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### *The morphology, ethology and palaeoecology of certain trace fossils from the Jurassic rocks of England*

George Ernest Farrow

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Plate One

The North Sea coast of northeast Yorkshire south-southeast of Blea Wyke Point, showing the backshore from which many trace fossils described in the text were collected.

Photograph taken from the track which leads down the cliff from Ravenscar under the Coast-guard hut.

The feature at the top of the undercliff is made by the Ellerbeck Bed.



Plate Two (A)

The North Sea coast at Cloughton Wyke,  
showing the limited "spray-zone" where  
trace fossils are well preserved, beneath  
which algae prohibit examination.

The cliff is formed of the higher  
Middle Deltaic Series.

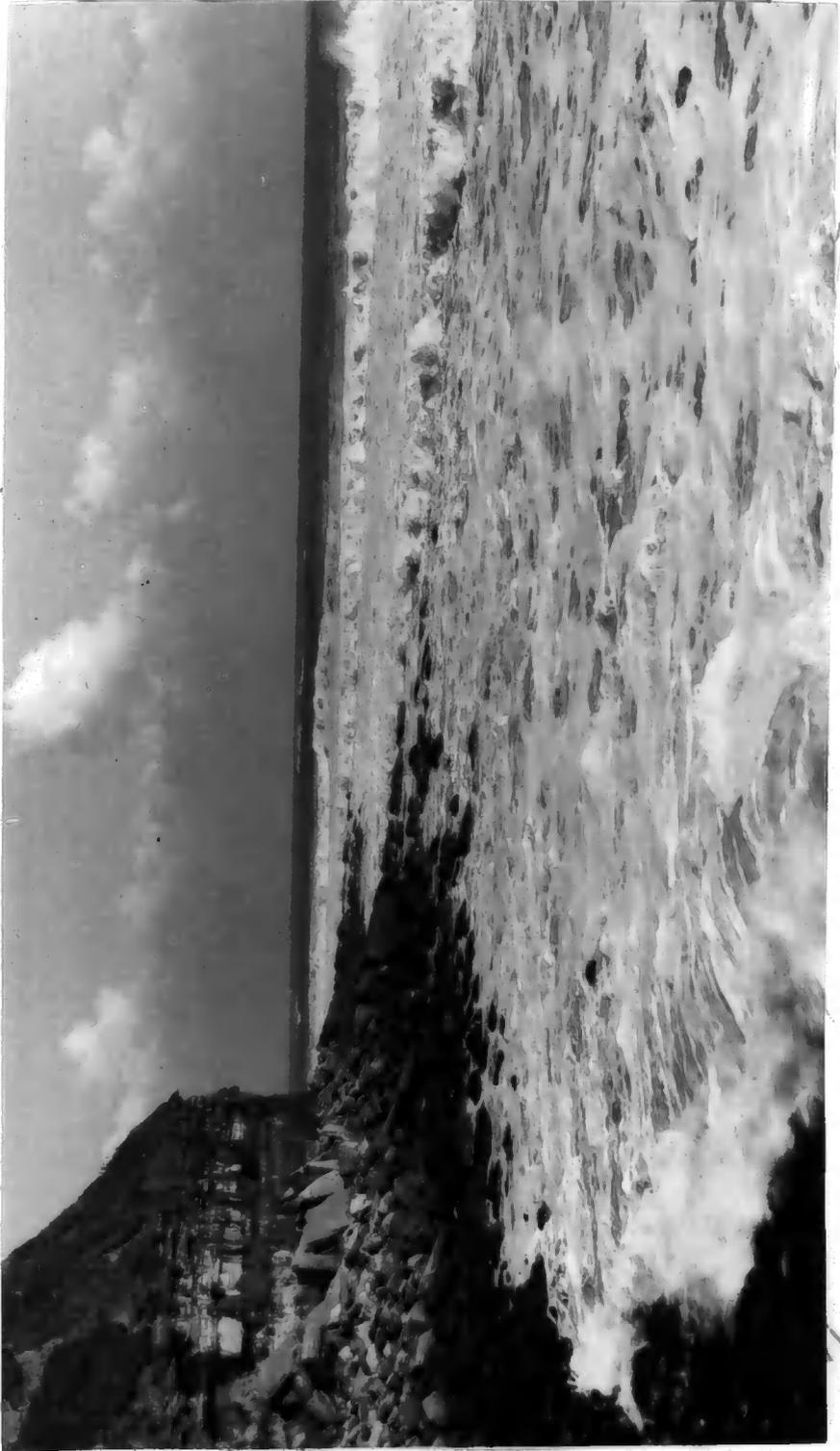


Plate Two (B)

The "Spray-zone" immediately north of Cloughton Wyke, showing the abundance of fallen material in the form of large tabular blocks of ideal size for the application of the Quadrat technique.

The blocks with excellently developed parting lineation come from a persistent sandstone in the Middle Deltaic Series.



Plate Three

Vertical section of loose block of S.B.32,  
a sandy limestone from the Scarborough Beds  
of Ravenscar, showing almost 100% re-working  
by burrowing organisms, with the complete  
destruction of original bedding.



Plate Four

Two loose blocks of Lower Liassic  
Mottled Marl on the foreshore west  
of Lyme Regis, showing diagenetically  
enhanced preservation of the trace fossils  
Thalassinoides, Corophioides lymensis,  
Chondrites and Rhizocorallium.



Plate Five

Close-up of Corophioides lymensis (right)  
and Rhizocorallium jenense (left) from  
the base of the Ellerbeck Bed beneath  
Stainton Dale, showing the preservation  
of delicate scratch markings on the walls  
of burrows impressed into very fine-  
grained kaolinitic silts of the Lower  
Deltaic Series. x 10



Plate Six

Recent colony of Arenicola marina in  
littoral mud, Sandsfoot, Dorset.

Note the varying preservation of the  
inhalent funnel due to differences  
in thixotropy.



Plate Seven

Recent trails of Littorina littorea  
preserved in littoral mud.

- A. Close-up of typical trail made in  
mud with low thixotropy; notice the  
marked transverse ridges (HANTZSCHEL)
- B. General view of trail showing the  
variable preservation of the transverse  
ridges, caused by thixotropic differences  
(HANTZSCHEL): scale = 10 cm.
- C. General view of a set of parallel  
trails with very pronounced lateral  
ridges but poor transverse ridges,  
constructed under thin sheet of  
water (FARROW): pencil = 9 cm.



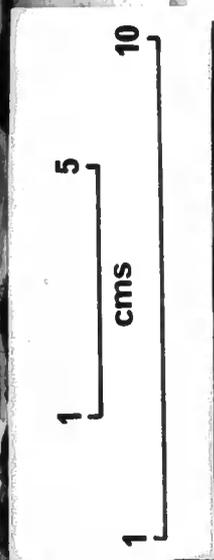


Plate Eleven

Arenicolites skeltonensis sp. nov. from  
basal Upper Lias, immediately above the  
Sulphur Band, North Skelton.

Top. Type specimen, showing the striking  
bed-junction preservation, associated  
Chondrites, and black burrow-lining.  
Note the burrow with the funnel  
penetrated by protrusive laminae  
to the right of the photograph.

Bottom. Specimen showing the highly polished  
burrow walls and the tube constrictions  
caused by resistant bands in the  
siderite mudstone.

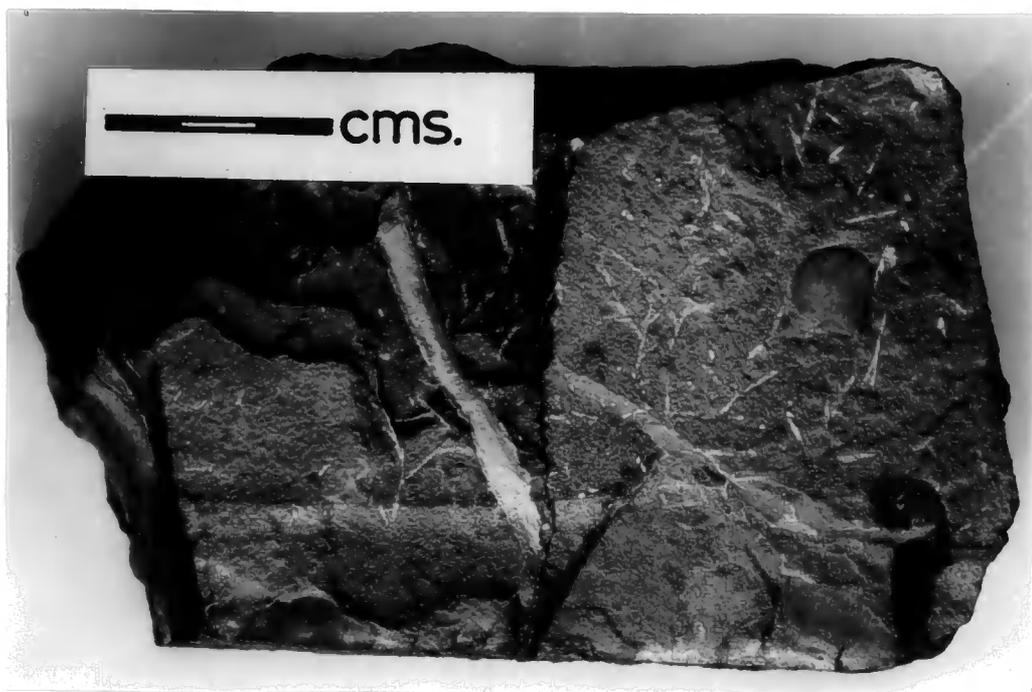
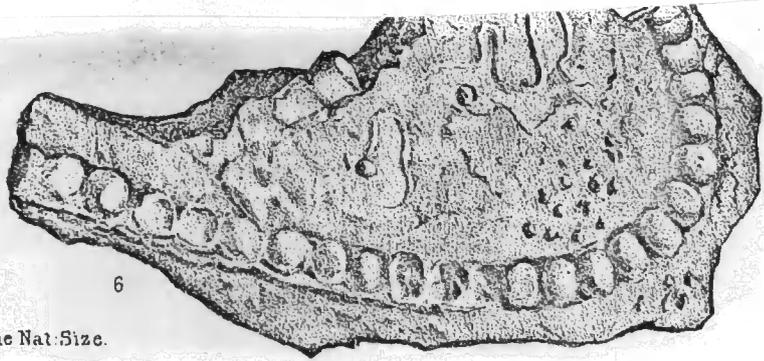


Plate Ten

Chondrites from the Middle Liassic Sandy Series

- A. Preserved by bed-junction sedimentation,  
from a loose block north of Skinningrove.
- B. Associated with Curvolithus and Entolium,  
preserved by bed-junction sedimentation  
accentuated by baking from the Cleveland Dyke;  
from Cliff Rigg quarry, near Great Ayton.



6

Half the Nat. Size.

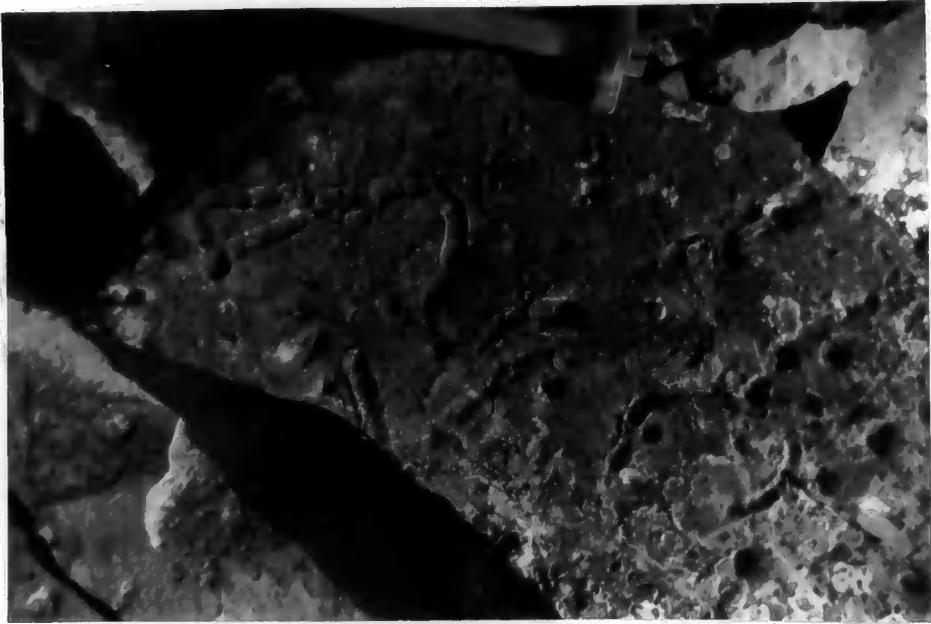


Plate Nine

- A. Eione noniliformis TATE G., a beaded trace fossil from the Namurian of Howick, Northumberland (type specimen)
- B. Beaded trace fossil from Swath Beck Hush, Moor House National Nature Reserve, with sharp lateral ridges.
- C. Related trace fossil from same locality lacking a beaded appearance and possessing pronounced lateral ridges.

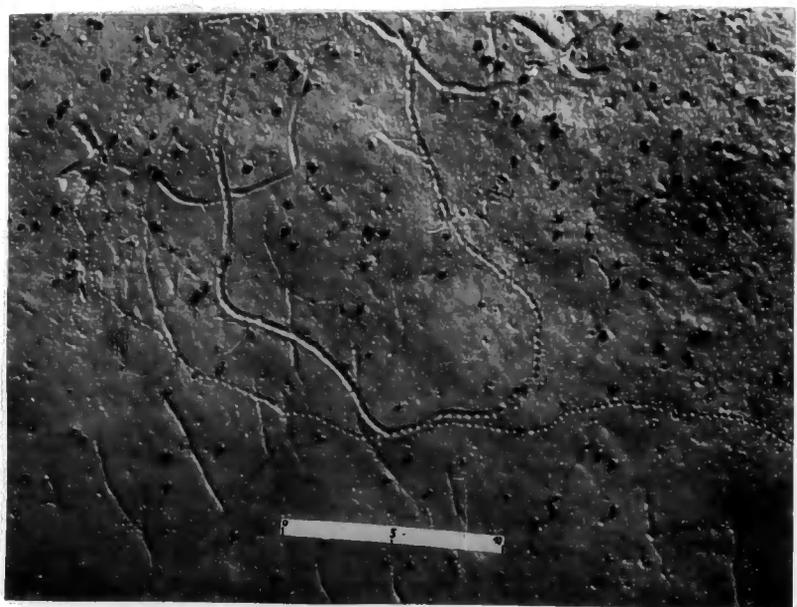
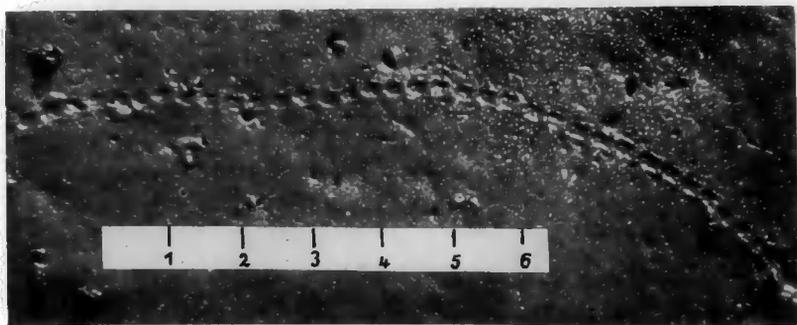


Plate Eight

- A. Close-up of typical beaded trail of the amphipod Corophium volutator, preserved in mud with low thixotropy.
- B. General view of a set of Recent trails of Corophium volutator, showing unbeaded areas caused by subsequent thixotropic flow.

Plate Fourteen

A. Close-up of a vertical section showing the "sagging" of the laminae on the inside of the 'U'.

Note the depressed laminae of the inhalent and the plugged tube of the exhalent limb of the burrow to the left.

B. Plan view of a horizontal section showing the slit-like cross-section of the burrows.



Plate Twelve

Oblique view of loose block of laminated sandstone (S.B.35) from the Scarborough Beds of Ravenscar, showing both vertical and horizontal aspects of Arenicolites statheri BATHUR.

Plate Thirteen

View of vertical face of sandstone, showing Arenicolites statheri descending from the plane of a small unconformity.  
Note the solid tube-casts in many of the burrows.

The hammer = 38 cm. in length.

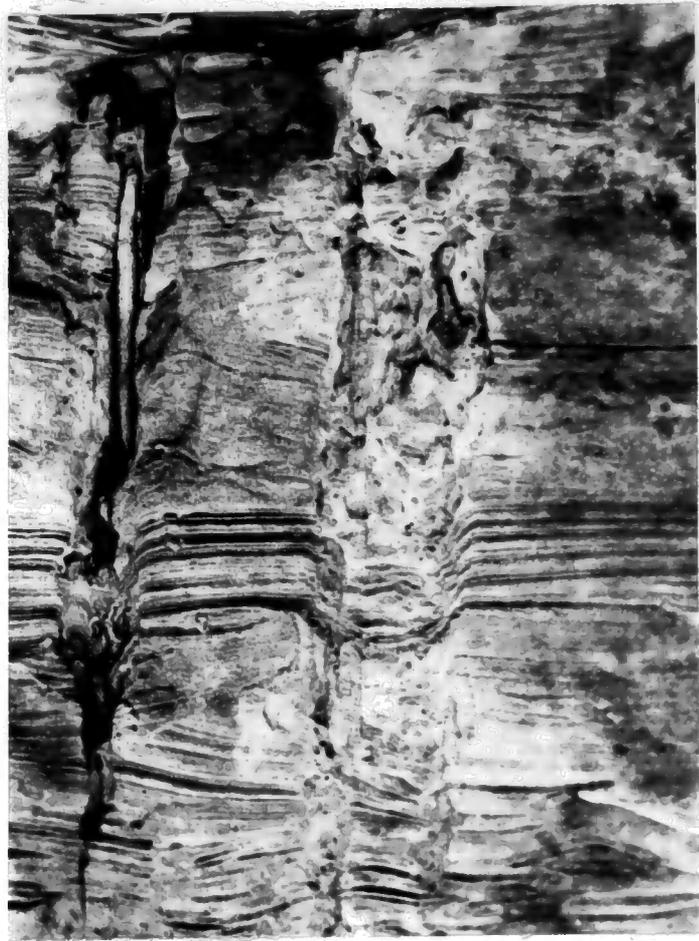


Plate Fifteen

- A. Calcareous gritstone dogger from the Bencliff Grits east of Osmington Mills showing slump structure associated with an immediately post-depositional fracture.
- B. Calcareous gritstone dogger from the Bencliff Grits on the backshore just west of Redcliff Point, showing deeply eroded slots of Diplocraterion arkelli sp.nov. Note the large size, and dumbbell-shaped cross-section. x 0.15
- C. Smaller examples of retrusive Diplocraterion arkelli associated with sharp linguoid ripples. Note the smaller size, sausage-shaped cross-section, and lower density. x 0.08



Plate Sixteen

A.

Vertical section of Diplo-  
craterion arkelli from Nothe  
Grits of Bowleaze Cove showing  
the strong Spreite and indistinct  
limbs. x  $\frac{1}{3}$

B.

Horizontal section  
showing ringed aperture  
and faecal pellets. x 1

C.

Vertical section  
across Spreite with  
retrusive laminae. x 1

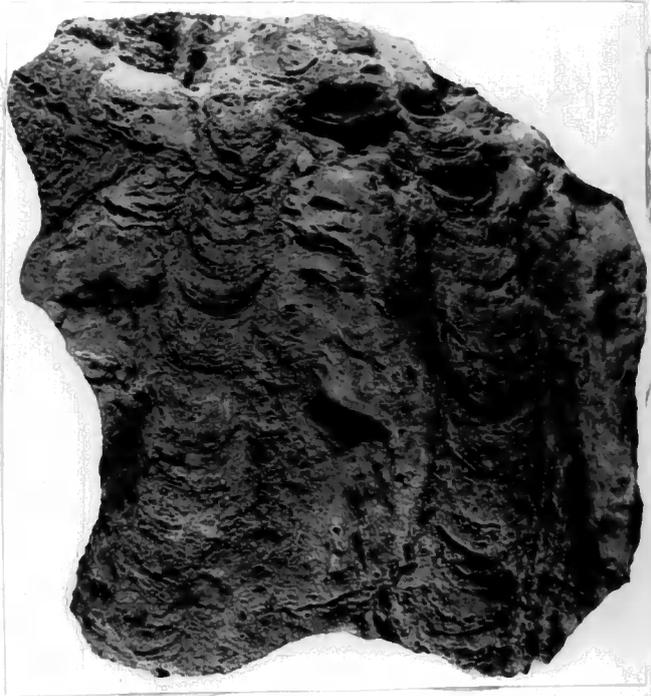


Plate Seventeen

Large loose block of sandy limestone (S.B.28)  
from the Scarborough Beds on the backshore  
at Iron scar, with retrusive Diplocraterion  
arkelli occurring in high densities.



Plate Eighteen (A)

Diplocraterion statheri sp. nov. from a  
large loose block of sideritic sandstone  
from the Dogger in Saltwick Bay, near  
Whitby; maximum burrow density recorded.



Plate Eighteen (3)

Diplocraterion statheri at intermediate density;

Old Nab, Saltwick Bay.

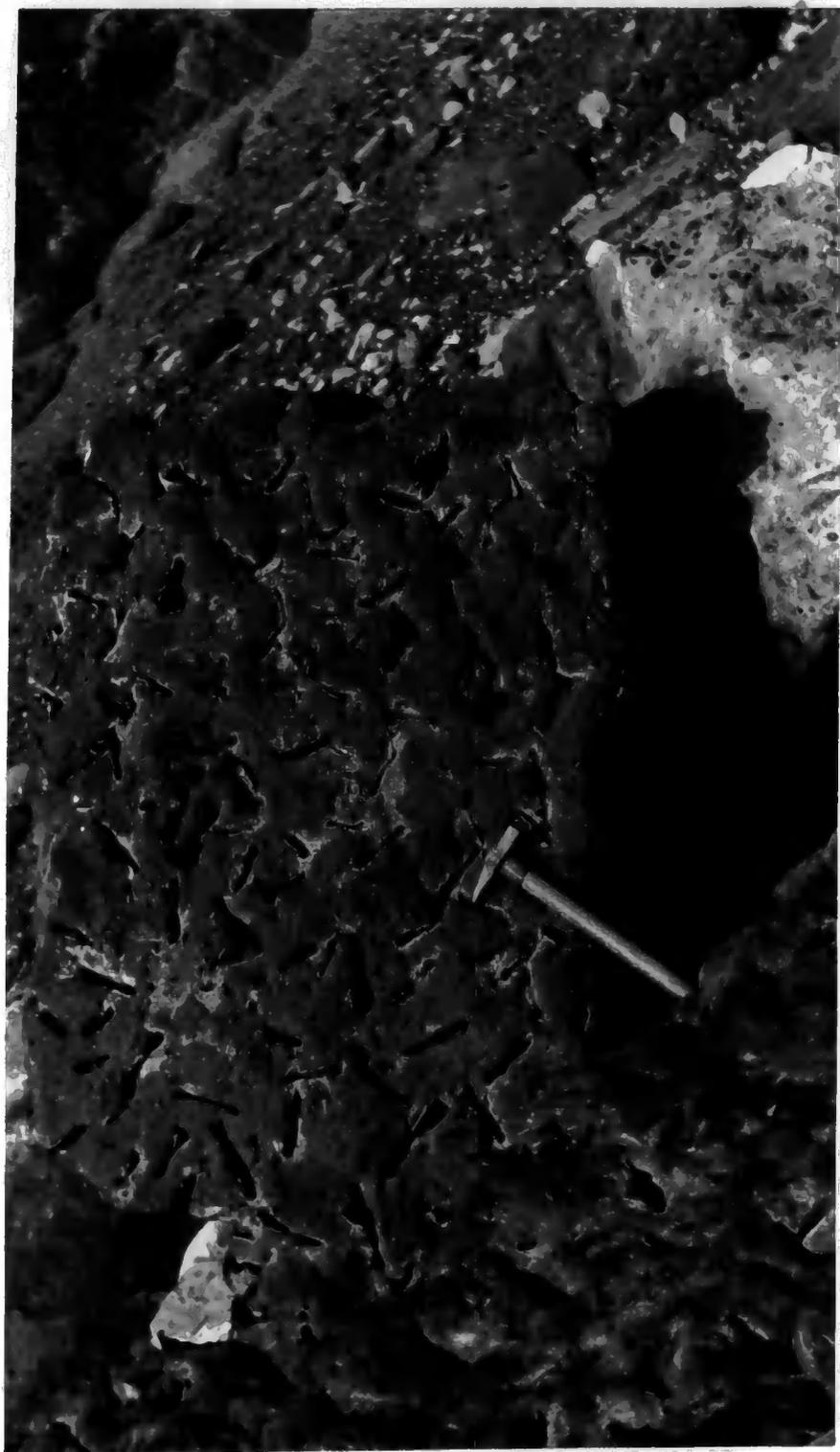


Plate Eighteen (C)

Diplocraterion statheri at low density;  
beneath Whitby High Light.



Plate Nineteen

Ironstone nodules from the base of the  
Ellerbeck bed with Corophioides lymensis (COYSH)

A. Associated with oblique Rhizocorallium  
jenense ZENKER and Chondrites.

B. Showing the delicate transverse striae, and  
the 'key-hole'-shaped cross-section.

In each specimen, notice the striking contrast  
with the white kaolinitic, soft, silts of the  
Lower Deltaic Series.



Plate Nineteen (1)

Rhizocorallium (Corophioides) jenense LEMMER;  
vertical crustacean burrows descending from  
the base of the Dogger into the Alum Shales  
in Long Sigt, East Cliff, Whitby.

A.

Vertical face showing the coarsely  
scratched spreite on the right, and  
slickensided shale with selenite  
crystals on the left.

B.

Slickensiding along the  
burrow sides of basal 'U'

C.

Basal 'U' of large  
burrow showing the  
very coarse scratches  
on limbs and Spreite

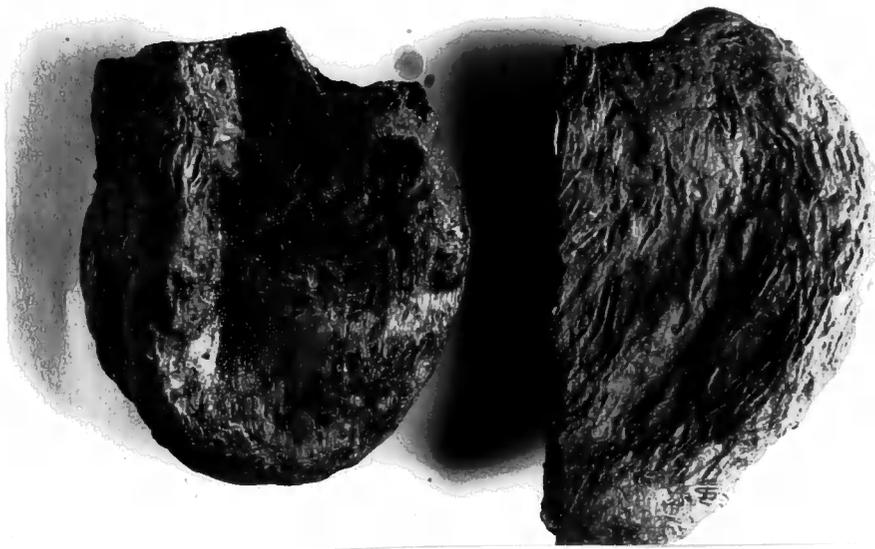
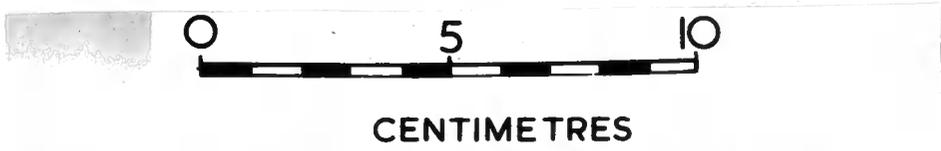


Plate Twenty

Skolithos c.f. linearis HALDEMAN from Bed 6  
of the Osmington Oolites, Black Head.

A. Burrows descending perpendicularly with  
respect to a cross-set of strata.

To the left of the photograph, burrows  
with bed-junction preservation; to the  
right, above the hammer-head, concealed  
bed-junction preservation.

B. Closeup of vertical face of oolite, showing  
concealed bed - junction preservation.

C. Horizontal section through the burrows of B)  
showing their circular cross-section, and  
coarsely oolitic filling.



Plate Twenty-five

Close-up of Thalassinoides suevicus from the condensed Hambleton Colite Series of Filey Brigg. Notice the bleached nature of the burrows compared with the matrix, where serpulids and Exogyra are very abundant.

Near the fountain-pen (length= 13 cm.) one burrow may be seen cutting another. Normally they anastomose.

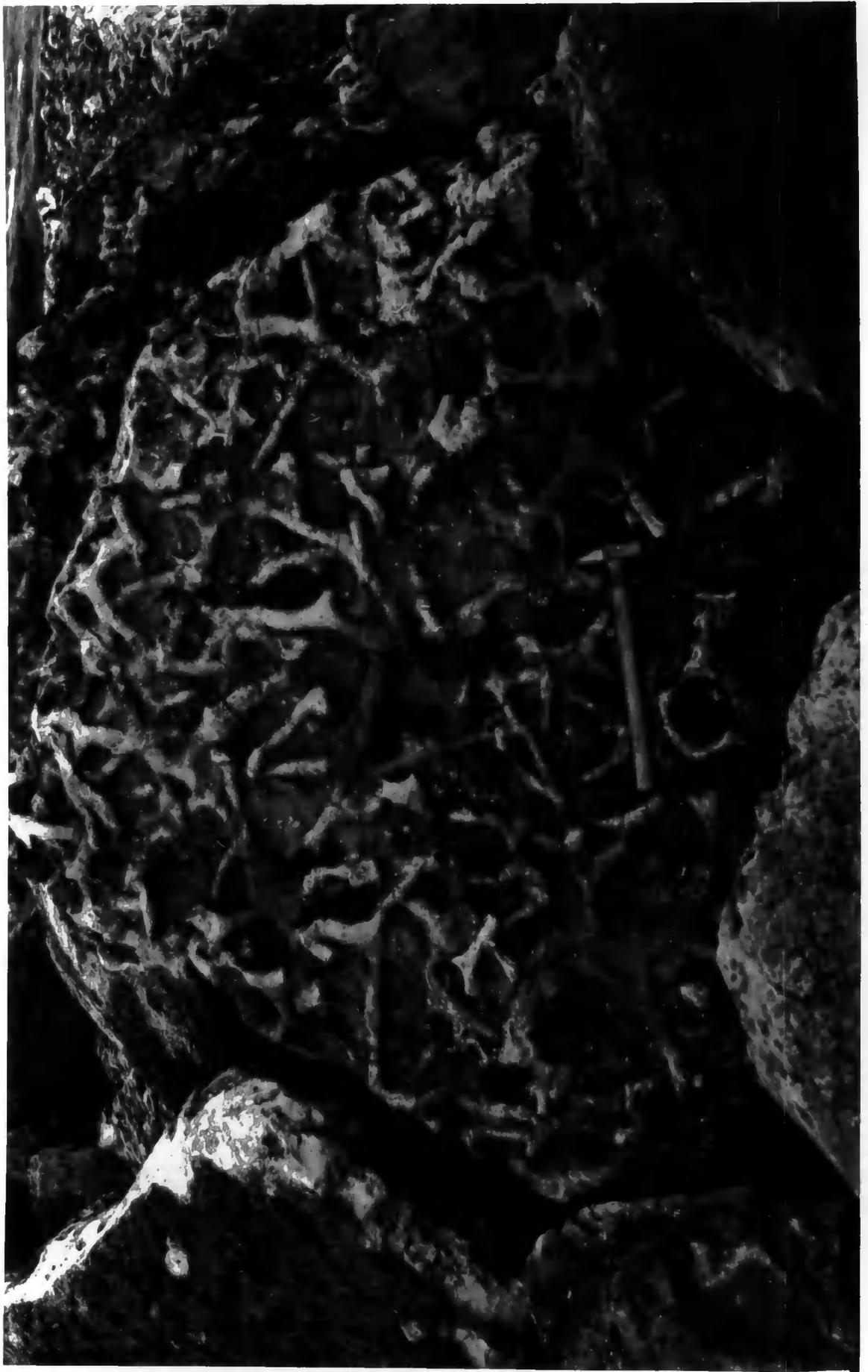


Plate Twenty-four

Thalassinoides suevicus preserved as white,  
horizontal Y-shaped burrows set in brown  
calcareous grit; loose block of Hambleton  
Oolite on Filey Brigg.



Plate Twenty-three

A. large Thalassinoides suevicus (QUEN.) from the Trigonia hadlestoni Bed, Redcliff Point, showing the dichotomous branching and peripheral furrows, where loosely compacted shelly matter has been removed by erosion.

Burrow width = 5 cm.

B. isolated burrow system of Thalassinoides suevicus in sandy limestone (S.B.28) from the Scarborough Beds; Cloughton Wyke (54/020951). Note the very regular dichotomy.

Teichichnus accounts for 90% of the ichnofauna



Plate Twenty-two

Essentially horizontal hummocky masses of Thalassinoides saxonicus (GEIN.) from coarse calcareous grit (S.B.28) of the Scarborough Beds; loose block on the backshore south-southeast of Blea Wyke (45/993012).

Note the annelid-like axial core running through many of the burrows.

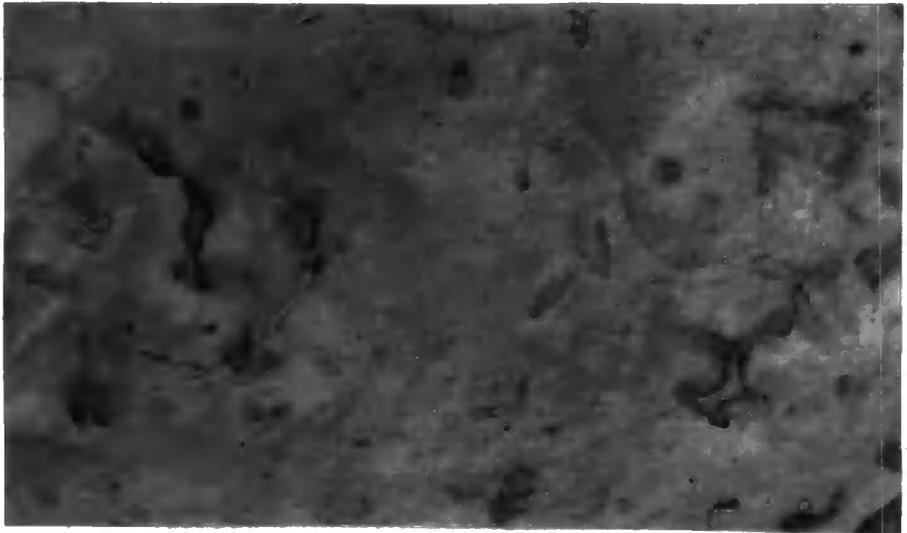


Plate Twenty-one

Ophiomorpha borneensis KEIJ from the Corallian

- A. From the Bencliff Grit of Redcliff Point,  
showing the wart-like lining of the burrows.
- B. From Bed 6 of the Osmington Colites of  
Black Head, showing the eroded lining,  
smooth core, and dichotomous branching.
- C. From Bed 7b of the Osmington Colites of  
Black Head, showing the regular pits along  
the burrow margins.

Plate Twenty-six

Rhizocorallium cicatricosus (TATE & BLAKE)

from the Main Seam of the Middle Lias

Ironstone Series, Old Nab, southeast of

Staithes (45/794187); bed 52 of HOWARTH (1955).

Notice the apparent absence of Spreite, the  
area being highly disturbed by Chondrites,  
and the lacerated limbs.

Specimen whitened with ammonium chloride.



CENTIMETRES

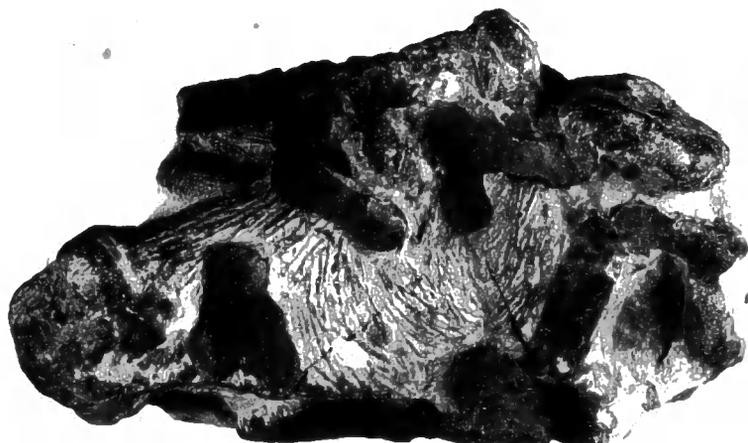


Plate Twenty-five (1)

View of an Ellerbeck Bed ironstone nodule from  
beneath, showing the Spreite of an oblique  
Rhizocorallium jenense ZENKER, and many 'key-hole'  
cross-sections of Corophioides lynensis (COYSE)

Notice the starting bed-junction preservation,  
and the great detail of the Spreiten sculpture.





Plate Twenty-seven

A.

Rhizocorallium cicatricosus

showing U-shaped vertex and  
absence of Spreite.

Locality as in Pl.26

C.

Rhizocorallium

cicatricosus ,

showing very long  
flexuous burrow  
and thick limbs.

Loc. as in Pl.26

B.

Small initial section of

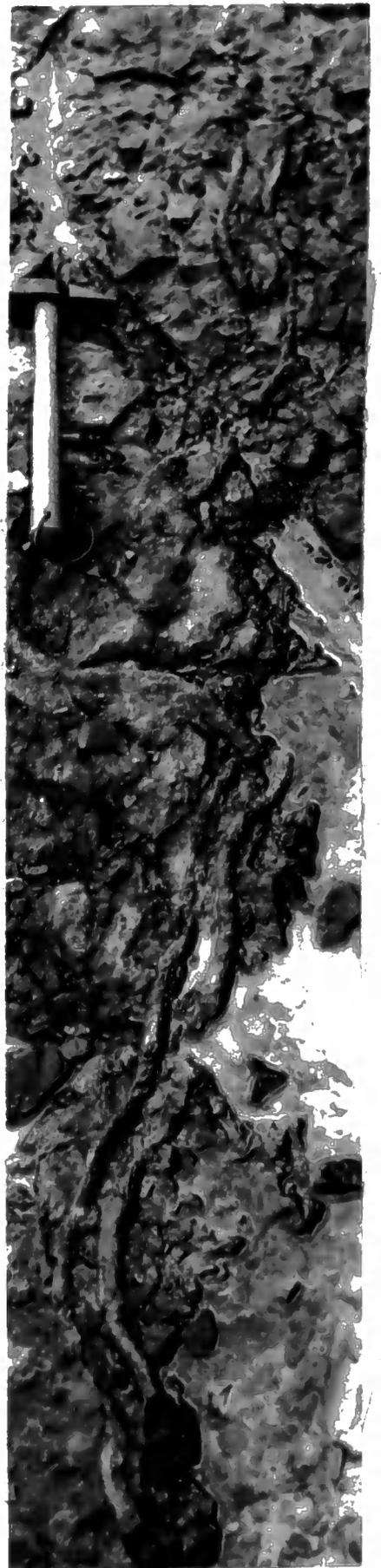
Rhizocorallium commune SCHMIDT

associated with Taenidium,

Chondrites, serpulid colonies

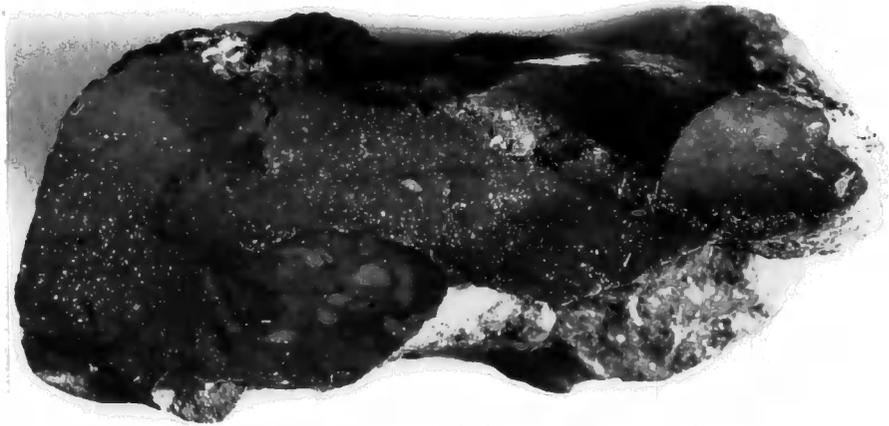
and pinna (vertical); Grey Beds

(Beds 80 of DEAN 1954); Peak.





CENTIMETRES



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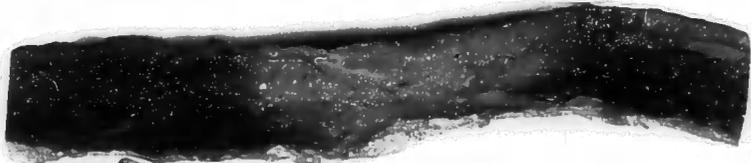


Plate Thirty

Polished sections of Rhizocorallium cicatricosus.

A. Vertical transverse section showing the siderite-plugged limbs which appear mottled with faecal pellets.

B. Horizontal longitudinal section showing irregularly ellipsoidal faecal matter (in the top limb) and Chondrites in the lower two limbs.

Locality as in Plate 26

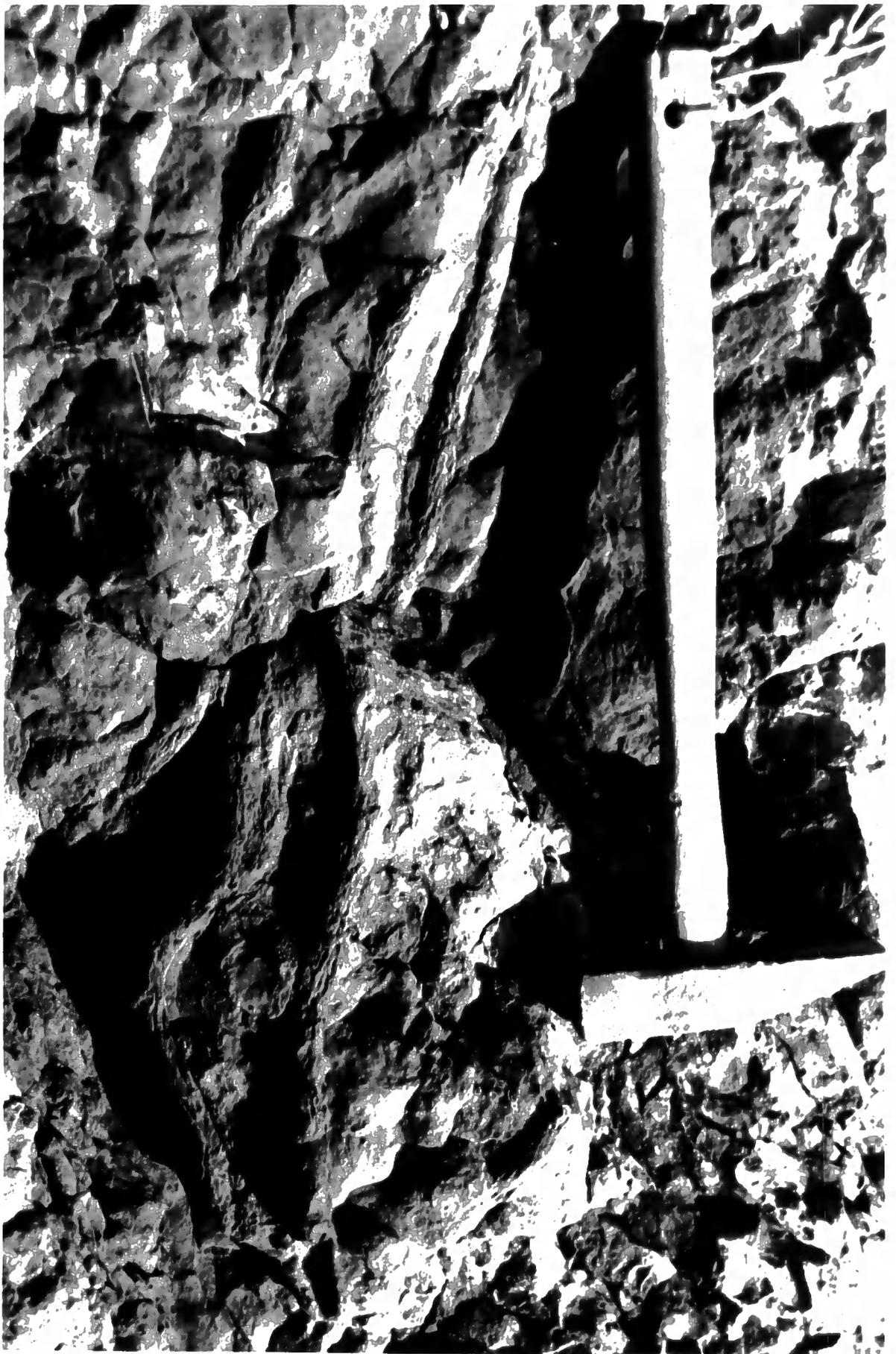


Plate Twenty-eight

Rhizocorallium cicatricosus with 'kink' in the  
return limb caused by a vertical obstruction.

Locality as in Plate 26

x  $\frac{1}{2}$

Plate Thirty-one

Succession of burrows of Rhizocorallium commune  
from argillaceous limestone with symmetrical  
ripple-marks (wavelength =  $3\frac{1}{2}$  "); Scarborough  
Beds (S.B.32) beneath Ravenscar.

Note the different ethological patterns of  
successive burrows.

(See also Text-figure 29)



Plate Thirty-two

Terminal 'kinking' of Rhizocorallium commune  
from silty limestone (S.B.32) of the Bajocian  
Scarborough Beds beneath Ravenscar, showing  
scratch markings within the area of the Spreite  
and sets of diamond-shaped claw impressions.

Notice the pod-like Pelecypodichnus SEILACHER  
within the Spreite. x 1



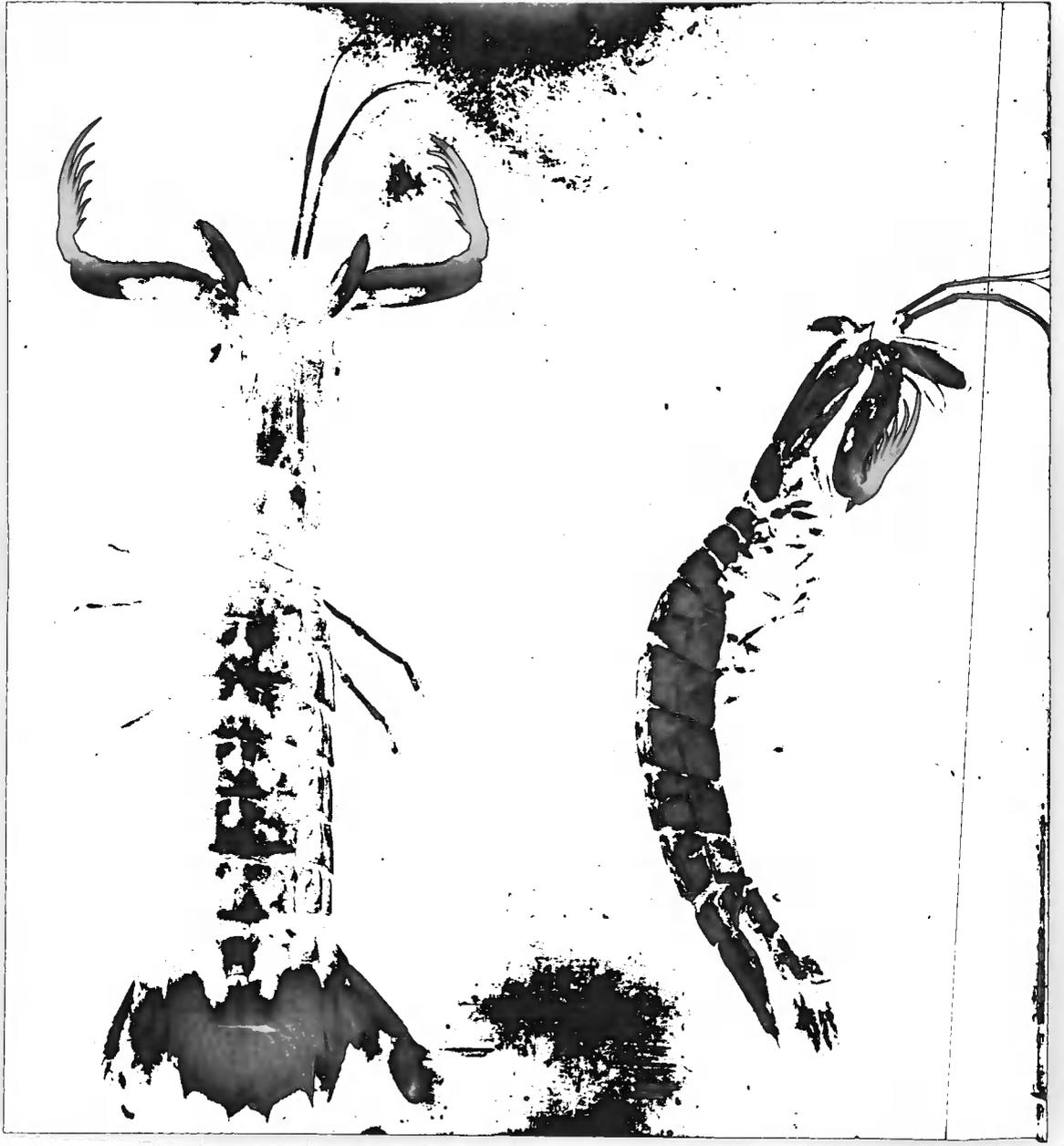


Plate Thirty-three

The Recent stomatopod crustacean Squilla serrata,  
one of the few organisms known to produce  
Rhizocorallium-like structures at the present-day.

Note the six-pointed sub-chelae.

x  $1\frac{1}{2}$



Plate Thirty-four

A. Typical orthodox Rhizocorallium commune from silty limestone (S.B.32) of the Scarborough Beds from beneath Ravenscar showing the narrow, lacerated limbs; poorly developed Spreite; and remarkably constant gauge.

B. Slightly oblique vertical transverse section of Rhizocorallium (probably R. cicatricosus) from the Middle Band of the Main Seam of the Ironstone Series at North Skelton Mine, showing the siderite-plugged limbs and well-developed Spreite filled with opaline oolites.

The matrix is dominantly siderite mudstone highly burrowed by Chondrites.

N.B. The object just beneath, and to the left of the Spreite, is an ammonite chamber.

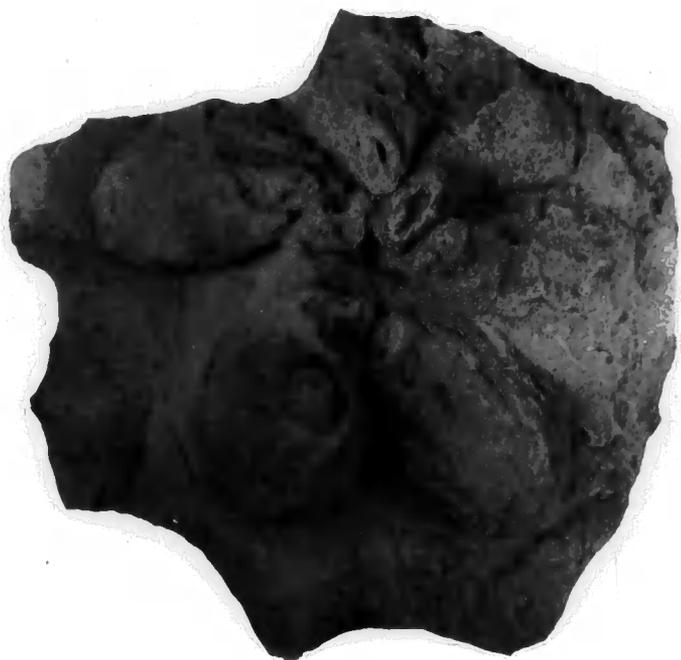


Plate Thirty-five

Asterosoma fosteri sp. nov. from the Dogger of  
Loop Wyke, northwest of Whitby.

A. Plan view showing the radiating lobes

B. Side view showing the strongly raised centre  
and the flat lobe profile.

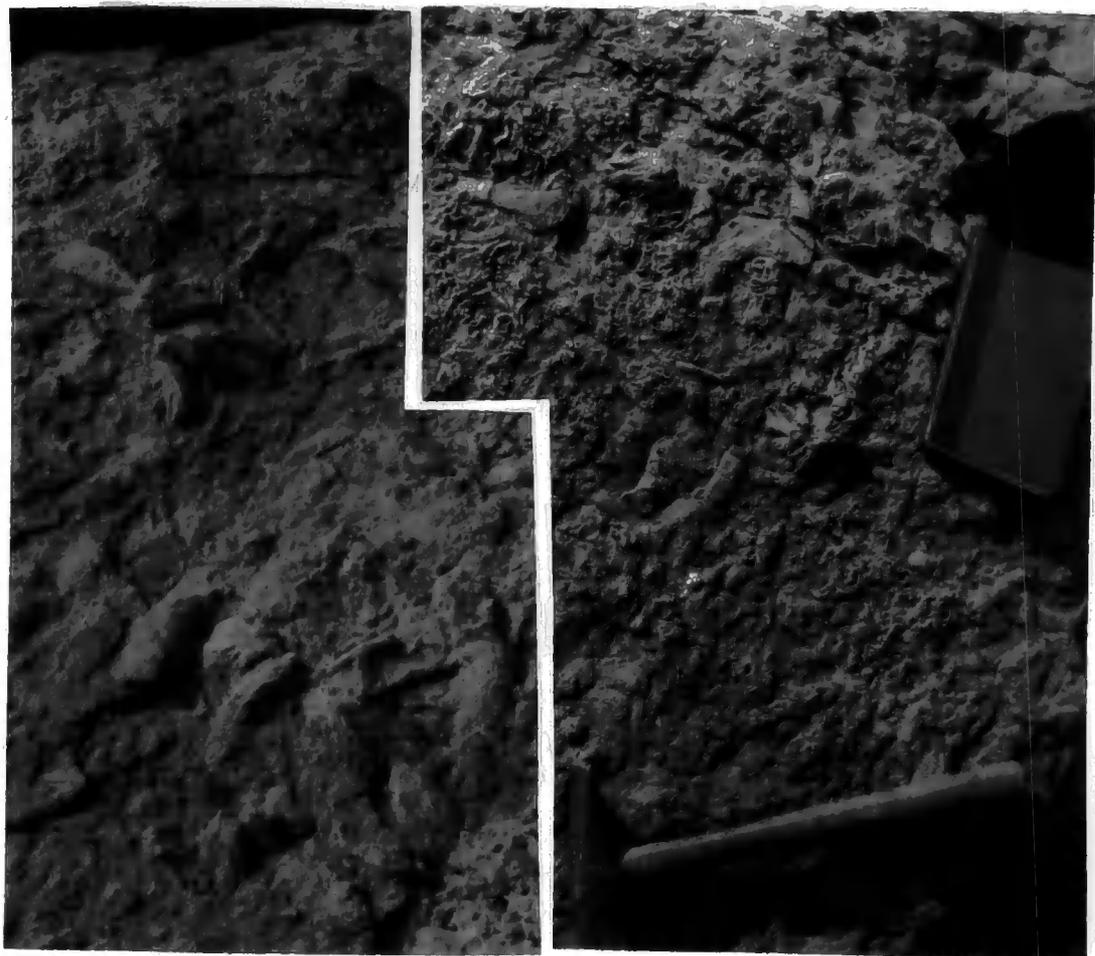


Plate Thirty-six

A.

Radially incomplete

Asterosoma c.f. radiciforme

from sandy limestone (S.B.32)

beneath Ravenscar

x  $\frac{1}{3}$

B.

Radially complete

example, distinctly

ovoid in outline

beneath Beast Cliff.

C.

Oblique view of Asterosoma

multilobatum sp. nov. from

sandy limestone (S.B.28);

Cloughton Wyke (54/993012).

Note the large number of

lobes in very high relief.



Plate Thirty-seven

Chondrites from the upper block of the Main Seam  
at Old Nab, southeast of Staitnes (45/794187).

Bed 54 of HOWARTH (1955)

x 6

Plate Thirty-nine

A. Pinnate branching of Chondrites in very coarse conglomeratic Middle Lias sandstone from Chideock, Dorset; associated by "Cylindrites"  
Note the occurrence of the Chlamys shell. x 1

B. Chondrites within the shell of a decalcified bivalve from the Blea Wyke Beds of Peak. x 5



Plate Thirty-eight

Chondrites from coarse grey siltstone of Ironstone Series (Bed 41 of MCWARTH 1955); Hawsker Bottoms (45/952076); showing tunnel systems of two sizes. Note the constriction in tube diameter at the point of branching in the larger system. x 5

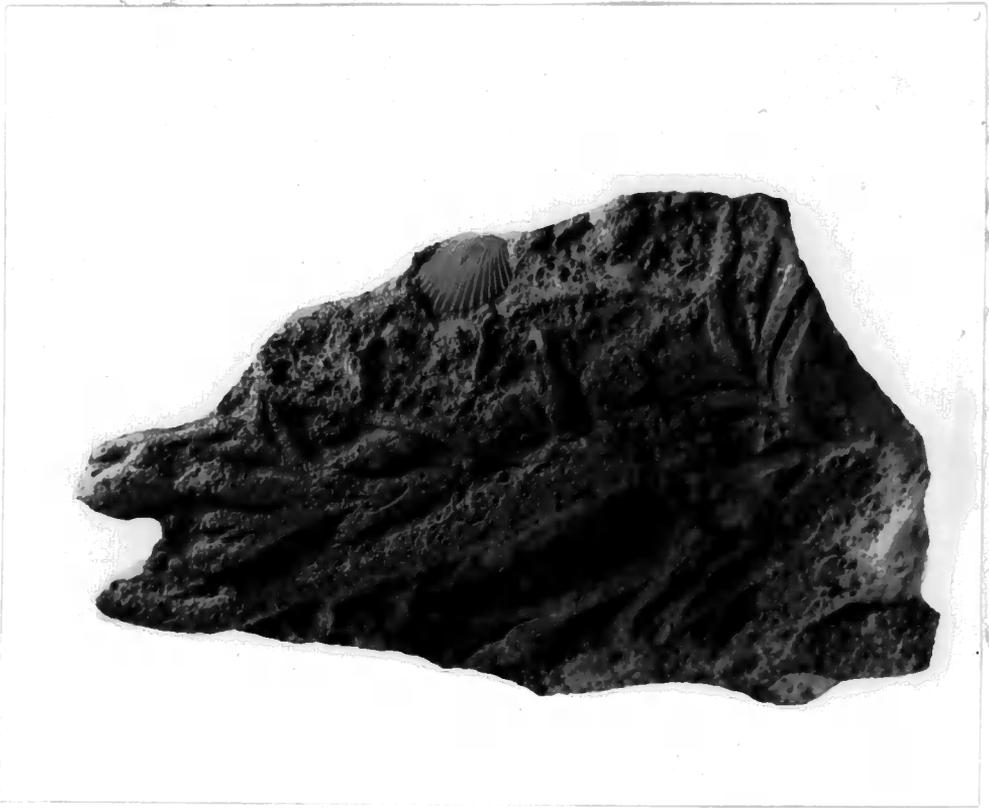


Plate Forty

Teichichnus from fine-grained sandy limestone  
(S.B.32) beneath Beast Cliff, Ravenscar.

A.

Example with 5 cm.  
vertical development  
and horizontal translation.

B.

Example with 3 cm.  
vertical development  
and no translation.

C.

Recent trace of Nereis, caused  
by the lateral migration of  
several dwelling tubes (SCHAFER)

D.

T-shaped apparent intersection  
of two Teichichnus.  
Locality as in A) and B)

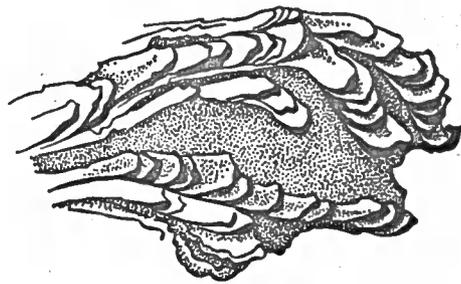


Abb. 214. Gepresste Schlacklamellen, entstanden durch seitlichen Versatz von mehreren Wohnröhren von *Nereis*. Freigespült widerstehen sie der Zerstörung länger als das umgebende Sediment. — Original.

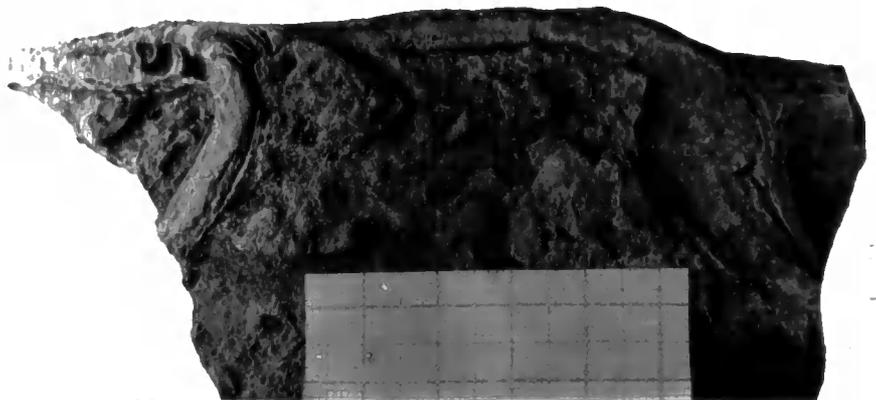


Plate Forty-one

A. Teichicinus associated with general spiral disturbance of surrounding sediment.

B. Oblique Teichicinus associated with horizontal Gyrochorte c.f. comosa HBER.

Locality and horizon as Plate 40A.





Plate Forty-two

Planolites ophthalmoides JESSEN from  
loose block of grey, fine-grained deltaic  
sandstone with rib-and-furrow structure;  
beneath Ravenscar.

Plate Forty-three

A. Loose block of cross-laminated sandstone  
(? Lower Deltaic Series) beneath Ravenscar,  
with aggregations of faecal pellets.

B. Close-up of the faecal pellets. Notice the  
impressions of many smaller pellets which  
have been removed by erosion.



Plate Forty-four

Recent crab pellets in two sizes (KREJCI-GRAP)  
from tropical shores around Hong Kong.  
Larger pellets identical in size to those  
illustrated on Plate 43.

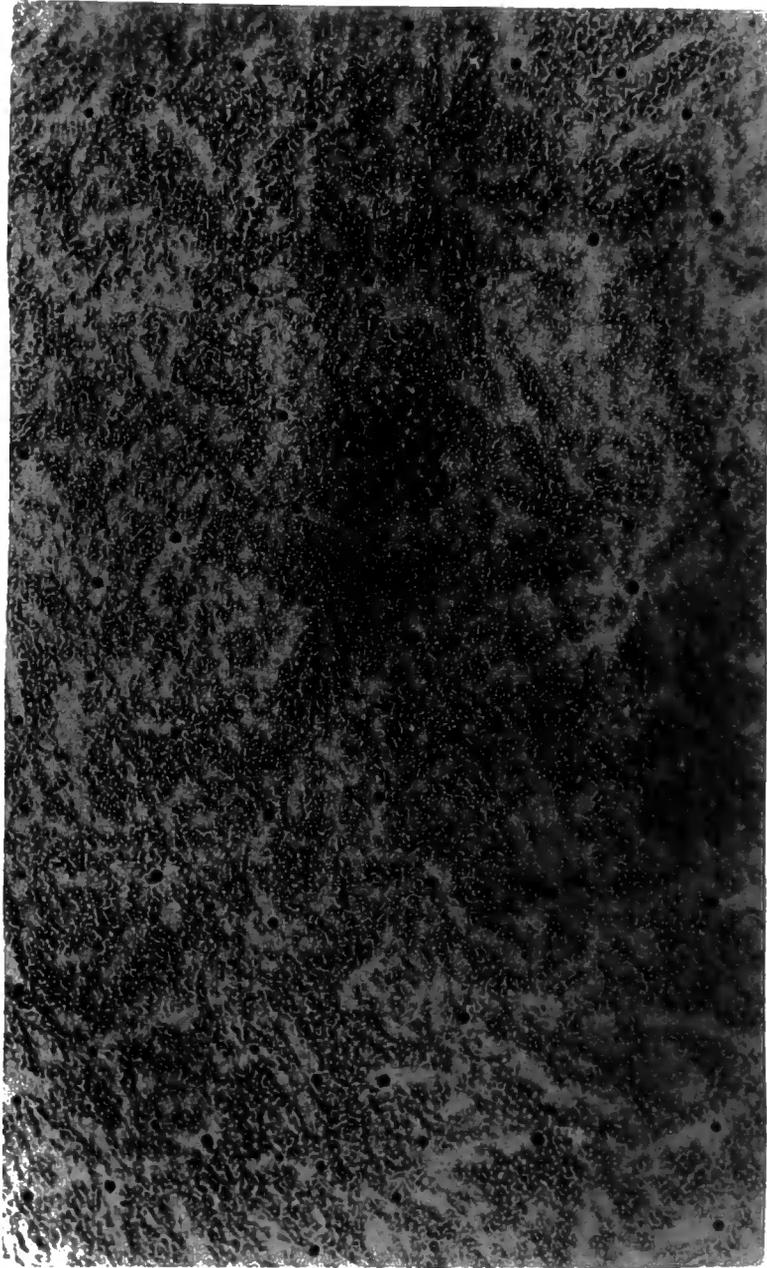




Plate Forty-five

Two loose blocks of deltaic sandstone  
with Gyrochorte carbonaria SCHLEICHER  
and the pod-like Pelecypodichnus  
SEILACHER.

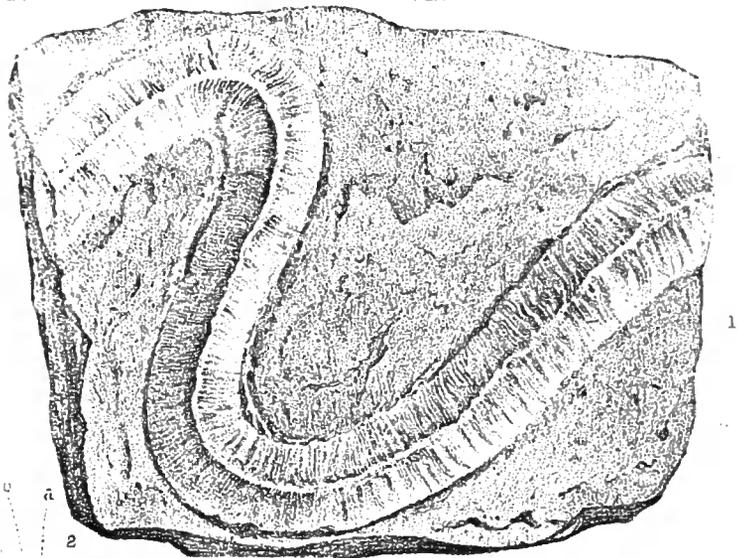
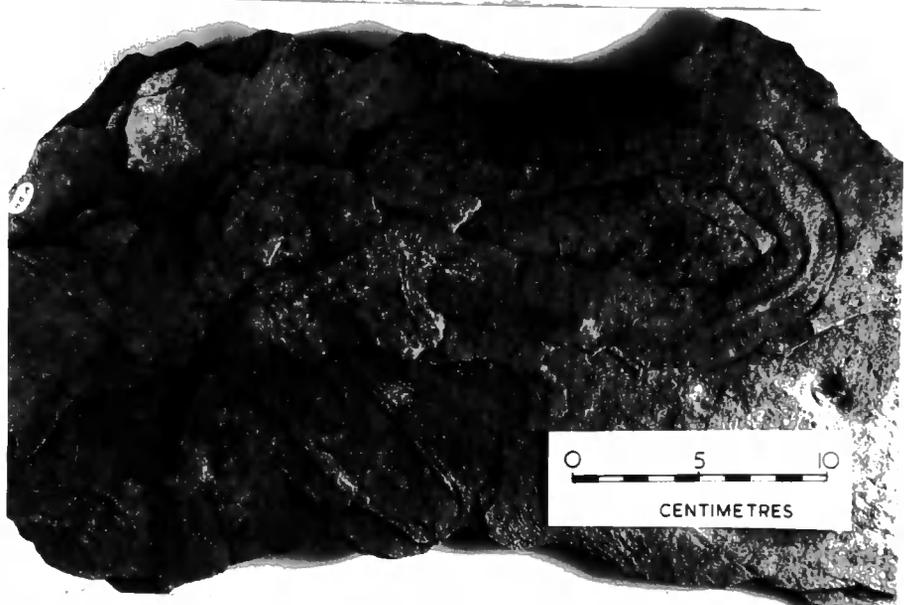


Plate Forty-five (1)

The Namurian trace fossil Crossopodia embletonia TATE G. from Northumberland, an example of the Pascichnia, which are completely absent from the Jurassic.

Plate Forty-six

Sandstone with symmetrical ripple-marks (S.B.35)  
from the Scarborough Beds below Ravenscar  
showing randomly oriented Gyrochorte carbonaria.





Plate Forty-seven

Gyrochorte carbonaria SCHLEICHER

- A. Examples from the Ellerbeck Bed of Goathland trending parallel to the crests of symmetrical ripple-marks.
- B. Examples from laminated siltstones with parting lineation from the Namurian of Haltwhistle Burn, Northumberland showing the pronounced orientation of the trails.

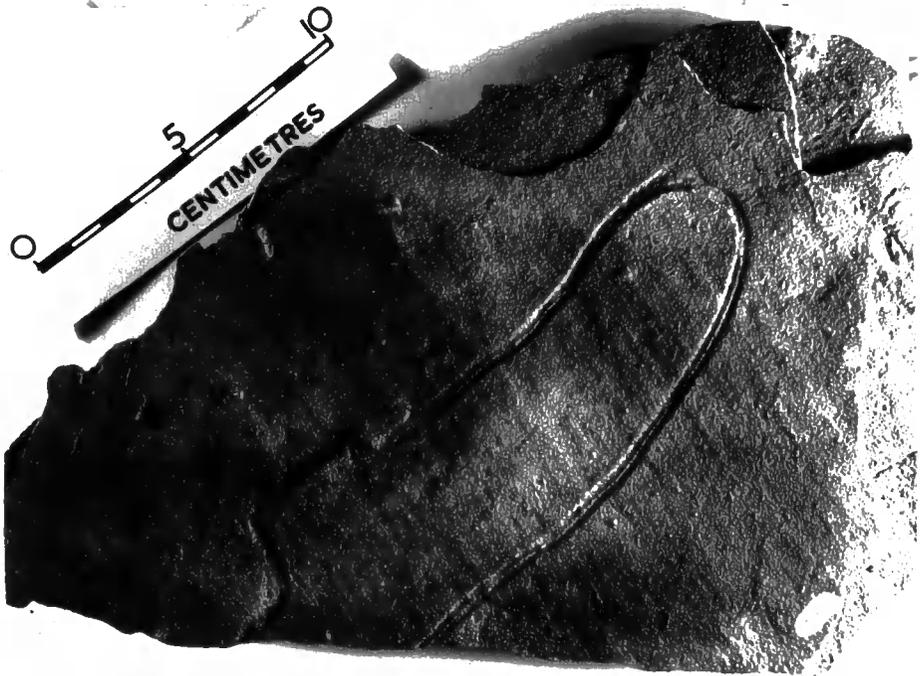


Plate Forty-seven

C. U-shaped Gyrochorte carbonaria oriented  
at right-angles to the parting lineation.

D. Two U-turns developed in adjacent trails;  
oriented at right-angles to parting lineation.

Both examples from the Carboniferous of Haltwhistle



Plate Forty-eight

Two broad U-turns developed by adjacent  
Gyrochorte trails in ripple-marked sandstone  
from the Ellerbeck Bed of Goathland.



Plate Fifty-one

Hundale Point seen from the cliffs above  
Cloughton Wyke.

The scar is formed by the thick sandstone  
above which occur the Scarborough Beds.



Plate Fifty

Trough cross-lamination in the basal sandstone  
of the Scarborough Beds (S.B.36); in situ  
at (45/990010) .

The notebook is 16 cm. in length.

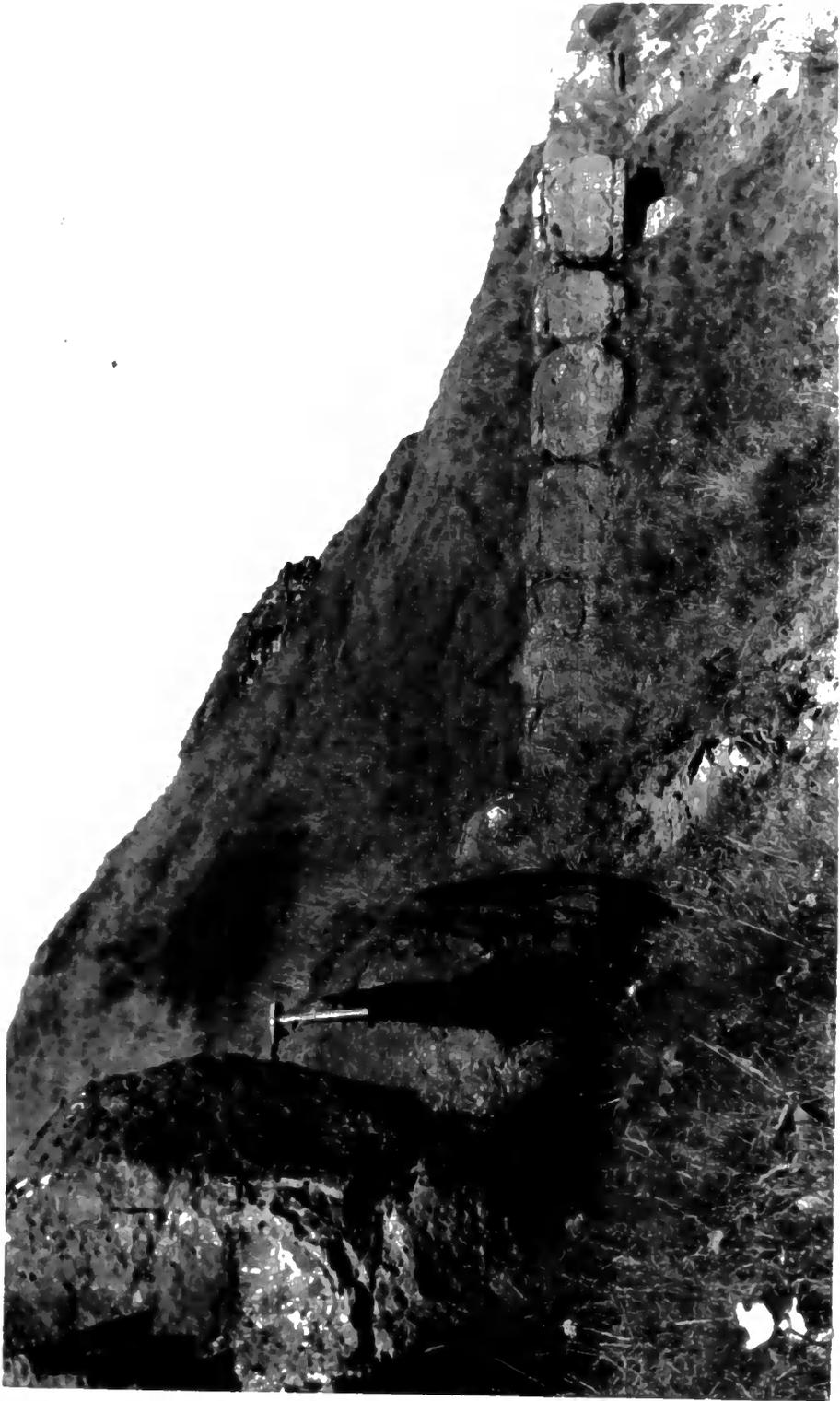


Plate Forty-nine

The outcrop of the Scarborough Beds in the cliffs to the southeast of Blea Wyke Point (45/990010) showing the sphaeroidal weathering of the coarse calcareous grit member (S.D.28) on which the hammer rests, the sandstones at the top of the succession, and the impure limestones, in the foreground. The gently sloping part of the cliff is formed by the thick shale member (S.D.27).



Plate fifty-three

A. Bowleaze Cove; cliffs west of Redcliff Point;  
showing prominent feature made by the large  
tabular blocks of the Trigonia hudlestoni Bed.

B. Bed 7b of the Osmington Oolite, Black Head;  
showing "churned" limestone overlain by  
massive oolite. The horizontal hollows  
are cross-sections of Ophiomorpha borneensis.  
In situ photograph.





Plate Fifty-two

Mixed trace-fossil assemblage in sandy limestone  
from the Scarborough Beds at Iron Scar;  
dominated by Teichichnus, but with ferruginous  
Thalassinoides suevicus and Rhizocorallium commune.

Pencil = 12 cm. in length

APPENDIX LV : MEASURED SECTION OF STRATA THROUGH THE BAJOCIAN SCARBOROUGH BEDS ¼ MILE SOUTHEAST OF RAVENSCAR STATION

e)	Bleached sandstone, flaggy, grey, micaceous		2' 10"	
d)	Ferruginous flaggy sandstone		9"	
c)	Grey micaceous siltstone parting		1"	
b)	Flaggy siltstone		3½"	
a)	Gritty siltstone parting		1"	
1)	Sandy shale with ironstone		4½"	
2)	Brown, micaceous, flaggy sandstone		2"	
3)	White, flaggy sandstone		6-9"	
4)	Grey, laminated silts		8"	
5)	Grey, flaggy siltstone with plant debris at top; ramified by "worm tubes"		7"	
6)	Massive ferruginous sandstone with boxstone rim; burrows from 5)		1'	
7)	Grey siltstone; ramified by horizontal "worm tubes"		3-5"	
8)	Iron Pan		1"	
9)	Ferruginous siltstone; small vertical tubes at base		6½"	
10)	Iron Pan		1"	
11)	Grey siltstone; ramified by horizontal "worm tubes" in 2" clusters		4"	
12)	Iron Pan		1"	
13)	Grey, finely-laminated siltstone; ramified by horizontal "worm tubes"		3"	
14)	Iron Pan		1"	
15)	Grey siltstone; infested with "worm tubes"		6"	
16)	White, flaggy sandstone		2-3"	
17)	Massive brown sandstone with boxstone rim		8"	
18)	Grey siltstone; ramified by "worm tubes"		2"	
19)	Iron Pan		1"	
20)	Grey sandy siltstone, cross-laminated; fewer burrows		4-7"	
21)	Iron Pan, persistent		1"	
22)	Grey sandy siltstone; few burrows		3"	
23)	Iron Pan		1"	
24)	Grey siltstone; infested with "worm tubes" of many types		3-5"	
25)	Massive ferruginous sandstone		7-10"	
26)	Sandy siltstone, cross-laminated; vertical burrows at base		6-8"	
27)	Silty shale		51'	
28)	Calcareous grit		4'	
29)	Purple-weathering, wavy-bedded limestone		2'	
30)	a. Calcareous shale, very shelly f. Nodular limestone full of pernids b. Calcareous shale		2'	
	a. Black paper shale		2'	
31)	Nodular flaggy limestone, very shelly		1'	
32)	Massive fine-grained sandy limestone, ripple-marked		2'	
33)	a. Calcareous shales with irregular bedding b. Carbonaceous ferruginous sandstone; extensive plant rootlets		2'	
34)	Black paper shales with thin siderite bands		10"	
35)	Ripple-marked massive sandstone with U-shaped vertical burrows		9"	
36)	Massive sandstone with low-angle trough cross-bedding		2' 1"	
			5' 7"	
			4'	
			8"	

Astarte minima, Meleagrinnella lycetti, Catinula sp. ; rare

Chlamys common; Pleuromya casts; Modiolus; gastropods indet. rare  
Chlamys rare; Catinula rare-common  
Pleuromya casts, Catinula common  
Catinula, M.lycetti, Pterocardia rare  
Catinula, M.lycetti, Pleuromya casts very common

M.lycetti, Lima rare

M.lycetti rare  
monotypic M.lycetti very common

Chlamys common; Catinula, M.lycetti rare

See TABLE 15 for details

Rhizocorallium commune; no shelly fossils  
Gervillella scarburgensis, Camptonectes lens, M.lycetti, belemnites

Gervillella, Isognomon very common; gregarious

Astarte, Pteroperna very common

Asterosoma c.f. radiciforme, Teichichnus; shelly fossils very rare  
Gervillella very common

Catinula, Pleuromya casts, M.lycetti along local erosion planes  
Catinula rare

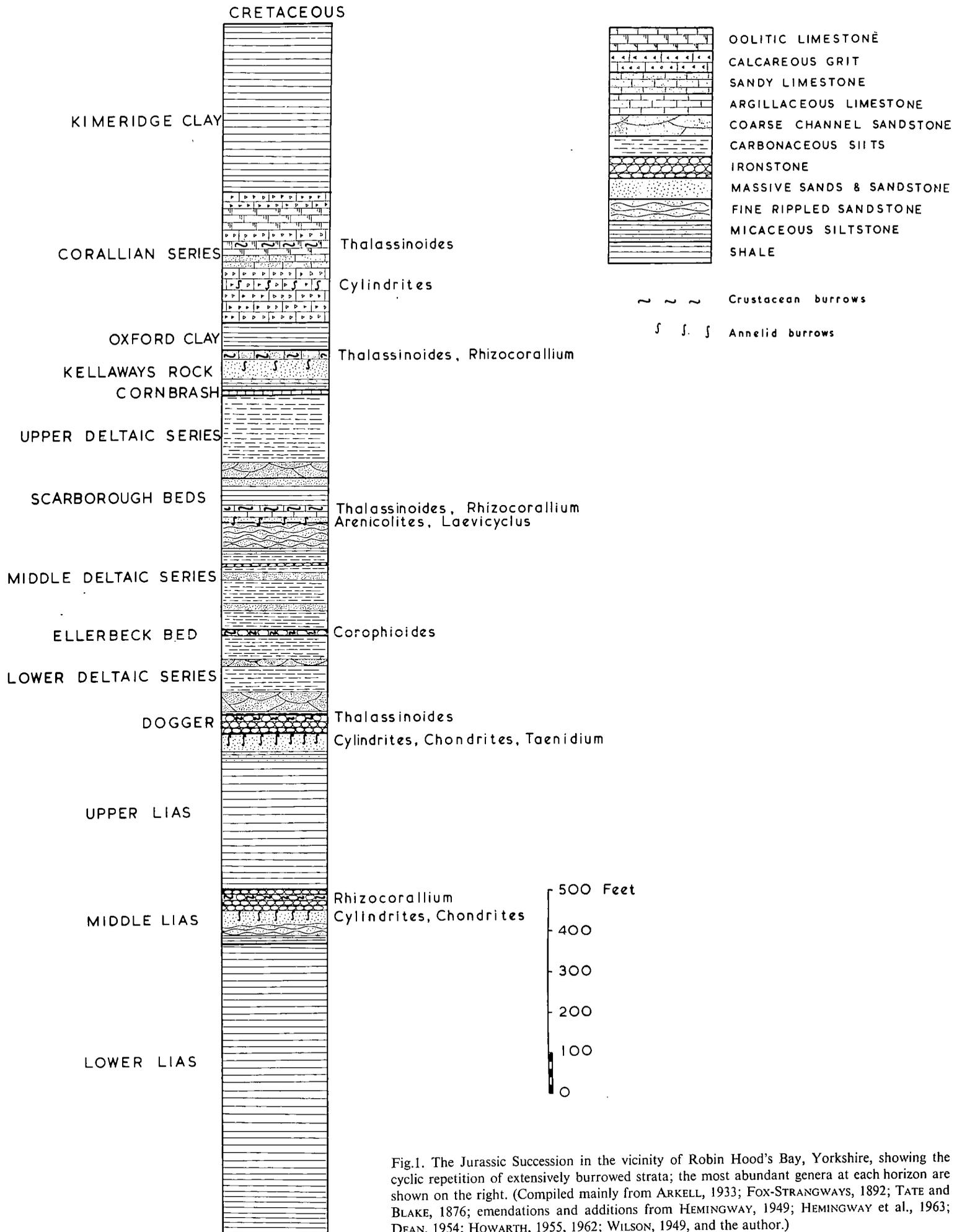
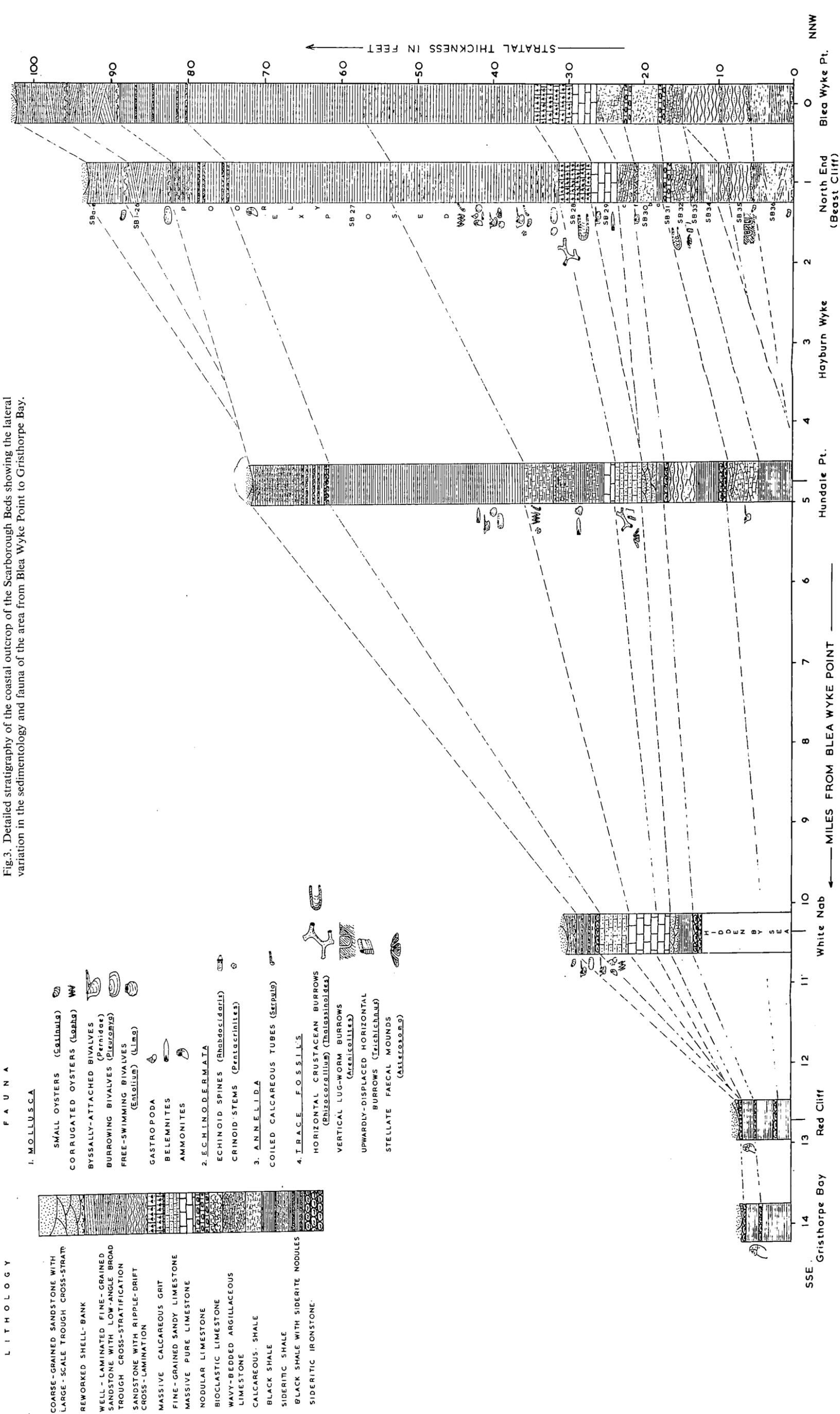


Fig.1. The Jurassic Succession in the vicinity of Robin Hood's Bay, Yorkshire, showing the cyclic repetition of extensively burrowed strata; the most abundant genera at each horizon are shown on the right. (Compiled mainly from ARKELL, 1933; FOX-STRANGWAYS, 1892; TATE and BLAKE, 1876; emendations and additions from HEMINGWAY, 1949; HEMINGWAY et al., 1963; DEAN, 1954; HOWARTH, 1955, 1962; WILSON, 1949, and the author.)

Fig.3. Detailed stratigraphy of the coastal outcrop of the Scarborough Beds showing the lateral variation in the sedimentology and fauna of the area from Blea Wyke Point to Gristhorpe Bay.



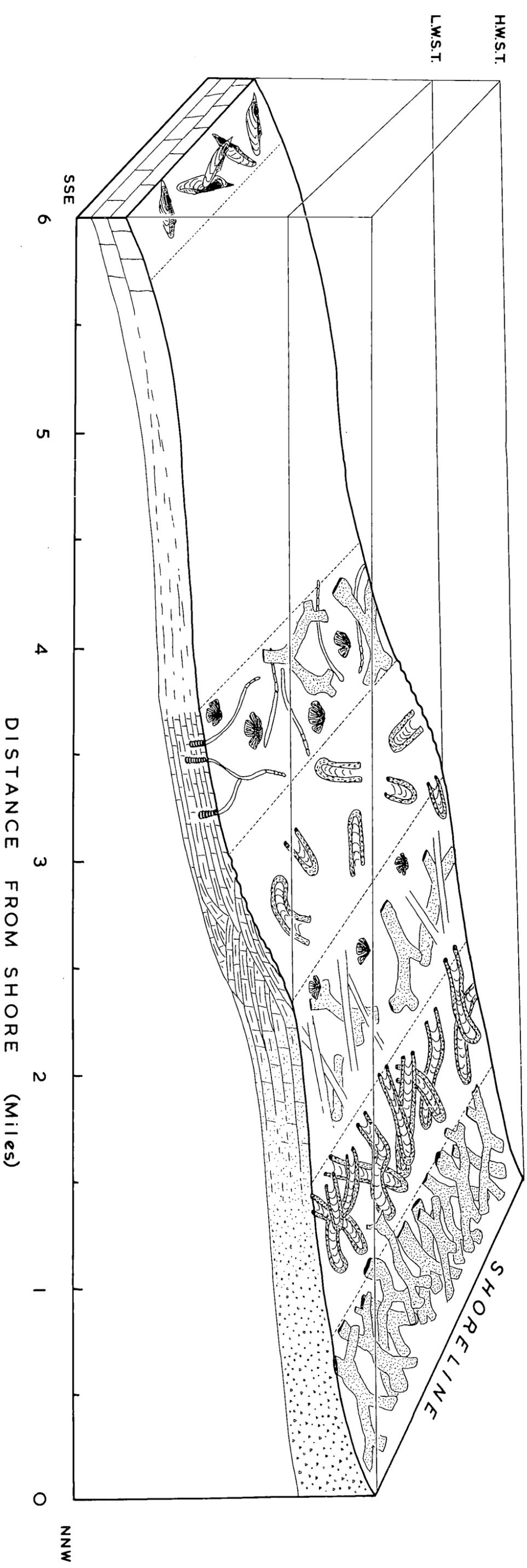
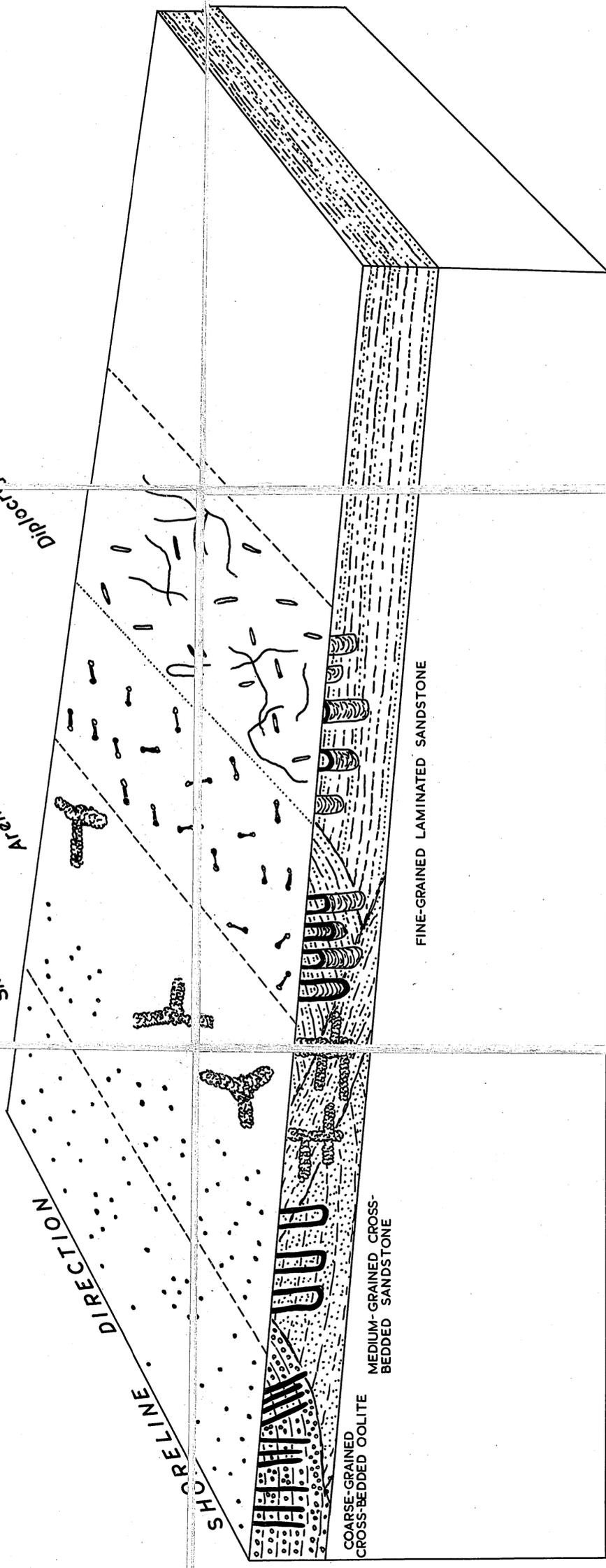


Fig. 1. Suggested bathymetric zonation of the endobenthos in shallow-water limestones from the Bajocian Scarborough Beds of the Yorkshire coast. Compiled from stratigraphic data presented in Table III, Fig. 10 and the text. (Horizontal scale accurate; vertical scale and lateral scale diagrammatic.)



TRACE-FOSSIL FACIES IN THE WELL-SORTED SANDSTONE AND OOLITE REGIME OF SEDIMENTATION

Skolithos FACIES  
Arenicolites FACIES  
Diplocraterion FACIES



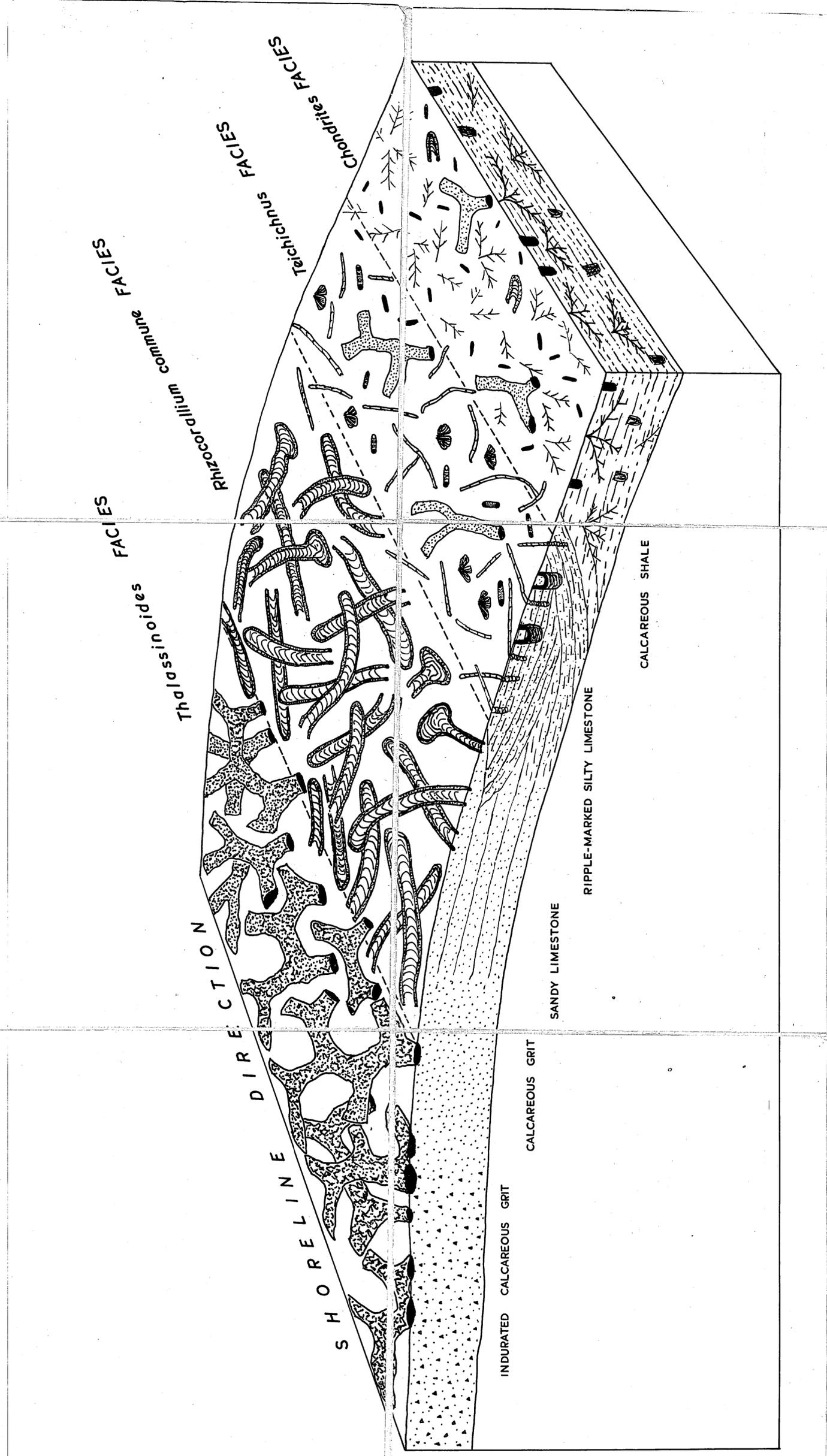
COARSE-GRAINED  
CROSS-BEDDED OOLITE

MEDIUM-GRAINED CROSS-  
BEDDED SANDSTONE

FINE-GRAINED LAMINATED SANDSTONE

SHORELINE  
DIRECTION

TRACE-FOSSIL FACIES IN THE IMPURE CALCAREOUS CLASTIC REGIME OF SEDIMENTATION



TRACE-FOSSIL FACIES IN THE IRONSTONE REGIME OF SEDIMENTATION

