Review of the Tertiary and Recent Neozelanic Pyramidellid Molluscs. No. 4—The Syrnolid Genera.

By C. R. LAWS, D.Sc., Auckland.

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TRUE Syrnolids are typically considerably elevated, often very attenuate, and imperforate, with a single more or less strong plait on the columella, and a strongly exsert, *Turbonilla*-like larval shell. Axial sculpture is usually not present, but in *Costosyrnola* n.gen. axial ribs are developed, though they become obsolete early on the posterior part of the whorls. Microscopic spiral striae may, or may not, be developed.

Costosyrnola n.gen. is exclusively fossil, and is not represented after Lower Miocene times. *Finlayola* n.gen. is found in the Lower Miocene, after which it does not appear as a fossil; but it reappears in the Recent fauna as a single species with a somewhat different style of shell, though of similar embryonic character. *Syrnola* A. Adams has persisted right down to the present from the time of its first appearance in beds of mid-Oligocene age. *Tibersyrnola* n.gen. is a fossil group known so far in only Awamoan and Castlecliffian faunas. *Puposyrnola* Cossmann has an undoubted ancestor in the Upper Oligocene, and is not again found until it appears in the Recent fauna (2 species).

KEY TO SYRNOLID GENERA.

Axial ribs absent.
- Lirations present within outer lip.
  - Apex helicoid with small, central, lateral nucleus. .. *Tibersyrnola.*
- Lirations not present within outer lip.
  - Outline of distinct pupoid aspect.
    - Whorls flattish, aperture ovate-rotund, its rim heavy and a thick pad of callus on inner lip; immersion of embryo reminiscent of that of *Odostomia.* .. .. *Puposyrnola.*
  - Outline not of pupoid aspect.
    - Protoconch helicoid with small, central, lateral nucleus. .. .. *Syrnola.*
    - Protoconch of one volution, lateral nucleus large and excentric; not helicoid. .. .. .. *Finlayola.*

Axial ribs present.
- Protoconch helicoid with small, central, lateral nucleus. *Costosyrnola.*

RANGE IN TIME OF SYRNOLID GENERA.

	Bortonian	Tahuian	Waiarekan	Ototaran	Waitakian	Hutchinsonian	Awamoan	Taranakian	Waitotaran	Nukumaruan	Castlecliffian	Recent
Costosyrnola				—	...	...	—					
Finlayola						—	—	...	...	...	...	—
Syrnola				—	...	—	—	...	...	—	...	—
Tibersyrnola							—	...	...	...	—	
Puposyrnola						—	...	...	...	...	...	—

RANGE IN TIME OF SPECIES OF SYRNOLID GENERA.

	Bortonian	Tahuian	Waiarekan	Ototaran	Waitakian	Hutchinsonian	Awamoan	Taranakian	Waitotaran	Nukumaruan	Castlecliffian	Recent
Costosyrnola												
tabulata							—					
waikaia				—								
solitaria							—					
Finlayola												
finlayi							—					
angulifera						—						
otaioensis						—						
waiauica						—	—					—
lurida												
Syrnola												
aclyformis				—								
wallacei				—								
sculptilis						—	—					
sulcifera												
irrevocata										—		
crawfordi												—
menda												—
Tibersyrnola												
semiconcava ..							—					
inexpectata ..							—					
lawsi											—	
tepikiensis											—	
Puposyrnola												
missile												—
fastigiata												—
stirps						—						

Genus SYRNOLA A. Adams.

1860. *Ann. Mag. Nat. Hist.* (3) 5, p. 405.

Type (by monotypy): *Syrnola gracillima* A. Adams.

Syrnola is reserved for slender, considerably elevated shells with a single more or less strong columella-fold and a heterostrophic embryo of helicoid coiling, whose nucleus is small, lateral and central. The Syrnolid apex is always exsert, and in this respect it resembles Turbonillid apices and differs from the depressed form of apex typical of *Odostomia* and related groups. Axial sculpture other than growth-striae is always lacking. There is no strong spiral ornamentation, but microscopic striae may, or may not, be present.

KEY TO SPECIES OF *Syrnola*.

Shell 5·0 mm. high or over.
- Shell moderately attenuate.
  - Suture strongly impressed.
    - Outlines straight; whorl-height between sutures low; whorls flattish; body-whorl short, inflated; protoconch broadly convex over summit. .. .. *wallacei.*
    - Outlines convex; whorl-height between sutures much greater; whorls convex; body-whorl rather long, not inflated; protoconch sharper at summit. .. .. *irrevocata.*
  - Suture not strongly impressed, indistinct.
    - Whorls flat; spire well sharpened; shell solid; apex very exsert. .. .. *aclyformis.*
    - Whorls lightly convex; spire not so much sharpened; shell of lighter build; apex not unduly exsert; body-whorl more convex. .. .. *crawfordi.*
- Shell very attenuate.
  - Whorls flat, a little overhanging; outline very elongately pupoid; plait very strong. .. .. *menda.*

Shell considerably less than 5·0 mm. high.
- Outline practically straight; suture strongly incised; whorls flat; plait very distinct, thin and sharply elevated; body-whorl not angulated. .. .. *sculptilis.*
- Outline lightly convex; suture weak; whorls concave; periphery rather swollen and sub-angled; plait small and not so obvious. .. .. *sulcifera.*

Syrnola wallacei Marwick (Fig. 13).

1929. *Syrnola wallacei* Marwick, *Trans. N.Z. Inst.*, vol. 59, p. 919, fig. 54.

In addition to the spiral threads on the periphery (referred to by Marwick in his description of the species), there are several very weak, sub-obsolete ones higher up on the whorl; one not far below suture, another at about the centre of whorl; and a third close above periphery. These can be picked up by orienting the shell almost parallel with the direction of travel of the light-rays, base towards the source of light. Fine microscopic striae are present between sutures and on the base of the shell.

Height, 4·75 mm.; width, 1·4 mm. (holotype).

Locality: Chatton, near Gore, Southland (Ototaran).

Type in collection of N.Z. Geological Survey, Wellington.

Syrnola irrevocata n.sp. (Fig. 1).

Shell of moderate size, well elevated, outlines convex, summit sharp. Post-nuclear whorls nearly 7, convex; suture strongly impressed. Protoconch heterostrophic, of about 2½ volutions; lateral nucleus small, central. Growth-striae constitute the only sculpture. Body-whorl high, convex throughout; aperture broken, probably subrhomboidal; columella thick, set vertically, arcuate, its plait distinct, situated high up near insertion; inner lip lightly callused within aperture; basal and outer lips broken.

Height, 5·0 mm.; width, 1·5 mm. (holotype).

Locality: Petane, Hawke's Bay (Nukumaruan).

Type in collection of Dr. H. J. Finlay.

The convex, sharpened summit is reminiscent of *S. menda*, but the shell is much less attenuate, and has the body-whorl longer and the sutures a good deal more cut in.

Syrnola aclyformis Marwick (Fig. 4).

1929. *Syrnola aclyformis* Marwick, *Trans. N.Z. Inst.*, vol. 59, p. 920, fig. 55.

Aclyformis has the small lateral nucleus entirely free of succeeding whorl, whereas in *wallacei* the nucleus is approximately one-half immersed. Microscopic striae are present between sutures and on base, poorly visible here and there on the holotype, but well preserved on some topotypes and on a specimen from Waikaia.

Height, 5·1 mm.; width, 1·4 mm. (holotype).

Localities: Chatton, near Gore, Southland; Waikaia. Both Ototaran.

Type in collection of N.Z. Geological Survey, Wellington.

Syrnola crawfordi Powell (Fig. 2).

1927. *Syrnola crawfordi* Powell, *Trans. N.Z. Inst.*, vol. 58, p. 297, pl. 34, fig. 2.

S. crawfordi has straight outline, lightly convex whorls, and apex well rounded over summit. The whorls are not high between sutures and the body-whorl is rather expanded. Fine microscopic striae are present. The slightly arcuate pillar carries a small plait high up near insertion. There is a slight umbilical chink present.

Height, 5·25 mm.; width, 1·45 mm. (holotype).

Locality: off Ahipara, in 23 fathoms.

Type in collection of Mr. A. W. B. Powell, Auckland.

Syrnola menda Finlay (Fig. 6).

1913. *Pyramidella (Syrnola) pulchra* Brazier. Suter, *Man. N.Z. Moll.*, p. 331, pl. 16, fig. 11 (Atlas).

1926. *Syrnola menda* Finlay, *Trans. N.Z. Inst.*, vol. 57, p. 405, figs. 50, 51.

The embryo is coiled in a very low helicoid spiral, and the lateral nucleus is small and central.

Height, 6·7 mm.; width, 1·3 mm. (holotype).

Localities: near Cuvier Island, in 40 fathoms (type); Hen and Chickens Islands, in 25 fathoms; Poor Knights, in 60 fathoms.

Type in collection of Dr. H. J. Finlay.

Syrnola sculptilis n.sp. (Fig. 3).

Shell very small, attenuated, outlines straight. Post-nuclear whorls 6 in number, perfectly flat, sharply cut in to suture both above and below. Protoconch heterostrophic, large, conspicuous, very much exsert, erect; low helicoid, central nucleus with its lower edge tangent to suture of first adult whorl. Except for growth-striae the shell is devoid of sculpture. Body-whorl flat above, periphery strongly convex, base lightly convex; aperture sub-rhomboidal (outer lip considerably broken away); columella broken in front, arcuate, its plait strong and situated high up; parieto-columellar junction obtusely sub-angled; basal and outer lips broken off.

Height, 2·8 mm.; width, 0·85 mm. (holotype).

Localities: Ardgowan shell-bed, Oamaru (type); Target Gully shell-bed, Oamaru; Clifden, Southland, band 8A. All are Awamoan horizons.

Type in Auckland Museum (ex writer's collection).

Syrnola sulcifera n.sp. (Fig. 9).

Shell very small, attenuate, spire sometimes a little stepped, outlines convex. Post-nuclear whorls 6½ in number, broadly and shallowly sulcate at centre; suture but little impressed. Protoconch heterostrophic, coiled in a low helicoid spiral, the lateral nucleus small, central, only very slightly immersed. Sculpture limited to growth-striae. Body-whorl concave above, angulated at periphery, convex on base; aperture sub-rhomboidal, angled behind, broad in front; columella vertical, arcuate, its plait small but distinct and situated a little below insertion; basal lip broadly rounded; outer lip straight.

Height, 2·3 mm.; width, 0·7 mm. (holotype). Corresponding dimensions of a paratype: 2·7 mm.; 0·8 mm.

Locality: Clifden, Southland, band 6A, and new road cutting behind racecourse = band 7C of the beds on right side along the river (type).

Type in Auckland Museum (ex writer's collection).

Genus PUPOSYRNOLA Cossmann.

1921. *Essais de Paléoconchologie Comparée,* p. 229.

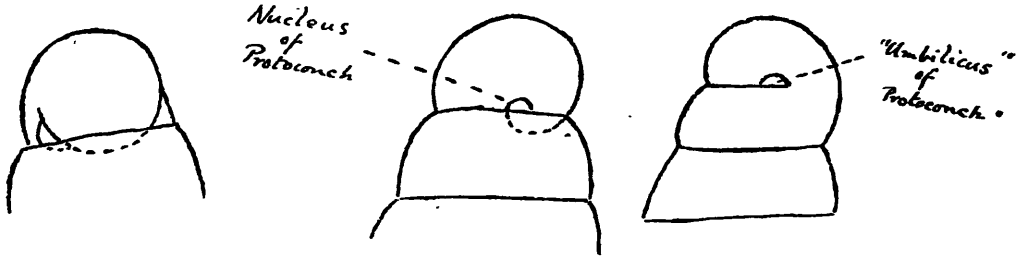
Type (o.d.): *Auricula acicula* Lam.

The New Zealand shells placed here conform well with Cossmann's description and figures of *Puposyrnola* (*Essais de Paléoconchologie Comparée,* p. 229, pl. 5, figs. 60–64; 1921). Their summits, however, seem more strongly pupoid, but they possess the same features of aperture, with thickened parietal callus.

In making the above location for the New Zealand shells it has been necessary to consider *Styloptygma* A. Adams. No illustration of the genotype of this group has been available, but Dall and Bartsch's figure of *Syrnola serotina* A. Adams (*Proc. U.S. Nat. Mus.,* vol. 30, p. 334; 1906), which these authors place in *Styloptygma,* corresponds exactly with the diagnosis of *Styloptygma* given by

Cossmann (*loc. cit.*, p. 265), who agrees with the location made by Dall and Bartsch. Comparison of the descriptions and figures of shells of the two groups in question shows that the New Zealand species have little affinity with *Styloptygma* and that *Puposyrnola* seems to cover them well.

The main features of this group are the *Pupa*-like form, flat whorls, and the peculiarly thickened rim of the aperture with a heavy pad of callus on the parietal wall, this last typical only of fully adult specimens. The aperture is ovate-rotund in shape. The heterostrophic embryo is paucispiral and has no projecting lateral nucleus; the degree to which the protoconch as a whole is sunk seems to be variable. Mr. L. R. Cox, of the British Museum, has kindly examined specimens of *Puposyrnola acicula*, and states that the protoconch consists of just over one volution, partly covered by the first post-nuclear whorl. Thus the embryo of the New Zealand species referred to *Puposyrnola* matches that of the species that is the type of the genus. The accompanying drawings of the protoconch of *acicula* have been made by Mr. Cox, to whom the writer is greatly indebted.



Protoconch of *Puposyrnola acicula*.

KEY TO SPECIES OF *Puposyrnola*.

Shell considerably attenuate and narrow.	
Outline over later whorls parallel; body-whorl of same width as whorls immediately preceding, not convex and expanded; whorls very lightly concave; plait weak; suture indistinct. ..	*missile.*
Outline over later whorls not quite parallel; body-whorl of greater width than whorls immediately preceding, strongly convex and expanded; whorls very lightly convex; plait strong; suture more distinct.	*stirps.*
Shell not considerably attenuate, stumpier, wider.	
Outline below pupoid summit faintly convex; whorls flat; suture indistinct; plait low and wide.	*fastigiata.*

Puposyrnola missile n.sp. (Fig. 8).

The shell is much more slender and is narrower than *fastigiata* (Suter), the body-whorl not so high, and the plait smaller. The parallelism of outline below the pupoid summit is very characteristic, and is unlike that of *fastigiata*, which has a lightly convex outline below the strongly convex pupoid summit. There is a narrow brownish colour-band running spirally around whorls about one-third of the distance behind the suture. Whorl very faintly concave, with several lightly incised microscopic spiral lines, which are not present in *fastigiata*.

Height, 4·6 mm.; width, 1·2 mm. (holotype).

Localities: Hen and Chickens Islands, in 25 fathoms (type); Poor Knights, in 60 fathoms; North Cape, in 75 fathoms.

Type in collection of Dr. H. J. Finlay.

The shells from Poor Knights and North Cape are slightly wider than those from the type-locality, but no doubt intermediate forms are to be had.

Puposyrnola fastigiata (Suter) (Fig. 5).

1906. *Odostomia fastigiata* Suter, *Trans. N.Z. Inst.*, vol. 39, p. 255, pl. 9, fig. 3.

1913. *Odostomia fastigiata* Suter, *Man. N.Z. Moll.*, p. 337, pl. 16, fig. 20 (Atlas).

Suter's figure in the Atlas is not exactly a good representation.

Height, 4·25 mm.; width, 1·25 mm. (holotype).

Localities: near Channel Island, Hauraki Gulf, in 25 fathoms (type); Hen and Chickens Islands, in 25 fathoms.

Type in Dominion Museum, Wellington.

Puposyrnola stirps n.sp (Fig. 11).

No doubt ancestral to the foregoing Recent forms, in contrast with which the spire (apex decollated) is taller, the pupoid summit a little longer, and the parallelism of the outline below that not so marked. The whorls are faintly convex, and the suture a little more, though still superficially, incised. The body-whorl is distinctly convex. The rim of the aperture is heavy, and the typical thick pad of callus on the inner lip is present. Aperture ovate-rotund; plait heavy, situated high up. The shell is devoid of sculpture.

Height, 5·0 mm.; width, 1·2 mm.

Locality: Clifden, Southland, band 6C.

Type in Auckland Museum (ex writer's collection).

Genus TIBERSYRNOLA n.gen.

Type (original designation): *Syrnola semiconcava* Marshall and Murdoch.

The shells for which this name has been provided have all the characters of *Syrnola,* but in addition the outer lip is strongly lirate internally. This feature allies them with *Tiberia* Monterosato, though typical *Tiberia* is a shell of different style, not having the attenuate habit of *Syrnola,* and has two folds on the columella. The embryo consists of heterostrophic volutions (low helicoid), and the small lateral nucleus is placed centrally.

KEY TO SPECIES OF *Tibersyrnola.*

Shell large, 7·0 mm. high or over.
Shell markedly attenuate.
Whorls practically flat, moderately wide from suture to suture. .. .. *lawsi.*
Whorls distinctly medially sulcate, wider across from suture to suture. .. .. *semiconcava.*

Shell more squat, not markedly attenuate.
Whorls short from suture to suture; suture distinctly cut in. .. .. *tepikiensis.*
Shell small, considerably less than 7·0 mm. high.
Shell not excessively tall and slender; outlines convex; whorls flat with only a very faint trace of a central, depressed zone; plait prominent, sharply elevated, not heavy; aperture sub-ovate. .. .. *inexpectata.*

Tibersyrnola semiconcava (Marshall and Murdoch) (Fig. 17).

1923. *Syrnola semiconcava* Marshall and Murdoch, *Trans. N.Z. Inst.*, vol. 54, p. 122, pl. 13, fig. 5.

The very attenuate shell and broad, weak sulcus around the centre of whorls are outstanding features of this species. The larval shell is that typical of *Syrnola,* as described in the generic diagnosis above.

Within the outer lip of adult shells there are three strong lirations, as shown by fragments of the later whorls of shells from Ardgowan and Target Gully. In the holotype two lirations are present, so that it can hardly be regarded as fully adult.

Marshall and Murdoch's description of the suture as "channelled" is in no sense correct. In fact, the suture of most of the upper whorls is imperceptibly impressed, and on the later whorls it can only be described as moderately impressed. There is no channelling around the suture.

Height, 7·4 mm.; width, 1·6 mm. (holotype).

Localities: Awamoa Creek (type); Ardgowan; Target Gully shell-bed. These are Awamoan horizons around Oamaru.

Type in Wanganui Museum.

Tibersyrnola inexpectata n.sp. (Fig. 10).

Shell very small, elongate-conic, of pupoid habit. Post-nuclear whorls 5½ in number, practically flat; suture not strongly impressed. Protoconch heterostrophic, the lateral nucleus small, central, its lower edge tangent to suture of first adult volution. Sculpture other than growth-striae absent. Body-whorl flat above, broadly convex over periphery, lightly convex on base, which is short; aperture sub-ovate, angled behind, narrowly rounded in front; columella vertical, arcuate, its plait very strong, sharply elevated, situated below insertion; parieto-columellar junction sub-angled; inner lip not callused; outer lip broken back, three lirations within.

Height, 2·7 mm.; width, 0·9 mm.

Locality: Otaio River, South Canterbury, a restricted outcrop in face of terrace on south side of the river, two miles below the Hutchinsonian beds at Blue Cliffs (Awamoan).

Type in Auckland Museum (ex writer's collection).

Tibersyrnola tepikiensis (Powell).

1934. *Syrnola tepikiensis* Powell, *Rec. Auck. Inst. Mus.*, vol. 1, no. 5, p. 266.

The heavy lirations within the outer lip demonstrate alliance with *semiconcava.*

Height (estimated), 15·5 mm.; width, 4·5 mm. (holotype).

Locality: Te Piki, Cape Runaway (Castlecliffian).

Type in Auckland Museum.

Tibersyrnola lawsi (Powell).

1934. *Syrnola lawsi* Powell, *Rec. Auck. Inst. Mus.*, vol. 1, no. 5, p. 266.

The reference to *Tibersyrnola* is based on the presence of an internally lirated lip on a fragment of a large specimen inseparable from those figured by Powell, and occurring with them in the same bed. The shells figured by Powell are apparently not fully adult. The lirations are finer and more numerous than those of either *semiconcava* or *tepikiensis*.

Height (estimated), 14·5 mm.; width, 3·4 mm. (holotype).
Locality: Te Piki, Cape Runaway (Castlecliffian).
Type in Auckland Museum.

Genus FINLAYOLA n.gen.

Type (original designation): ***Finlayola finlayi*** n. sp.

This group comprises Syrnolids with a planispiral embryo of about one heterostrophic volution; the nucleus is large, lateral, and excentric.

KEY TO SPECIES OF *Finlayola*.

Whorls evenly convex.
- Outlines straight; whorls high between sutures; body-whorl elongated; aperture pyriform; plait weak; protoconch rather bulbous. .. .. ***lurida.***

Whorls flat or nearly so.
- Outlines convex.
  - Whorls flat above, bulging and overhanging below; aperture sub-ovate; plait weak. .. .. .. ***finlayi.***
- Outlines straight.
  - Shell considerably attenuate.
    - Whorls flat above, overhanging below; periphery angulated; apex very prominent and exsert; columella heavy, straight, vertical. .. .. ***angulifera.***
  - Shell not so attenuate.
    - Shell narrow; columella oblique; embryo well rounded over summit. .. .. ***otaioensis.***
    - Shell not so narrow, body-whorl half as wide again; columella vertical; embryo sharper and narrower. .. ***waiauica.***

Finlayola finlayi n.sp. (Fig. 12).

Shell very attenuate, outline faintly convex. Post-nuclear whorls 9 in number, earlier ones flattish, later ones flat above but rapidly rounded in to suture at about lower fifth, so that they are strongly bulging and overhanging. Protoconch typically Syrnolid, exsert, tilted, of one volution; nucleus large, not central, one-half immersed. Shell entirely devoid of sculpture, except for growth-striae. Body-whorl very lightly convex above periphery, which is strongly rounded; base almost flat, a little excavated towards columella; aperture sub-oval, angled behind, rounded in front; columella strong, slightly oblique, arcuate, its plait not strong, considerably ascending, and high up at insertion; parieto-columellar junction not well differentiated; basal lip rounded; inner lip with a light, narrow zone of callus within aperture; outer lip straight.

Height, 6·0 mm.; width, 1·4 mm. (holotype).

Localities: Pukeuri, Oamaru (type); Ardgowan. Both are Awamoan horizons.

Type in Auckland Museum (ex writer's collection).

The very attenuate habit and low, bulging periphery serve to distinguish this species. For further comparisons refer to remarks under *otaioensis* n.sp. described below.

This very fine shell and the genus it typifies are named in honour of Dr. H. J. Finlay, as a mark of gratitude for his very great generosity in placing his entire Pyramidellid collection at the writer's disposal for the purpose of this revision.

Finlayola otaioensis n.sp. (Fig. 7).

Shell of moderate size, attenuate, outlines straight. Post-nuclear whorls 8½ in number, flat, faintly bulging over suture below; suture not incised. Protoconch heterostrophic, of one prominent, bulbous volution; nucleus lateral, large, not central; embryo as a whole overhanging first adult whorl. Sculpture of growth-striae only. Body-whorl flat above, convex at periphery, lightly convex on base; columella oblique, straight, plait at insertion; outer lip not preserved.

Height, 5·0 mm.; width, 1·15 mm.

Locality: Blue Cliffs, South Canterbury (Hutchinsonian).

Type in Auckland Museum (ex writer's collection).

This is another species of the "*finlayi*" line, to which belong *waiauica* n.sp., *finlayi* n.sp., and *angulifera* n.sp., all characterised by a similar habit of shell, build of whorl, and suture. *Waiauica* has a similar type of nucleus, but the embryo as a whole is smaller and less blunt over the summit, the columella is vertical and the shell much wider; *finlayi* has whorls very strongly bulging and overhanging, a weaker plait, arcuate columella, and the embryonic whorls much less exsert; *angulifera* has a high, exsert embryo and flat whorls angulated at periphery.

Finlayola angulifera n.sp. (Fig. 18).

Shell very tall and slender, outlines straight. Post-nuclear whorls 9½ in number, flat from posterior suture down to the very low periphery, which is distinctly angulated and rapidly cut in to suture, which it thus overhangs. Protoconch extremely exsert, high, conspicuous, tilted; of 1 volution, the nucleus large, excentric, and but little immersed. Sculpture is limited to growth-striae. Body-whorl flat above, angulated at periphery, convex on base; aperture sub-rhomboidal, angled behind, broad in front; columella heavy, vertical, straight, its plait strong, narrow, sharply elevated, situated below insertion; parieto-columellar junction angled; inner lip heavily callused; basal and outer lips broken.

Height, 5·0 mm.; width, 1·0 mm. (holotype).

Locality: Clifden, Southland, band 6C.

Type in Auckland Museum (ex writer's collection).

For comparisons with related forms see remarks under

F. otaioensis.

Finlayola waiauica n.sp (Fig. 16).

Shell of moderate size, attenuate, outlines straight. Post-nuclear whorls about 8 in number, very lightly convex, later ones slightly overhanging suture. Protoconch of one heterostrophic volution, lateral nucleus large, excentric and partly immersed. All sculpture absent with the exception of growth-striae. Body-whorl flat above, sharply rounded at periphery, lightly convex on base; aperture sub-rhomboidal, angled behind, wide in front; columella heavy, set vertically, arcuate, its plait prominent, situated at insertion; parieto-columellar junction sub-angled; basal lip broad; inner lip thinly callused within aperture; outer lip about straight.

Height, 5·4 mm.; width, 1·5 mm. (holotype).

Locality: Clifden, Southland, bands 6A (type), 6C, 7C, 8.

Type in Auckland Museum (ex writer's collection).

For comparisons with related forms refer to remarks under *F. otaioensis.*

Finlayola lurida (Suter) (Fig. 14).

1907. *Pyramidella (Syrnola) lurida* Suter, *Trans. N.Z. Inst.*, vol. 40, p. 347, pl. 27, fig. 4.

1913. *Pyramidella (Syrnola) lurida* Suter, *Man. N.Z. Moll.*, p. 331, pl. 16, fig. 10 (Atlas).

Suter's figure is by no means an accurate representation of his species. The whorl-outline on the spire is too convex, and the sutures are very much more incised than those of his holotype. He shows an incorrect flattening of the body-whorl above the periphery, which is too low in his figure, and the columella is made too heavy.

Height, 5·75 mm.; width, 1·4 mm. (holotype).

Locality: off Cuvier Island, in 38 fathoms.

Type in Wanganui Museum.

The high, convex whorls and weak plait are distinctive.

Genus COSTOSYRNOLA n.gen.

Type (original designation): *Costosyrnola tabulata* n. sp.

The species representing *Costosyrnola* possess all the features of *Syrnola,* and in addition the whorls are corrugated by axial ribbing. The larval shell is heterostrophic with helicoid lateral volutions, its nucleus small and central.

Turbonilla (Chemnitzia) garrettiana Dall and Bartsch (*Proc. U.S. Nat. Mus.*, vol. 30, p. 339, pl. 21, fig. 5; 1906) seems to belong here. It has the strong Syrnolid pillar-plait, and the axial ribbing is quite like that of the New Zealand species, evanescing, as it does, above the periphery of the whorls. *Garrettiana* is certainly not a *Chemnitzia.*

KEY TO SPECIES OF *Costosyrnola.*

Shell large, 6.0 mm. or over. Axial ribs not strong; whorls quite flat, not overhanging; suture channelled.	*tabulata.*
Shell small, less than 6.0 mm. high. Axial ribs strong and heavy; whorls lightly convex, sometimes overhanging; suture not channelled.	*waikaia.*

Shell of moderate size; axials strong; whorls lightly convex, much broader than high; suture narrowly channelled. .. .. *solitaria.*

Costosyrnola tabulata n.sp. (Fig. 19).

Shell large, considerably attenuate, outlines straight. Post-nuclear whorls 10 in number, distinctly tabulated above, then quite flat down to anterior fourth or fifth, where they are cut in to suture, giving a concave outline; suture very distinct, channelled. Protoconch heterostrophic, with helicoid lateral volutions, its nucleus small, central, high up and entirely free of the suture of first adult whorl. Axial sculpture present in the form of low, somewhat irregularly spaced ribs (varying in strength on different individuals) and strong growth-striae; the ribs are distinct towards summits of whorls, but die out just above periphery; intercostal spaces narrower than ribs; fine, wavy microscopic spiral striations cover the whole surface between sutures and on base. Body-whorl lightly convex above periphery and on base, periphery evenly convex; aperture sub-ovate, narrowly angled behind, and narrowly produced in front; columella wide, straight, a little oblique, its plait very prominent, thin, sharp, and situated high up; inner lip not callused; basal lip narrowly rounded, drawn down and inwards towards axis of shell; outer lip straight.

Height, 6·4 mm.; width, 1·4 mm. (holotype).

Localities: White Rock River (type); Sutherlands, Tengawai River; Holme Station, Pareora Gorge. These are Awamoan horizons in South Canterbury.

Type in Auckland Museum (ex writer's collection).

Costosyrnola solitaria n.sp.

Shell moderately attenuate, outline straight, but earlier whorls missing. Suture closely channelled; whorls lightly convex. Protoconch lost. Axial sculpture of strong, rounded, straight corrugations (14 to 16 on penultimate whorl), their trend oblique (antecurrent to lower suture); axials evanescent above periphery. Plait sharply and strongly elevated. Height of whorl much less than width; this feature at once separates the species from *waikaia,* and the heavy axials also distinguish it from *tabulata.*

Height (estimated), 5·5 mm.; width, 1·2 mm.

Locality: Sutherlands, South Canterbury (Awamoan).

Type (unique) in writer's collection.

Costosyrnola waikaia n.sp. (Fig. 15).

Shell very small, considerably attenuate, outlines straight, topmost whorls missing. Post-nuclear whorls last 5½ remaining, flatly convex over centre, cut in to suture above and below, rather overhanging; suture distinct. Axial ribs (about 13 on penultimate whorl) somewhat oblique, wide, rounded, short, not reaching lower suture or periphery, and often evanescent not far below middle of

PLATE A.

FIG. 1—*Syrnola irrevocata* n.sp.; holotype. FIG. 2—*Syrnola crawfordi* Powell: holotype. × 10. FIG. 3—*Syrnola sculptilis* n.sp.; holotype. FIG. 4—*Syrnola aclyformis* Marwick; holotype. FIG. 5—*Puposyrnola fastigiata* (Suter); holotype. FIG. 6—*Syrnola menda* Finlay; holotype. FIG. 7—*Finlayola otaiozusis* n.gen. n.sp.; holotype. FIG. 8—*Puposyrnola missile* n.sp.; holotype. FIG. 9—*Syrnola sulcifera* n.sp.; holotype. FIG. 10—*Tibersyrnola inexpectata* n.gen. n.sp.; holotype. FIG. 11—*Puposyrnola stirps* n.sp.; holotype. All illustrations × 13 unless otherwise indicated.

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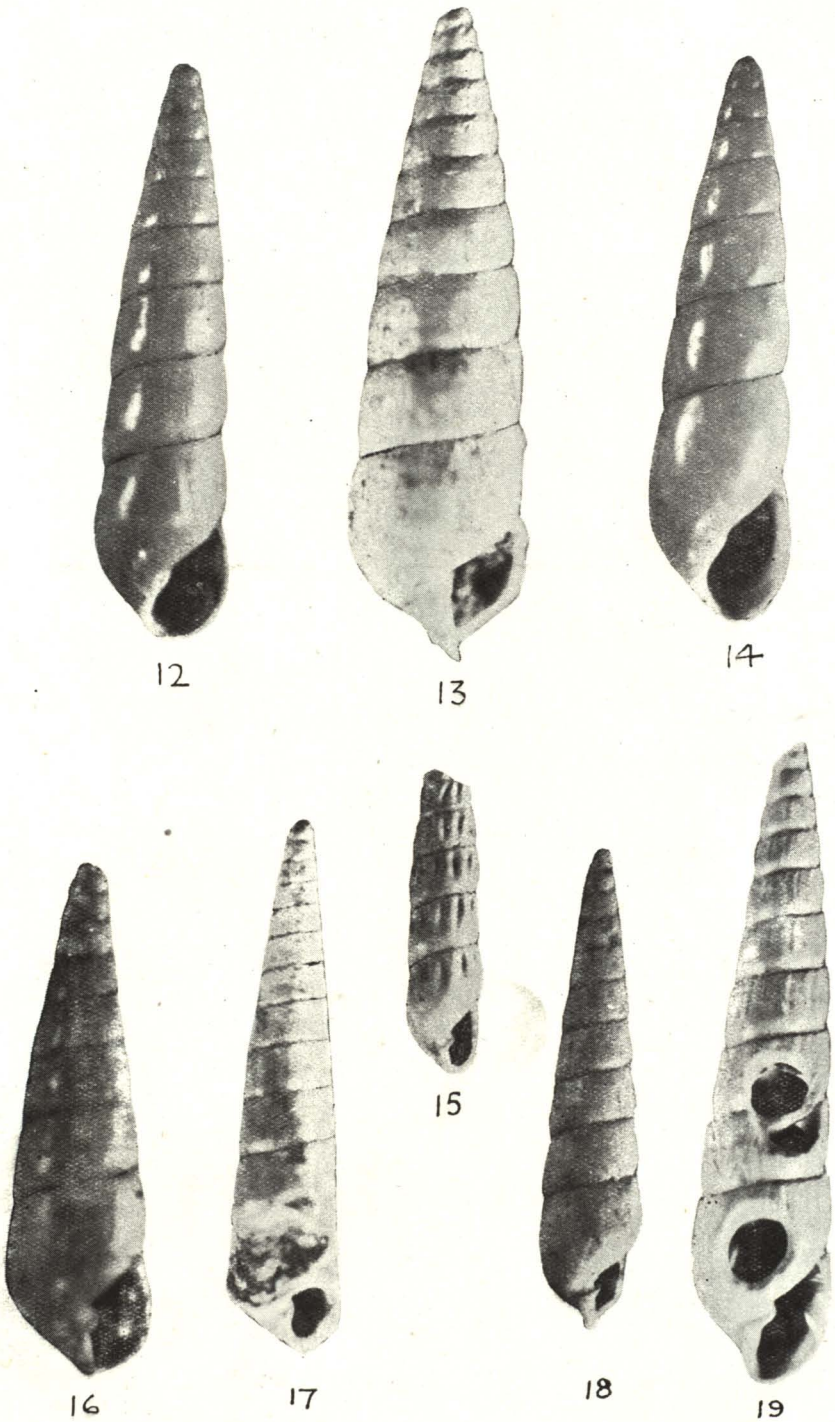

PLATE B.

FIG. 12—*Finlayola finlayi* n.gen. n.sp.; holotype. FIG. 13—*Syrnola wallacei* Marwick; holotype. FIG. 14—*Finlayola lurida* (Suter); holotype. FIG. 15—*Costosyrnola waikaia* n.gen. n.sp.; holotype. FIG. 16—*Finlayola waiauica* n.gen. n.sp.; holotype. FIG. 17—*Tibersyrnola semiconcava* (Marshall and Murdoch); holotype. × 9.4. FIG. 18—*Finlayola angulifera* n.gen. n.sp.; holotype. FIG. 19—*Costosyrnola tabulata* n.gen. n.sp.; holotype. All illustrations × 13 unless otherwise indicated.

whorl; intercostal spaces much narrower than ribs; excessively fine microscopic striae barely visible here and there between sutures. Body-whorl convex throughout; aperture broken, probably sub-ovate; columella heavy, anterior extremity broken off, apparently slightly curved, its plait prominent and situated high up; inner lip not callused; basal lip narrowly rounded; outer lip straight.

Height (estimated), 4·5 mm.; width, 0·75 mm.

Locality: Waikaia (Ototaran).

Type in collection of Dr. H. J. Finlay.

Shell more slender than the genotype, and with heavier axials and different suture.

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