PLATE 11

Fig. 38. Prism-forming epithelium on the dorsal surface of the outer marginal fold. X marks the probable edge of this epithelium which, in the living specimens, underlies the edge of the shell. Compare Figs. 33 and 45. Spec. III.

Fig. 39. Shell and nacre-forming epithelium. Spec. III.

Fig. 40. Muscle attachment epithelium, tangential section. Spec. III. The tono-fibrils are collected in bundles, on the surface of which the nuclei are situated.

Fig. 41. Sterile shell epithelium between the nacreous layer and the wall of an intestinal loop. Spec. III.

Fig. 42. Muscle attachment epithelium in the region of insertion of the pedal retractors. Spec. III.

Fig. 43. Nacre-forming epithelium. Spec. III.

Fig. 44. Muscle attachment epithelium, showing the bundles of tono-fibrils and the position of the nuclei. Spec. III.

ep = epithelium
int. ep = intestinal epithelium
int. l = intestinal lumen
L. ce = Leydig cells
mu = muscle fibres
na. l = nacreous layer
per = periostracum
pr. l = prismatic layer
x = probable site of the edge of the outer marginal fold

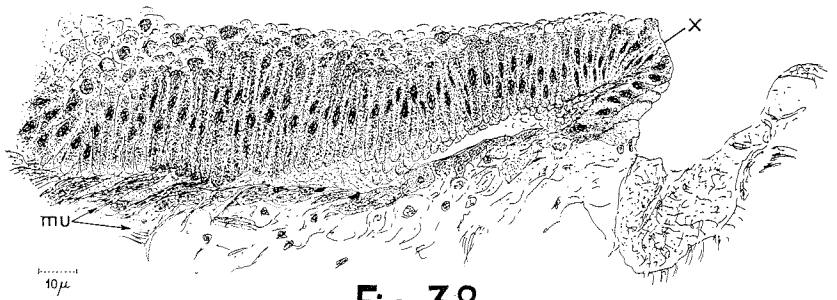


Fig.38

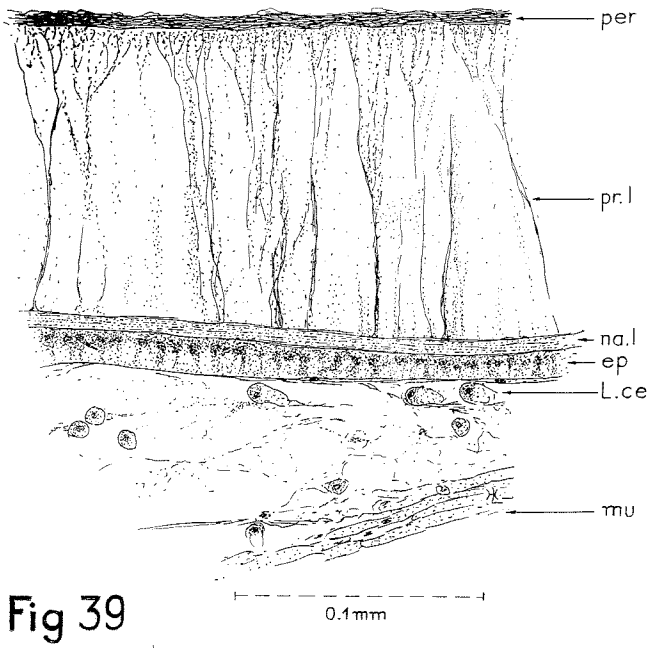


Fig 39

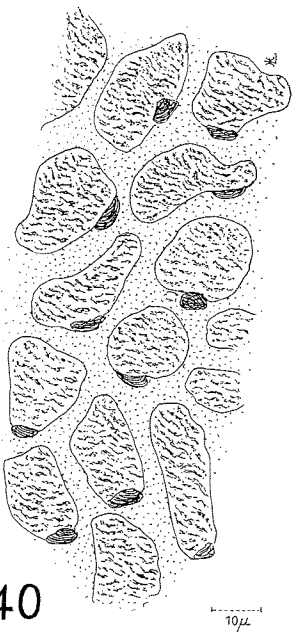


Fig.40

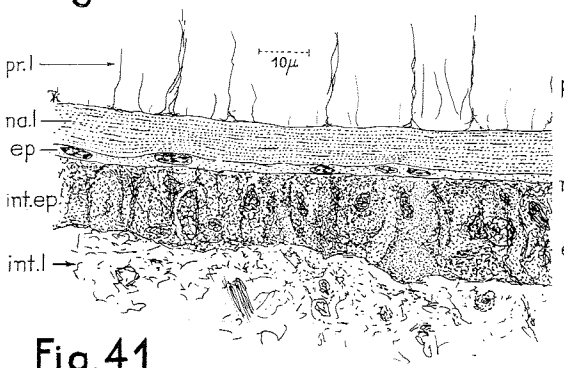


Fig.41

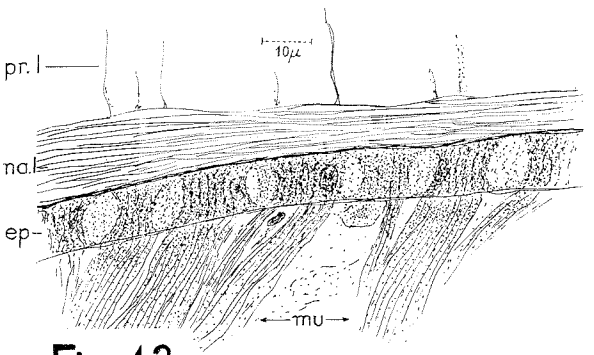


Fig.42

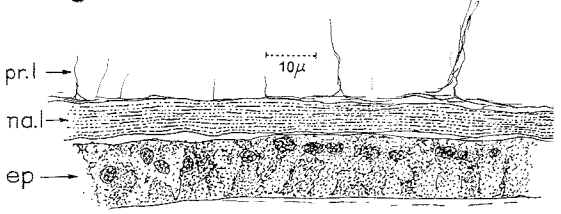


Fig.43

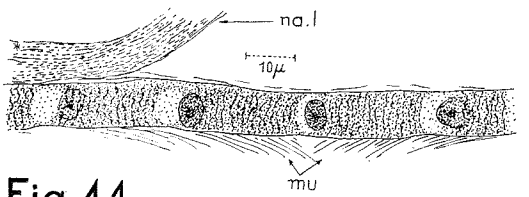


Fig.44

PLATE 12

Fig. 45. Section through the peripheral part of the shell and mantle. The latter must be strongly contracted since, in living specimens, the outer marginal fold (ou. ma. f) must reach the edge of the shell. The periostracum (per) has broken over at the shell edge. Microphotograph. Spec. III.

Fig. 46. The structure of the shell in the region of insertion of the pedal retractor muscles. Microphotograph. Spec. III.

Fig. 47. Section through the pallial fold, showing the marginal mucous gland (ma. mu. gl), the inner and middle marginal folds, and the periostracum gland (per. gl). Microphotograph. Spec. III.

Fig. 48. Muscle attachment epithelium with tono-fibrils (ep) underlying the lamellate nacreous layer in the region of the pedal retractors. Microphotograph. Spec. III.

ep = epithelium
in. ma. f = inner marginal fold
ma. mu. gl = marginal mucous gland
mi. ma. f = middle marginal fold
mu = muscles (tendinous part)
mu. a. ce = scattered muscle attachment cells
na. l = nacreous layer
ou. ma. f = outer marginal fold
per = periostracum
per. gl = periostracum gland
pr. l = prismatic layer

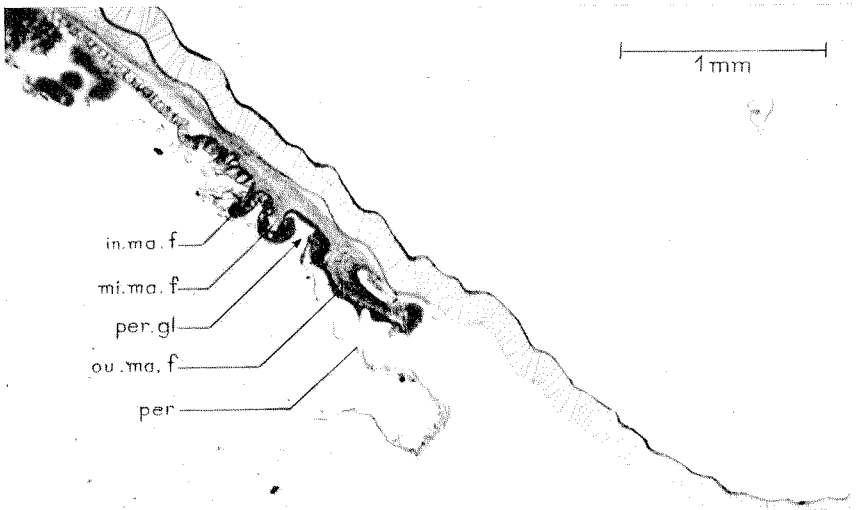


Fig.45

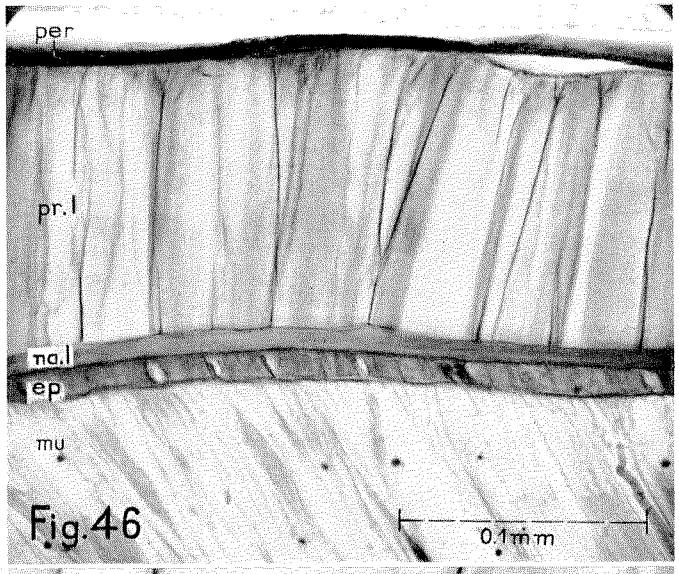


Fig.46

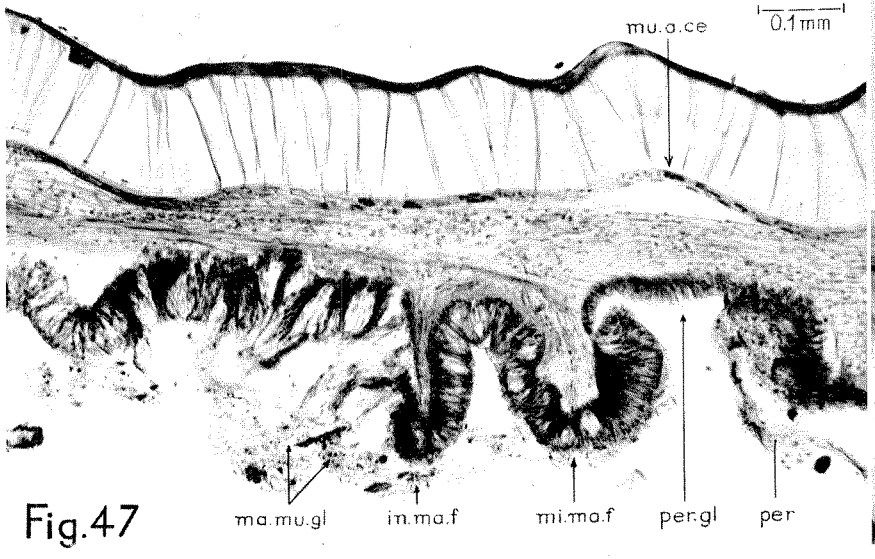


Fig.47

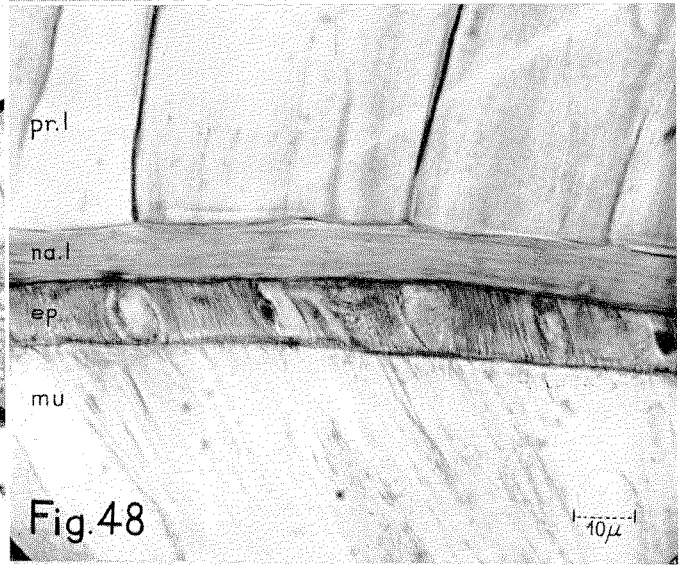


Fig.48

PLATE 13

Fig. 49. Apex with protoconch of Spec. IV after decalcification and imbedding in celloidin. Compare fig. 34. Microphotograph.

Fig. 50. Periostracum gland with the periostracum on the surface. Note the dark fibrils in the basal part of the cells. Central direction to the left. Microphotograph. Spec. III.

Fig. 51. Section through shell with a growth line (gr. l). Microphotograph. Spec. III.

Fig. 52. Nacre-forming epithelium (ep), with a single muscle attachment cell (mu. a. ce). Microphotograph. Spec. III.

ep = epithelium
gr. l = growth line
L. ce = Leydig cells
mu = muscle fibres
mu. a. ce = muscle attachment cells
na. l = nacreous layer
per = periostracum
per. gl = periostracum gland
pr. l = prismatic layer

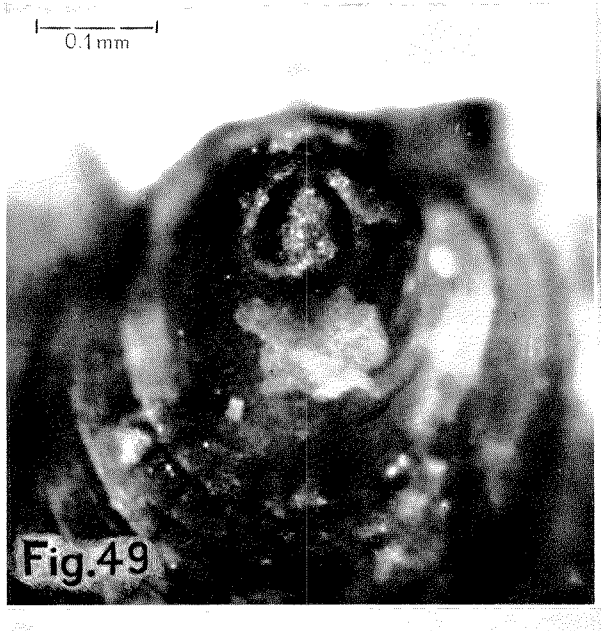


Fig.49

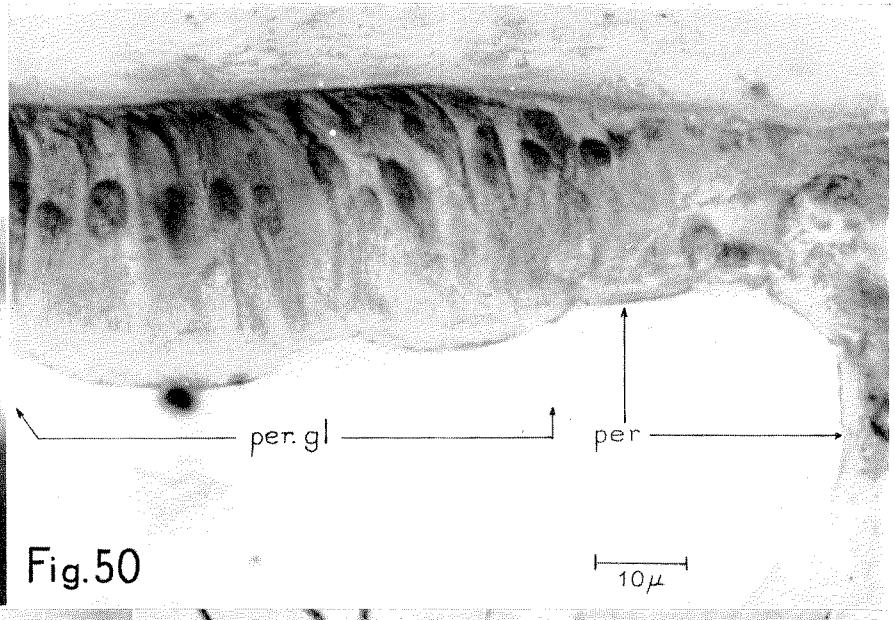


Fig.50

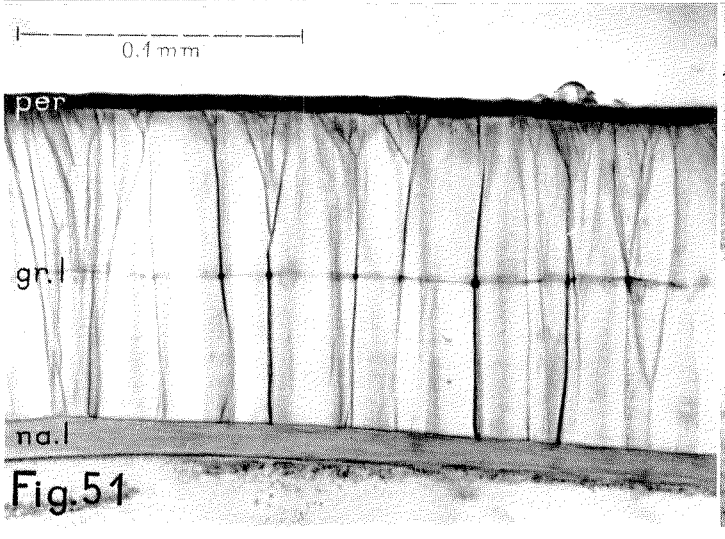


Fig.51

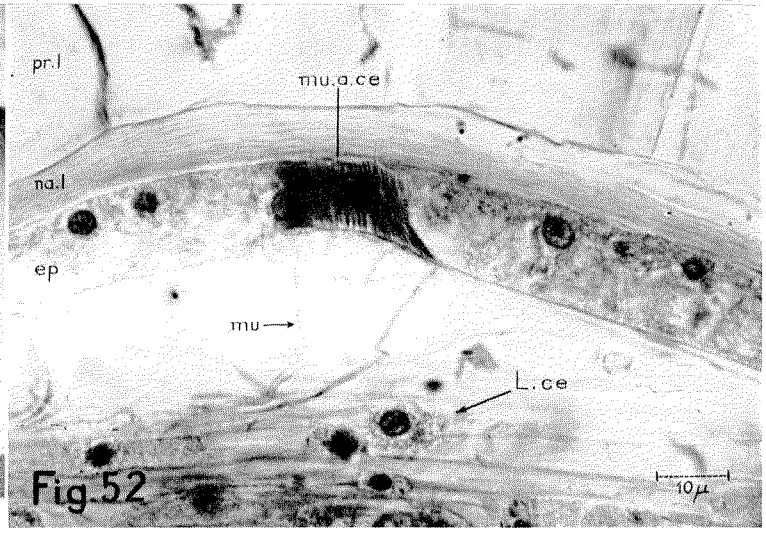


Fig.52

PLATE 14

Fig. 53. Muscle attachment epithelium, seen in tangential section. In the place shown, the nuclei are situated on the surface of the bundles of tono-fibrils. Microphotograph. Spec. III.

Fig. 54. Muscle attachment epithelium of a buccal muscle. The nuclei are situated inside the bundles of tono-fibrils. Microphotograph. Spec. III.

Fig. 55. Nacre-forming epithelium, seen in tangential section. Microphotograph. Spec. III.

Fig. 56. Longitudinal section through the stem of the 2nd left gill, showing the alternation of dorsal and ventral lamellae. Microphotograph. Spec. III.

do. la = dorsal lamellae
ne = nephridia
nu = nucleus
pa. w = wall of pallial groove
to.-fi = bundles of tono-fibrils
us. p = unspecialized plasm
ve. la = ventral lamellae

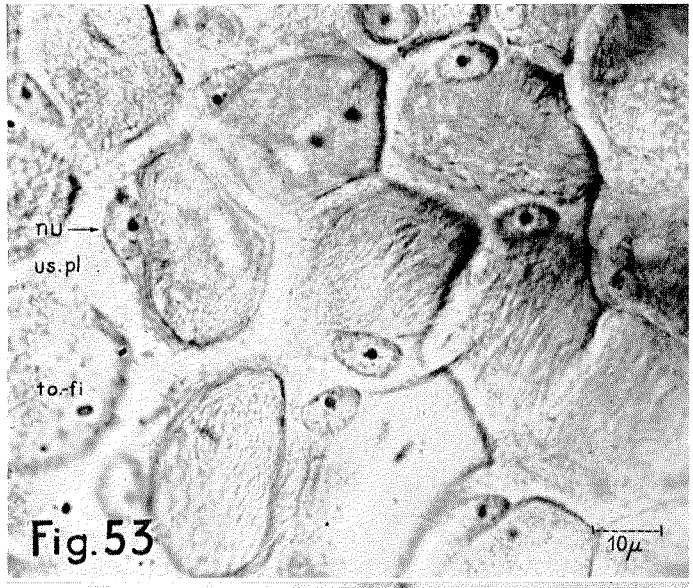


Fig.53

Fig.54

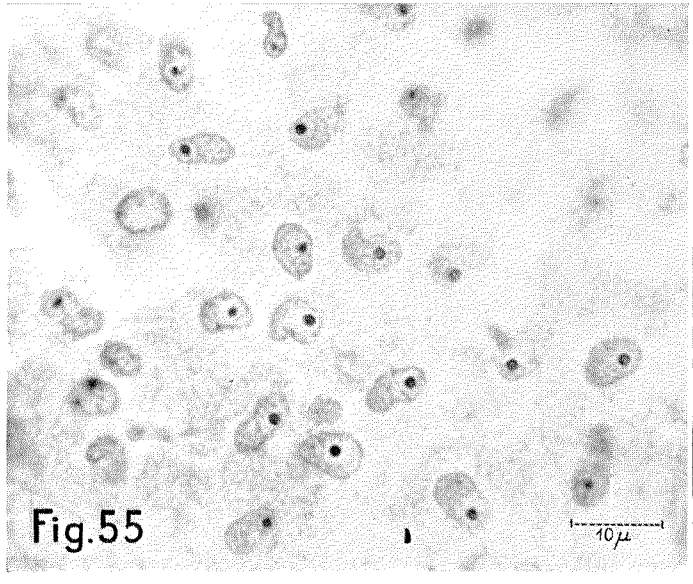


Fig.55

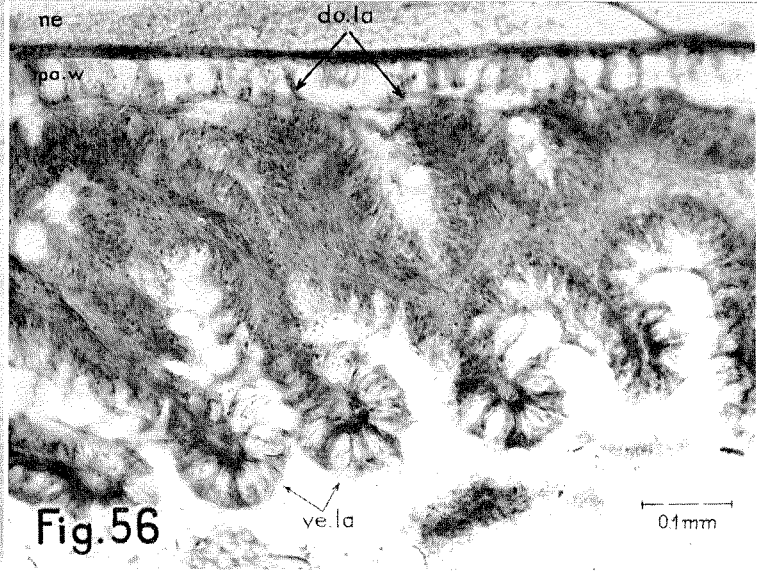


Fig.56

PLATE 15

Fig. 57. Ventral view of *Neopilina* showing diagrammatically the arrangement of the gills. The arrows indicate the probable course of the water currents. The foot margin is removed to the left in the figure.

an = anus
f. m = foot margin
gi_1-gi_5 = gills number 1 and 5, resp.
in. ma. f = inner marginal fold of mantle
m = mouth
mi. ma. f = middle marginal fold
ou. ma. f = outer marginal fold
pa. g = pallial groove
po. te = postoral tentacles
pr. te = preoral tentacle
vel = velum

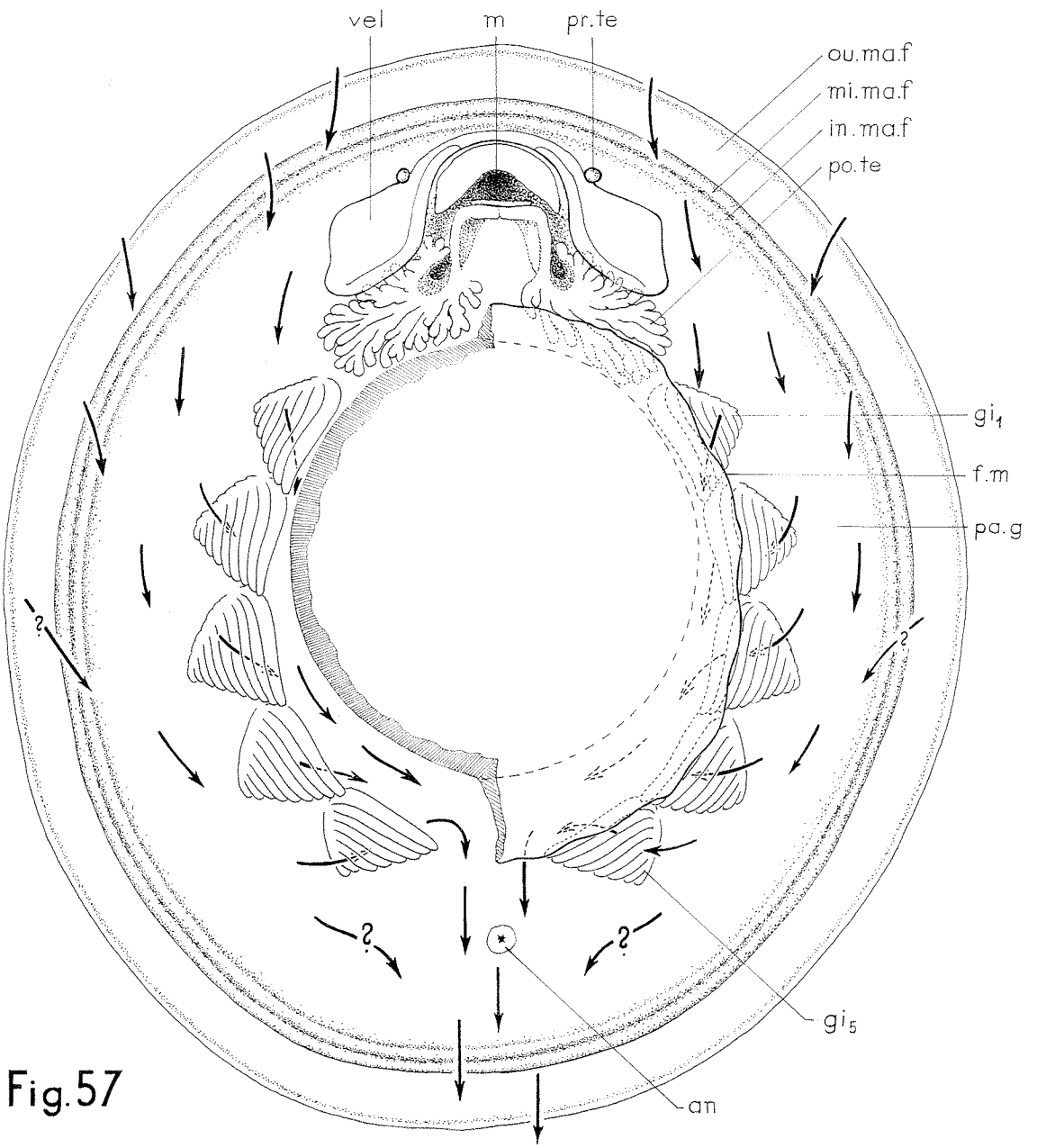


Fig.57

PLATE 16

Fig. 58. Diagrammatical drawing of a gill, seen from the ventral side. The lamellae are partly disarranged in the specimens but they have been drawn in what is believed to be the natural position. The different kinds of epithelia are indicated.

Fig. 59. The same gill, seen from the dorsal side. The position of the renopore is shown, and the longitudinal direction of the pallial groove is indicated by the orientation of the lateral nerve cord. Both figures are based on wax-plate reconstructions.

aff. g. v = afferent gill vessel
an. e. st = anterior edge of gill stem
do. e. la = dorsal edge of lamellae
do. la = dorsal gill lamellae
do. si. st = dorsal side of gill stem
eff. gi. v = efferent gill vessel
ext. gi. n = external gill nerve
int. gi. n = internal gill nerve
lat. n. c = lateral nerve cord
m. br. ext = musculus branchialis externus
po. e. st = posterior edge of gill stem
ren. p = renopore
si. la = sides of lamellae
tip la = tip epithelium of lamellae
ve. e. la = ventral edge of lamellae
ve. si. st = ventral side of gill stem

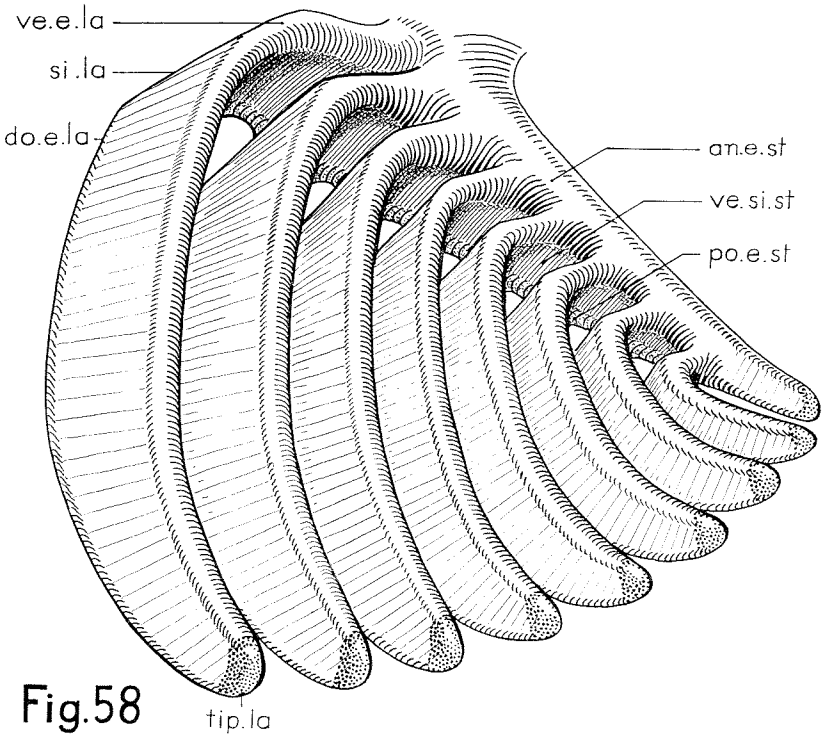

ve.e.la
si.la
do.e.la
an.e.st
ve.si.st
po.e.st
tip.la

Fig.58

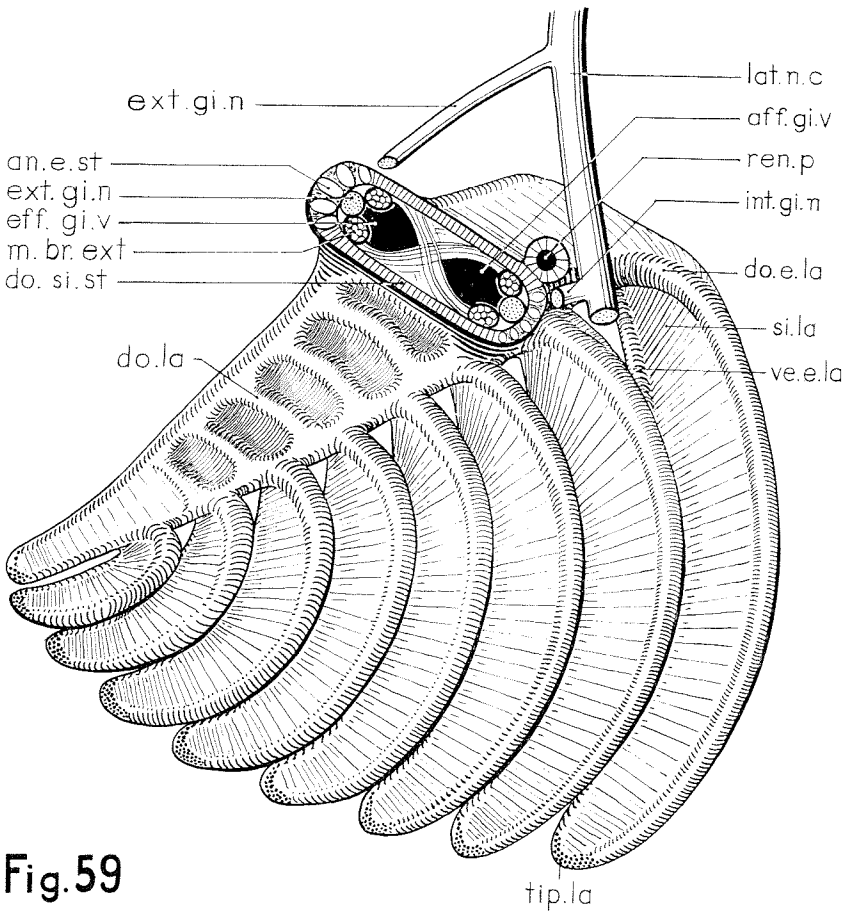

ext.gi.n
lat.n.c
aff.gi.v
an.e.st
ext. gi.n
eff. gi.v
m. br. ext
do. si. st
ren.p
int.gi.n
do.e.la
si.la
ve.e.la
do.la
tip.la

Fig.59

PLATE 17

Fig. 60. The course and ramifications of the gill retractors, shown diagrammatically in a simplified gill. Ventral view.

Fig. 61. Cross section of a gill lamella (1st right gill of Spec. III). Camera lucida drawing. Dorsal edge to the right.

aff. gi. v = afferent (venous) gill vessel
an. e. st = anterior edge of gill stem
do. e. la = dorsal edge of lamella
eff. gi. v = efferent (arterial) gill vessel
ext. gi. n = external gill nerve
in. ce = interstitial (ciliated) cells
in. gi. m = inner gill muscles
int. gi. n = internal gill nerve
lat. si. la = lateral side of lamella
m. br. ext. d = musculus branchialis externus dorsalis
m. br. ext. v = musculus branchialis externus ventralis
m. br. int. d = musculus branchialis internus dorsalis
m. br. int. v = musculus branchialis internus ventralis
mu. ce = mucous (goblet) cells
ve. e. la = ventral edge of lamella

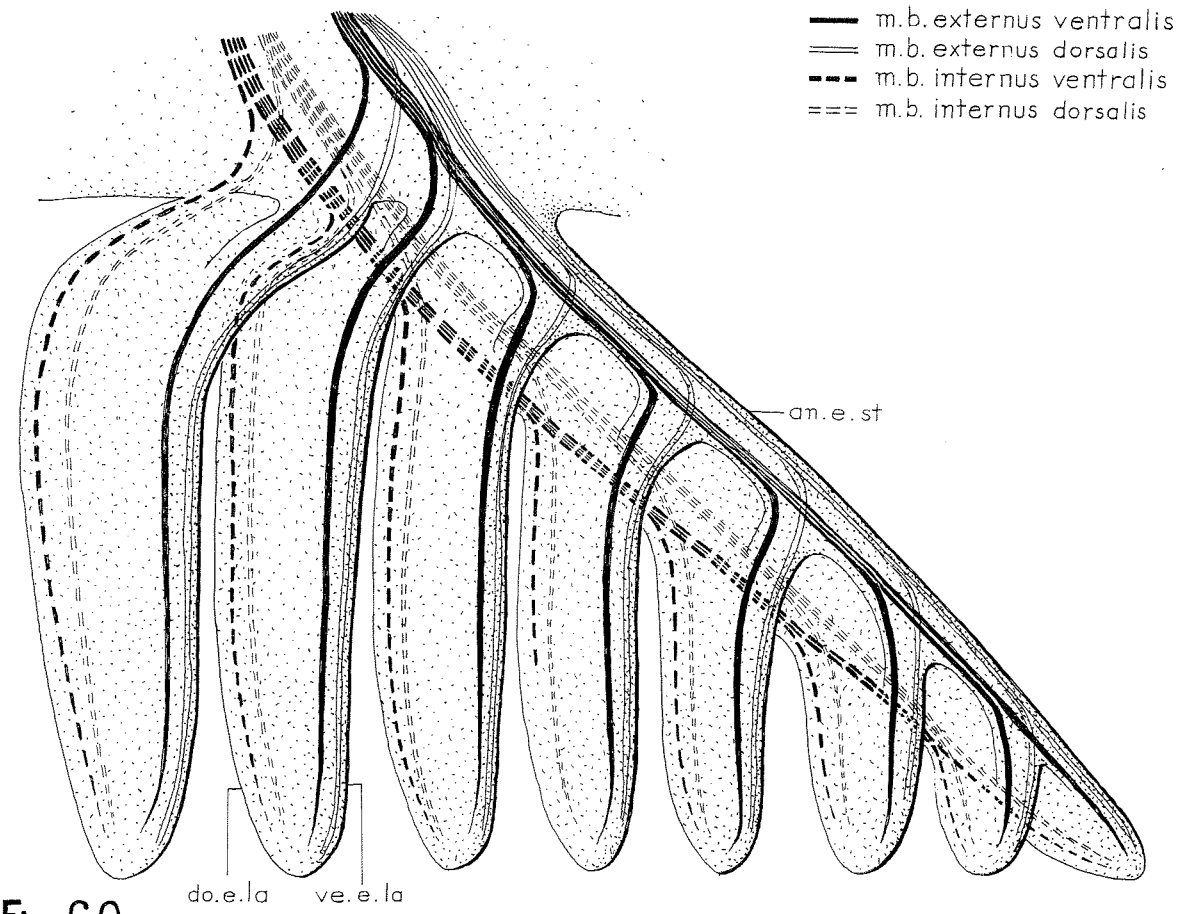

m.b. externus ventralis
m.b. externus dorsalis
m.b. internus ventralis
m.b. internus dorsalis
an.e.st
do.e.la
ve.e.la

Fig.60

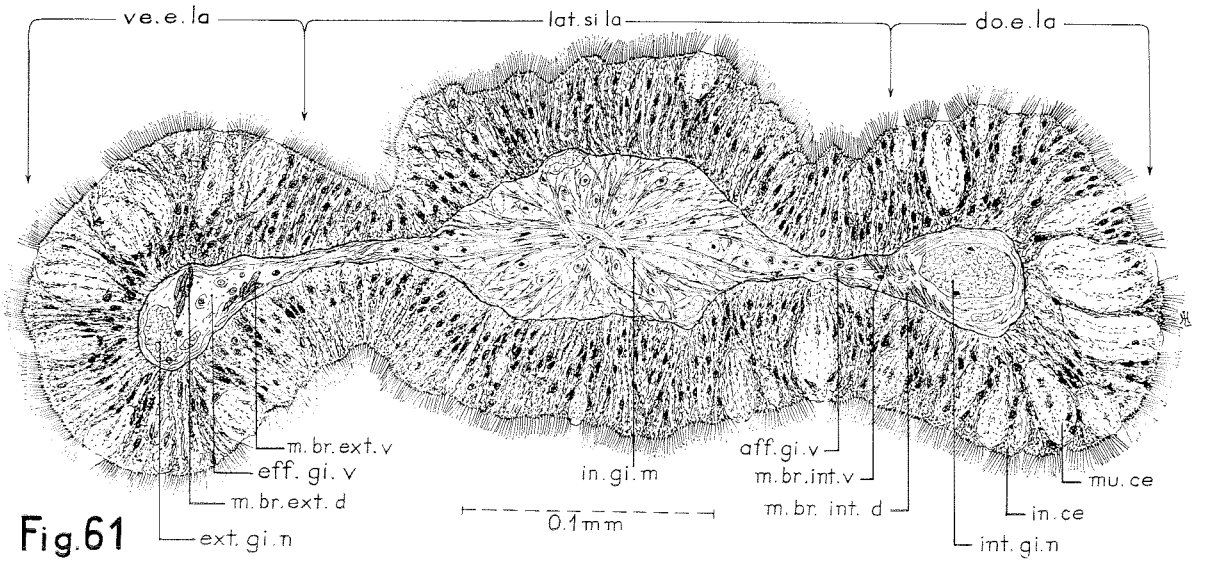

ve.e.la
lat.si la
do.e.la
m.br.ext.v
eff. gi. v
m.br.ext. d
ext. gi.n
in.gi.m
0.1mm
aff.gi.v
m.br.int.v
m.br. int. d
mu.ce
in.ce
int. gi.n

Fig.61

PLATE 18

Fig. 62. Cross section through the stem of the 5th left gill. Central direction to the left. Microphotograph. Spec. III.

Fig. 63. Cross sections of the lamellae of the 2nd right gill. Central direction to the right. Microphotograph. Spec. III.

Fig. 64. The dorsal edge of a gill lamella, showing ciliated interstitial cells (in. ce) and goblet cells (mu. ce). Microphotograph. Spec. III.

Fig. 65. Longitudinal section through the gill stem and the base of the lamellae, showing the ramification of the musculus branchialis internus (m. br. int). Microphotograph. Spec. III.

aff. gi. v = afferent (venous) gill vessel
ant. e. st = anterior edge of gill stem with dark granulate cells and mucous cells
do. e. la = dorsal edge of lamellae
eff. gi. v = efferent (arterial) gill vessel
ext. gi. n = external gill nerve
in. ce = interstitial (ciliated) cells
int. gi. n = internal gill nerve
m. br. ext = musculus branchialis externus (double)
m. br. int = musculus branchialis internus (double)
mu. ce = mucous (goblet) cells
pa. ep = pallial epithelium
ve. e. la = ventral edge of lamellae
ve. la = ventral lamella

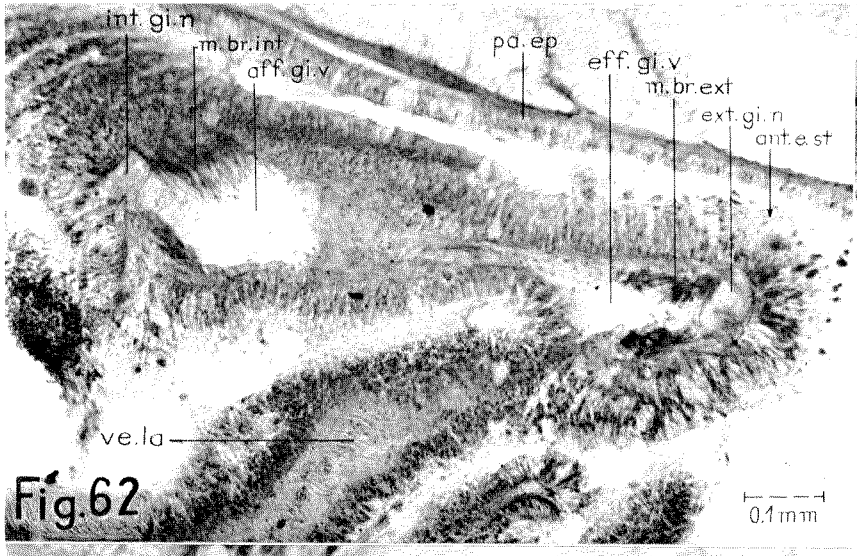


Fig.62

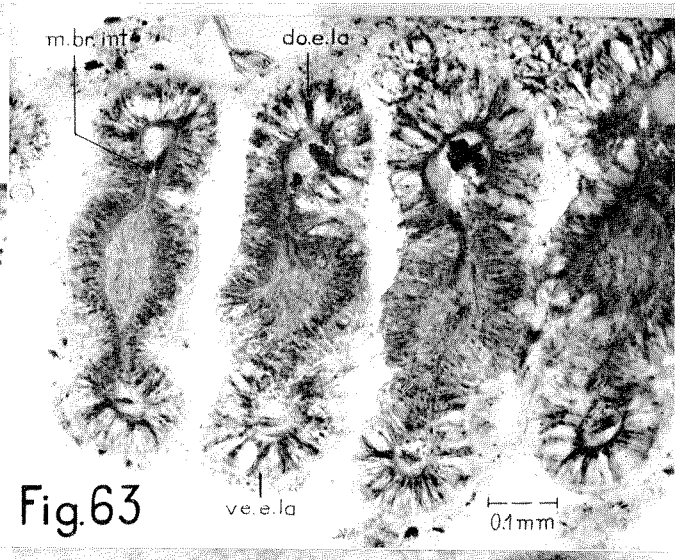


Fig.63

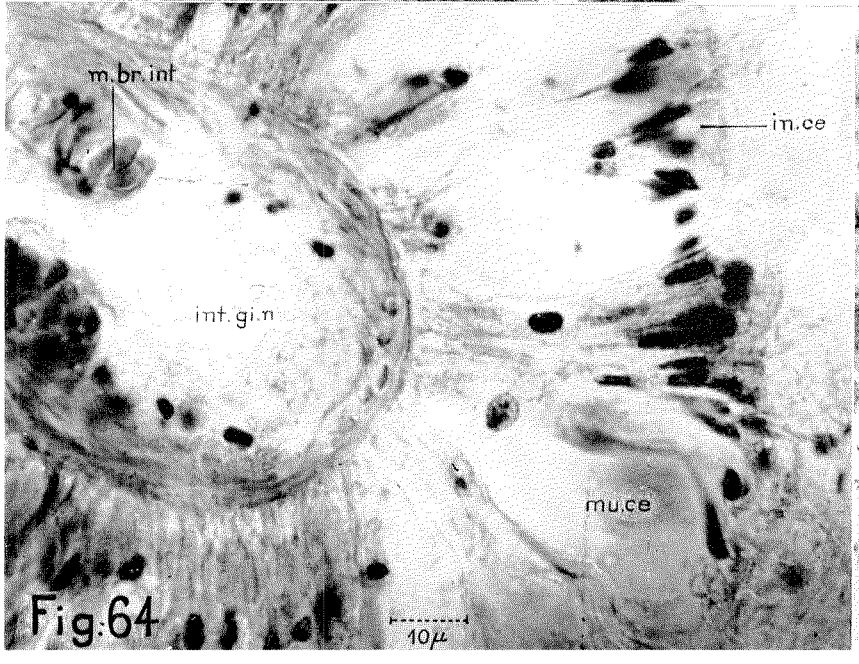


Fig.64

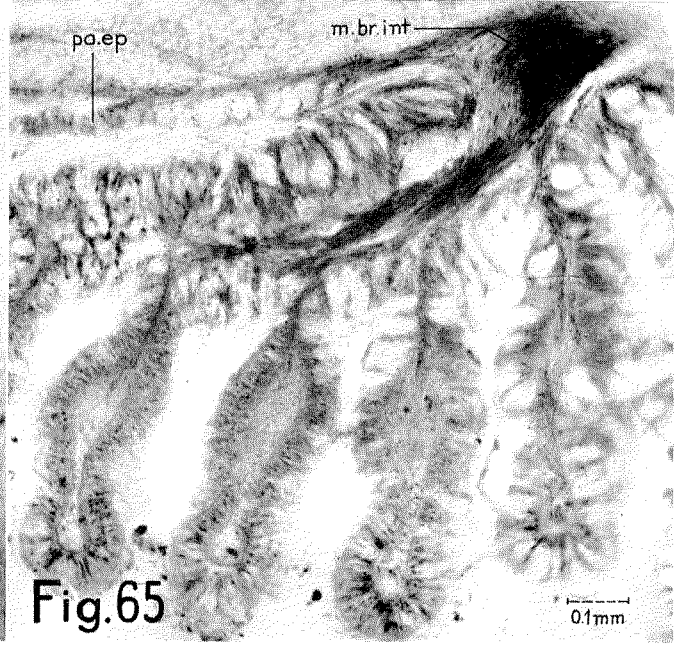


Fig.65

PLATE 19

Fig. 66. Diagrammatical drawing of the mouth region, based on Spec. IV but simplified and changed so as to show the morphological relationships indicated by the sections. Cuticle black.

Fig. 67. Drawing of the mouth region of Spec. IV in situ. For explanations see fig. 66.

Fig. 68. The appearance of the left tentacle tuft in Spec. VII, in which it is believed to be preserved in a natural position. The dislocated pallial fold (pa. m) covers part of the area.

Fig. 69. The preoral tentacle of the left side. Spec. VI.

Fig. 70. Longitudinal section through the preoral tentacle. Spec. III.

ant. l = anterior lip
ci. ep = ciliated epithelium on the transverse part of the tentacle ridge
co. ant. l = cuticularized corner of anterior lip
cu. ant. l = cuticular plate on the anterior lip and in the ventral wall of the pharynx
da. gr. ce = dark granulate cell
fe. f = feeding furrow
f. m = foot margin
m = mouth
me. ve. ri = median velar ridge
n. fi = nerve fibres
pa. ep = pallial epithelium
pa. m = pallial margin
po. l = posterior lip with cuticle
po. te = postoral tentacles
pp. a = propodial area
pr. te = preoral tentacle
ra = radula
te. ri = tentacle ridge
ve. e. vel = ventral, strongly ciliated edge of velum
vel = velum

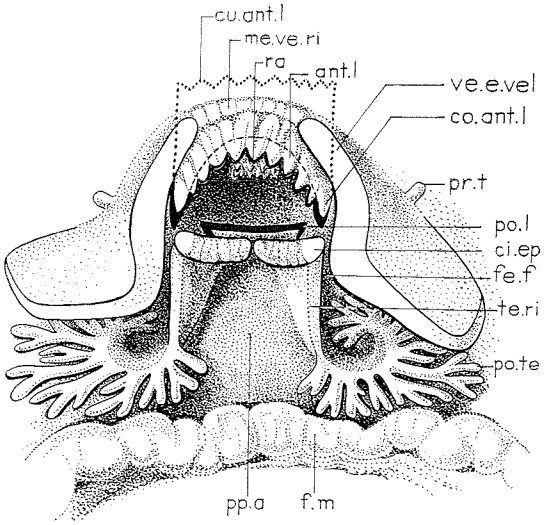


Fig.66

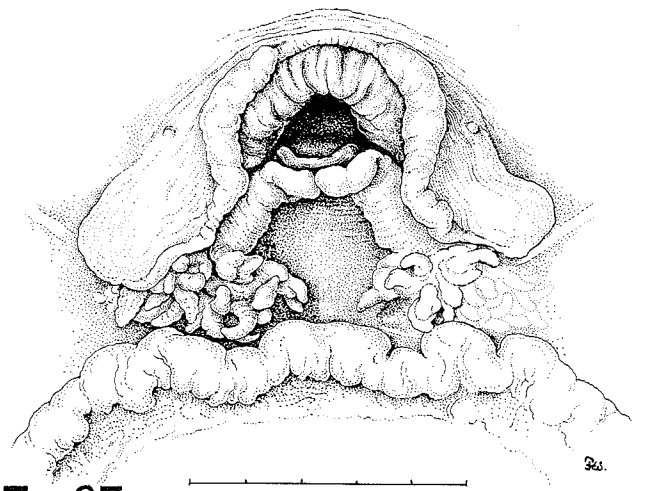


Fig.67

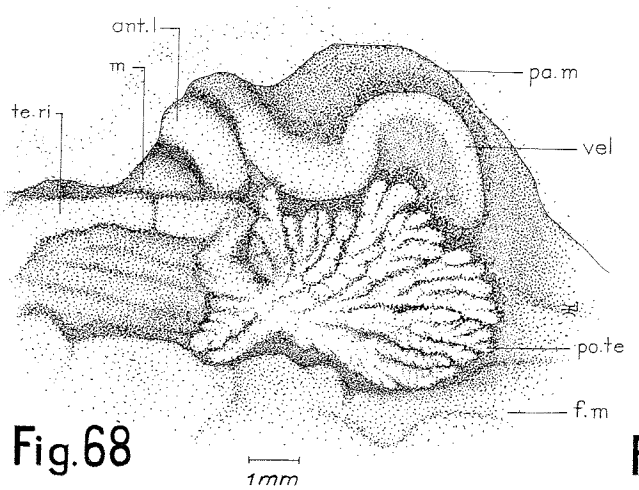


Fig.68

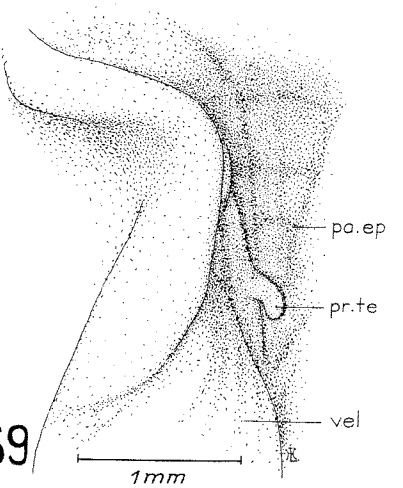


Fig.69

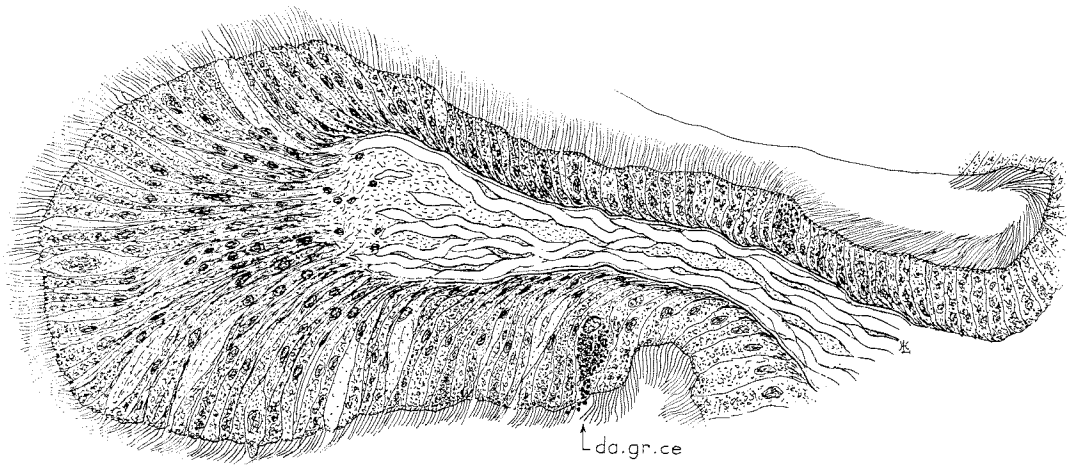


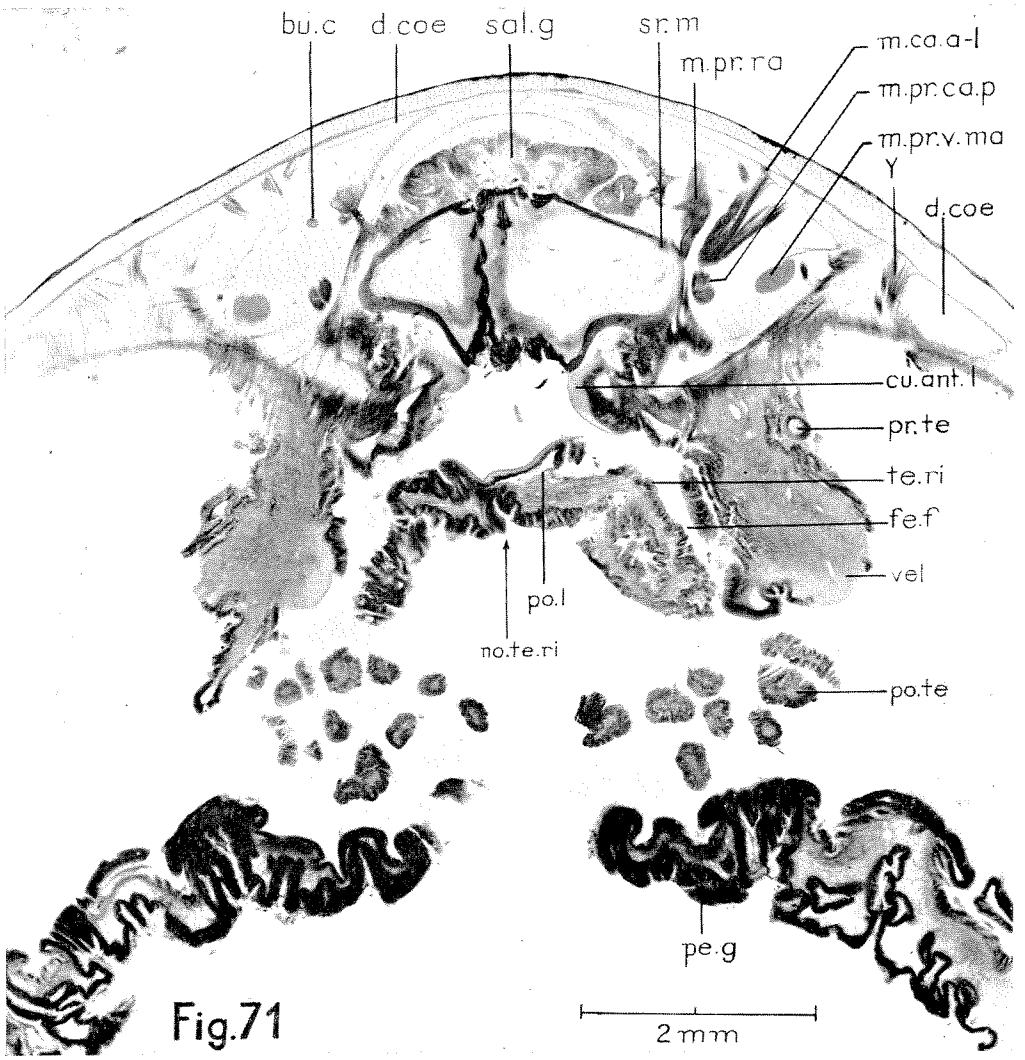
Fig.70

PLATE 20

Fig. 71. Horizontal section through the anterior body region at the level of the oral cavity. Microphotograph. Spec. IV.

Fig. 72. Transversal section just behind the mouth. Microphotograph. Spec. III.

bu. c = buccal connective
ci. ep = strongly ciliated epithelium on the tentacle ridge and on the ventral edge of the velum
cu. ant. l = cuticle on the anterior lip
d. coe = parts of the dorsal coelom
fe. f = feeding furrow
m. ca. a-l = musculus cartilaginis antero-lateralis
m. pr. ca. p = musculus protractor cartilaginis profundus
m. pr. ra = musculus protractor radulae
m. pr. v. ma = musculus protractor vesicae major
m. ra. l. d = musculus radulae longus, pars dorsalis
m. re. v = musculus retractor veli posterior
m. tr. a = musculus transversalis anterior
no. te. ri = median notch of the tentacle ridge
pe. g = pedal gland epithelium
po. l = posterior lip
po. te = postoral tentacles
pr. te = preoral tentacle
ra. sh = radula sheath
sal. g = "anterior salivary gland"
sr. m = subradular membrane
sr. o = subradular organ
te. ri = tentacle ridge
vel = velum
Y = insertion area Y
Y_1 = the muscle Y_1


bu.c
d.coe
sal.g
sr.m
m.pr.ra
m.ca.a-l
m.pr.ca.p
m.pr.v.ma
Y
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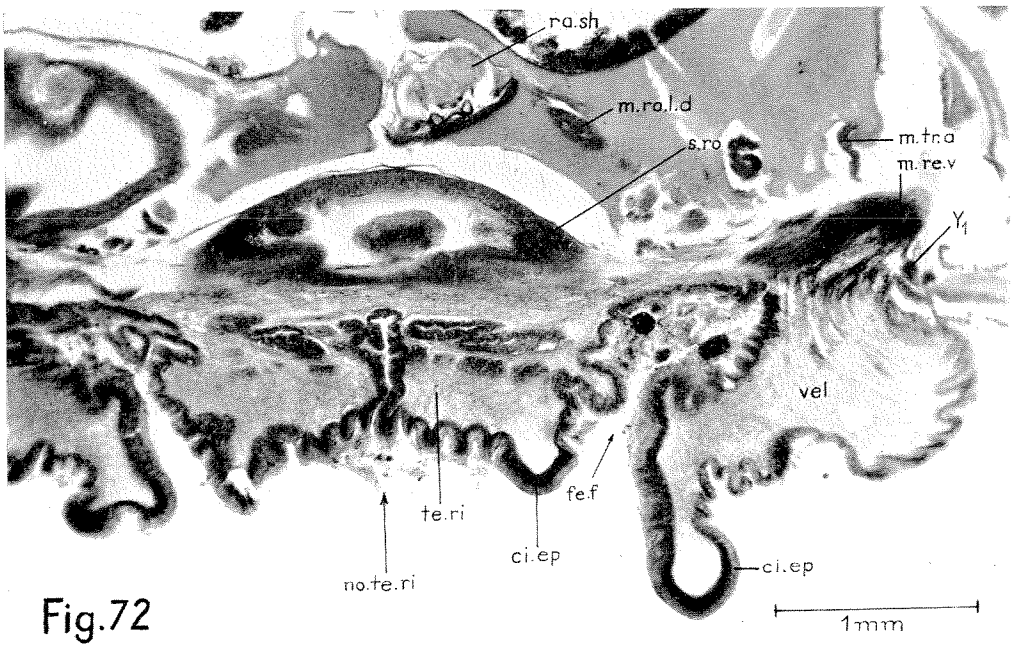
no.te.ri
po.te
pe.g
2 mm

Fig.71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m.ro.l.d
s.ro
m.tr.a
m.re.v
Y_1
vel
te.ri
fe.f
ci.ep
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ci.ep
1mm

Fig.72