PLATES

photographs by Mr. W. C. Laurijssen

PLATE I

MOLLUSCS FROM THE YUSO GROUP

1. *Productus* cf. *carbonarius* de Koninck, x 3. Prioro Formation, loc. 698.

2. *Dictyoclostus* ? *aegiranus* Böger & Fiebig, x 3. Pando Fm., Lower Sandstone Mbr., loc. 733.

3. *Karavankina* sp., x 3. Pando Fm., Lower Sst. Mbr., loc. 612.

4. *Schizophoria* sp., x 3. Pando Fm., Lower Sst. Mbr., loc. 612.

5. *Rugosochonetes acutus* Demanet, x 3. Pando Fm., Mesao Limestone Mbr., loc. 747. Note well-preserved spines.

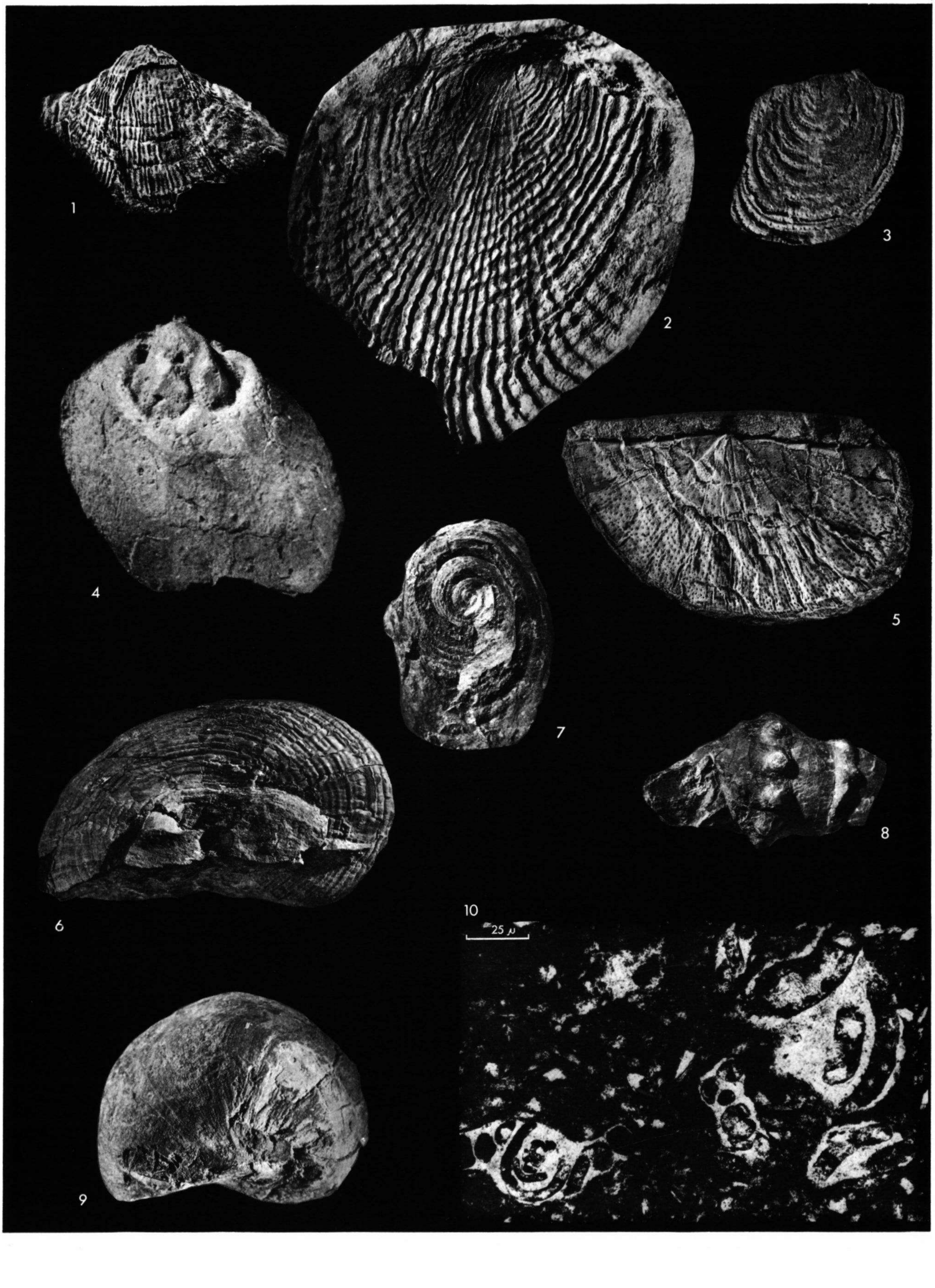
6. Unidentified gasteropod, x 1. Pando Fm., Mesao Lst. Mbr., loc. 742.

7. Unidentified gasteropod, x 2. Pando Fm., Mesao Lst. Mbr., loc. 742.

8. Unidentified gasteropod, x 1. Pando Fm., Mesao Lst. Mbr., loc. 742.

9. Unidentified, *Bellerophon*-like, gasteropod, x 2. Pando Fm., Mesao Lst. Mbr., loc. 631.

10. Thin section of sample 488 (Pando Fm., Mesao Lst. Mbr.), showing mudstone with several specimens of ? *Glomospira* sp.



1
2
3
4
5
6
7
8
9
10
25 µ

PLATE II

FOSSILS FROM THE PANDO, OCEJO AND TEJERINA FORMATIONS

1. Calyx of a dicyclic inadunate crinoid, x 2½. Pando Fm., Lower Sst. Mbr., loc. 732.

2. Calyx, cf. *Talanterocrinus* sp., cf. *Synerocrinus* sp. and cf. *Amphicrinus* sp., x 2½. Pando Fm., Mesao Lst. Mbr., loc. 691.

3. Calyx of a dicyclic inadunate crinoid, x 2½. Pando Fm., Upper Sst. Mbr., loc. 680.

4. *Palmatopteris furcata* (Brongniart) Potonié, x 2½. Pando Fm., Mesao Lst. Mbr., loc. 742.

5. Unidentified gasteropod, x 2. Tejerina Fm., Barranquito Mbr., loc. 756.

6. *Juresania* sp., x 3. Tejerina Fm., Barranquito Mbr., loc. 752.

7. *Linoproductus* sp., x 1. Tejerina Fm., Barranquito Mbr., loc. 756.

8. *Linoproductus* sp., x 1½. Tejerina Fm., Barranquito Mbr., loc. 756.

9. *Callipteridium (Praecallipteridium) armasi* (Zeiller) Wagner, x 1½. Ocejo Fm., loc. 429.

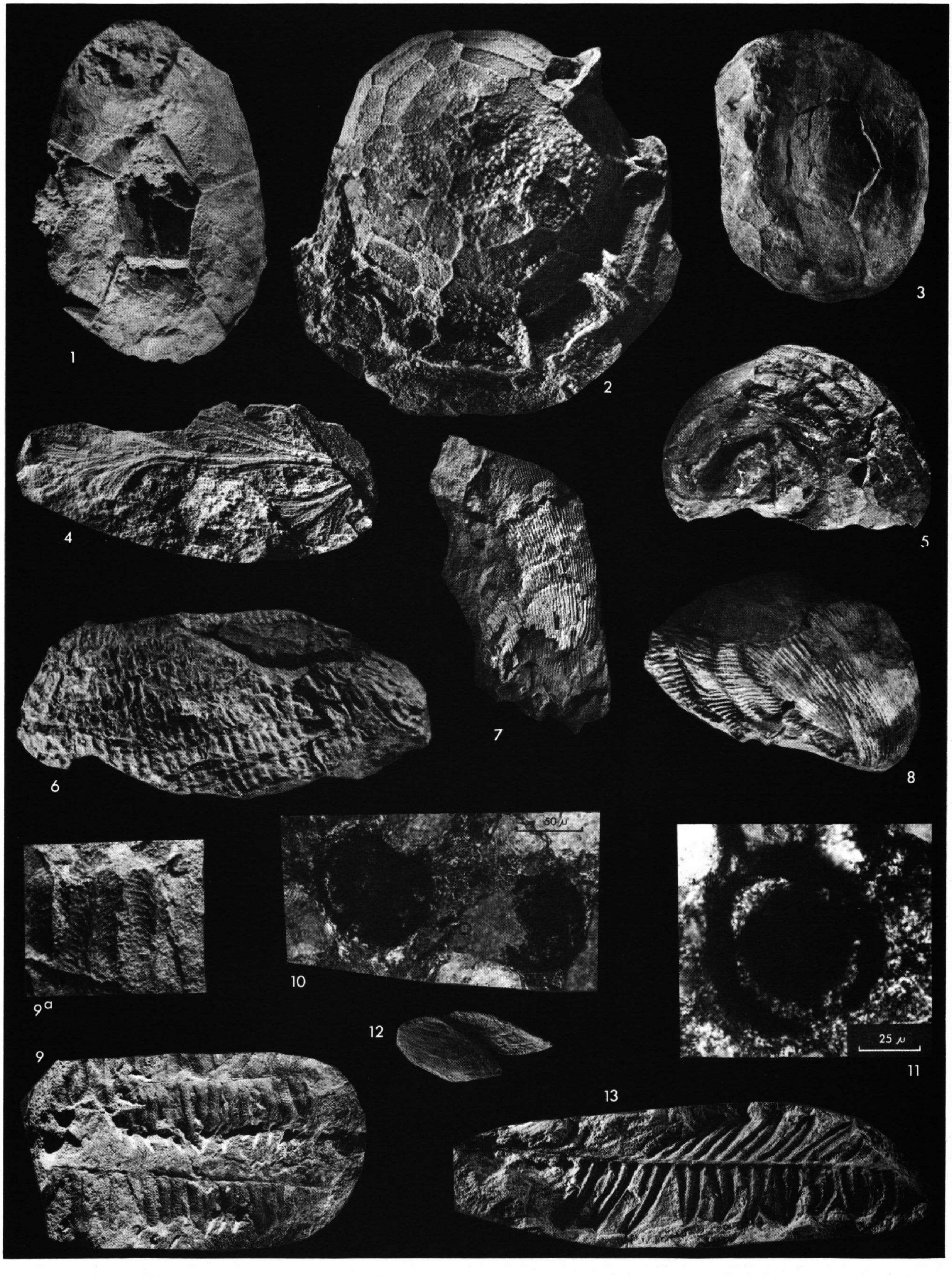
9–A. Same specimen, detail enlarged 3 times.

10. Thin section of sample 537 (Ocejo Fm.), showing spherical particles probably of organic origin (pollen?). Note that one of the particles is partly replaced by quartz.

11. Same slide, showing other particle of similar origin.

12. *? Anthraconaia* aff. *pruvosti* (Chernyshev). Probably a juvenile form, x 5. Tejerina Fm., Corriello Mbr., loc. 443.

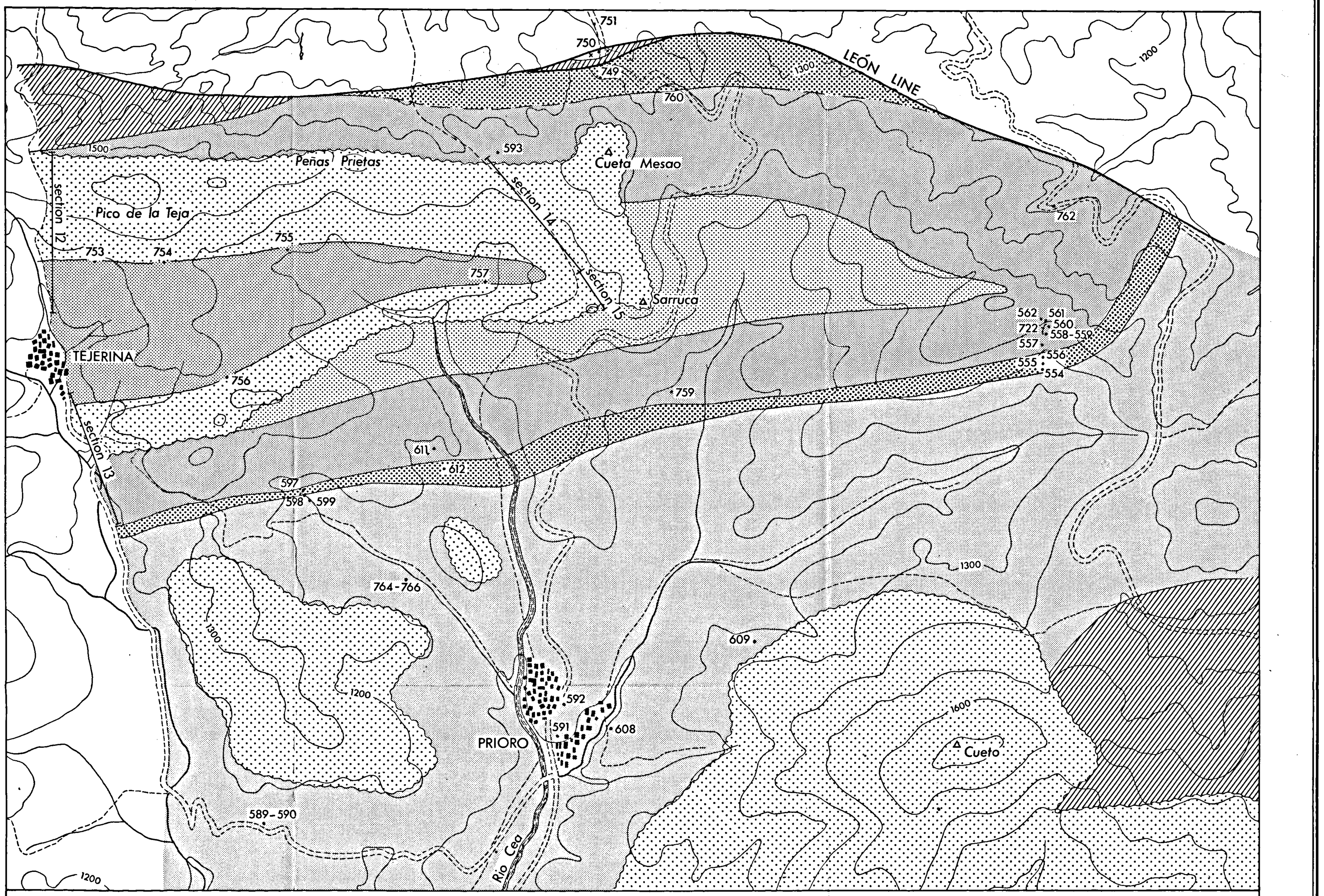
13. *Alethopteris ambigua* Lesquereux, x 1½. Ocejo Fm., loc. 539.


1
2
3
4
5
6
7
8
9a
9
10
50 µ
11
25 µ
12
13


VERTICAL SCALE OF ALL SECTIONS 1:1,000
SECTION 1
(compare with Helmig, 1965, fig. 3a, p. 87)
SECTION 2
SECTION 3
SECTION 4
SECTION 5
(compare with section described in appendix of van Loon, 1971)
SECTION 6
SECTION 7
(reference sections of the Prioro and Pando Formations, compare with van Loon, 1971, fig. 4. Possibly identical with the type sections as proposed by Brouwer & van Ginkel, 1964, p. 311. Compare also with Helmig, 1965, fig. 3b, p. 87)
SECTION 8
SECTION 9
SECTION 10
SECTION 11
OCEJO FORMATION
Upper Sandstone Member
PANDO FORMATION
Mesao Limestone Member
Lower Sst. Mbr.
PRIORO FORMATION
PICO DE LA TEJA
CUETO MESAO
PUERTO DE PANDO
TEJERINA
PRIORO
Rio Cea
PUENTE ALMUHEY
0
2 km
Location of the sections 1-11
Tejerina Formation
Ocejo Formation
Upper Sandstone Member
Mesao Limestone Member
Lower Sandstone Member
Pando Formation
Prioro Formation
Older formations
LEGEND
LITHOLOGY
conglomerate
pebbly mudstone
sandstone
mudstone
limestone
small sandy intercalations
small muddy intercalations
small calcareous intercalations
small carbonaceous intercalations
sandy
muddy
calcareous
single pebble
fault breccia
the lithology in these sections has been indicated according to field observations and not to petrographic analysis
SPECIAL FEATURES
qp (Ø 5) quartzite pebble with longest axis of 5 cm
sst. p sandstone pebble
p.e. poorly exposed
n.e. not exposed
1 metres
2 sample number
3 sedimentary structures
4 lithology
5 special features
SEDIMENTARY AND DIAGENETIC STRUCTURES
parallel lamination
wavy lamination
convolute lamination
current ripples
wave ripples
interference ripples
graded bedding
groove cast
flute cast
load cast
pseudonodule
channel fill
clay gall
slump structure
olistolith
imbrication
mottling
apparently homogeneous
pressure solution phenomena
geopetal structure
birdseye structure
stromatactis
concretion of ankerite
concretion of calcite
concretion of limonite
concretion of siderite
erosive contact
(angular) unconformity
FOSSILS
leaves of terrestrial plants
trunk
unidentifiable wood fragment
algae
oncolites
calcispheres
crinoids (stems and ossicles)
crinoids (calyx)
crinoids (tegmen)
echinoderms in general
brachiopods
pelecypods
gasteropods
goniatites
other cephalopods
fusulinids
siliceous foraminifers
other foraminifers
bryozoans
solitary corals
budding (?) corals
coral colonies
trilobites
ostracods
sphinctozoan sponges
fish teeth
conodonts
trails
burrows in various directions
vertical burrows
spicules and spines of brachiopods, echinoderms, sponges and trilobites

SECTION 12

(compare with Wagner, Vilegas & Fonollà, 1969, fig. 2, p. 122, and with Helmig, 1965, fig. 15 (section gn-gs), p. 108)



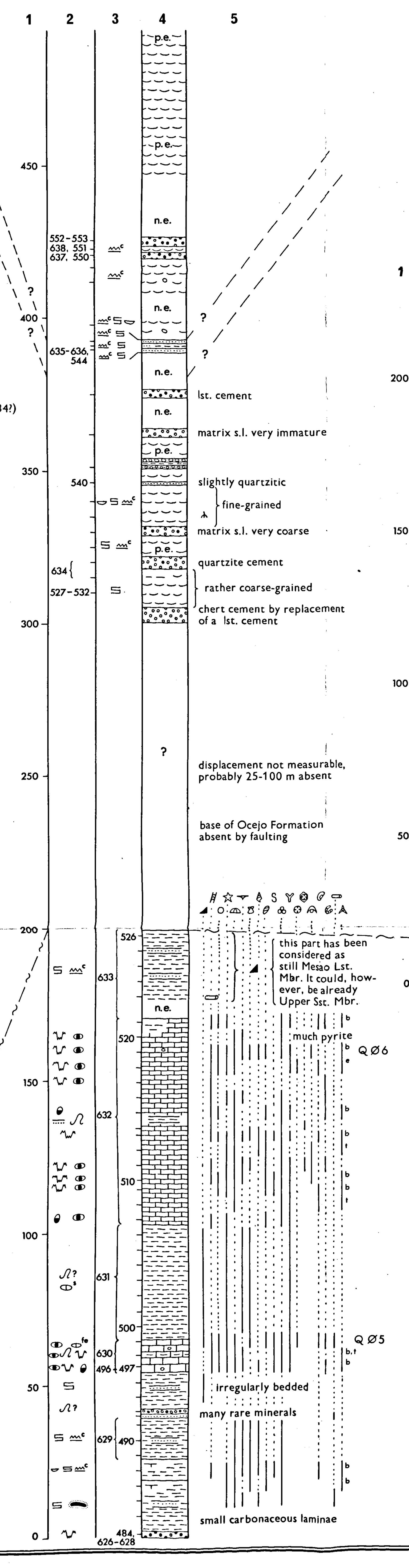
Generalized map (1:25,000) showing locations of sections 12-15 and locality numbers that are not indicated in sections 1-15.

LEGEND

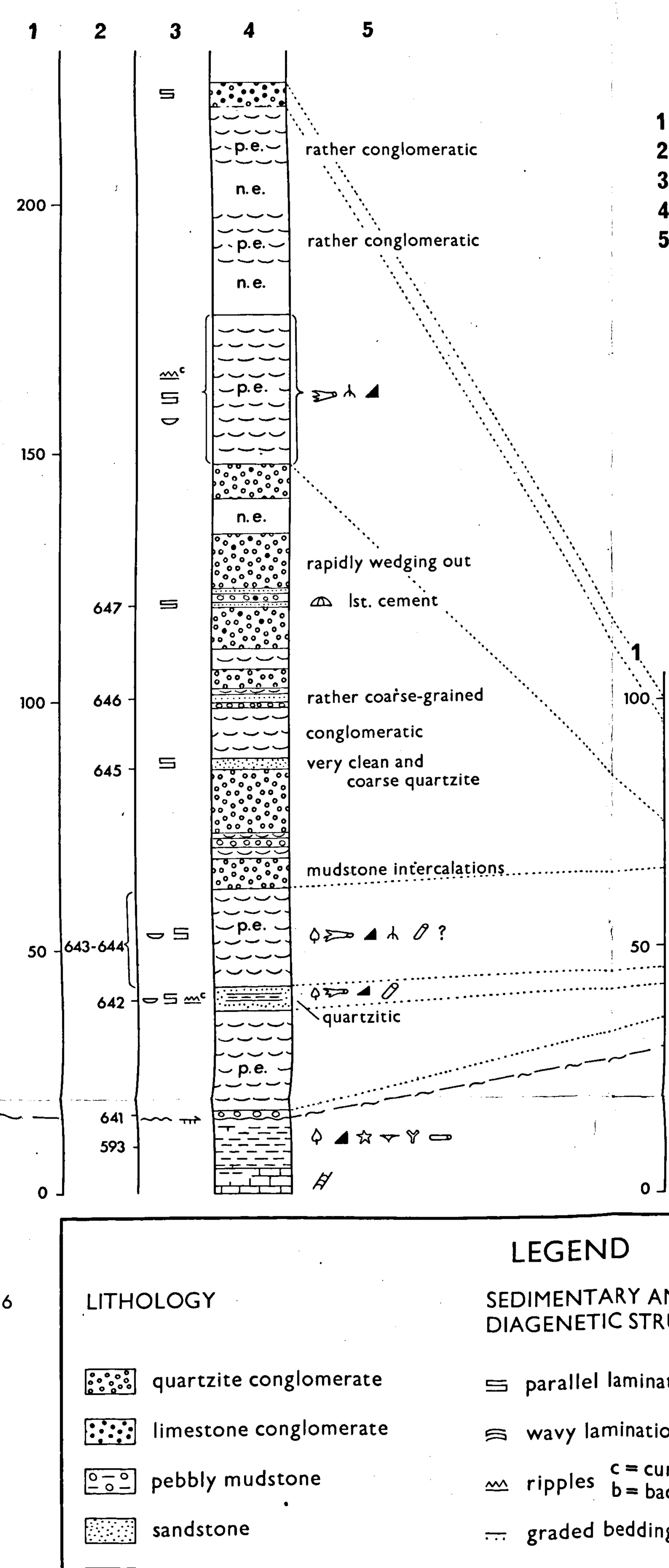
- Tejerina Formation
- Ocejo Formation
- Upper Sandstone Member } Pando Formation
- Mesao Limestone Member } Pando Formation
- Lower Sandstone Member } Pando Formation
- Prioro Formation
- Older formations
- Carboniferous intrusion (?)

SECTION 13

(compare with Helmig, 1965, fig. 15 fig. 15 (section hn-hs), p. 108)



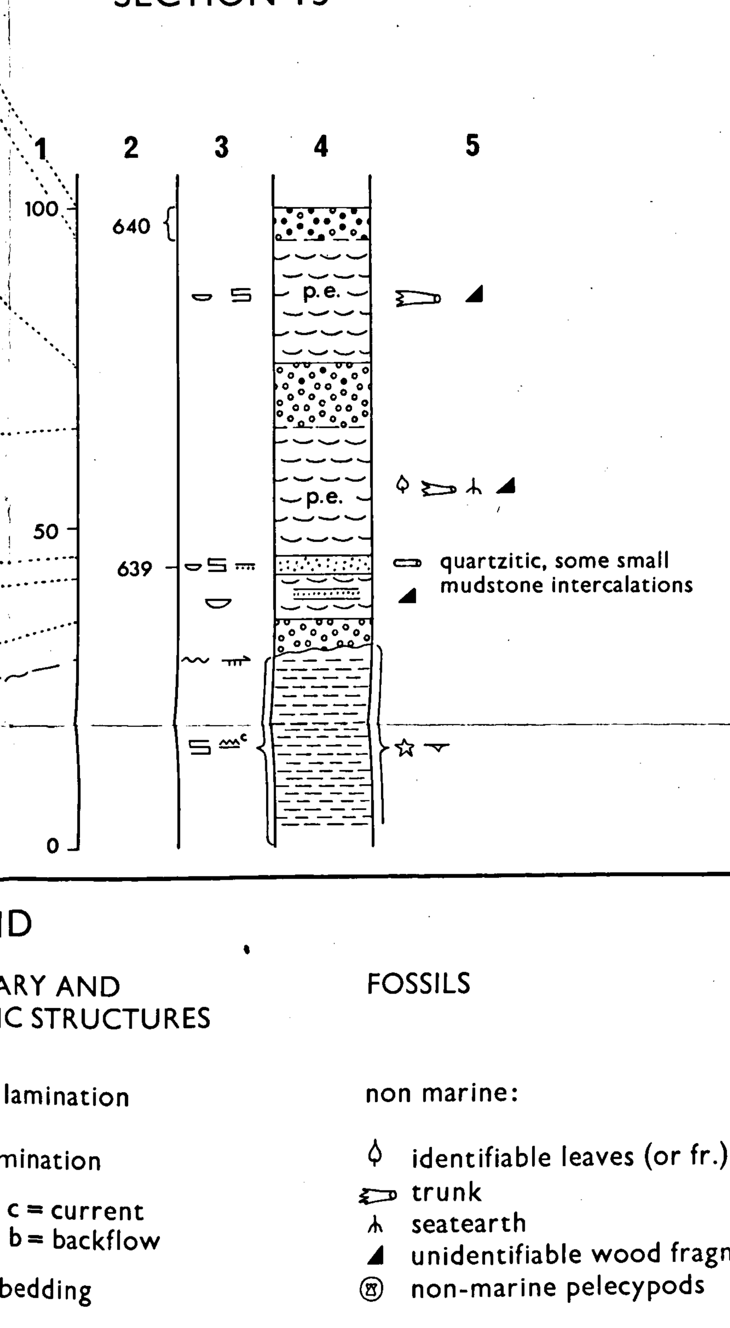
SECTION 14



vertical scale of all sections 1 : 1,000

- **1** metres
- **2** sample number
- **3** sedimentary structures
- **4** lithology
- **5** special features

SECTION 15



LEGEND

LITHOLOGY

- quartzite conglomerate
- limestone conglomerate
- pebbly mudstone
- sandstone
- mudstone
- limestone
- fluvial sequences with sst., mudst. and coal
- sandy
- muddy
- calcareous
- single pebble
- small sst. intercalations
- small mudst. intercalations
- p.e. poorly exposed
- n.e. not exposed

SEDIMENTARY AND DIAGENETIC STRUCTURES

- parallel lamination
- wavy lamination
- ripples c = current, b = backflow
- graded bedding
- load cast
- channel fill
- slump structure
- flaser-linsen structure
- clay flakes
- pressure solution phenomena
- geopetal structure
- birdseye structure
- concretion fe = limonite, s = siderite
- erosive contact
- (angular) unconformity

FOSSILS

non marine:

- identifiable leaves (or fr.)
- trunk
- seatearth
- unidentifiable wood fragment
- non-marine pelecypods

marine:

- algae
- calcispheres
- crinoids (stems and ossicles)
- echinoderms in general
- brachiopods
- pelecypods
- gasteropods
- fusulinids
- siliceous foraminifers
- other foraminifers
- bryozoans
- solitary corals
- coral colonies
- trilobites
- ostracods
- sphinctozoan sponges
- trails
- burrows in various directions
- b,e,t spines of brachiopods, spicules of echinoderms, trilobites


SCALES:
1:10 in sections 1, 3, 4, 7 and 8
1:20 in sections 2, 5 and 6
DETAILED SECTION 1
(part of the Prioro Formation in Section 3)
sandstone, wedging out
thin mudstone layer, in most places pinched out
thin mudstone layer
thin mudstone layer, locally pinched out
DETAILED SECTION 2
(part of the Lower Sandstone Member of the Pando Formation in Section 6)
laminations due to fossil concentrations
sandy shales and clayey sst.
decalcified; shells lie with convex side upwards
limestone at the base, passing gradually into sst. at the top
all fossils lie parallel to the bedding plane
groove (?) casts, indicating E-W trending transport
decalcified
level with several sst. lenses in shale
sed. struct. only in a few thin sandstone laminae
big coarse-grained, fining upwards channel fill, in lower part showing a mega cross-stratification; in upper part (still coarse sst.) often decalcified; fossils only as fragments
alternating mudst. and sst. of 0.3 - 17.0 cm thick, showing channelling, par. lam. and current ripples
p.e.
DETAILED SECTION 3
(part of the Mesao Limestone Member of the Pando Formation in Section 5)
graded lst. turbidite
graded lst. turbidite
graded lst. turbidite
DETAILED SECTION 4
(on boundary Mesao Limestone Member Upper Sandstone Member of Pando Formation in Section 5)
structureless (E)
very thin par. lam. (D)
well developed convol. lam.; current ripples (C)
relat. thick lam. of coarser mat., and relat. thin lam. of finer mat.(B)
structureless (A)
structureless (E)
parallel lam. (D)
current ripples (C)
parallel lam. (B)
grading from sst. with little mud at the base to sandy mudstone at the top
grading from base to top
par. lam. only at the base
par. lam. only in the lowermost cm
decalcified
DETAILED SECTION 5
(part of the Upper Sandstone Member of the Pando Formation in Section 4)
irregular sandstones, channelling in each other
wedging out; probably channelling in underlying mudstone
n.e.
most probably completely mudstones
probably channelling, indistinct because of cleavage
sandy mudst., partly homog., possibly due to mottling
fine-grained sand with some silt
fine-grained sand with much silt
some fine-grained sand at the base
LEGEND
Lithology:
Oligomict conglomerate
Sandstone
Mudstone
Limestone
Calcareous sandstone mudstone
Muddy sandstone limestone
Sandy mudstone
Coal
n.e.: not exposed
p.e.: poorly exposed
Bedding contacts:
Sharp contact
Gradual contact
Sedimentary structures:
current ripples
parallel lamination
graded bedding
clay galls
convolute lamination
groove cast
mega cross-bedding
wavy lamination
channelling
load cast
mottling
Fossils
brachiopods
fusulinids
algae
seatearth
gastropods
crinoids (stems and ossicles)
pelecypods
ostracods
bryozoans
unidentifiable wood fragments
solitary corals
1 centimetres
2 bedding contacts
3 sedimentary structures
4 lithology
5 special features
PICO DE LA TEJA
CUETO MESAO
TEJERINA
PRIORO
PUENTE ALMUHEY
0
2 km
situation map
Tejerina Formation
Ocejo Formation
Upper Sandstone Member
Mesao Limestone Member
Lower Sandstone Member
Pando Formation
Prioro Formation
locality of detailed section 7
DETAILED SECTION 6
(part of the Ocejo Formation in Section 12)
quartzite conglomerate with sandy intercalations
somewhat sandy
rapidly wedging out a few m from this section
½ cm of coaly mudstone
silty
coaly
fine-grained sst.
alternating fine-grained and coarse-grained sst. layers
sandy
lam. of coaly mat.
½ cm of coaly silt
thin sandy coal layer, sometimes pinched out
coarse-grained sst. with some coaly mat.
sst. with coal lam.
washed-in coaly mat.
coaly silty mudst.
fine-grained sst. with coal lam.
very coarse-grained sst.
DETAILED SECTION 7
(part of the Corriello Member of the Tejerina Formation in Section 12)
coaly
DETAILED SECTION 8
(part of the marine Barranquito Member of the Tejerina Formation in Section 12)