"	"	"	<u>Turimettichnus conaghani</u> ichno. gen. sp. nov.	"

1. The study area is covered by three 1:25,000 orthophoto maps. These are; Broken Bay (9130-I-N), Mona Vale (9130-I-S), and Sydney Head (9130-II-N). No sample were collected for study within the latter map area, but were studied at reconnaissance level.

Appendix I.3a (continued)

Field sp. no.	Macq. Cat. no. (MU. no.)	Uni. code no.	Area Sample collected area.	Location in grid co-ordinates.1	Strat. code.	Stratigraphy (Formation & Member).	Trace fossil Zones (intervals & sub-intervals).	Index trace fossils, fossils, and other features in the sample.	Remarks and logged section numbers.
501a	44404	5	St. Michaels Cave.	4590,7725	Tr2n1	Lr. Newport Mbr.	ID1	<u>Skolithos</u>	5.1.1
501b	44404	"	"	"	"	"	"	"	"
502a	44402	"	"	"	"	"	ID4	<u>Palaeophycus tubularis</u>	"
502b	"	"	"	"	"	"	"	<u>Palaeophycus striatus</u>	"
503	44403	"	"	"	"	"	ID1	<u>Skolithos?</u>	"
504	44405	"	"	"	"	"	"	<u>Skolithos</u>	"
505	44521	"	"	"	"	"	ID2	<u>Helikospirichnus veeversi</u> ichno. gen. sp. nov.	"
506	44522	"	"	4588,7735	Tr2n2	Mid. Newport Mbr.	IE1	<u>Scalarituba</u>	
601	44406	6	Warriewood Beach.	4329,7048	Tr2n1	Lr. Newport Mbr.	ID1	<u>Skolithos</u> roots and rootlets.	
701	44407	7	Little Head.	4555,8004	Tr2n2	Mid. Newport Mbr.	IE7.1	<u>Thalassinoides paradoxicus</u>	7.1.1 & 7.1.2
702	44408	"	"	"	"	"	"	<u>Thalassinoides paradoxicus</u> natural section with spreite.	"
703	44409	"	"	"	"	"	IE	<u>Palaeophycus</u>	"
704	44410	"	"	"	"	"	"	Sand dykes.	"
705	44411	"	"	"	"	"	IE7.1	Excavation pellets.	"
706a	44412	"	"	"	"	"	IE7.2	Rootlets.	"
706b	44412	"	"	"	"	"	"	Carbonaceous plant remains.	"
707	44413	"	"	"	"	"	IE9.1	<u>Scovenia</u> & <u>Skolithos</u>	"
708	44414	"	"	"	"	"	IE9.2	<u>Thalassinoides paradoxicus</u> Y-shaped with spreite.	"
709	44415	"	"	"	"	"	IE9.1	<u>Skolithos</u> & roots.	"
710	44416	"	"	"	"	"	"	<u>Scovenia</u> with striated surface.	"
711	44417	"	"	"	"	"	IE	<u>Planolites</u>	"
801	44418	8	Bangalley Head.	4605,7813	Tr2n1	Lr. Newport Mbr.	ID	<u>Chondrites?</u> or <u>Planolites</u>	8.1.1
802	44419	"	"	4600,7790	Tr2n2	Mid. Newport Mbr.	IE1-IE5	<u>Helikospirichnus veeversi</u>	"
803	44420	"	"	"	"	"	"	"	"
804	44421	"	"	"	Tr2n1	Lr. Newport Mbr.	ID2	"	"
805	44499	"	"	"	Tr2n2	Mid. Newport Mbr.	IE3-IE4	<u>Phycodes</u> and <u>Planolites</u>	"
806	44500	"	"	"	"	"	"	<u>Planolites</u>	"
1001	44422	10a	Bilgola Head.	4525,7610	Tr2b	Bald Hill Claystone.	IC	<u>Thalassinoides</u>	10a.3.1
1002	44423	"	"	"	Tr2n1	Lr. Newport Mbr.	ID1	<u>Planolites</u> and <u>Diplocraterion</u> .	"
1003	44424	"	"	"	"	"	"	<u>Thalassinoides</u> Y-shaped.	"
1004	44425	"	"	"	"	"	"	"	"
1005a	44426	"	"	"	"	"	"	<u>Diplocraterion</u> (polyupsilon) <u>polyupsilon</u>	"

Appendix I.3a (continued)

Field sp. no.	Macq. Cat. no. (MU. no.)	Uni. Area code no.	Sample collected area.	Location in grid co-ordinates.1	Strat. code.	Stratigraphy (Formation & Member).	Trace fossil Zones (intervals & sub-intervals).	Index trace fossils, fossils, and other features in the sample.	Remarks and logged section numbers.
1005b	44427	10a	Bilgola Head.	4525,7610	Tr2n1	Lr. Newport Mbr.	ID1	Ring-structures.	10a.3.1
1006	44428	10b	"	4478,7540	"	"	"	Bivalve resting traces.	
1007	44429	"	"	"	"	"	"	"	
1008	44430	"	"	"	"	"	"	"	
1009	44431	"	"	"	"	"	"	"	
1010	44432	"	"	"	"	"	"	Lenticular shrinkage Cracks (Synaeresis cracks).	
1011	44433	"	"	"	"	"	"	<u>Planolites</u> & <u>Skolithos</u>	
1012	44434	"	"	"	"	"	"	<u>Skolithos</u> & plant remains.	
1013	44435	"	"	"	"	"	ID1-ID3	<u>Colichnites howardi</u> ichno. gen. sp. nov.	
1014	44436	"	"	"	"	"	"	"	
1015	44437	"	"	"	"	"	"	"	
1016	44438	"	"	"	"	"	ID1	<u>Planolites</u> & <u>Skolithos</u>	
1017	44439	"	"	"	"	"	"	<u>Colichnites howardi</u> ichno. gen. sp. nov.	
1101	44502	11	Hole in the Wall.	4562,7705	Tr2n1	Lr. Newport Mbr.	ID1	<u>Chondrites</u>	
1102	44503	"	"	"	"	"	"	Small vertical unclassified burrows.	
1103	44504	"	"	"	"	"	"	<u>Skolithos</u>	
1104	44505	"	"	"	"	"	"	"	
1105	44506	"	"	4622,7705	"	"	"	"	
1106	44507	"	"	4560,7706	"	"	"	"	
1107	"	"	"	"	"	"	"	"	
1108	"	"	"	"	"	"	"	"	
1109	44508	"	"	"	"	"	"	"	
1110	44509	"	"	"	"	"	"	"	
1111	44510	"	"	"	"	"	"	"	
1112	44511	"	"	"	"	"	"	"	
1113	44512	"	"	"	"	"	"	"	
1114	44523	"	"	"	"	"	"	Sandballs (feeding and excavation pellets.	
1201	44440	12	Little Reef.	4453,7414	Tr2n1	Lr. Newport Mbr.	ID1	Bivalve escape-burrows.	
1202	44441	"	"	"	"	"	"	"	
1203	44442	"	"	"	"	"	"	"	
1204	44442	"	"	"	"	"	"	"	
1205	44443	"	"	4460,7410	"	"	"	<u>Diplo craterion paralelum</u>	
1206	44444	"	"	"	"	"	"	"	
1207	44445	"	"	"	"	"	"	"	
1208	44446	"	"	"	"	"	"	"	
1209	44447	"	"	"	"	"	"	"	
1210	44448	"	"	"	"	"	"	"	
1211	44449	"	"	"	"	"	"	"	

Appendix I.3a (continued)

Field sp. no.	Macq. Cat. no. (MU. no.)	Uni. no.	Area Sample code collected area.	Location in grid co-ordinates.1	Strat. code.	Stratigraphy (Formation & Member).	Trace fossil Zones (intervals & sub-intervals).	Index trace fossils, fossils, and other features in the sample.	Remarks and logged section numbers.
1212	44450	12	Little Reef.	4460,7410	Tr2n1	Lr. Newport Mbr.	ID1	<u>Diplocraterion parallelum</u>	
1213-									
1214	44451	"	"	"	"	"	"	"	
1215	44452	"	"	"	"	"	"	"	
1216	44453	"	"	4458,7415	"	"	"	Unclassified network burrows.	
1217	44454	"	"	"	"	"	"	"	
-									
1301a	44455	13	Bungan Head.	4470,7381	Tr2n3	Mid. Newport Mbr.	IE9	<u>Rhizocorallium jenense</u>	Broken pieces.
1301b	44455	"	"	"	"	"	"	"	Broken piece showing biolypths.
-									
1401a	44456	14	Mona Vale Head.	4400,7275	Tr2n1	Lr. Newport Mbr.	ID5/6	<u>Chondrites</u> and <u>Skolithos</u>	
1401b	44513	"	"	"	"	"	"	"	
-									
2601	44457	26	Beacon Hill Quarry Brookvale.	4490,7735	Tr2h	Hawkesbury Sandstone (in shales).	IG	<u>Brookvalichnus obliquus</u>	In plastic bags.

The additional other collected (at later stage) field samples and relevant MU numbers are recorded in Appendix I.3b and also in Appendix II.3.

APPENDIX 1.3b Macquarie University catalogue numbers (MU) and relevant field sample numbers.

MU.no.	Sp.no.	Strat. unit	Area	Ichnology
44351	212	Tr1b	2	<u>Turimettichnus conaghani</u> .
44352	213	"	"	"
44353	215	"	"	"
44354	216	"	"	"
44355	209b	"	"	"
44356	209a	"	"	<u>Turimettichnus webbyi</u> .
44357	211	"	"	<u>Turimettichnus conaghani</u> .
44358	208a	"	"	<u>Thalassinoides</u> .
44359	208b	"	"	" (y-shaped).
44360	208c	"	"	"
44361	217a	"	"	" (turn-around).
44362	217b	"	"	"
44363	214	"	"	<u>Ophiomorpha</u> .
44364	203	"	"	" (large slab).
44365	303	"	3	<u>Pytiniichnus trifurcatum</u> .
44366	305	"	"	Shrimp (decapod crustacean).
44367	306	"	"	<u>Turimettichnus conaghani</u> .
44368	101	Tr2n3	1	<u>Barrenjoeichnus mitchelli</u> .
44369	102	"	"	"
44370	103	"	"	"
44371	104	"	"	Sample in plastic bag for micropal.
44372	105	"	"	<u>B. mitchelli</u> (loose).
44373	106	"	"	"
44374	107	"	"	"
44375	108	"	"	"
44376	109	"	"	"
44377	110	"	"	"
44378	111	"	"	"
44379	112	"	"	"
44380	113	"	"	"
44381	114	"	"	"
44382	115	"	"	"
44383	116	"	"	"
44384	129	"	"	"
44385	130	"	"	"
44386	201	Tr2g	2	<u>Skolithos</u> .
44387	202	"	"	Rootlets.
44388	206	"	"	Plant remains.
44389	207	Tr1b	"	Intraclast (angular mudstones).
44390	210	"	"	Pellets (faecal pellets).
44391	301	Tr2n1	3	<u>Skolithos</u> .
44392	302	"	"	"
44393	304	"	"	Plant remains.
44394	401	Tr2n3	4a	<u>Thalassinoides</u> y-shaped.
44395	402	tr2n3	b	<u>Barrenjoeichnus mitchelli</u> and rootlets.
44396	403	Tr2n2	"	<u>Rhizocorallium</u> .
44397	404	"	"	"
44398	405	"	"	<u>Palaeophycus</u> .

APENDIX 1.3b (continued)

MU.no.	Sp.no.	Strat. unit	Area	Ichnology
44399	406	"	"	<u>Planolites.</u>
44400	407	"	"	"
44401	501	Tr2n1	5	<u>Skolithos.</u>
44402	502a	"	"	<u>Palaeophycus tubularis.</u>
	502b	"	"	<u>P. striatus.</u>
44403	503	"	"	<u>Skolithos?.</u>
44404	501	"	"	<u>Skolithos.</u>
44405	504	"	"	"
44406	601	Tr2g	6	<u>Skolithos</u> , roots & rootlets.
44407	701	Tr2n2	7	<u>Thalassinoides</u> (turn-around).
44408	702	"	"	"
44409	703	"	"	<u>Palaeophycus.</u>
44410	704	"	"	Sandykes.
44411	705	"	"	Excavation pellets.
44412	706a	"	"	Rootlets.
	706b	"	"	Carbonaceous plant remains.
44413	707	"	"	<u>Scoyena</u> , & <u>Skolithos.</u>
44414	708	"	"	<u>Thalassinoides</u> y-shaped.
44415	709	"	"	Carbonaceous root remain.
44416	710	"	"	<u>Scoyena.</u>
44417	711	"	"	<u>Planolites.</u>
44418	801	Tr2n1	8	<u>Chondrites?/Planolites?.</u>
44419	802	Tr2n2	"	<u>Helikospirichnus veeversi.</u>
44420	803	"	"	"
44421	804	"	"	"
44422	1001	Tr2n1	10a	<u>Thalassinoides.</u>
44423	1002	"	"	<u>Planolites/Diplocraterion.</u>
44424	1003	"	"	<u>Thalassinoides.</u>
44425	1004	"	"	"
44426	1005a	"	"	<u>Diplocraterion polyupsilon.</u>
44427	1005b	"	"	Ringed structures.
44428	1006	"	10b	Resting traces/ <u>Lockeia?.</u>
44429	1007	"	"	"
44430	1008	"	"	"
44431	1009	"	"	"
44432	1010	"	"	Synaeresis cracks.
44433	1011	"	"	<u>Planolites</u> & <u>Skolithos.</u>
44434	1012	"	"	<u>Skolithos</u> & Plant remains.
44435	1013	"	"	<u>Colichnites howardi.</u>
44436	1014	"	"	"
44437	1015-	"	"	"
44438	1016	"	"	<u>Planolites</u> & <u>Skolithos.</u>
44439	1017	"	"	<u>Colichnites howardi.</u>
44440	1201	Tr2n1	12	Bivalve escape-burrows.
44441	1202	"	"	"
44442	1203/4	"	"	"
44443	1205	"	"	<u>Diplocraterion.</u>
44444	1206	"	"	"
44445	1207	Tr2n1	12	<u>Diplocraterion.</u>
44446	1208	"	"	"

APPENDIX 1.3b (continued)

MU.no.	Sp.no.	Strat unit	Area	Ichnology
44447	1209	"	"	"
44448	1210	"	"	"
44449	1211	"	"	"
44450	1212	"	"	"
44451	1213/4	"	"	"
44452	1215	"	"	"
44453	1216	"	"	Unknown networks.
44454	1217	"	"	"
44455	1301a	Tr2n2	13	<u>Rhizocorallium</u> (broken).
	1301b	"	"	<u>Rhizocorallium</u> (bioglyphs).
44456	1401a	Tr2n1	14	<u>Chondrites</u> , <u>Skolithos</u> .
44457	2601	Tr2h	26	<u>Brookvalichnus</u> broken pieces in plastic bag.
*44458		Tr	..	Plant remains.
*44459		..	..	<u>Palaeophycus</u> .
*44460		..	..	Large vertical Burrows.
*44461	to			
*44487		..	..	<u>Cruzianas</u> , <u>Isopodichnus</u> & <u>Dimorphichnus</u> .
*44488	to			
*44498	2701	..	..	<u>Maculichnus</u> .
44499	805	Tr2n2	8	<u>Phycodes</u> , & <u>Planolites</u> .
44500	806	"	"	<u>Planolites</u> .
*44501		..	..	<u>Nerietes</u> .
44502	1101	Tr2n1	11	<u>Chondrites</u> .
44503	1102	"	"	Small unclassified burrows.
44504	1103	"	"	<u>Skolithos</u> .
44505	1104	"	"	"
44506	1105	"	"	"
44507	1106/8	"	"	"
44508	1109	"	"	"
44509	1110	"	"	" (red).
44510	1111	"	"	"
44511	1112	"	"	"
44512	1113	"	"	" (black).
44513	1401	Tr2n1	14	<u>Chondrites</u> & <u>Skolithos</u> .
44514	408	Tr2n2	4b	<u>Rhizociralliids</u> , <u>thalassiniids</u> , <u>Spongeliomorpha</u> , <u>Planolites</u>
to	to	"	"	and <u>B. mitchelli</u> .
44518	412	"	"	
*44519	010	?	Mis.	Pebble imbrications.
*44520	011	?	"	Ring-structures.
44521	505	Tr2n1	5	<u>Helikospirichnus veeversi</u> .
44522	506	"	"	<u>Scalarituba</u> .
44523	1114	Tr2n2	11	Sandballs.

* - These samples are not from the study area but are from miscellaneous other areas and were given to the author by colleagues. They are not treated or otherwise described in this report but are included in this tabulation for completeness of the trace-fossil collection made here. These specimens will be described elsewhere.

Appendix I.4a. Statistical discrimination of cylindrical vertical burrows of Skolithos sp? (in sample 201/MU.44386) from Turimetta Head and Skolithos linearis from the Lower Cambrian Bradore Formation of Labrador (Pemberton & Frey, 1984), on the basis of the distance-to-nearest-neighbour data the 't' test.

I. Parameters of Turimetta Head burrows (from Table 8.3).

Mean distance in the sample group $\bar{X}_0 = 0.576$
Degree of observed distribution departure from random $R_0 = 0.565$
Total number of measurements $N_0 = 116$

II. Parameters of Bradore Formation burrows (Pemberton & Frey, 1984, table 3).

Mean distance in the sample group $\bar{X}_1$
Degree of observed distribution departure from random R_1
Total number of measurements N_1

Seven data sample are tested using distance-to-nearest-neighbour data.

	<u>$\bar{X}_1$</u>	<u>R_1</u>	<u>N_1</u>
1.	0.985	0.98	99
2.	0.914	0.94	106
3.	0.870	0.04	142
4.	0.825	1.05	162
5.	1.072	1.52	201
6.	1.132	1.65	212
7.	1.070	1.66	242

't' test statistical discrimination equation applied to each sample of Skolithos linearis data from the Bradore Formation (SB) and Skolithos from Turimetta Head (Tur):

$$t = \frac{(\bar{X}_0 - \bar{X}_1) (N_0 \times N_1) / (N_0 + N_1)}{(N_0 - 1) R_0^2 + (N_1 - 1) R_1^2 / N_0 + N_1 - 2}$$

$$\text{Tur vs. SB} \quad t = \frac{(\bar{X}_0 - \bar{X}_1) (N_0 \times N_1) / (N_0 + N_1)}{(N_0 - 1) R_0^2 + (N_1 - 1) R_1^2 / N_0 + N_1 - 2}$$

$$t_1 = \frac{(0.567 - 0.985) (116 \times 99) / (116 + 99)}{(116 - 1) 0.565^2 + (99 - 1) 0.98^2 / 166 + 99 - 2} = 3.82$$

<u>'t' result</u>	<u>Probability</u>	<u>Interpretation</u>
t1 = 3.82	P > 0.1%	Significantly different
t2 = 3.279	0.5% > P > 0.1%	"
t3 = 2.732	1% > P > 0.5%	"
t4 = 2.492	2.5% > P > 1%	Probably difference is significant
t5 = 3.382	P = 0.1%	Significantly different
t6 = 3.529	P > 0.1%	"
t7 = 3.117	0.5% > P > 0.1%	"

Appendix. I.4b. Statistical discrimination of cylindrical vertical burrows of Skolithos sp? (in sample 201/MU.44386) from Turimetta Head and burrows of Skolithos linearis from the Lower Cambrian Bradore Formation of Labrador (Pemberton & Frey, 1984), on the basis of distance-to-nearest-neighbour data using the 'student t' test.

I. Parameters of Turimetta Head burrows (from Table 8.3).

Number of distance measurements in the sample group $n = 116$
Mean of distance measurements in the sample group $m = 0.576$
Standard deviation of the sample measurements (n) $S = 0.45$

II. Parameter of Bradore Formation burrows (Pemberton & Frey, 1984, table 3).

Mean of large parent group (M) = (M1 to M7)

Seven data samples are tested using distance-to-nearest-neighbour data.

1. M1 = 0.985
2. M2 = 0.914
3. M3 = 0.87
4. M4 = 0.825
5. M5 = 1.072
6. M6 = 1.134
7. M7 = 1.07

Student 't' test statistical discrimination equation applied to each sample of Skolithos linearis data from the Bradore Formation (SB) and Skolithos data from Turimetta (Tur):

$$\text{Student } t = \frac{n [M - m]}{S}$$

Tur vs. SB Student $t = \frac{116 [0.985 - 0.576]}{0.45} = 9.789$

t result	Probability	Interpretation
t1 = 9.789	P>0.2%	Significantly different
t2 = 8.09	"	"
t3 = 7.04	"	"
t4 = 5.96	"	"
t5 = 11.87	"	"
t6 = 13.36	"	"
t7 = 11.82	"	"

Appendix I.4c. Statistical discrimination of cylindrical vertical burrows of Skolithos sp? (in sample 201/MU.44386) from Turimetta Head and Skolithos linearis burrows from the Middle Silurian Thorold Formation of Southern Ontario (Pemberton & Frey, 1984), on the basis of distance-to-nearest-neighbour data using the 't' test.

I. Parameters of Turimetta Head burrows (from Table 8.3).

Mean distance in the sample group $\bar{X}_0 = 0.576$
Degree of observed distribution departure from random $R_0 = 0.565$
Total number of measurements $N_0 = 116$

II. Parameters of Thorold Formation (Pemberton & Frey, 1984, table 4).

Mean distance in the sample group $\bar{X}_1$
Degree of observed distribution departure from random R_1
Total number of measurements N_1

Nine data samples are tested using distance-to-nearest-neighbour data.

	$\bar{X}_1$	R_1	N_1
1.	1.53	1.04	23
2.	1.14	0.88	23
3.	1.02	1.08	36
4.	1.11	1.12	18
5.	0.77	0.91	34
6.	0.79	0.97	38
7.	1.18	0.99	64
8.	0.72	0.93	69
9.	0.76	1.08	88

't' test statistical discrimination equation applied to each sample of Skolithos linearis data from the Thorold Formation (ST) and Skolithos data from Turimetta Head (Tur):

$$t = \frac{(\bar{X}_0 - \bar{X}_1) (N_0 \times N_1) / (N_0 + N_1)}{(N_0 - 1) R_0^2 + (N_1 - 1) R_1^2 / N_0 + N_1 - 2}$$

Tur vs. ST $t = \frac{(\bar{X}_0 - \bar{X}_1) (N_0 \times N_1) / (N_0 + N_1)}{(N_0 - 1) R_0^2 + (N_1 - 1) R_1^2 / N_0 + N_1 - 2}$

$$t_1 = \frac{(0.567 - 1.53) (116 \times 23) / (116 + 23)}{(116 - 1) 0.565^2 + (23 - 1) 0.98^2 / 166 + 23 - 2} = 6.29$$

't' result	Probability	Interpretation
$t_1 = 6.92$	$P > 0.1\%$	Significantly different
$t_2 = 3.945$	$P > 0.1\%$	"
$t_3 = 3.23$	$0.5\% > P < 0.1$	"
$t_4 = 3.185$	"	"
$t_5 = 1.475$	$20\% > P < 10\%$	Not significantly different
$t_6 = 1.649$	$P = 10\%$	"
$t_7 = 5.169$	$P > 0.1\%$	Significantly different
$t_8 = 1.315$	$20\% > P < 10\%$	Not significantly different
$t_9 = 1.556$	"	"

Appendix I.4d. Statistical discrimination of cylindrical vertical burrows of Skolithos sp? (in sample 201/MU.44386) from Turimetta Head and Skolithos linearis burrows from the Middle Silurian Thorold Formation of Southern Ontario (Pemberton & Frey, 1984), on the basis of distance-to-nearest-neighbour data using the 'student t' test.

I. Parameters of Turimetta Head burrows (from Table 8.3).

Number of distance measurements in the sample group $n = 116$
Mean of distance measurements in the sample group $m = 0.576$
Standard deviation of the sample measurements (n) $S = 0.45$

II. Parameter of Thorold Formation burrows (Pemberton & Frey, 1984, table 4).

Mean of large parent group (M) = (M1 to M9)

Nine data samples are tested using distance-to-nearest-neighbour data.

1. M1 = 1.53
2. M2 = 1.41
3. M3 = 1.02
4. M4 = 1.11
5. M5 = 0.77
6. M6 = 0.79
7. M7 = 1.18
8. M8 = 0.72
9. M9 = 0.76

Student 't' test statistical discrimination equation applied to each Skolithos linearis from Thorold Formation (ST) and Skolithos data from Turimetta (Tur):

Student $t = \frac{n [M - m]}{S}$

Tur vs. ST Student $t = \frac{116 [1.53 - 0.576]}{0.45} = 22.83$

t result	Probability	Interpretation
t1 = 22.83	P>0.2%	Significantly different
t2 = 13.5	"	"
t3 = 10.6	"	"
t4 = 12.8	"	"
t5 = 4.52	"	"
t6 = 5.05	"	"
t7 = 14.34	"	"
t8 = 3.45	"	"
t9 = 4.35	"	"

Appendix I.5. Summary information regarding data samples of burrow form and orientation measured on burrows of the new ich-nogenus Barrenjoeichnus mitchelli at outcrop 1, Barrenjoey Head (GR. 4520,8277, Broken Bay (9130-I-N). Details of burrows form (geometry) and orientation (inclination angle (θ) and azimuth or trend (φ) are tabulated in appendices I.5a - 5y.

appendix No.	Logged Section	Cell/Unit Location	Bounding 'T' lines	Number of burrow counts
1- I.5a	TF1	B1X	T7.5 - T8.0	21
2- I.5b	"	B2X	T8.5 - T11.0	37
3- I.5c	"	B1Y	T7.5 - T8.0	17
4- I.5d	"	B2Y	T8.5 - T11.0	25
5- I.5e	TF2	B1X	T6.5 - T8.0	18
6- I.5f	"	B2X	T8.0 - T11.0	18
7- I.5g	"	B3X	T14.4 - T16.0	18
8- I.5h	"	B1Y	T6.5 - T 8.0	21
9- I.5i	"	B2Y	T8.0 - T11.0	24
10- I.5j	"	B3Y	T14.5 - T16.0	13
11- I.5k	TF3	B1X	T7.5 - T9.5	31
12- I.5l	"	B2X	T13.5 - 16.5	3
13- I.5m	"	B1Y	T7.5 - 9.5	42
14- I.5n	"	B2Y	T12.0 - T16.5	14
15- I.5o	"	B1Z	T7.5 - T9.5	26
16- I.5p	"	B2Z	T13.5 - T16.5	13
17- I.5q	TF4	B1X	T6.5 - T7.5	6
18- I.5r	"	B2X	T7.5 - T8.0	45
		B3X	T8.0 - T11.5	No record
19- I.5s	"	B4X	T11.5 - T12.0	5
20- I.5t	"	B5X	T16.5 - T17.0	14
21- I.5u	"	B1Y	T6.5 - T7.5	7
22- I.5v	"	B2Y	T7.5 - T8.0	38
23- I.5w	"	B3Y	T8.0 - T11.5	11
24- I.5x	"	B4Y	T11.5 - T12.0	7
25- I.5y	"	B5Y	T16.5 - T17.0	8

1. Average thickness of each bedrock

* Most of the energy... length... greenish... 3' x 4'... 6' x 8'... uniform... ing... with...

Appendix I.5a. Burrow inclination angle (θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 1 (cf. Appendix I.5).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	0.90	9.5	75	155	BD, TD
2.	1.05	2.0	76	090	UC
3.	0.95	1.0	81	028	UC
4.	0.78	1.0	64	107	UC
5.	0.66	3.5	65	106	TU
6.	0.52	5.0	75	107	TD
7.	0.66	5.3	78	108	TD
8.	1.24	6.0	85	104	TU
9.	0.98	9.0	78	097	TD
10.	1.19	2.5	66	069	UC
11.	1.18	8.0	74	070	TU
12.	0.95	7.5	85	064	BU, UC
13.	0.85	7.0	83	075	TD
14.	0.88	6.8	82	230	TD
15.	1.09	5.0	75	058	TU
16.	0.57	7.0	V	-	TD
17.	1.09	7.0	74	333	TD
18.	0.97	5.5	V	-	TU
19.	1.08	9.0	78	080	TU, TD
20.	0.67	8.0	72	075	TU
21.	0.40	3.5	79	082	UC

¹ Average diameter (measured at top, middle and lower part of each burrow).

² Most of the burrow lengths measured here constitute the entire length from opening or aperture to terminal end, but some measurements represent partial length due to incomplete exposure.

³ V = 90° (no trend angle)

⁴ Six distinctive burrow forms or geometrics were recorded: (1) uniform cylindrical (UC); (2) branching upward (BU); (3) branching downward (BD); (4) tapering upward (TU); (5) tapering downward (TD); and (6) irregular shape (IR).

Appendix I.5b. Burrow inclination angle (Θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 2 (cf. Appendix I.5).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (Θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	1.12	9.5	V	-	TU
2.	1.0	3.5	V	-	UC
3.	0.6	8.0	80	090	TD
4.	0.96	9.0	80	090	TU
5.	0.92	3.0	85	090	UC
6.	0.95	14.0	82	064	UC
7.	1.2	1.7	V	-	UC
8.	1.68	5.5	86	087	UC
9.	0.6	40.0	86	080	UC
10.	1.04	12.5	V	-	IR
11.	1.3	14.0	86	096	BD, TU(?)
12.	0.93	14.5	V	-	TD
13.	1.08	2.5	85	274	UC
14.	0.7	6.5	79	080	TD
15.	1.86	6.0	79	097	UC
16.	1.18	2.5	V	-	UC
17.	0.97	9.0	74	084	TU
18.	0.56	2.5	V	-	UC
19.	0.93	3.5	80	080	UC
20.	1.1	3.5	70	220	UC
21.	0.88	9.0	75	243	TU
22.	0.46	4.0	72	047	UC
23.	0.57	1.0	V	-	UC
24.	1.20	7.5	74	060	TD(?)
25.	0.75	9.5	81	240	TD
26.	0.9	7.0	V	-	TU(?)
27.	1.07	11.0	81	100	UC
28.	0.65	4.0	73	100	UC
29.	0.84	2.5	V	-	UC
30.	0.49	4.0	51	060	UC
31.	0.77	3.5	V	-	UC
32.	0.52	1.0	V	-	UC
33.	1.21	5.0	V	-	UC
34.	1.14	3.0	V	-	UC
35.	0.7	5.0	V	-	UC
36.	0.7	5.0	V	-	UC
37.	0.7	5.0	V	-	UC

Appendix I.5c. Burrow inclination angle (θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 3 (cf. Appendix I.5).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	1.08	9.5	V	-	TD
2.	1.23	2.5	V	-	UC
3.	0.4	1.0	V	-	UC
4.	0.48	5.5	84	050	TD
5.	1.3	4.0	V	-	UC
6.	0.66	6.0	80	077	UC
7.	0.71	6.0	78	073	UC
8.	1.13	2.5	54	060	TD
9.	0.45	1.5	54	060	UC
10.	1.17	10.0	73	055	TU
11.	0.91	7.0	83	310	UC
12.	0.47	1.0	49	015	UC
13.	0.82	3.0	75	054	UC
14.	0.45	3.5	82	100	UC
15.	1.32	4.0	78	060	UC
16.	0.85	10.0	72	060	TU
17.	0.84	5.0	74	072	TU

Appendix I.5d. Burrow inclination angle (θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 4 (cf. Appendix I.5).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	0.65	9.0	V	-	TU
2.	0.7	8.0	V	-	TD
3.	0.58	3.0	V	-	UC
4.	0.44	1.5	84	055	UC
5.	0.42	1.0	78	055	UC
6.	0.98	6.5	V	-	TD
7.	0.9	5.0	83	063	UC
8.	0.93	7.5	84	074	TD
9.	0.6	4.0	66	065	UC
10.	0.99	15.0	82	075	TD
11.	0.7	4.0	V	-	UC
12.	1.11	5.5	V	-	TD
13.	1.6	10.0	V	-	TD
14.	0.68	13.5	80	070	TU
15.	1.36	6.0	V	-	TU
16.	1.97	7.0	80	050	TU
17.	1.5	2.5	80	050	UC
18.	0.78	2.0	V	-	UC
19.	1.0	6.0	78	057	UC
20.	0.78	9.5	81	248	TD
21.	0.74	6.0	84	055	UC
22.	0.64	2.5	V	-	UC
23.	0.9	3.0	76	070	UC
24.	0.98	10.0	82	250	TU
25.	0.7	3.0	78	074	UC

Appendix I.5e. Burrow inclination angle (θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 5 (cf. Appendix I.5).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	0.78	15.0	V	-	TU
2.	1.45	6.0	70	240	UC
3.	1.23	3.5	V	-	UC(?)
4.	0.83	9.5	69	236	TD
5.	1.23	7.0	80	235	TD(?)
6.	0.38	4.5	80	058	UC
7.	1.22	17.5	-	-	IR
8.	0.52	11.0	-	-	IR
9.	0.48	5.0	75	063	UC(?)
10.	1.05	14.5	78	063	TD
11.	0.9	6.5	V	-	UC
12.	0.87	5.0	V	-	UC
13.	0.96	9.0	75	064	TU
14.	1.23	12.0	V	-	TD(?)
15.	1.33	13.0	V	-	TU
16.	0.82	2.5	V	-	UC(?)
17.	0.64	3.0	V	-	UC(?)
18.	1.19	20.0	80	230	TU

Appendix I.5f. Burrow inclination angle (θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 6 (cf. Appendix I.5).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	0.6	6.0	V	-	TU
2.	0.49	8.0	-	-	IR
3.	0.58	7.0	79	060	TU
4.	0.56	7.5	68	069	TU
5.	0.6	5.5	82	078	TU
6.	0.31	3.0	V	-	UC
7.	0.64	11.5	83	237	TD
8.	1.24	1.0	V	-	UC(?)
9.	0.86	6.5	78	073	TD
10.	0.6	8.0	76	234	UC
11.	0.89	6.0	77	230	TU
12.	1.19	5.0	V	-	TD
13.	1.35	9.0	78	068	TD
14.	0.83	3.0	V	-	UC(?)
15.	0.99	9.0	85	232	TD
16.	0.81	7.5	75	205	TD
17.	1.62	11.0	76	083	TU
18.	1.16	10.0	85	234	TU

Appendix I.5g. Burrow inclination angle (θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 7 (cf. Appendix I.5).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	0.93	11.5	78	046	TD
2.	0.66	3.0	V	-	UC
3.	0.39	3.5	V	-	UC
4.	1.11	11.0	83	200	TD
5.	1.2	14.0	V	-	TD
6.	0.59	2.0	V	-	UC
7.	0.82	10.0	V	-	TU
8.	0.55	3.0	-	-	IR
9.	0.55	2.5	-	-	IR
10.	0.82	1.0	V	-	UC(?)
11.	0.51	1.0	V	-	UC
12.	0.85	1.0	-	-	UC(?)
13.	0.86	1.0	-	-	UC(?)
14.	0.70	1.0	V	-	UC
15.	0.41	2.0	V	-	UC
16.	0.91	3.0	V	-	UC(?)
17.	0.96	1.5	V	-	UC
18.	0.75	2.5	V	-	UC

Appendix I.5h. Burrow inclination angle (Θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 8 (cf. Appendix I.5).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (Θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	0.46	9.0	82	240	TU
2.	1.54	8.0	V	-	TD(?)
3.	0.46	9.0	V	-	TU
4.	1.11	8.0	V	-	TU
5.	0.55	5.5	V	-	UC
6.	0.76	1.0	V	-	UC(?)
7.	0.85	4.5	85	085	UC(?)
8.	1.08	18.0	V	-	TD
9.	0.85	4.5	V	-	UC
10.	0.4	6.0	78	-	TD
11.	0.63	13.0	V	-	TD
12.	0.58	8.0	V	-	TD
13.	0.69	9.0	V	-	UC
14.	0.49	8.0	76	240	TD
15.	1.0	2.0	62	310	UC
16.	1.23	15.0	78	230	UC
17.	1.3	17.5	84	240	TU
18.	1.75	6.0	68	305	IR
19.	0.81	9.0	V	-	UC
20.	0.6	4.0	V	-	UC(?)
21.	0.79	10.0	82	245	TD(?)

23. 0.82 1.10 82
24. 0.9 12.0 81

Appendix I.5i. Burrow inclination angle (Θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 9 (cf. Appendix I.5).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (Θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	1.72	3.3	70	038	UC
2.	1.19	5.0	V	-	UC
3.	0.89	2.0	82	260	UC(?)
4.	0.69	1.0	V	-	?
5.	0.73	2.0	66	070	UC
6.	0.92	2.0	73	345	UC(?)
7.	1.01	4.0	68	074	UC
8.	0.88	2.0	73	303	UC
9.	0.7	3.0	80	110	UC
10.	0.85	1.5	75	092	?
11.	1.28	4.0	V	-	UC
12.	0.6	2.0	66	085	UC
13.	0.42	2.0	V	-	?
14.	1.22	2.0	V	-	UC
15.	0.64	3.0	66	080	UC
16.	0.74	0.5	-	-	?
17.	0.92	1.5	85	256	UC(?)
18.	0.55	2.0	85	256	UC(?)
19.	0.42	3.0	86	245	UC
20.	1.12	3.5	66	080	UC
21.	0.9	1.5	84	243	UC(?)
22.	0.84	1.5	70	080	UC
23.	0.82	11.0	78	090	TD
24	0.9	12.0	81	250	TU

Appendix I.5j. Burrow inclination angle (θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 10 (cf. Appendix I.5).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	0.92	4.0	V	-	UC(?)
2.	0.52	4.0	V	-	UC
3.	0.95	8.0	V	-	TU
4.	0.6	9.0	80	043	TD
5.	0.84	3.0	V	-	UC(?)
6.	0.88	5.5	76	046	TD
7.	0.75	3.5	71	052	UC
8.	0.6	4.0	V	-	UC(?)
9.	1.06	9.0	87	060	TU
10.	0.88	1.5	85	243	UC(?)
11.	0.62	2.5	50	205	UC
12.	0.66	4.0	V	-	BU
13.	0.69	6.5	V	-	TD(?)

Appendix I.5k. Burrow inclination angle (θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 11 (cf. Appendix I.5).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	2.05	4.0	69	275	UC
2.	0.41	2.5	V	-	UC?
3.	1.32	40.0	75	275	TD
4.	0.52	60.0	74	275	TU
5.	1.1	14.0	V	-	TD
6.	1.12	20.0	86	106	BU, TU
7.	0.59	6.0	V	-	UC
8.	0.66	7.0	84	100	TD?
9.	0.85	12.0	80	278	TU
10.	1.03	10.0	80	272	UC
11.	1.17	2.0	V	-	UC?
12.	1.15	3.0	V	-	UC
13.	1.02	10.0	85	100	TD
14.	0.76	10.0	82	255	UC
15.	1.12	10.0	76	275	TU
16.	1.66	16.0	72	258	BD, TD
17.	1.13	7.0	83	098	UC
18.	0.91	4.0	82	260	UC
19.	1.41	9.0	84	268	TU
20.	0.92	9.0	74	265	UC
21.	1.21	3.0	V	-	UC?
22.	0.53	6.0	68	258	TD
23.	0.44	3.0	74	260	UC
24.	0.78	2.0	72	260	?
25.	1.17	5.0	82	263	TD
26.	1.38	4.0	V	-	UC
27.	1.08	5.0	V	-	UC
28.	1.38	13.0	84	260	TD
29.	0.7	4.0	82	267	UC
30.	1.2	7.0	83	260	TD
31.	1.14	9.0	74	256	TU

Appendix I.5l. Burrow inclination angle (θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 12 (cf. Appendix I.5).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	1.24	11.0	-	-	IR
2.	0.89	8.0	85	270	TD
3.	1.32	10.0	83	266	BD, TU

Appendix I.5m. Burrow inclination angle (Θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 13 (cf. Appendix I.5).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (Θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	0.69	10.0	76	270	TD
2.	1.13	12.0	85	097	UC
3.	1.13	14.0	84	262	BU, UC
4.	1.23	11.0	80	276	TU
5.	0.98	7.5	82	278	TD
6.	0.75	7.0	84	276	TD?
7.	1.27	5.0	80	273	UC
8.	1.22	6.0	80	270	TU
9.	0.93	8.0	80	283	TD
10.	1.64	11.0	77	273	TU
11.	0.75	5.0	V	-	UC
12.	1.13	17.0	80	282	BD, UC
13.	0.84	3.0	77	266	UC
14.	1.16	4.0	70	280	UC
15.	1.0	5.0	70	279	UC
16.	0.75	2.0	76	279	UC?
17.	1.11	4.0	65	283	UC
18.	0.9	2.0	72	283	UC?
19.	0.46	6.0	76	290	TU
20.	1.1	2.0	82	280	TU
21.	1.11	11.0	81	099	TU
22.	0.22	5.0	70	280	UC
23.	0.73	2.0	75	276	UC?
24.	1.01	5.0	76	275	TD
25.	1.01	3.0	V	-	UC
26.	0.95	7.0	70	285	TD
27.	1.77	15.0	81	275	TU
28.	0.99	3.0	82	265	UC
29.	0.72	3.0	75	275	UC
30.	0.9	2.0	80	107	UC?
31.	0.9	2.0	80	092	UC?
32.	0.73	5.0	77	286	UC
33.	0.98	8.0	72	280	BD, UC
34.	1.06	3.0	V	-	UC
35.	0.92	2.0	V	-	UC?
36.	0.85	3.0	66	290	UC
37.	1.37	21.0	78	280	BD, TU
38.	0.66	3.0	72	275	UC
39.	0.77	7.0	78	275	UC
40.	0.94	11.0	74	283	TU
41.	0.93	8.0	74	280	BU, UC
42.	1.09	10.0	74	294	UC

Appendix I.5n. Burrow inclination angle (Θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 14 (cf. Appendix I.5).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (Θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	1.14	17.0	82	255	TU
2.	0.8	7.5	80	260	UC
3.	1.45	14.0	86	255	BD, UC
4.	0.36	5.0	84	265	UC
5.	0.91	10.0	64	083	UC
6.	0.82	8.0	66	260	UC
7.	0.88	3.0	V	-	UC?
8.	1.05	6.0	85	242	UC
9.	0.84	16.00	V	-	TU
10.	0.68	3.0	V	-	UC
11.	1.15	7.0	85	260	UC
12.	0.92	12.0	82	268	TU
13.	1.07	14.0	80	262	TU
14.	1.0	6.0	66	286	UC

Appendix I.5o. Burrow inclination angle (Θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 15 (cf. Appendix I.5).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (Θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	1.21	16.0	76	295	TU
2.	0.76	11.0	76	285	TD
3.	0.48	3.0	76	293	UC
4.	1.8	3.0	70	293	UC
5.	0.71	5.0	75	285	UC
6.	0.46	3.0	77	285	UC
7.	0.62	7.0	69	275	TU
8.	0.73	14.0	86	278	TD
9.	0.92	3.0	70	278	UC
10.	0.88	3.0	53	090	UC
11.	0.88	2.0	V	-	UC?
12.	1.22	14.0	76	265	TD
13.	1.08	10.0	80	283	TD
14.	0.64	7.0	73	283	UC
15.	0.51	5.0	73	285	UC
16.	1.38	5.0	V	-	UC
17.	1.25	3.0	72	063	UC
18.	0.61	7.0	80	270	TU
19.	1.07	7.0	84	275	TD
20.	1.1	10.0	V	-	UC
21.	0.73	8.0	75	283	UC
22.	0.75	14.0	80	278	UC
23.	0.93	18.0	75	280	BU, TD
24.	0.88	4.0	56	271	UC
25.	0.87	17.0	75	278	TU
26.	1.32	20.0	70	272	BU, TU

Appendix I.5p. Burrow inclination angle (θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 16 (cf. Appendix I.5).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	1.15	5.0	V	-	UC
2.	0.95	4.0	83	270	UC
3.	1.0	9.0	83	263	TU
4.	1.02	13.0	-	-	IR
5.	0.97	8.0	77	255	TU
6.	1.06	14.0	80	266	TU
7.	1.14	13.0	80	270	TU
8.	0.9	4.0	74	255	UC
9.	0.98	4.0	73	258	UC
10.	0.69	6.0	70	260	TU
11.	1.02	3.0	73	265	UC?
12.	0.9	3.0	70	260	UC?
13.	0.95	10.0	70	270	UC

Appendix I.5q. Burrow inclination angle (Θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 17 (cf. Appendix I.5).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (Θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	1.24	8.0	66	110	TD
2.	0.88	6.0	80	100	TU
3.	0.72	6.0	V	-	TU
4.	0.64	15.0	83	106	BD, TD
5.	0.68	3.5	78	110	UC?
6.	0.71	4.5	86	110	TD

Appendix I.5r. Burrow inclination angle (Θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 18 (cf. Appendix I.5).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (Θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	1.42	10.0	78	100	UC
2.	0.65	4.0	70	100	UC
3.	0.76	5.5	78	100	UC
4.	0.73	7.0	V	-	UC
5.	0.33	16.0	79	098	TD?
6.	0.92	7.0	69	095	UC
7.	1.14	10.0	79	100	TD
8.	0.75	1.0	V	-	UC?
9.	1.0	15.0	80	090	TU
10.	1.17	19.0	85	265	TD
11.	0.65	4.0	V	-	UC
12.	1.05	7.0	63	084	UC
13.	1.28	11.0	84	092	TD
14.	1.11	7.5	-	-	IR
15.	0.77	3.0	75	086	UC
16.	2.06	1.0	V	-	?
17.	0.92	6.0	75	098	UC
18.	0.76	3.0	V	-	UC
19.	0.7	3.0	80	100	UC
20.	1.1	3.0	V	-	UC
21.	1.24	4.0	87	266	UC
22.	0.81	2.0	75	084	UC?
23.	1.38	3.0	82	075	UC
24.	0.89	3.0	82	084	UC
25.	0.91	4.0	82	090	UC
26.	0.72	2.0	76	095	UC?
27.	1.21	8.0	76	100	TU
28.	0.72	7.0	76	090	UC
29.	0.6	6.0	80	090	TU
30.	0.8	9.0	81	094	TU
31.	1.5	17.0	86	246	TD
32.	0.81	7.0	80	108	TU
33.	1.06	15.0	80	095	TD
34.	1.15	12.0	80	103	TU
35.	1.04	1.4	84	085	BD, TD
36.	0.52	7.0	74	095	TU
37.	1.03	4.0	84	085	UC
38.	1.35	14.0	84	080	TU
39.	1.03	10.0	84	085	TD
40.	0.89	6.0	80	078	TU
41.	1.03	10.0	80	120	TU
42.	0.87	13.0	80	115	UC
43.	1.12	13.0	80	105	UC
44.	0.59	11.0	86	270	UC
45.	1.45	13.0	80	093	UC

Appendix I.5s. Burrow inclination angle (θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 19 (cf. Appendix I.5).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	0.53	9.0	78	088	TD
2.	0.74	12.0	82	095	UC
3.	0.83	10.0	80	098	UC
4.	0.67	7.0	70	100	TD
5.	0.61	5.0	78	098	TD

Appendix I.5t. Burrow inclination angle (θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 20 (cf. Appendix I.5).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	0.62	2.0	V	-	UC
2.	1.0	0.5	-	-	?
3.	0.95	3.0	V	-	UC
4.	0.8	2.0	82	088	UC?
5.	0.55	2.0	85	083	UC
6.	0.85	8.0	V	-	TU?
7.	0.63	5.0	V	-	UC
8.	0.82	1.0	85	098	?
9.	0.87	2.0	75	088	UC?
10.	0.68	2.0	75	075	UC?
11.	0.93	5.0	85	080	UC
12.	0.65	3.0	68	100	UC
13.	0.76	2.0	80	105	UC?
14.	1.0	9.0	V	-	TU

Appendix I.5u. Burrow inclination angle (Θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 21 (cf. Appendix I.5).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (Θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	0.95	3.0	V	-	UC
2.	1.04	1.0	85	255	?
3.	1.21	1.0	V	-	?
4.	1.38	8.0	V	-	UC
5.	1.19	10.0	80	080	UC
6.	0.75	8.0	78	090	UC
7.	0.67	7.0	78	090	UC

Appendix I.5v. Burrow inclination angle (θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 22 (cf. Appendix I.5).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	1.21	20.0	78	075	TU
2.	0.99	20.0	86	078	UC
3.	1.05	4.5	77	087	UC
4.	0.77	5.5	88	252	UC
5.	2.19	10.0	87	256	TU?
6.	1.02	4.0	V	-	UC
7.	1.25	10.0	85	087	TD
8.	0.76	7.0	88	262	UC
9.	0.95	11.0	V	-	TD
10.	1.1	3.0	73	282	UC
11.	1.55	3.0	78	268	UC
12.	0.81	6.0	75	075	TD
13.	0.8	5.0	88	097	UC
14.	1.35	8.0	80	075	TU
15.	1.16	8.0	69	305	BD, TU
16.	1.19	7.0	86	085	BU, TU
17.	0.99	12.0	85	085	TU
18.	1.32	3.0	72	327	UC
19.	0.52	3.0	85	100	UC
20.	0.5	2.0	V	-	UC?
21.	0.52	2.0	65	085	UC?
22.	0.93	3.0	75	090	UC
23.	0.95	2.5	V	-	UC?
24.	0.8	10.0	V	-	TD
25.	1.0	13.0	V	-	TD
26.	0.67	9.0	83	268	TD
27.	0.85	1.0	-	-	?
28.	0.52	2.0	V	-	UC?
29.	1.67	8.0	V	-	TU
30.	0.74	3.0	V	-	UC?
31.	1.39	10.0	85	080	TD
32.	0.62	1.0	-	-	?
33.	0.54	4.0	84	100	TD
34.	0.67	10.0	78	092	TU
35.	1.05	6.0	V	-	TU
36.	1.01	7.0	82	095	UC
37.	1.12	3.0	84	085	UC
38.	0.97	8.5	V	-	TD

Appendix I.5w. Burrow inclination angle (θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 23 (cf. Appendix I.5).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	1.38	10.0	88	280	TU
2.	1.2	23.0	84	083	UC
3.	0.78	16.0	82	092	BU, UC
4.	1.32	13.0	74	090	TU
5.	0.9	14.0	83	092	BU, TU
6.	1.07	20.0	88	080	TD
7.	1.07	10.0	V	-	TU
8.	0.65	5.0	V	-	UC
9.	0.7	5.0	V	-	UC
10.	0.64	6.0	V	-	UC
11.	1.55	15.0	88	260	TD

Appendix I.5x. Burrow inclination angle (θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 24 (cf. Appendix I.5).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	0.64	9.0	84	085	UC
2.	0.72	2.0	80	076	UC?
3.	0.93	4.5	V	-	UC
4.	0.81	10.0	83	083	TU
5.	0.88	5.0	V	-	UC
6.	0.59	10.0	V	-	TD
7.	0.5	2.0	V	-	UC?

Appendix I.5y. Burrow inclination angle (θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 25 (cf. Appendix I.5).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	0.75	8.0	88	250	UC
2.	1.03	5.0	85	070	UC
3.	0.7	4.0	V	-	UC
4.	0.73	5.0	78	245	UC
5.	0.65	4.0	80	060	UC
6.	0.73	4.0	76	055	UC
7.	1.03	1.0	-	-	?
8.	0.64	1.0	-	-	?

Appendix I.6. Summary information regarding data samples of burrow form and orientation measured on burrows of the new ich-nogenus Barrenjoeichnus mitchelli at outcrop 2, Barrenjoey Head, (GR.4502,8275, Broken Bay (9130-I-N). Details of burrow form (geometry) and orientation (inclination angle (Θ) and azimuth or trend angle (ϕ)) are tabulated in Appendix I.6a - 6f.

Appendix No.	Logged Section	Cell/Unit Location	Bounding 'T' lines	Number of burrow counts
1- I.6a	TF1	B1X	T0 - T1	14
2- I.6b	"	B2X	T1 - T2	12
3- I.6c	"	B3X - B4X	T2 - T4	11
4- I.6d	"	B1Y	T0 - T1	9
5- I.6e	"	B2Y	T1 - T2	7
6- I.6f	"	B3Y - B4Y	T2 - T4	3

Appendix I.6a. Burrow inclination angle (Θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 1 (cf. Appendix I.6).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (Θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	0.88	4.0	62	105	UC
2.	0.83	2.0	70	120	UC?
3.	0.7	2.0	80	120	UC?
4.	0.92	2.0	V	-	UC?
5.	1.1	3.0	73	110	UC
6.	1.02	3.5	82	287	UC
7.	1.2	4.0	65	115	BD, UC
8.	1.41	4.0	67	115	UC
9.	0.88	3.0	70	125	UC
10.	0.57	4.5	V	-	UC
11.	0.92	2.0	67	130	UC?
12.	1.5	2.5	V	-	UC
13.	0.92	5.5	V	-	UC
14.	0.92	3.5	85	280	UC

¹ Average diameter (measured at top, middle and lower part of each burrow).

² Most of the burrow lengths measured here constitute the entire length from opening or aperture to terminal end, but some measurements represent partial length due to incomplete exposure.

³ V = 90° (no trend angle)

⁴ Six distinctive burrow forms or geometrics were recorded: (1) uniform cylindrical (UC); (2) branching upward (BU); (3) branching downward (BD); (4) tapering upward (TU); (5) tapering downward (TD); and (6) irregular shape (IR).

Appendix I.6b. Burrow inclination angle (Θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 2 (cf. Appendix I.6).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (Θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	0.66	2.0	75	115	?
2.	1.02	5.0	V	-	UC
3.	1.11	6.0	74	100	UC
4.	1.0	2.0	V	-	UC?
5.	0.97	2.0	75	110	UC?
6.	0.72	2.5	69	110	UC
7.	0.97	2.0	64	108	UC?
8.	0.61	2.0	80	290	UC
9.	0.81	4.0	80	275	TD
10.	0.8	4.0	76	108	UC
11.	1.36	3.0	64	108	UC
12.	0.98	2.0	80	270	UC?

Appendix I.6c. Burrow inclination angle (Θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 3 (cf. Appendix I.6).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (Θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	1.02	4.0	67	130	TD
2.	0.75	3.0	64	130	UC
3.	1.1	6.0	82	100	UC
4.	1.03	6.0	79	145	UC
5.	1.2	3.0	60	135	UC
6.	0.8	8.0	72	135	UC
7.	0.82	13.0	82	133	TD
8.	0.88	5.0	84	130	UC
9.	1.13	2.5	75	140	UC
10.	0.9	3.0	70	120	UC
11.	0.75	3.0	73	123	UC

Appendix I.6d. Burrow inclination angle (θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 4 (cf. Appendix I.6).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	1.09	5.0	78	110	TD
2.	0.77	2.0	V	-	UC?
3.	0.82	6.0	70	270	TU
4.	1.03	7.0	V	-	TD
5.	0.94	5.0	80	100	UC
6.	1.05	4.0	V	-	BU, TU
7.	1.84	12.0	75	110	UC
8.	0.77	3.0	78	108	UC
9.	1.15	6.0	V	-	UC

Appendix I.6e. Burrow inclination angle (θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 5 (cf. Appendix I.6).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	1.09	9.0	84	145	TU
2.	1.15	8.0	83	300	TU
3.	1.33	7.5	82	110	TD
4.	0.97	7.0	78	112	UC
5.	1.14	7.0	V	-	TA
6.	1.53	8.0	83	275	UC
7.	1.06	9.0	76	260	UC

Appendix I.6f. Burrow inclination angle (θ), azimuth or trend (ϕ), and burrow geometry recorded for burrows of Barrenjoeichnus mitchelli in data sample 6 (cf. Appendix I.6).

No.	Diameter ¹ (cm)	Length ² (cm)	Dip ³ angle (θ) degrees	Trend angle (ϕ) degrees	Morphological Characteristics ⁴
1.	1.14	9.0	V	-	TD
2.	0.68	5.0	83	120	TD
3.	0.9	5.0	80	114	TU

Appendix I.7. Azimuths of burrow bifurcation/branching from main burrow in *Barrenioeichnus mitchelli* at outcrop 1 Barrenjoey Head (GR. 4520,8277 Broken bay (9130-I-N)) between sections TF1 and TF4 (T7.5 - T12.0).

No.	Diameter (cm) Main Branch burrow/stem		Length ¹ (L)	Azimuth of Branching U - upward D - downward (degrees)		Branching angles ² from main stem	Location of burrow open- ing with ref- erence to 'T' lines ³	Remarks
1.	0.87	0.53	-	288	(U)	-	T7.5	-
2.	0.94	0.59	-	135	(U)	-	"	-
3.	-	-	-	140	(U)	-	"	J-shaped
4.	0.98	0.62	-	145	(D)	-	"	-
5.	1.04	0.70	-	137	(U)	-	"	-
6.	1.77	0.80	-	094	(D)	-	"	-
1.	1.21	0.75	-	085	(D)	-	T8.0	-
2.	1.10	0.80	-	082	(U)	-	"	-
3.	1.30	0.80	-	132	(U)	-	"	-
4.	0.87	0.80	-	273	(U)	-	"	-
5.	0.99	0.95	-	099	(U)	-	"	-
6.	1.44	1.35	-	110	(U)	-	"	-
7.	1.69	1.02	-	310	(U)	-	"	-
8.	1.15	1.05	-	125	(U)	-	"	-
9.	1.74	0.88	-	115	(U)	-	"	-
10.	1.42	1.06	-	275	(U)	-	"	-
11.	0.96	0.88	-	290	(U)	-	"	-
12.	1.03	0.87	-	100	(U)	-	"	-
13.	1.12	0.56	-	290	(U)	-	"	-
14.	1.22	0.89	-	068	(D)	-	"	-
15.	1.20	0.80	-	075	(U)	-	"	-
16.	1.32	0.77	-	267	(U)	-	"	-
17.	1.55	0.97	-	297	(U)	-	"	-
18.	1.20	0.80	-	086	(D)	-	"	-
19.	1.20	0.92	-	095	(U)	-	"	-
20.	1.09	0.64	-	300	(U)	-	"	-
21.	1.42	0.78	-	080	(U)	-	"	-
1.	-	-	-	090	(U)	-	T11.0	U-shaped
2.	0.73	0.75	-	270	(U)	-	"	-
3.	1.69	1.42	-	108	(U)	-	"	-
4.	1.60	1.03	-	290	(U)	-	"	-
5.	1.35	1.20	-	320	(D)	-	"	-
1.	1.52	1.02	-	320	(D)	-	T11.5	-
2.	1.58	1.18	-	230	(D)	-	"	-
3.	1.18	0.80	-	230	(U)	-	"	-
4.	1.28	1.16	-	098	(D)	-	"	-
1.	0.84	0.62	-	270	(U)	-	T12.0	-
2.	0.80	0.62	-	288	(U)	-	"	-

¹ 'L', Length of the branch (normally only partly exposed, not recommended for measurement).

² Angle between main burrow and branch (normally angles are less than 45° and are variable, not recommended for measurement).

³ 'T' lines where diameter of burrows' openings are measured; measurements of branches or bifurcations are normally taken below these lines.

APPENDIX I.8. List of trace fossils present in the study area with interpretation in terms of their ethology, trophic level, ichnofacies and also their possible producer(s). (Body fossils and plant fossils are also listed here for completion).

STUDIED TRACE FOSSILS AND BODY FOSSILS.	ETHOLOGY	TROPHIC GROUP (feeding group)	PRODUCER(S)	ICHNOFACIES CODES ¹
<u>Agrichnium</u> sp.....	Agrichnia/pasichnia.....	Suspension/deposit.....?	_____	1,6
<u>Arenicolites</u> sp.....	Fodichnia.....	Deposit.....	Worms. _____	5
<u>Asteriacites</u> sp?.....	Cubichnia.....	Suspension.....	Starfish. _____	1,6,7
<u>Barrenjoeichnus mitchelli</u> ichno. gen. sp. nov.....	Fodichnia/domichnia.....	Suspension/deposit.....	Worms. _____	4,5
<u>Beaconites antarcticus</u>	Domichnia/fodichnia.....	Deposit.....	Crustacean/lung-fish. _____	1,5
<u>Bifungites</u>	Domichnia.....	Deposit/suspension.....	Worms. _____	4,5
<u>Brookvalichnus obliquus</u>	Domichnia/fodichnia?.....	Suspension?/deposit.....	Worm/insect larva. _____	1
<u>Chondrites</u> spp.....	Fodinichnia.....	Deposit.....	Worms. _____	5,6,7,8
Type. A (horizontal, angular).....	".....	".....	".....	"
var. 1 (dense, uniform size).....	".....	".....	".....	"
var. 2 (non-uniform size).....	".....	".....	".....	"
var. 3 (regular, uniform size).....	".....	".....	".....	"
Type. B (oblique, radial).....	".....	".....	".....	"
Type. C (oblique, asymmetrical).....	".....	".....	".....	"
var. 1 (widely spaced).....	".....	".....	".....	"
<u>Colichnites howardi</u> ichno. gen. sp. nov.....	Repichnia.....	Deposit?.....	Worms. _____	1,4,5
Collapse-structures.				
Decapod crustacean fossil.				
<u>Diplocraterion parallelum</u>	Domichnia.....	Suspension.....	Worms/crustacean. _____	4,5
<u>D. vovo</u>	".....	".....	".....	"
<u>D. polyupsilon</u>	".....	".....	".....	4,5,6
<u>D. polyupsilon</u> var. <u>polyupsilon</u>	".....	".....	".....	"
<u>D. polyupsilon</u> var. <u>corophioides</u>	".....	".....	".....	"
Escape-structures.....	Fugichnia.....	Suspension.....	Bivalve & crustacean/ fish. _____	5,6
Type. A. (bivalves)				
<u>Adeiaichnus</u> ichno. gen. nov.....	".....	".....	Bivalve (mollusc). _____	"
var. 1 (normal escape), <u>A. kykleomotatus</u> ichno. sp. nov.....	".....	".....	".....	"
var. 2 (rapid escape), <u>A. alyxis</u> ichno. sp. nov.....	".....	".....	".....	"
Type. B. (crustacean/fish)				
<u>Hannibalichnus amplius</u> ichno. gen. sp. nov.....	".....	Deposit/suspension.....	Crustacean/fish. _____	1,5,6
Flask-shaped structures (produced by bivalve).....	Domichnia/fugichnia.....	Suspension.....	Bivalve (mollusc). _____	4,5
<u>Fuersichnus communis</u> ?.....	Fodinichnia.....	Deposit.....	Worms. _____	1
<u>Imbrichnus</u> sp.....	Repichnia.....	Suspension.....	Bivalve (mollusc). _____	1,5,6
J-shaped structures.....	Domichnia.....	Suspension.....	Crustacean/bivalve? _____	4,5
L-shaped structures.....	".....	".....	".....	"
Microfossils.				
A. Palynoflora (spores and pollen).				
B. Acritarchs.				
<u>Ophiomorpha nodosa</u>	Domichnia.....	Suspension/deposit.....	Crustacean. _____	1,5
Type. A (individual, vertical).....	".....	".....	".....	"
Type. B (networks, horizontal).....	".....	".....	".....	"
Type. C (Type A with turn-around).....	".....	".....	".....	"

STUDIED TRACE FOSSILS AND BODY FOSSILS.	ETHOLOGY	TROPHIC GROUP (feeding group)	PRODUCER(S)	ICHOFAECIES CODES ¹
<u>Palaeophycus alternatus</u>	Domichnia.....	Carnivore.....	Worms.....	1, 4-8
<u>P. striatus</u>	".....	".....	".....	"
<u>P. sulcatus</u>	Domichnia.....	Carnivore.....	Worms.....	"
<u>P. tubularis</u>	".....	".....	".....	"
Pelecypod (body fossil).				
Category A. Para-autchothonous.				
Category B. Autchothonous.				
<u>Pelecypodichnus (=Lockeia)</u>	Cubichnia.....	Suspension.....	Bivalve (mollusc).....	4, 5, 6
Pellets.				
Type. A (faecal).....	Excretion.....		Worms/crustacean.....	3, 4, 5, 6
Type. B (feeding).....	Fodinichnia.....	Deposit.....	Crustacean.....	"
Type. C (excavation).....	Excavation.....	Deposit.....	Crustacean.....	"
Type. D (Fe ooids).				
<u>Phycodes bischoffi</u> ichno. sp. nov.....	Fodinichnia.....	Deposit.....	Worms.....	1, 5, 6
<u>Planolites beverlyensis</u>	Fodinichnia.....	Deposit.....	Worms.....	1, 4-8
<u>P. montanus</u>	".....	".....	".....	"
Plant remains.				
Large leaf impressions.				
Small plant? stems				
Tree trunk (carbonised).				
<u>Pytiniichnus trifurcatum</u> ichno. gen. sp. nov.....	Domichnia.....	Carnivorous/herbivorous.....	Reptile/amphibian.....	1
Resting traces.				
<u>Rusophycus?</u>	Cubichnia.....	Deposit/suspension.....	Arthropod.....	1, 6, 7
Resting trace-like structures.....	".....	".....	".....	"
<u>Rhizocorallium jenense</u>	Domichnia.....	Suspension.....	Crustaceans/worms?.....	4, 5, 6
<u>R. jenense</u> var. <u>jenense</u>	".....	".....	".....	"
<u>R. jenense</u> var. <u>retrosus</u>	".....	".....	".....	"
<u>Rhizocorallium irregulare</u>	Fodinichnia/domichnia.....	Deposit.....	".....	"
<u>R. irregulare</u> var. <u>irregulare</u>	".....	".....	".....	"
<u>R. irregulare</u> var. <u>bifurcatum</u>	".....	".....	".....	"
<u>R. irregulare</u> var. <u>nexus</u>	".....	".....	".....	"
<u>Rhizocorallium uliarene</u>	".....	".....	".....	"
<u>R. uliarene</u> var. <u>planuspirus</u>	".....	".....	".....	"
Ring-structures.				
Type. A (rings without column).....	Domichnia/fodinichnia.....	Suspension/deposit.....	Worms.....	1, 4-7
Type. B (rings with column).....	".....	".....	".....	"
Type. C (numerous rings with column).....	".....	".....	".....	"
Type. D (Large ringed-structure).....	?	?	?	?
Roots and rootlets penetration structures.				
Rhizoliths.				
Type A. Root-mould.....	Fodinichnia.....	Deposit.....	Plants.....	1, 2, 4, 5, 6
Type B. Root-tubules.....	".....	".....	".....	"
Type C. Root-cast.....	".....	".....	".....	"
Type D. Rhizoconcretion.....	".....	".....	".....	"
Roots and rootlets petrification structures (Type E).				
<u>Scalarituba</u> sp.....	Fodinichnia/domichnia.....	Deposit.....	Worms.....	1, 5, 6
<u>Scoyenia gracilis</u>	Domichnia/fodinichnia.....	Deposit.....	Worms?.....	1

STUDIED TRACE FOSSILS AND BODY FOSSILS.	ETHOLOGY	TROPHIC GROUP (feeding group)	PRODUCER(S)	ICHTNOFACIES CODES ¹
Scribbling grazing traces.....	Pasichnia.....	Deposit.....	Worms?.....	1, 6, 7
<i>Skolithos verticalis</i>	Domichnia.....	Suspension.....	Worms.....	1, 4-6
<i>S. linearis</i>	".....	".....	".....	"
<i>S. monocraterion</i>	".....	".....	".....	"
<i>S. tigillites</i>	".....	".....	".....	"
<i>S. annulatus</i>	".....	".....	".....	"
<i>Skolithos</i> sp.....	".....	".....	".....	"
<i>Spongeliomorpha</i> (Type C).....	Domichnia.....	Deposit.....	Crustaceans.....	1, 5, 6
Star-shaped traces.				
<i>Helikospirichnus veeversi</i> ichno. gen. sp. nov.....	Fodinichnia.....	Deposit.....	Worms/Bivalves.....	1, 6, 7
Straight horizontal filled burrows.....	Fodinichnia.....	Depsoit.....	Worms?.....	"
Stuffed burrows.....	Domichnia.....	Suspension.....	?.....	3, 4, 5
<i>Thalassinoides suevicus</i> (Type A).....	Domichnia.....	Deposit.....	Crustaceans.....	1, 5, 6
<i>T. paradoxicus</i> (Type B).....	".....	".....	".....	"
Thalassinid Turn-around.....	".....	".....	".....	"
Type. A (for an individual animal).....	".....	".....	".....	"
var. 1 (cylindrical).....	".....	".....	".....	"
var. 2 (Y- or V- shaped).....	".....	".....	".....	"
Type. B (for a colony of animal).....	".....	".....	".....	"
var. 1 (irregular-shaped).....	".....	".....	".....	"
var. 2 (Y-shaped).....	".....	".....	".....	"
Track marks.				
Type. A1 (with unweb-feet).....	Repichnia.....	Carnivore/Herbivore.....	Amphibian.....	1, 4, 5
Type. A2 (with web-feet).....	".....	".....	".....	"
Type. B (small reptile), <i>Moodieichnus</i>	Repichnia.....	Herbivore/carnivore.....	Reptile.....	"
Species 1. <i>M. didactylus</i>	".....	".....	".....	"
Var. 1 <i>M. didactylus</i> var. <i>permiansis</i>	".....	".....	".....	"
Var. 2 <i>M. didactylus</i> var. <i>triassicus</i>	".....	".....	".....	"
Species 2. <i>M. tridactylus</i> ichno. sp. nov.....	".....	".....	".....	"
<i>Turimettichnus conaghani</i> ichno. gen. sp. nov.....	Domichnia.....	Suspension/deposit.....	Crustacean.....	4, 5
1. <i>T. conaghani</i> var. A.....	".....	".....	".....	"
2. <i>T. conaghani</i> var. B.....	".....	".....	".....	"
3. <i>T. conaghani</i> var. C.....	".....	".....	".....	"
<i>T. webbyi</i> ichno. gen. sp. nov.....	Domichnia.....	".....	?.....	"
Unclassified structures.				
1. Small bean-shaped structures.....	Cubichnia.....	Suspension?.....	Bivalve?.....	?
2. Networks systems.....	Dwelling.....	Deposit.....	Crustacean?.....	6?

¹ ICHNOFACIES CODES

1. SCOYENIA
2. TEREDOLITES
3. TRYPANITES
4. GLOSSIFUNGITES
5. SKOLITHOS
6. CRUZIANA
7. ZOOPHYCOS
8. NEREITES