

JOHN R. NUDDS

AN ILLUSTRATED KEY TO THE BRITISH LITHOSTROTIONID CORALS

NUDDS, J. R.: An illustrated key to the British lithostrotionid corals. *Acta Palaeont. Polonica*, 25, 3/4, 385-394, January 1981.

The key is a guide to the identification of the 28 British species of the Lower Carboniferous coral family Lithostrotonidae. Each species is illustrated diagrammatically, emphasizing those features which distinguish it from comparable forms. The stratigraphical ranges of these species through the Lower Carboniferous are shown in tabular form.

Key words: corals, Rugosa, Lithostrotonidae, Lower Carboniferous, Great Britain, identification key.

John R. Nudds, Trinity College, Dublin, Ireland. Received: September 1979.

INTRODUCTION

In Great Britain the lithostrotionid rugose corals constitute one of the most common and most recognisable fossil groups of the Carboniferous period and most students of Carboniferous palaeontology and stratigraphy are familiar with them to a certain extent. The purpose of this key is to enable these specialists to make an actual specific identification of the members of this group and then, by using the stratigraphical range chart (table 1, this paper), to attempt some sort of age determination. It is envisaged that the key will be of use first to the numerous field surveyors and stratigraphers of Carboniferous rocks in Great Britain whose samples commonly include these corals and secondly to those specialists of Carboniferous Rugosa outside Great Britain who may have an intimate knowledge of lithostrotonids from their own country, but who may lack comparative material from Great Britain.

The key proceeds by presenting a number of contrasted statements each of which leads to a further set of alternative and eventually to a specific identification. It should be noted that directions of 'keying-out' do not indicate in any way the lines of descent within the group.

Unnecessary jargon has been avoided wherever possible and measurements, where given, are usually self-explanatory. It should be noted, however, that where counts of septal number are quoted these are inter-colony ranges of *maximum* septa and are not means or intra-colony ranges. (It will be seen that this does not apply to the diphyphylloid (non-columellate) group of *Lithostrotion* owing to difficulties in separating species of this group using maximum counts).

Table 1

Stratigraphical occurrence of the lithostrotionid species in Great Britain through the regional stages of the Viséan

	V I S É A N							
	CHADIAN	EARLY ARUNDIAN	LATE ARUNDIAN	HOLKERIAN	EARLY ASBIAN	LATE ASBIAN	EARLY BRIGANTIAN	LATE BRIGANTIAN
<i>L. junceum</i> (Fleming, 1828)					•	•	•	•
<i>L. pauciradiale</i> (M ^c Coy, 1844)					•	•	•	•
<i>L. irregularare</i> (Phillips, 1836)					•	•	•	•
<i>L. sp. n. A</i>			•	•	•	•	•	•
<i>L. martini</i> Milne Edwards et Haime, 1851		•	•	•	•	•	•	•
<i>L. sociale</i> (Phillips, 1836)			•	•	•	•	•	•
<i>L. sp. n. B</i>						•		
<i>L. affine</i> (Fleming, 1828)							•	
<i>L. edmondsi</i> (Smith, 1928)							•	
<i>L. gracile</i> (M ^c Coy, 1851)							•	•
<i>L. fasciculatum</i> (Fleming, 1828)							•	•
<i>L. furcatum</i> (Thomson, 1887)							•	•
<i>L. concinnum</i> (Lonsdale, 1845)							•	•
<i>L. maccoyanum</i> Milne Edwards et Haime, 1851					•	•	•	•
<i>L. decipiens</i> (M ^c Coy, 1849)					•	•	•	•
<i>L. vorticale</i> (Parkinson, 1808)				•	•	•	•	•
<i>L. araneum</i> (M ^c Coy, 1844)				•	•	•	•	•
Gen. n. <i>matura</i> (Hudson, 1929)					•			
Gen. n. <i>magna</i> (Kato et Mitchell, 1970)							•	
<i>O. ensifer</i> (Milne Edwards et Haime, 1851)							•	
<i>O. phillipsi</i> (M ^c Coy, 1849)							•	
<i>O. tuberosa</i> (M ^c Coy, 1849)							•	
<i>O. placenta</i> (M ^c Coy, 1849)							•	
<i>O. garwoodi</i> Hudson, 1929							•	
<i>O. sera</i> Hudson, 1929							•	
<i>O. indivisa</i> Hudson, 1926							•	
<i>O. edmondsi</i> Hudson, 1929							•	
<i>O. rete</i> Hudson, 1929							•	

L. = *Lithostrotion*, *O.* = *Orionastrea*.

Clearly a key of this nature cannot be expected to describe all of the characters common to a particular species, but merely those which are required to distinguish it from its closest allies. Complete descriptions, together with the results of a full systematic revision of the British representatives of this family are at present being prepared for publication by the author.

KEY

- | | |
|-------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| 1. Corallum fasciculate | 2 |
| Corallum massive | 13 |
| 2. Columella present [columellate fasciculate group of <i>Lithostrotion</i>] | 3 |
| Columella absent (axis empty or with weak axial column) | 9 |
| 3. Dissepiments absent | <i>Lithostrotion junceum</i> (fig. 1a) |
| Dissepiments present | 4 |
| 4. Dissepiments in a single row | 5 |
| Dissepiments in many rows (> 1) | 6 |
| 5. 17—19 septa of both orders | <i>Lithostrotion pauciradiale</i> (fig. 1b) |
| 20—26 septa of both orders | <i>Lithostrotion irregulare</i> (fig. 1c) |
| 6. 20—26 septa of both orders | <i>Lithostrotion</i> sp.n. A (fig. 1d) |
| 27—28 septa of both orders | <i>Lithostrotion martini</i> (fig. 1e) |
| 29—36 septa of both orders | 7 |
| 7. Increase by lateral budding only | 8 |
| Increase by lateral and calicular budding | <i>Lithostrotion affine</i> (fig. 2a) |
| 8. Tabularium diameter about 8 mm | <i>Lithostrotion sociale</i> (fig. 1f) |
| Tabularium diameter about 12 mm | <i>Lithostrotion</i> sp.n. B (fig. 1g) |
| 9. Axis empty ['diphyphylloid' group of <i>Lithostrotion</i>] | 10 |
| Weak axial column | <i>Lithostrotion edmondsi</i> (fig. 2b) |
| 10. Dissepiments in a single row | 11 |
| Dissepiments in many rows (> 1) | 12 |
| 11. Majority of corallites with < 20 septa | <i>Lithostrotion gracile</i> (fig. 2c) |
| Majority of corallites with > 20 septa | <i>Lithostrotion fasciculatum</i> (fig. 2d) |
| 12. Majority of corallites with < 26 septa | <i>Lithostrotion furcatum</i> (fig. 2e) |
| Majority of corallites with > 26 septa | <i>Lithostrotion concinnum</i> (fig. 2f) |
| 13. Corallum cerioid (epitheca separating adjacent corallites) [cerioid group of <i>Lithostrotion</i>] | 14 |
| Little or no epitheca separating adjacent corallites | 15 |

14. 12—14 septa of both orders, tabularium diameter about 1.5 mm	<i>Lithostrotion maccoyanum</i> (fig. 3a)	
14—18 septa of both orders, tabularium diameter about 2.5 mm	<i>Lithostrotion decipiens</i> (fig. 3b)	
20—24 septa of both orders, tabularium diameter about 4.25 mm	<i>Lithostrotion vorticale</i> (fig. 3c)	
26—28 septa of both orders, tabularium diameter about 6 mm	<i>Lithostrotion araneum</i> (fig. 3d)	
15. Corallum astraeoid/thamnastraeoid (septa continuous between corallites)		16
Septa not continuous between corallites		23
16. Large corallites (> 20 septa of both orders) [Gen.n. A]		17
Small corallites (< 20 septa of both orders) [<i>Orionastraea</i>]		18
17. Traces of epitheca between corallites, columella present	Gen.n. A <i>matura</i> (fig. 3e)	
Epitheca absent, columella absent	Gen.n. A <i>magna</i> (fig. 3f)	
18. 15—18 septa of both orders		19
10—14 septa of both orders		21
19. Traces of epitheca between corallites, columella present	<i>Orionastraea ensifer</i> (fig. 4a)	
Epitheca absent		20
20. Columella present	<i>Orionastraea phillipsi</i> (fig. 4b)	
Columella absent	<i>Orionastraea tuberosa</i> (fig. 4c)	
21. Primary dissepiments concave, no secondary dissepiments	<i>Orionastraea placenta</i> (fig. 4d)	
Primary dissepiments convex, secondary dissepiments present		22
22. Secondary dissepiments occur on the primary dissepiments	<i>Orionastraea garwoodi</i> (fig. 5a)	
Secondary dissepiments occur on the sides of the septa	<i>Orionastraea sera</i> (fig. 5b)	
23. Corallum aphroid (septa retreated peripherally)		24
Corallum indivisoid (septa absent altogether)	<i>Orionastraea indivisa</i> (fig. 5c)	
24. 15—18 septa of both orders	<i>Orionastraea edmondsi</i> (fig. 5d)	
10—14 septa of both orders	<i>Orionastraea rete</i> (fig. 5e)	

Acknowledgements.—I am extremely grateful to Trinity College Dublin Trust for financially supporting my attendance at the Warsaw symposium during which this paper was presented.

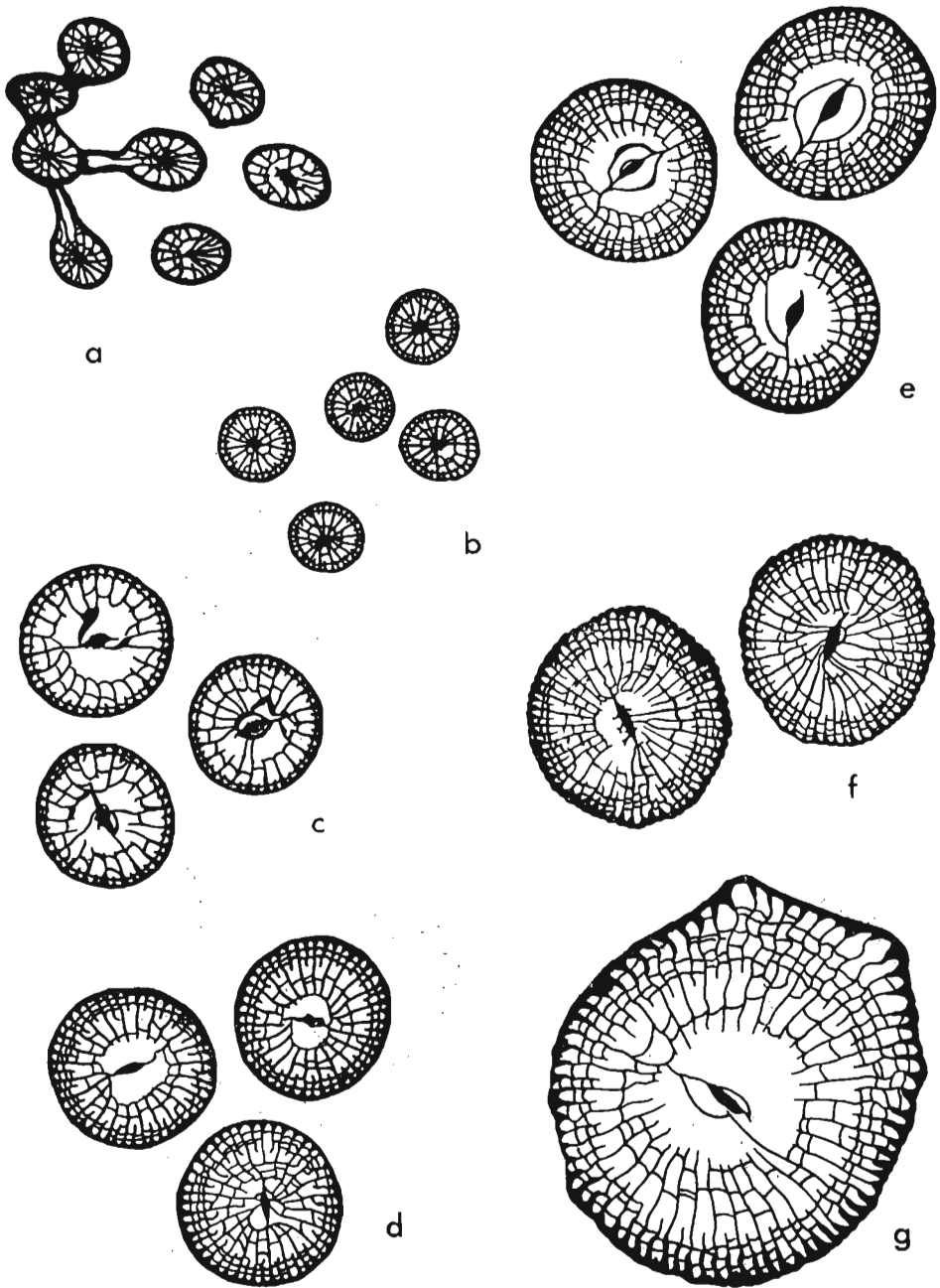


Fig. 1. Fasciculate *Lithostrotion* species, $\times 3$. (a) *L. junceum*, (b) *L. pauciradiale*, (c) *L. irregulare*, (d) *L. sp. n. A*, (e) *L. martini*, (f) *L. sociale*, (g) *L. sp. n. B*

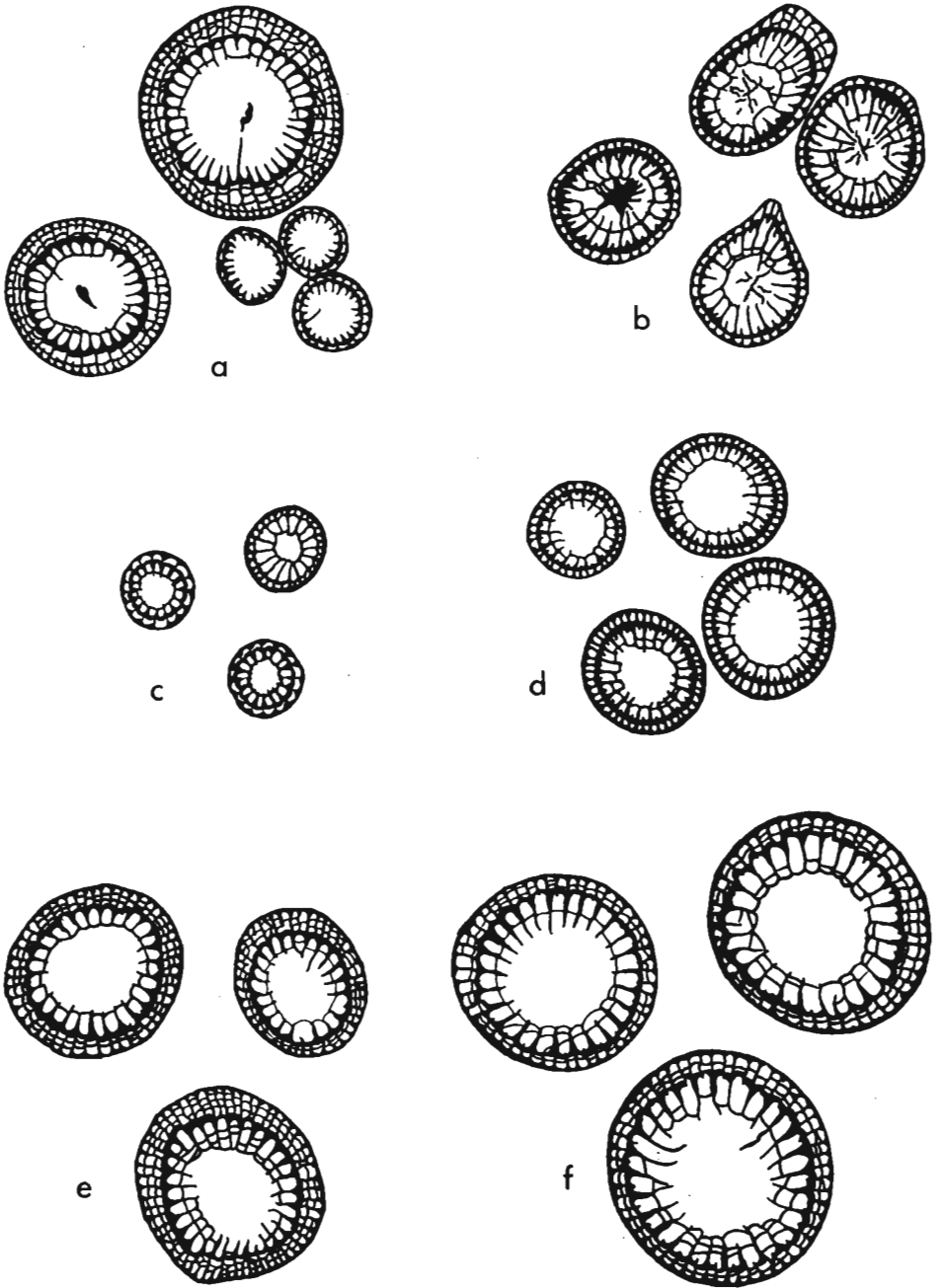


Fig. 2. Fasciculate *Lithostrotion* species cont'd, $\times 3$. (a) *L. affine*, (b) *L. edmondsi*, (c) *L. gracile*, (d) *L. fasciculatum*, (e) *L. furcatum*, (f) *L. concinnum*.

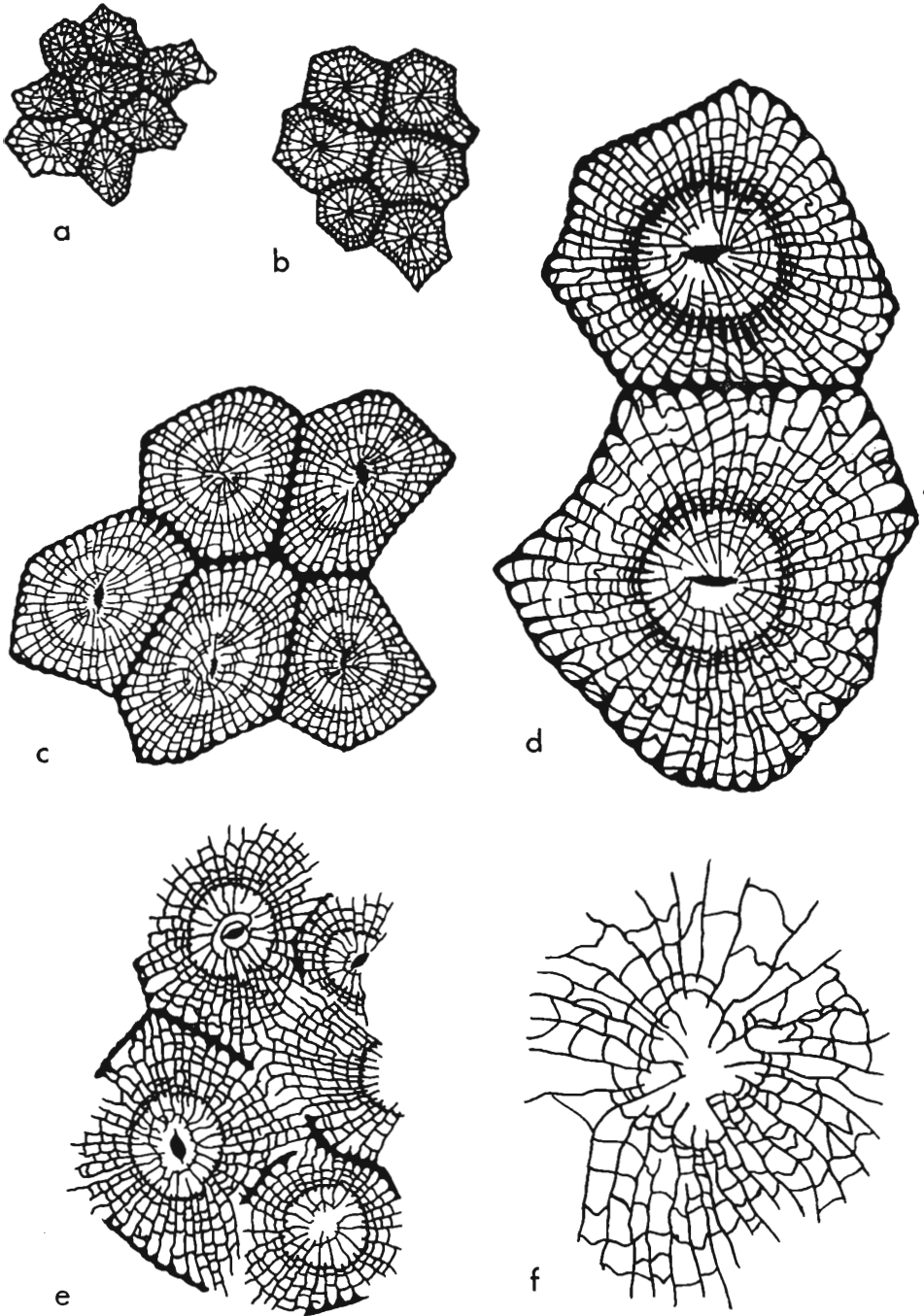


Fig. 3. Cerioid *Lithostrotion* species and Gen. n. A species, $\times 3$. (a) *L. maccoyanum*, (b) *L. decipiens*, (c) *L. vorticale*, (d) *L. araneum*, (e) Gen. n. A *matura*, (f) Gen. n. A *magna*.

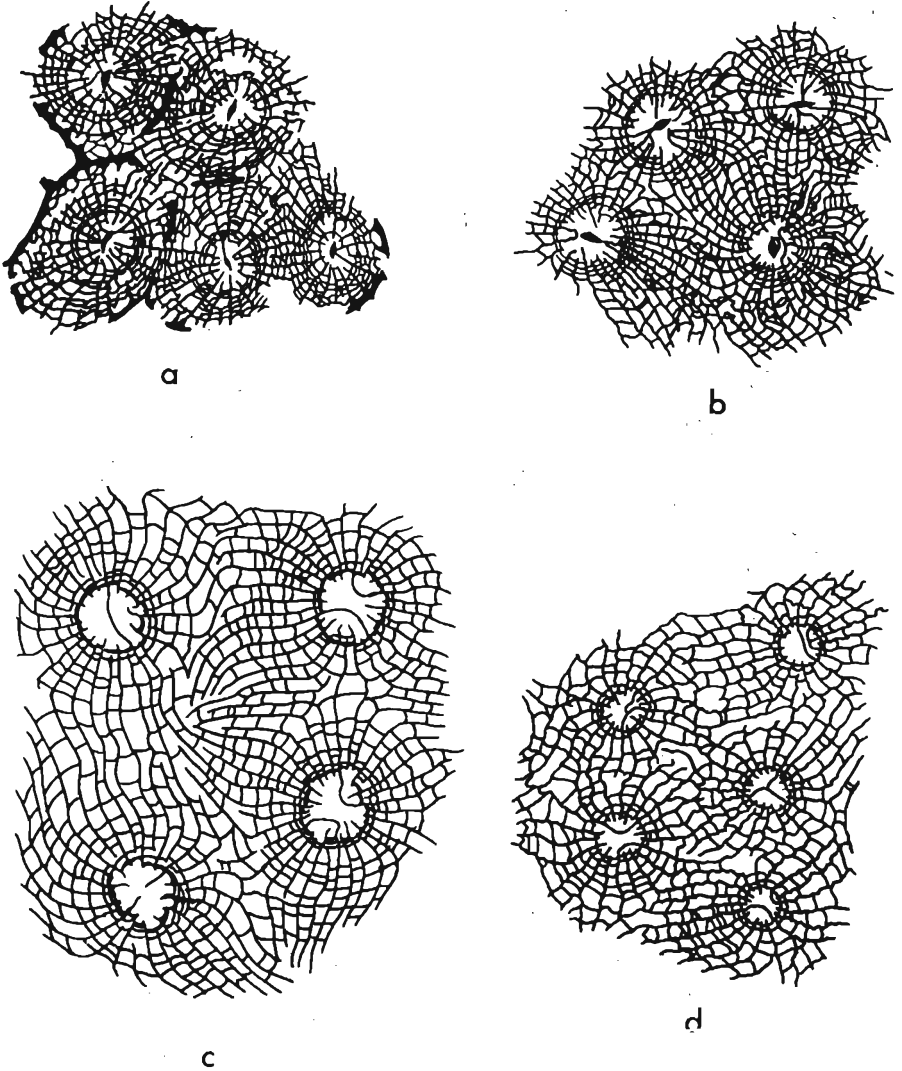


Fig. 4. *Orionastraea* species, $\times 3$. (a) *O. ensifer*, (b) *O. phillipsi*, (c) *O. tuberosa*, (d) *O. placenta*.

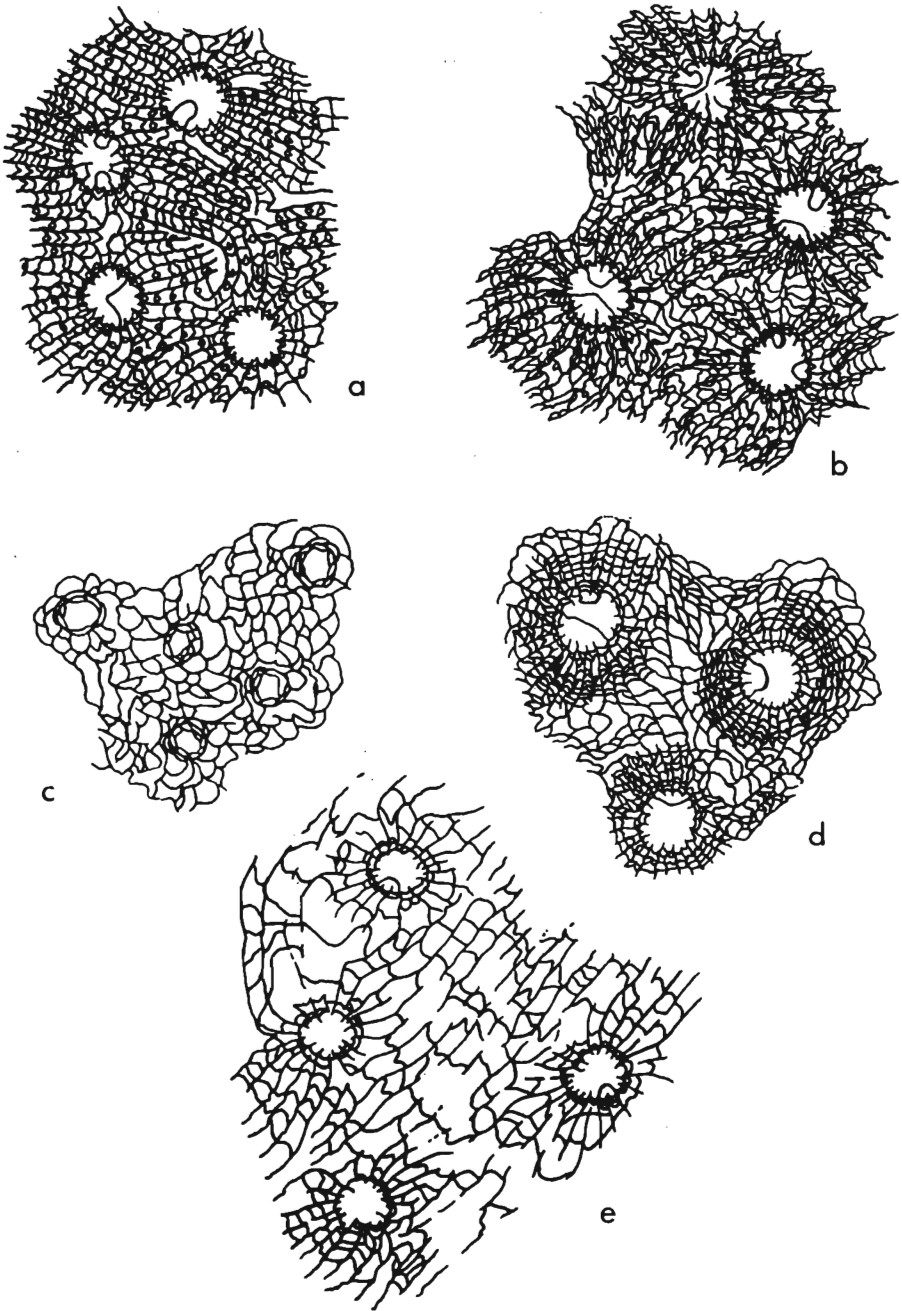


Fig. 5. *Orionastraea* species cont'd, $\times 3$. (a) *O. garwoodi*, (b) *O. sera*, (c) *O. indivisa*, (d) *O. edmondsi*, (e) *O. rete*.

REFERENCES

- FLEMING, J. 1828. A history of British animals... xxiii+565. Edinburgh and London.
- HUDSON, R. G. S. 1926. On the Lower Carboniferous corals: *Orionastraea indivisa*, sp.n., and *Thysanophyllum praedictum* sp.n. — *Ann. Mag. Nat. Hist.*, ser. 9, 18, 144—151.
- 1929. On the Lower Carboniferous corals — *Orionastraea* and its distribution in the north of England. — *Proc. Leeds Phil. Lit. Soc.*, 1, 440—457.
- KATO, M. and MITCHELL, M. 1970. A new *Orionastraea* (Rugosa) from the Lower Carboniferous of northern England. — *Palaeontology*, 13, 47—51.
- LONSDALE, W. 1845. Descriptions of some characteristic Palaeozoic corals of Russia. In: R. I. Murchison, E. de Verneuil and A. F. M. L. A. von Keyserling. The geology of Russia in Europe and the Ural Mountains. 1, 591—634. London and Paris.
- M'COY, F. 1844. A synopsis of the characters of the Carboniferous Limestone fossils of Ireland. viii+207. Dublin.
- 1849. On some new genera and species of Palaeozoic corals and Foraminifera. — *Ann. Mag. Nat. Hist.*, ser. 2, 3, 1—20, 119—136.
- 1851. Descriptions of some new Mountain Limestone fossils. — *Ibidem*, ser. 2, 7, 167—175.
- MILNE EDWARDS, H. et HAIME, J. 1851. Monographie des polypiers fossiles des terrains palaeozoïques. — *Arch. Mus. Hist. Nat.*, Paris, 5, 1—502.
- PARKINSON, J. 1808. Organic remains of a former world... 2, xiv+286. London.
- PHILLIPS, J. 1836. Illustrations of the geology of Yorkshire... Part 8. xx+253. London.
- SMITH, S. 1928. The Carboniferous coral *Nemistium edmondsi*, gen. et sp. n. — *Ann. Mag. Nat. Hist.*, ser. 10, 1, 112—120.
- THOMSON, J. 1887. On the occurrence of species of the genus *Diphyphyllum*, Lonsdale, in the Lower Carboniferous strata of Scotland, with a description of some new species and notices of varieties. — *Q. J. Geol. Soc. London*, 43, 33—39.
-