



A Monograph of the Eocene Mollusca, or Descriptions of Shells from the Older Tertiaries of England. Part III, No. III. Prosobranchiata (Continued)

Frederic E. Edwards

To cite this article: Frederic E. Edwards (1861) A Monograph of the Eocene Mollusca, or Descriptions of Shells from the Older Tertiaries of England. Part III, No. III. Prosobranchiata (Continued), *Monographs of the Palaeontographical Society*, 12:51, 241-330, DOI: [10.1080/02693445.1861.12027924](https://doi.org/10.1080/02693445.1861.12027924)

To link to this article: <https://doi.org/10.1080/02693445.1861.12027924>



Published online: 14 Sep 2018.



Submit your article to this journal [↗](#)



Article views: 1



View related articles [↗](#)

A MONOGRAPH

OF

THE EOCENE MOLLUSCA,

OR

DESCRIPTIONS OF SHELLS FROM THE OLDER TERTIARIES
OF ENGLAND.

BY

FREDERIC E. EDWARDS.

PART III, No. III.

PROSOBRANCHIATA

(CONTINUED).

LONDON:

PRINTED FOR THE PALÆONTOGRAPHICAL SOCIETY.

1860.

PRINTED BY J. E. ADLARD, BARTHOLOMEW CLOSE.

No. 162. PLEUROTOMA INNEXA. *Solander*. Tab. XXVIII, fig. 1, a—c.

MUREX INNEXUS. *Sol.* 1766. *Brand. Foss. Hant.*, p. 19, fig. 30.

PLEUROTOMA INNEXA. *Forbes*. 1856. *Tert. Fluv. Mar. Format., &c.*; *Mem. Geol. Surv.*, p. 154, t. 5, fig. 5.

P. testá elongato-fusiformi, reticulato-crenulatá: spirá sub-conicá, elevatá: anfractibus vix convexis, lineas elevatas concentricas, et costellas longitudinales, sese decussantes, gerentibus; marginibus posticis angustis, spiraliter sulcatis, ad suturam granulatis; ultimo anfractu in canali patulo, per-brevi, exeunti; costellis acutis, usque ad basin tendentibus, arcuatis, tuberculatis: aperturá oblongo-ovali, angustá; labro aliforme, intús nonnunquam obscure denticulato; sinu lato, rotundato, in margine collocato; labio angusto, incrassato.

Shell elongated, fusiform, and ornamented with concentric and longitudinal raised lines, nearly equally prominent, and which, from their decussation, present the appearance of fine network. The spire is thick, nearly conical, and much elevated, almost equalling two thirds of the entire length of the shell. The whorls, eight or nine, exclusive of a pointed pullus of three volutions, are short, very slightly convex, nearly flat-sided; the posterior margins are very narrow, and present a more or less shallow transverse furrow; they are thickened on the edge of the suture, which is bordered by a single row of small, round, or somewhat oblong, granulations. The longitudinal ribs, which are narrow and sharp, extend from the marginal granulations to the very front of the whorl, and are rather strongly curved over the middle; in general the ribs are a little more prominent than the concentric lines, and are thickened at the points of decussation, like the knots of a net, forming rows of small tubercles, the last of which, immediately in front of the margin, is more prominent than the rest. The concentric lines are irregular, close-set at the base, distant over the front of the whorl, and become more or less crowded as they approach the posterior margin. The aperture is of a narrow, oblong-ovate form, and terminates in a short, wide canal, rather deeply notched in front; the outer lip is much arched, sharp at the edge, thickened within, and presents three or four thick, tooth-like callosities, of which the posterior one in front of the sinus is large and prominent; the inner lip is narrow and thickened; the columella is slightly curved, and bears in front a small crest; the sinus is rounded and wide, occupying the whole width of the margin.

The figure of this shell, given by Brander, is not executed with the felicity which usually characterises that author's work, and to this circumstance, probably, is to be attributed the difficulty which the Continental writers have had in identifying the species. Thus Lamarck and, after him, Deshayes, referred *P. innexa*, although with doubt, to *P. undata* (Lamk.), from which species, however, it is easily distinguished

by the narrower form of the shell, the more conical spire, the reticulated character of the ornamentation, the narrower margin of the whorls, and the shape of the sinus. Again, M. Nyst, with equal hesitation, has suggested the identity of *P. inneva* with his *P. Stoffelsii*; the latter shell, however, differs in the more pointed spire, the greater length of the whorl, the absence of the longitudinal lineation, and the position of the sinus, which, judging from the figure given by the author, is on the shoulder of the whorl. To *P. dubia* (Def.), a species from the Calcaire grossier, *P. inneva* presents a very close resemblance; but the French shell is much smaller, the spire less obtuse, the costellæ fewer, more prominent in character, bifurcated and not decussated, and the transverse lineation is comparatively feeble. I am indebted to M. Deshayes for some specimens of a species from Damery, hitherto undescribed, which appears to be smaller and narrower than the present species, but in other respects to agree closely with it. A comparison of *P. inneva* with a larger series of the Damery shells will probably establish the identity.

Size.—Axis, 9-12ths of an inch; diameter, 3-12ths of an inch.

Localities.—Highcliff, Barton, Alum Bay (Stratum No. 29, Prestwich), Colwell Bay, Bracklesham Bay, and Whitecliff Bay (fide Forbes).*

No. 163. PLEUROTOMA INFLEXA. Lamk. Tab. XXVIII, fig. 3, a—c.

- PLEUROTOMA INFLEXA. Lamk. 1804. Ann. du Musée, vol. iii, p. 267, No. 22.
 — SEMICOLON. Sow. 1816. Min. Con., vol. ii, p. 104, t. 146, fig. 6.
 — INFLEXA. Lamk. 1822. Hist. nat., &c., vol. vii, p. 101, No. 27.
 — — Desh. 1824-37. Coq. foss., &c., de Paris, vol. ii, p. 475, t. 66, figs. 11—13.
 — — Bronn. 1849. Index Palæontol., p. 1005.
 — SEMICOLON. Bronn. 1849. Idem, p. 1009.
 — INFLEXA. D'Orb. 1850. Prod. de Paléont., vol. ii, p. 357, No. 359.
 — SEMICOLON. D'Orb. 1850. Idem, p. 359, No. 423.
 — INFLEXA. Sow. 1850. Dixon's Geol., &c., of Sussex, p. 103.
 — DUBIA? Defr. 1824-37. Desh., Coq. foss., &c., de Paris, vol. ii, p. 481, t. 67, figs. 12—14.
 Nec — SEMICOLON. Nyst. 1836. Coq. foss. de Hoesselt, &c., p. 32, No. 84.
 nec — — Nyst. 1843. Coq., &c., de Belgique, p. 527, No. 451.
 nec — — S. Wood. 1848. Crag. Moll., p. 54, t. 6, fig. 3, a, b.

P. testá fusiformi, sub-turritá, costellatá, transversim obsolete lineatá: anfractibus numerosis, angustis, sub-planis, ad suturam crenulatis; costellis in medio inflexis, sæpissime

* I suspect that specimens of *P. inflexa* (Lamk.), a form belonging to the Bracklesham Bay series of deposits, have been erroneously referred to *P. inneva*, which that species much resembles. I do not know of any specimen of *P. inneva* coming either from Bracklesham Bay, or from Stubbington, Bramshaw, or Brook.

bifurcatis; ultimo anfractu brevi, ad basin tenuissime striato: aperturá ovali, in canali brevi, mediocriter lato, excavanti; labro tenuissimo, intús plicato; sinu lato, minime profundo, sub-semicirculari, in margine collocato.

Shell elongated, narrow, ribbed, and spirally lined: spire elevated, formed of eight or nine volutions exclusive of the pullus: whorls slightly convex, short, and thickened at the sutural margin, which is ornamented with a single row of bold, roundish or oblong beads, imparting somewhat of a turreted character to the spire. The surface of the whorls presents numerous costellæ, long, narrow, curved, swelled at the top, and corresponding with the marginal granulations, so as to resemble a semicolon, from which circumstance the name given by Sowerby was taken; the costellæ, as they pass over the centre of the whorl, bifurcate and disappear towards the base of the shell: the concentric lines are not very prominent, but are most conspicuous on the anterior part of the shell, becoming feeble as they ascend the whorl; they become almost obsolete in the adult shell. The aperture is ovate, one third of the whole length of the shell, and terminates in a short, moderately wide canal; the outer lip is slightly arched, very thin, and plicated within; the sinus is wide, shallow, nearly semicircular, and placed in the margin.

This species presents a very close resemblance to *P. innexa*, of which many may perhaps be inclined to regard it as a local variety. The shell, however, is narrower; the spire more slender; the sutural granulations and the extremities of the costellæ closely approximated instead of being separated by a wide, well defined furrow; the costellæ themselves bifurcated, and the transverse lineation closer and less prominent than in *P. innexa*.

It is difficult to distinguish *P. dubia* (Def.) from the present species. In Defrance's species the longitudinal ribs are fewer and rounder; but the ornamentation of the two appears to be similar in the essential characters, and I should have regarded the two species as identical. M. Deshayes, however, with the advantage of an extended comparison, has considered *P. dubia* as distinct, an opinion in which both Bronn and D'Orbigny concur, and I have therefore cited Defrance's species with a doubt as to the identification.

Nyst has referred some shells from Vliermael to *P. semicolon* (Sow.), which are described as granulated, angulated at the shoulders, and concentrically striated, but not as being costellated; these shells cannot, therefore, be considered as correctly identified.

The Crag Pleurotomæ, referred by Mr. S. Wood, doubtingly, to this species, appear to be distinct; they are both broader shells, with angulated and strongly tuberculated whorls, the posterior margins of which are wide and broadly concave; and the costæ, which in the present species form a prominent character, appear to be obscure or wanting; while, on the other hand, the transverse lineation, which in *P. inflexa* is a subordinate character, is in the Crag shells strong and distinct;

the sinus also is placed on the shoulder. The variety (fig. 3, *a*) somewhat resembles the *P. denticula* of Basterot, and the other shell (fig. 3, *b*) more nearly approaches the typical form of *P. plebeia*. Mr. Wood speaks of *P. semicolon* (Sow.) as being a common and well-known Barton shell; but I have never seen a specimen from that locality. The species appears to be limited to the Bracklesham Bay sands and the synchronous beds; it is rare.

Size.—Axis, 7-12ths of an inch (15 millim.); diameter, 2-3-12ths of an inch (5 millim.).

Localities.—Bracklesham Bay, Stubbington, Bramshaw, Brook. *French*: Grignon, Mouchy (fide Desh.), Les Groux, Hermes, Cuisse-Lamotte, Ver, Acy-en-Mulcien (fide Graves).

No. 164. PLEUROTOMA LEPTA. *F. E. Edwards*. Tab. XXVIII, fig. 10, *a—c*.

P. testá parvá, fusiformi, gracili, spiraliter lineatá, semi-costellatá: spirá elevatá: anfractibus depresso-convexis, ad humeros angulatis; postice unico sulco profunde exaratis, ad suturam granulato-marginatis; lineis spiralibus elevatis, acutis, haud distantibus; costellis crebris, per-brevibus: aperturá angusto-ovali, antice in canali brevi, indistincto, terminanti; sinu lato, semicirculari, in margine collocato.

A small, slender, fusiform shell, spirally lined, and ribbed: the spire narrow, pointed, elevated, forming nearly two thirds of the whole length of the shell: the whorls flatly convex, angulated at the shoulders; the posterior margins furrowed by a deep sulcus, and somewhat thickened and granulated round the suture; the concentric lines elevated, sharp, and moderately close; the longitudinal ribs rather numerous, very short, not extending beyond the middle of the whorls, narrow, and slightly oblique. The aperture is narrow, oval, terminating anteriorly in a wide, short, indistinct canal; and the sinus, which is wide and semicircular, is placed in the margin.

This species is closely allied to *P. inflexa*, but the shell is slenderer, with a more broadly furrowed posterior margin; the costellæ also are shorter, the transverse lineation more prominent, and the sinus wider and more rounded.

Size.—Axis, rather more than 3-12ths of an inch; diameter, rather more than 1-12th of an inch.

Localities.—Stubbington and Bracklesham Bay, at both of which places it is rare.

No. 165. PLEUROTOMA COARCTATA. *F. E. Edwards.* Tab. XXVIII, fig. 12, *a—c.*

P. testá sub-fusiformi, costellatá, concentric lineatá: spirá elevatá, conoideá: anfractibus convexiusculis, antice valde coarctatis; postice unico sulco exaratis, ad suturam tuberculatis; costellis arcuatis, per-brevibus; aperturá ovali, in canali brevi, latiusculo, exeunti; labro arcuato, intús dentato; sinu sub-trigono, profundo, in margine collocato.

Shell elongate, fusiform, ornamented with longitudinal ribs and sharp, concentric, raised lines: the spire, which is composed of seven or eight whorls, is rather conical, pointed, and elevated, forming almost two thirds of the whole length of the shell. The whorls are slightly convex, and suddenly much contracted towards the middle, so as to be almost angulated; a deep concentric furrow runs round the posterior margin, the sutural edge of which is thickened and presents a single row of round or oblong tubercles, varying in size in different specimens: the ribs are arched, sharp, and rarely extend beyond the middle of the whorl. The aperture is oval and terminates anteriorly in a short, wide canal; the outer lip is arched, sharp-edged, and armed within with two or three teeth, the largest of which is placed immediately in front of the sinus; the sinus itself is deep, sub-trigonal, and wide, occupying the whole breadth of the margin.

This Pleurotoma is smaller and narrower than *P. innexa*, to which it bears some resemblance; but the contracted whorls and short ribs distinguish it from that species.

Size.—Axis, rather more than 5-12ths of an inch; diameter, 2-12ths of an inch.

Locality.—Highcliff, where it is not uncommon.

No. 166. PLEUROTOMA MICROCHEILA. *F. E. Edwards.* Tab. XXVIII, fig. 8, *a—f.*

P. testá parvá, crassá, fusiformi, nodulosá: spirá obtusá: anfractibus convexiusculis, ad humeros sub-angulatis; marginibus posticis canaliculatis, ad suturam unicá serie tuberculorum ornatis; ultimo anfractu costellas angustas et lineas concentricas acutas, sese decussantes, gerenti; aperturá elongato-ovalí, in canali per-brevi terminanti; labro leviter arcuato, acuto, intús incrassato, plicifero; sinu lato, sub-profundo, sub-trigono, anticá in margine collocato.

Var. PRODUCTA, testá angustiori; spirá elevatiori; lineis spiralibus eminentioribus.

Shell small, thick, fusiform, and having the whole surface ornamented with concentric rows of round, knob-like tubercles: the spire, which equals the last whorl in length, is obtuse and pointed: the whorls, six or seven in number, exclusive of the

pullus, are slightly convex and angulated at the shoulders ; the posterior margins rather wide, deeply channelled, and bordered by a series of closely-set, knob-like tubercles ; the shoulders present a single row of oblong tubercles, divided by a concentric sulcus, and from these tubercles arise narrow, curved costellæ, which extend almost to the very front of the whorl, and are decussated by sharp, concentric, raised lines, not quite so prominent as the costellæ, forming small tubercles at the points of decussation ; the costellæ and concentric lines, in the earlier whorls, are nearly concealed by the succeeding whorl, and are only perfectly seen on the body-whorl. The aperture is of an oblong-oval form, terminating in a wide, short canal ; the outer lip is but slightly arched, sharp on the edge, and thickened and strongly plicated within ; the sinus, which is placed in front of the margin, is wide, rather deep, and sub-trigonal in shape. A variety occurs in which the shell is narrower, the spire relatively longer, and the concentric lines more prominent.

This seems to be a well-marked species, of which I have not been able to find a foreign representative.

Size.—Axis, 4-12ths of an inch ; diameter, 2-12ths of an inch.

Localities.—Highcliff, where it is found rather abundantly, Alum Bay (No. 29, Prestwich), Barton.

No. 167. PLEUROTOMA DISSIMILIS. *F. E. Edwards.* Tab. XXVIII, fig. 7, a—c.

P. testá parvá, crassá, rugose costatá, omnino concentricè lineatá: spirá brevi, obusá, nodulosá: anfractibus convexiusculis, ad humeros sub-carinatis, postice sulco profundo spiraliter exaratis, marginatis; costis brevibus, latis, rotundatis; lineis concentricis plus minusve numerosis, per-elevatis, denticulatis: aperturá oblongo-ovali, in canali brevi, latiusculo exeunti; labro sub-recto, acuto, intus unicam plicam dentiformem gerenti; labio angustissimo; sinu lato, profundo, trigono, in margine collocato.

Shell small, thick, coarsely ribbed, concentrically lined : the spire wide and rather short, being less than two fifths of the whole length of the shell : the whorls rather convex, slightly carinated at the shoulders, and bordered round the sutural margin by a sharp, elevated, ridge-like line, the space between which and the shoulder is traversed by a deep, round furrow, in which two or three feeble concentric lines are seen. The ribs are few in number, very short, broad, rounded, and separated by narrow furrows ; they become nearly obsolete, and frequently altogether lost on the last whorl ; the concentric lines are sharp, much elevated, more or less numerous in different specimens, and generally denticulated by the lines of growth. The broad, short, posterior terminations of the ribs, left exposed by the overlapping of the succeeding whorls, resemble tubercles, and give a coarsely nodulous character to

the spire. The aperture is of an oblong-ovate form, and terminates anteriorly in a short, but distinct and moderately wide, canal; the outer lip is very slightly arched, nearly straight, sharp-edged, and presents within, near the posterior extremity, and immediately under the shoulder, a single large, tooth-shaped callosity; the inner lip is very narrow, barely extending to the front of the columella; the sinus is nearly triangular in form, deep and wide, extending across the whole of the posterior margin.

Size.—Axis, 3·4-12ths of an inch; diameter, 1·75-12ths of an inch.

Localities.—Highcliff, where it is not uncommon; Haverstock Hill.

No. 168. PLEUROTOMA GOMPHOIDEA. *F. E. Edwards*. Tab. XXVIII, fig. 13, a—f.

P. testá angustá, elongatá, sub-turritá, longitudinaliter costatá, concentricè lineatá: spirá acuminatá, elevatá: anfractibus depresso-convexis, ad humeros sub-angulatis; marginibus posticis latiusculis, concavis, ad suturam distanter granulatis; ultimo anfractu brevi, antice coarctato; costellis curvis, brevibus, plus minusve numerosis; lineis concentricis, supra margines fere obsoletis, cæterum elevatis, acutis, sæpe denticulatis: aperturá oblongo-ovalí, in canali brevi, sub-recto exeunti; labro sub-aliformi, acuto, sinu lato, minime profundo, in margine collocato.

Var. AVITA, testá anfractibus unicá serie tuberculorum coronatis.

A long, narrow, turriculate shell, ribbed, and concentrically lined: the spire, which forms two thirds of the whole shell, consists of seven or eight volutions: the whorls are flatly convex on the sides, angulated at the shoulders, contracting rather suddenly in front, and having the posterior margins widely channelled and bordered on the sutural edge by a single row of round, rather distant granules, corresponding with the ribs, and variable in size; the angulated shoulders and channelled margins give a turriculate character to the spire. The longitudinal ribs are more or less numerous in different specimens; they are curved, sharp, and terminate abruptly where the whorl contracts; the concentric lines over the posterior margins are close-set, and so fine as to be barely visible to the naked eye; over the middle and front parts of the whorl they are moderately distant, elevated, sharp, and generally denticulated where they cross the ribs. The aperture is of an oblong-oval shape, and terminates in a wide, short, but distinct and nearly straight canal; the outer lip is expanded anteriorly, sharp-edged, and smooth within; and the sinus, which is wide, rather shallow, and rounded, is placed in the margin.

I possess specimens both from Clarendon and Southampton, in which the ribs are wanting, and the whorls are girt round the shoulders with a single row of knob-like tubercles; in all other respects these shells agree with the typical *P. gomphoidea*, of which, therefore, I consider them to be a variety.

Size.—Axis, rather less than half an inch ; diameter, not quite 2-12ths of an inch.

Localities.—Barton, Highcliff, Alum Bay (No. 29, Prestwich). *For the variety*: Clarendon and Southampton.

No. 169. PLEUROTOMA PLICATA. *Lamk.* Tab. XXVIII, fig. 11, *a—c*.

- PLEUROTOMA PLICATA. *Lamk.* 1804. Ann. du Mus., vol. iii, p. 169, No. 14.
 — — *Lamk.* 1822. Hist. natur., &c., vol. vii, p. 100, No. 19.
 — — *Desh.* 1824-37. Descr. des Coq. foss., &c., vol. ii, p. 487, t. 66, figs. 17—19.
 Nec — — *Bast.* 1825. Mem. Géol. sur les Env. de Bord., p. 64, No. 6.
 nec — — *Des Moul.* 1834. (Dufren. Terr. tert., &c., du Midi de la France.) Ann. des Mines, 3d series, vol. iii, p. 122.
 nec — — *Phil.* 1836. Enum. Moll. Sicil., p. 198, No. 5.
 nec — — *Grat.* 1847. Conchyl. foss., &c., du bass. de l'Adour (Atlas); Pleurot., t. 2, No. 20, fig. 36.

P. testá crassá, elongato-fusiformi, angustá, longitudinaliter costatá, omnino concentricè lineatá: spirá mediocriter elatá, sub-acuminatá: anfractibus convexis, suturá perspicuá divisís; costis rotundatis, obliquis, arcuatis, distantibus; lineis concentricis filiformibus, regularibus: aperturá angustá, ovali, in canali brevi exeunti; labro acuto, intus incrassato postice, prope sinum, callum nodiformem gerente; sinu lato, profundo, sub-trigono, in margine collocato.

Shell thick, elongated, fusiform, rather narrow, longitudinally ribbed, and having the whole surface covered with concentric, raised lines ; the spire, which consists of six or seven volutions, exclusive of the pullus, is moderately elevated, forming nearly one half of the whole length of the shell ; the whorls convex, and separated by a perspicuous suture. The longitudinal ribs are prominent, rounded, oblique, slightly curved, distant, numbering only six or seven on each whorl, and becoming nearly obsolete on the body-whorl ; the intermediate spaces are nearly flat, imparting a polygonal aspect to the spire ; the concentric lines are rather numerous, elevated, rounded, clearly defined, and regular, giving to the shell the appearance of being bound with thread ; the two or three lines over the shoulder are, in general, more distant, and a very little more prominent, than the others. The aperture is of a narrow, oval form, and terminates in a wide, short canal ; the outer lip is moderately arched, sharp on the edge, much thickened within, where it presents a long, rather broad, and elevated ridge, extending quite into the canal, and terminating behind, immediately in front of the sinus, in a round, knob-like callus ; the sinus is broad, deep, somewhat triangular in shape, and placed in the margin.

The English shells present several points of disagreement with those from the

Calcaire grossier, and may be regarded by some, perhaps not unreasonably, as specifically distinct rather than as constituting a local variety. Thus, in the French shells, the posterior margins of the whorls are so feebly lined that to the naked eye they appear to be smooth; the ribs are more numerous, narrower, and less prominent; the concentric lines are rather more crowded and more feeble, becoming nearly obsolete; and the shells themselves are thinner. It appears to me, however, that these variations can scarcely be regarded as of specific value; while in the relative proportions, the general character of the ornamentation, the condition of the outer lip, particularly the characteristic callus, and the shape and position of the sinus, the French and English shells correspond. On the whole, therefore, I am inclined to regard the English shells as forming merely a coarse, strongly marked variety of the French species.

The shells from Dax and Bordeaux, referred to this species by Basterot and Grateloup, appear to be distinct, and Desmoulins has separated them under the name *P. variabilis*. According to Bronn, they correspond with certain Pleurotomoid shells previously separated by Millet as *Defrancia variabilis*.

Size.—Axis, 8-12ths of an inch (17 millim.); diameter, 3-12ths of an inch ($6\frac{1}{2}$ millim.)

Localities.—Bramshaw, Brook. *French*: Grignon, Parnes, Mouchy, Courtagnon (fide Desh.), Halaincourt (fide Graves).

No. 170. PLEUROTOMA ACUTICOSTA. *Nyst.*? Tab. XXVIII, fig. 14, *a—c*.

PLEUROTOMA ACUTICOSTA. *Nyst.*? 1843. Coq., &c., foss. de Belg., p. 529, No. 454, tab. 42, fig. 5.

— — *Morris*. 1854. Cat. Brit. Foss., 2d edit., p. 269.

P. testá elongato-fusiformi, longitudinaliter costellatá, concentric lineatá: spirá elevatá, acuminatá: anfractibus convexiusculis, postice depressis, sub-canaliculatis; ultimo anfractu antice coarctato, in canali brevi, indistincto, latiusculo terminanti; costellis obliquis, angustis, sub-distantibus; lineis concentricis exilibus, numerosis: aperturá ovatá; labro leviter arcuato acuto; sinu lato, sub-semicirculari, in margine collocato.

Shell oblong, fusiform, longitudinally ribbed, concentrically lined; spire pointed, much produced, nearly equalling three fifths of the entire length of the shell; whorls, eight or nine, slightly convex; the posterior margins somewhat depressed and furrowed; the last whorl contracted in front and forming a wide, short, and indistinct canal. The longitudinal ribs are narrow, rather distant, rounded on the upper surface, and slightly oblique; the concentric lines very slender, irregular, close-set, becoming obsolete over the posterior margins. The aperture is of an oblong-oval

form; the outer lip a little arched, thin, sharp-edged, and smooth within; the sinus wide and nearly semicircular, and placed in the posterior margin.

The figure of *P. acuticosta* in M. Nyst's work is, unfortunately, so indistinct that it affords but little assistance towards an identification. The English shell, however, agrees tolerably well with the description given by that author, and I have referred it to M. Nyst's species, although with hesitation, as I have not had an opportunity of comparing it with any Belgian specimen.

The English shells which the present *Pleurotoma* most nearly resembles, are those referred to *P. plicata* (Lamk.); but this species differs from them in the more slender form of the shell, the more depressed margins of the whorls, the narrower, more numerous, and more regular costæ, and the finer transverse lineation; and, in the specimen I possess, the outer lip is not thickened within, nor does it present the callus which characterises *P. plicata*.

The species appears to be very rare.

Size.—Axis, $\frac{1}{2}$ inch; diameter, rather more than 2-12ths of an inch.

Localities.—Barton. *Belgian*: Gremittingen (Lower Limburg series).

No. 171. *PLEUROTOMA TERETICOSTA*. *F. E. Edwards*. Tab. XXIX, fig. 5, *a—d*.

P. testá fusiformi, sub-turritá, costellatá, spiraliter fasciolatá: spirá obtusiusculá, elevatá, in longitudine aperturam æquanti: anfractibus depresso-convexis, ad humeros sub-angulatis, postice sulco profundo exaratis, marginatis; ultimo anfractu antice coarctato, in canalem brevem latum producto; costellis numerosis, leviter arcuatis, rotundatis, brevibus; fasciis spiralibus crebris, irregularibus, alternatim latiusculis et angustioribus; fasciis anterioribus elevatis, cæteris fere obsoletis: sinu lato, minime profundo, triangulari, in margine collocato.

Var. SOROR, testá spiraliter sulcatá; canali antico breviori.

Shell fusiform, longitudinally ribbed, and spirally girt with ribbon-like bands: the spire is thickish and moderately elevated, not exceeding the aperture in length: the whorls, five or six in number without the pullus, are rather flat-sided and bluntly angulated at the shoulders; the posterior margins narrow, deeply furrowed, and much thickened at the edges, where they present a moderately wide band running round the suture. The longitudinal ribs are numerous (twelve to fourteen), slightly curved, round and smooth on the upper surface, short, not extending beyond the middle of the whorl, tapering towards the front, and occasionally bifurcated; the posterior extremities are continued over the shoulder up to the sutural band; the spiral bands are numerous and irregular, ribbon-like bands alternating with other narrower bands; over the anterior canal and the front part of the whorl up to the termination of the ribs, these bands are elevated and distinct; elsewhere they are nearly obsolete. The body-whorl contracts rather suddenly about the middle,

and thence tapers gradually towards the front, so as to form a wide and short, but distinct, canal; the aperture is of a compressed-oval shape; and the sinus, which is placed in the marginal furrow, is wide, shallow, and triangular in form.

The general resemblance between the present species and *P. turgidula* might suggest the propriety of uniting the two; but, on a careful examination, differences will be found which seem to justify their separation. Thus, in the present species, the spire is more obtuse; the whorls more contracted in front; the posterior margins deeply furrowed and bordered at the suture by a broad, thick band; the longitudinal ribs are more numerous, more decided in character, and less oblique; and the sinus is shallower and more pointed.

A specimen in my cabinet, obtained from the Artesian well at Southampton, has the surface of the shell spirally furrowed instead of banded, and the anterior canal a little shorter and wider. These differences, however, do not appear to be sufficiently important for specific distinction, and I have therefore regarded the shell in question as a variety of the present species.

Size.—Axis, 6-12ths of an inch; diameter, rather more than 2-12ths of an inch.

Localities.—Highgate, Southampton.

No. 172. PLEUROTOMA TURGIDULA. *F. E. Edwards.* Tab. XXIX, fig. 4, a—c.

P. testá fusiformi, sub-turritá, spiraliter sulcatá, costellatá: anfractibus sub-ventricosis, ad humeros angulatis, postice declivis vix cavatis, ad suturas unicá serie granularum instructis; sulcis spiralibus irregularibus, minime profundis, fere obsoletis; costellis obliquis, angustis: aperturá ovali, antice in canali breviusculo exeunti; labro arcuato; sinu sub-trigono, latiusculo, mediá in margine collocato.

Shell fusiform, sub-turreted, concentrically furrowed, and longitudinally ribbed; the spire, formed of six volutions exclusive of the pullus, is moderately elevated, forming rather less than half of the shell: the whorls are roundedly convex, almost ventricose, and bluntly angulated at the shoulders; the posterior margins, which slope gently backwards, are nearly straight, and the sutural edge is girt by a single row of small, round tubercles. The concentric furrows are numerous, irregular, and almost obsolete over the posterior margins and middle of the whorls, but a little deeper and more perspicuous over the front; the longitudinal ribs are rather numerous, narrow, oblique, and very short, barely extending to the middle of the whorl, and slightly swelled at the posterior extremities; on the last whorl the ribs become reduced to small and not very prominent tubercles. The aperture is oval, and terminates in front in a short, but distinct and moderately wide, canal; the outer lip is slightly arched; the sinus, placed in the very middle of the posterior margin, is wide, rather shallow, and somewhat triangular in form.

Size.—Axis, 8-12ths of an inch ; diameter, 3-12ths of an inch.

Locality.—Alum Bay (Stratum No. 29, Prestwich ?); rare.

No. 173. PLEUROTOMA DILINUM. *F. E. Edwards*. Tab. XXVIII, fig. 15, *a, b*.

P. testá minimá, oblongá, fusiformi, granulátá, concentrice lineatá: spirá obtusiusculá, sub-conicá: anfractibus sub-convexis, duplici serie granulorum coronatis, spatio inter series concavo, lævi; ultimo anfractu antice valde coarctato, in canalem latissimum, brevem, reflexum producto; lineis spiralibus, acutis, sub-distantibus: aperturá ovali; labro acuto, leviter arcuato, intús plicato; sinu latissimo, mediocriter profundo, sub-trigono, anticá in margine collocato.

Shell very small, oblong, fusiform, spirally girt by a double row of small, bead-like tubercles, concentrically lined; spire rather thick, nearly conical; whorls slightly convex; the posterior margins concave, smooth, bordered in front and behind by the rows of tubercles; the last whorl much contracted in front, and terminating in a very wide, short, but distinct, canal, a little bent backwards; the concentric lines thin, sharp, and rather distant. The aperture is of an oval form; the outer lip slightly arched, expanding towards the front, sharp-edged, and plicated within; the sinus very wide, moderately deep, somewhat triangular in shape, and placed in the front part of the posterior margin.

This Pleurotoma is allied to *P. microcheila*, the var. *producta* of which closely resembles it; but the wide posterior margins, the greater regularity of the granulations, and the broad anterior canal, distinguish the present species.

Size.—Axis, not quite 3-12ths of an inch ; diameter, 1-12th of an inch.

Locality.—Alum Bay (No. 29, Prestwich).

No. 174. PLEUROTOMA TRICINCTA. *F. E. Edwards*. Tab. XXVIII, fig. 6, *a, b*.

P. testá parvá, elongato-fusiformi, sub-turritá, spiraliter lineatá: spirá acuminatá, breviusculá, aperturam in longitudine vix æquanti: anfractibus depresso-convexis; postice profunde canaliculatis, marginatis; ultimo anfractu in canalem brevem, latum, producto; lineis spiralibus exilibus, filiformibus, irregularibus, sub-clathratis: aperturá oblongo-ovalí; labro arcuato; sinu lato, mediocriter profundo, in margine collocato.

Shell small, oblong, fusiform, indistinctly turreted, concentrically lined; spire pointed, rather short, not equalling the last whorl in length; whorls flatly convex at the sides; the posterior margins deeply hollowed, giving the turreted aspect to the spire, and ornamented with a series of roundedly curved plications, formed by the successive elevated margins of the sinus; the sutural edge is bordered by a sharp, ridge-like, raised line; the last whorl is contracted in front, and terminates in a very

wide, short, indistinct canal. The spiral lines are slender, thread-like and irregular, others, finer still, occasionally intervening; all are much roughened, almost decussated, by the prominent lines of growth; from the upper three lines, left uncovered by the succeeding whorl, the specific name is taken. The aperture is of a narrow, oval form; the outer lip roundedly arched, thin, sharp-edged, and smooth within; and the sinus, which extends over the whole breadth of the margin, is wide, rather deep, and somewhat triangular in form.

The only two specimens I have seen of this rare *Pleurotoma* do not appear to have attained their full growth; the characters, however, are sufficiently distinct to justify the present notice.

Size.—Axis, 4-12ths of an inch, nearly; diameter, 1-8th of an inch.

Locality.—Potter's Bar.

No. 175. PLEUROTOMA PUPA. *F. E. Edwards*. Tab. XXVIII, fig. 9, *a-c*.

P. testá elongato-fusiforimi, longitudinaliter plicatá, concentricè lineatá: spirá obtusiusculá, sub-conicá: anfractibus convexiusculis; postice plicatis, unico sulco angusto exaratis, ad suturam aliquando lineá elevatá filiformi cinctis, aliquando granulatis; costellis crebris angustis, arcuatis, in ultimo anfractu obsoletis; lineis concentricis acutis, plus minusve numerosis, costellas decussantibus: aperturá angustá, ovali, in canali brevi, obliquo exeunti; labro leviter arcuato, intús plicato; sinu sub-trigono, profundo, in margine collocato.

Var. a, testá graciliori; spirá acutiori.

Shell oblong, fusiform, with an elevated, somewhat obtuse, and nearly conical spire, forming one half of the entire shell; whorls six or seven, slightly convex, longitudinally plicated, concentrically lined, and separated by a conspicuous suture; the posterior margins are thickened round the sutural edge, and present a narrow, concentric furrow, corresponding with the smaller extremity of the sinus, and finely plicated; the narrow space between this furrow and the suture is girt by a thickish, elevated, thread-like line, generally simple, but sometimes—more especially in the early whorls—decussated by the successive margins of the sinus, so as to present a row of rather coarse granulations. The longitudinal plications are numerous, and curved; they are slightly prominent on the shoulder, but become attenuated as they pass over the middle of the whorl, and are frequently altogether lost on the last whorl of the mature shell. The concentric lines are prominent, sharp, more or less distant in different specimens, and feebly denticulated, where they cross the longitudinal plications. The aperture is of a narrowish, oval form, and terminates in front in a short, but distinct and moderately wide, canal, to which the twisted columella gives an oblique direction; the outer lip is slightly arched, thin, and sharp

on the edge, and frequently, but not invariably, armed within with three or four pliciform teeth; the sinus is deep, three-cornered, and placed in the margin.

A variety occurs in which the shell is slenderer, and the spire more pointed.

Size.—Axis, 6-12ths of an inch; diameter, rather more than 2-12ths of an inch.

Localities.—Barton, Highcliff, for the type; Bramshaw and Alum Bay (Stratum No. 4, Prestwich), for the variety.

No. 176. PLEUROTOMA SCABRIUSCULA. *F. E. Edwards*. Tab. XXIX, fig. 2, a—c.

PLEUROTOMA DECUSSATA, *Lamk.*? 1804. Ann. du Mus., vol. iii, p. 267, No. 25.

P. testá sub-turritá, tuberculatá, omnino concentricè lineatá: spirá obtusiusculá, elatá, in longitudine dimidium totius testæ superanti: anfractibus convexis, antice coarctatis, ad humeros sub-angulatis, unicá serie tuberculorum instructis; marginibus posticis declivis, vix cavatis, granulato-marginatis; lineis concentricis elevatis, sub-distantibus, simplicibus vel leviter denticulatis: aperturá obovatá, in canali lato, brevi terminatá; labro arcuato, acuto, intús plicato; sinu lato, profundo, sub-trigono, mediá in margine collocato.

Var. a, testá tuberculis verticaliter productis, costellas simulantibus.

Shell turriculated, tuberculated, and ornamented with concentric, raised lines, which cover the whole surface: the spire, consisting of six or seven volutions, is rather thick and elevated, forming a little more than one half of the entire shell. The whorls are convex, slightly contracted in front, and bluntly angulated at the shoulders, where they present a single row of small, oblong tubercles, more or less distant in different individuals, and crossed by the concentric lines, two of which are generally more prominent than the rest; the posterior margins are moderately wide, gently depressed, very slightly concave, and thickened and granulated round the sutural edge. The concentric lines are prominent, sharp, and not very distant, varying in this respect in different specimens; they are generally simple and smooth on the edge, but sometimes denticulated by the strongly marked lines of growth. The aperture is of a broadish, oval shape, and terminates anteriorly in a wide and short, but distinct, canal; the outer lip is much arched, sharp-edged, and plicated within; the sinus is wide, deep, somewhat triangular in form, and placed in the middle of the margin.

A variety occurs, rather plentifully, in which the spire is more pointed, and the tubercles on the shoulders of the whorls are lengthened both in front and behind, so as to form short, narrow ribs.

This shell presents so close a resemblance to *P. decussata* (*Lamk.*), that I am reluctant to consider the two as specifically distinct. The French shell is generally narrower, and the body-whorl is less contracted in front and more conical than in the English specimens; and M. Deshayes describes it as being much shorter than the spire; but in a series of French specimens, for which I am indebted to the liberality

of that gentleman, the spire forms, in a majority of instances, very little more than half of the length of the shell, and the diameter, in some individuals, is relatively greater than that of the English shells. The tubercles are larger and coarser in the French shells, and the plication within the outer lip is found in them, although that character is not noticed by M. Deshayes.

The chief distinctions between the English and French shells appear to lie in the more conical form of the whorls and the coarser tuberculation in the latter; but these distinctions give very different aspects to the shells, and I have not ventured absolutely to refer the English shells to the French species, although they may perhaps be fairly regarded as forming a local variety.

Size.—Axis, rather more than 5-12ths of an inch (11 millim.); diameter, rather more than 2-12ths of an inch (5 millim.).

Localities.—Highcliff (where it is rather abundant) and Barton.

No. 177. PLEUROTOMA VERTICILLUM. *F. E. Edwards*. Tab. XXIX, fig 3, *a—c*.

P. testá turriculatá, longitudinaliter costellatá, omnino concentrice lineatá: spirá elatá, acuminatá: anfractibus planulatis, ad humeros angulatis, antice coarctatis; marginibus posticis depressis, sub-rectis, vix cavatis, obscure lineatis, ad suturam granulatis; ultimo anfractu in canali brevi terminanti; costellis crebris, arcuatis, acutis, fere ad basin tendentibus; lineis concentricis irregularibus, acutis, denticulatis: aperturá ovali; labro arcuato, acuto, intús plicato; sinu profundo, sub-trigono, anticá in margine collocato.

Var. testá costellis brevioribus, tuberculiformibus, ultimo anfractu obsolete.

Shell turriculate, longitudinally ribbed, concentrically lined: spire pointed, elevated, considerably exceeding the aperture in length; whorls, eight or nine, flat-sided, slightly angulated at the shoulders, and much contracted in front; the posterior margins depressed, very slightly channeled, nearly straight, and most generally bordered round the sutural edge by a row of small tubercles. The longitudinal ribs are numerous, thin, sharp, and obliquely curved, and extend almost to the very front of the shell; the concentric lines are elevated and sharp, and cover the whole surface of the shell; over the margins of the whorls they are moderately close and regular; but over the middle and front parts of the whorls they become more elevated, more distant, and somewhat irregular, very fine lines occasionally intervening between the more prominent ones; these concentric lines strongly decussate the longitudinal ribs, rising into small, sharp tubercles at the points of decussation. The aperture is rather widely oval, and terminates anteriorly in a short, but distinct, canal; the outer lip is arched, and somewhat dilated in front; the inner lip narrow, but thick and prominent; and the sinus, which is three-cornered in shape, deep, and wide, is placed in the front part of the margin.

Occasionally specimens occur in which the longitudinal ribs are lost on the last

whorl, and are much shortened on the earlier whorls, assuming the appearance of oblong tubercles; and the decussation by the concentric lines disappears.

The present species presents a close analogy with *P. scabriuscula*, with which it may, especially in the young state, be readily confounded. On comparing adult shells, however, it will be found that, in this species, the shell is wider, the spire more pointed, the whorls less bluntly angulated at the shoulders, and more depressed and more deeply channeled round the margin, giving a decidedly turreted character to the spire; the whorls themselves are more numerous and shorter, and, in the typical form, the sharp ribs and prominent concentric lines give a rougher aspect to the surface. In the varieties a somewhat closer approximation will be found in the ornamentation of the two species; but, in other respects, the characteristic distinctions are preserved.

From *P. constricta*, the only other species with which it might be confounded, it is separated by the depressed margins, and more sharply angulated shoulders of the whorls, the more regular costellation, and the deep, narrow sinus of that species.

Size.—Axis, rather more than 8-12ths of an inch; diameter, 3-12ths of an inch.

Localities.—Barton, Highcliff; not common.

No. 178. *PLEUROTOMA CONSTRICTA*. *F. E. Edwards*. Tab. XXIX, fig. 1, *a—c*.

P. testá elongato-fusiforimi, longitudinaliter costellatá, concentrice lineatá: spirá conoideá, sub-acuminatá, aperturam in longitudine paullo superanti: anfractibus depresso-convexis, ultimo anfractu in canali brevi, terminanti; marginibus posticis leviter declivis, canaliculatis, plicatis, ad suturam marginatis; costellis crebris, angustis, obliquis; lineis concentricis, acutis, denticulatis: aperturá oblongo-ovali; labro leviter arcuato; sinu angusto, profundo, trigono, anticá in margine collocato.

Shell elongated, fusiform, longitudinally ribbed, and concentrically lined; the spire, formed of seven or eight whorls, is rather conical, pointed, and moderately elevated, barely exceeding the body-whorl in length; whorls flatly convex; the posterior margins widely and deeply channeled, thickened at the sutural edges, and bordered by a single sharp, prominently raised line; the surface of the marginal furrow presents a series of prominent, curved plications, formed by the successive margins of the advancing sinus. The longitudinal ribs are numerous, slender, oblique, slightly curved, and extend almost to the very front of the whorl; the concentric lines are sharp, prominent, more or less distant in different individuals, and denticulated at the points where they cross the ribs. The aperture is of an oblong-oval form, and terminates in front in a short, moderately wide, canal; the outer lip is but slightly arched, thin, sharp-edged, and smooth within; the sinus is trigonal, narrow, very deep, and placed in the front part of the margin.

The present species much resembles *P. innexa*, with which, in fact, at first sight, it may be easily confounded; on a closer inspection, however, differences will be detected which render it impossible to regard it as even a strongly-marked variety of *P. innexa*. In the general form, *P. constricta* is a slenderer shell, with a more pointed spire, and, instead of the shallow, obscure furrow, bordered by a row of granulations which runs round the posterior margins of the whorls in *P. innexa*, the present species presents a wide, conspicuous channel, defined by a sharp, elevated ridge; the outer lip is much less arched, and is not thickened or plicated within, and the sinus is deep, narrow, three-cornered, and placed in the front part of the margin, instead of the wide, rounded sinus extending over the whole width of the margin which characterises *P. innexa*.

Size.—Axis, rather more than 8-12ths of an inch; diameter, 3-12ths of an inch.

Localities.—Barton, Highcliff, Highgate.

NO. 179. PLEUROTOMA PYRGOTA. *F. E. Edwards*. Tab. XXVIII, fig. 16, a—c.

P. testá sub-fusiforini, turritá, longitudinaliter obscure costulatá, concentrice sulcatá: anfractibus ad humeros carinatis, antice planulatis, sub-conicis, postice canaliculatis, transversim lineatis, crenato-marginatis; costellis antice bifurcatis, sub-obsoletis: aperturá oblongo-ovalí, in canali brevi exeunti; labro intús plicifero; sinu lato, sub-semicirculari, in margine collocato.

Var. a. Testá costellis distinctioribus, productioribus: anfractibus antice granoso-lineatis, cæterúm lævibus.

Shell sub-fusiform, turreted, longitudinally ribbed, and concentrically furrowed: the spire, which consists of seven or eight volutions, exclusive of the smooth, conical pullus, is moderately elevated, forming about one half of the entire shell; the whorls flat-sided, giving a nearly conical aspect to the anterior part of the shell, sharply carinated at the shoulders, and having the posterior margins channelled and bordered round the suture by a sharp, elevated line, simple or feebly crenulated, the concave space between which and the shoulder is smooth; the keel on the shoulders is notched with much regularity, presenting a row of oblong, somewhat oblique, rib-like tubercles. These tubercles are prolonged anteriorly, and bifurcate, forming two curved, narrow, obscure ribs, which are lost as they cross the middle of the whorls; the concentric furrows are shallow and wide, the intervening spaces becoming gradually more elevated and sharper as they approach the base of the shell. The aperture is of a narrow, elongated, oval form, and terminates in front in a short, wide canal; the outer lip is slightly arched, somewhat thickened and plicated within; and the sinus, which extends over the whole margin, is wide and deep, and nearly semicircular.

Specimens occur, constituting a local variety, in which the ribs are more distant and prominent, and extend to the very front of the shell; four or five distant, elevated, concentric lines cross the whorl over the anterior canal, and are granulated at the points where they are intersected by the lengthened ribs; elsewhere the whorls are smooth.

A miocene shell, described by Brocchi (*Murex reticulatus*—*Pleur. ramosa*, Bast.), presents a very close analogy with this *Pleurotoma*, as well in the general shape as in the character of the ornamentation; it is distinguishable, however, by the greater size of the shell, which attains a length of nearly three inches, the greater narrowness and the simple margins of the whorls, the relatively longer spire and shorter aperture, the shape and position of the sinus, and the condition of the outer lip, which is smooth within. A *Pleurotoma* also occurs in the nummulitic beds near Pau, described by Rouault (*Pleur. Tallavignesii*), to which I have referred some shells from Nuneham and Southend, and which, in the young state particularly, much resembles the present species; but in that shell the whorls are more contracted in front; the posterior margins spirally lined, wider, and not so depressed; the longitudinal plications are more oblique, the lineation finer and more close; the anterior canal longer; the outer lip more arched; and the sinus not so deep.

Size.—Axis, 10-12ths of an inch nearly; diameter, rather more than 3-12ths of an inch.

Localities.—Bramshaw, for the type; Brockenhurst, for the variety.

No. 180. PLEUROTOMA BREVIROSTRUM. Sow. Tab. XXIX, fig. 6, a, b.

	PLEUROTOMA BREVIROSTRUM.	Sow.	1823.	Min. Con.,	vol. iv,	p. 120,	t. 387,	fig. 2.
	—	—		Bronn.	1848.	Index Palæont.,	p. 1002.	
	—	—		D'Orb.	1852.	Prodrome de Paléont.,	25 ^e Etage,	No. 411.
Nec	PLEUROTOMA BREVIROSTRUM.	Sism.	1847.	Syn. Meth. Anim. Invert.	Pedem. foss.,	p. 32.		
nec	—	—		Bell.	1847.	Pleurot. Foss. del Piem. (Mem. R. Accad. delle		
						Sc. di Torino),	p. 607,	t. 4, fig. 9.
nec	—	—		Naumann.	1853.	Atlas zu sein. Lehrb. der Geogn.,	t. 70,	fig. 4.

P. testá elongatá, angustá, turritá, longitudinaliter nodo-costatá, concentricè lineatá: spirá elevatá, acuminatá: anfractibus medio angulatis; marginibus posticis latis, declivis, vix cavatis, sub-levibus, ad suturam incrassatis; ultimo anfractu brevi, antice coarctato; costis crassiusculis, brevibus; lineis concentricis filiformibus, sub-regularibus: aperturá obovatá, in canali brevi, mediocriter lato, leviter arcuato et retrorsum reflexo exeunti; sinu lato, profundo, subtrigono, mediá in margine collocato.

Shell narrow, elongate, turreted, longitudinally ribbed, and spirally lined: the spire, which consists of nine volutions exclusive of the pullus, is pointed and much elevated, forming nearly two thirds of the entire shell. The whorls are sharply

angulated at the shoulders, to which the last but one of the concentric lines, more prominent than the others, gives the appearance of being carinated. By this keel-like line, the whorl is nearly equally divided; the anterior half, covered with the concentric lines, is flat-sided; the posterior half, forming the margin of the whorl, is very slightly channelled, almost straight, and smooth, except where it presents obscure curved lines, indicating the earlier outlines of the sinus, and is bordered round the suture by a single coarsish, thread-like, raised line. The posterior margins slope backwards, at an angle with the shoulders corresponding with that formed by the anterior portion of the whorl, giving a regular zig-zag outline to the spire. The ribs are moderately distant, not very broad, rounded, and short, barely extending to the middle of the whorls; the concentric lines are thread-like, rather thick, and separated by concave furrows as wide as the lines; excepting the one on the shoulders, they are nearly equal and regular. The aperture, which is of a widish-oval shape, terminates in front in a short, slightly oblique, and not very wide canal, the anterior extremity of which is a little bent backwards; the outer lip, as indicated by the lines of growth, is arched; and the sinus, which extends over the whole width of the margin, is deep and subtrigonal in shape.

The wide, straight margins, angular shoulders, and zig-zag outline of the whorls, which characterise this species, are not noticed in the description, nor represented in the figure given in the 'Mineral Conchology.' The present *Pleurotoma*, as described and figured in that work, would appear to resemble a well-known Miocene species (*Murex oblongus*, Brocchi, the *Pleurotoma dubia*, Jan.; *P. obeliscus*, Des Moul.; and *P. multinoda*, Grat.); and this, probably, has misled Bellardi and other continental authors into referring the Miocene shells to *P. brevirostrum*. In these shells, however, the posterior margins of the whorls are narrow and concave, the sides nearly parallel with the axis, the ribs long, extending to the front of the whorls, and the anterior canal is very short and wide. *P. brevirostrum*, in fact, more nearly resembles *P. Lamarcki*, Bell (*P. semistriata* of Partsch), a species described by Hörnes as occurring in the Tertiary Beds of Germany; and it agrees so closely with some Miocene shells, from the neighbourhood of Vienna, in the British Museum, that the latter cannot be regarded as specifically distinct. These shells have been, I think incorrectly, referred to *P. oblonga*; they are smaller and narrower than *P. Lamarcki*, and the margins of the whorls are not quite so concave, but they may be, probably, a variety of that species.

The shell on which the present species was founded, and for the use of which I am indebted to Mr. Sowerby, was presented to the late Mr. Sowerby by Lady Burgoyne, by whom it was stated to have been found at Muddiford; I do not know of any other specimen having hitherto been found, although the beds at Muddiford, High-cliff, and Barton have, probably, been explored more thoroughly than any other Eocene deposit in England. The shell in question does not present the aspect of

shells from that locality ; and I am strongly inclined to think that by one of those accidents, which the greatest care will not always prevent, a shell from the Miocene beds of Germany or Italy has been mixed with Hampshire fossils, and that thus an erroneous locality has been given. The matrix, unfortunately, has been entirely removed, and this evidence is not available. Under these circumstances, I retain the species, for the present, as one of the English Eocene Pleurotomæ, but with much doubt.

Size.—Axis, $1\frac{1}{2}$ inch ; diameter, 4-12ths of an inch.

Locality.—Muddiford ?

No. 181. PLEUROTOMA NODULOSA. Lamk. Tab. XXIX, fig. 7, a—c.

PLEUROTOMA NODULOSA. Lamk. 1804. Ann. du Mus., vol. iii, p. 170, No. 18.
 — — — 1822. Histoire Naturelle, &c., vol. vii, p. 101, No. 25.
 — — — Desh. 1824-37. Descr. des Coq. foss., &c., vol. ii, p. 466,
 t. 65, fig. 11—14.

P. testá elongatá, fusiformi, undique spiraliter lineatá : spirá elevatá, acuminatá : anfractibus ad humeros angulatis, nodulosis ; lineis filiformibus, sub-regularibus ; nodulis, obtusis, crassis, obliquis : ultimo anfractu per-brevis, postice concavo, antice depresso-convexo, repente coarctato, in canali brevi, latiusculo, obliquo, terminanti : aperturá oblongo-ovali ; labro tenue, aliforme ; sinu latiusculo, paullo profundo, in margine collocato.

Shell elongated, fusiform, having the whole surface covered with concentric raised lines : spire pointed, produced, much exceeding the aperture in length ; whorls angulated at the shoulders, where they present a series of blunt, thickish, rather oblong, tubercles, somewhat distant from each other, very slightly oblique, and becoming feeble and obscure on the last whorl ; the posterior margins are a little concave. The last whorl is very short, flatly convex at the sides, contracted rather suddenly in front, and terminates in a short, and somewhat wide canal. The spiral lines are thickish, rounded, thread-like, equal, and nearly regular ; the aperture is of an oblong-oval shape ; the outer lip thin, wing-like, projecting at the middle, and smooth within ; and the sinus, which is placed in the margin, is rather wide, not very deep, and triangular in form.

Lamarck describes the concentric lines which ornament the French shells as very thin ; while in the English specimens the lineation is strong and coarse. This difference in the character of the sculpture on the Eocene shells of the two countries is not of unfrequent occurrence, and may be attributed to outward conditions only. The sinus in the outer lip is described by Deshayes as being “ narrow and deep ; ” but in a series of specimens from Grignon, for which I am indebted to that gentleman, the sinus corresponds pretty closely with that found in the English specimens.

In all other respects the shells agree ; and I do not feel any doubt, therefore, as to the accuracy of the identification.

With the Grignon specimens, I received some from Damery, in which the tubercles are thin and compressed, resembling small, oblique ribs ; they form a variety, probably not known to Deshayes at the date of his work above cited, and therefore not noticed by him. Our English shells present the thick rounded tubercles characteristic of the type, and from which the specific name was taken.

Size.—My specimens have not attained the size of the French shells ; of the largest the axis is 9-12ths of an inch nearly (18 millim.) ; the diameter 3·5-12ths of an inch nearly (7 millim.).

Localities.—Stubbington. *French* : Grignon, Parnes, Courtagnon, Damery (fide *Desh.*) ; Lattainville (fide *Graves*).

No. 182. PLEUROTOMA NODOSARIA. *F. E. Edwards*. Tab. XXIX, fig. 8 *a, b*.

P. testá turritá, tuberculo-costatá, spiraliter lineatá : spirá acuminatá, elevatá : anfractibus convexis, ad humeros sub-angulatis ; marginibus posticis depressis, vix canaliculatis, ad suturam lineá elevatá cinctis ; ultimo anfractu brevi, antice valde coarctato, in canalem brevem producto ; lineis spiralibus exilibus, proeminentibus, sub-distantibus : aperturá ovata ; labro parum arcuato ; sinu lato, sub-semicirculari, anticá in margine collocato.

Shell narrow, turreted, ribbed, concentrically lined : spire pointed, produced, much exceeding the last whorl in length : whorls convex on the sides, rather bluntly angulated at the shoulders, and crowned with a row of small, oval-shaped, vertical tubercles, impressed by the concentric lines ; the posterior margins are depressed, very slightly furrowed, almost straight, and bordered round the suture by a single slender raised line ; the spiral lines are slender, very prominent, and rather distant. The last whorl is short, and somewhat suddenly contracted towards the front, and terminates in a short, narrowish canal. The aperture is ovate ; the outer lip slightly arched, and the sinus wide, nearly semicircular, and placed in the very front of the margin.

I possess but an imperfect specimen of this species, but the characters are so distinct that it appears worthy of being recorded.

Size.—Axis, 5-12ths of an inch ; diameter 2-12ths of an inch.

Locality.—Southampton.

No. 183. PLEUROTOMA UNDATA. *Lamk.* Tab. XXIX, fig. 11, *a, b*.

PLEUROTOMA UNDATA. *Lamk.* 1804. Ann. du Mus., vol. iii, p. 169, No. 9.

— — *Lamk.* 1822. Hist. nat., &c., vol. vii, p. 99, No. 14.

— — *Desh.* 1824-37. Descr. des Coq. foss., &c., vol. ii, p. 456 ; t. 63, figs. 11—13 ; t. 64, figs. 21—23.

- Nec PLEUROTOMA UNDATA. *Bast.* 1825. Mém. Géol. sur les Env. de Bordeaux, p. 64, No. 7.
 nec — — *V. Hauer.* 1837. Fossth. imtert. Becken v. Wien. Jahrb., p. 419,
 No. 98.
 nec — — *Grat.* 1838. Cat. Zool., &c., du Bass de la Gironde, p. 46, No. 394.
 nec — — *Grat.* 1840. Conchyl. foss., &c., du Bass. de l'Adour (Atlas
 Pleurot., t. 2, fig. 36).

P. testá elongato-fusiformi, sub-turritá, lineis spiralibus costulisque longitudinalibus ornatá: spirá acuminatá: anfractibus convexiusculis, postice sub-canaliculatis; lineis concentricis crassiusculis, depressis, numerosis, undatis; costulis undatis, variis: aperturá angusto-ovatá, antice in canali brevi exeunti; labro tenuissimo, arcuato; sinu latiusculo, marginibus sub-parallelis, anticá in margine collocato.

Shell oblong, fusiform, somewhat turreted, ornamented with spiral lines and longitudinal ribs; the spire pointed, produced, always exceeding the last whorl in length; whorls eight or nine (exclusive of a smooth, conical pullus of three volutions), convex, short, and bluntly angular on the shoulders. The posterior margins are slightly channelled; the sutural edges, in the young shells, are frequently bordered by a single row of small, roundish tubercles, which disappear on the fourth or fifth whorl, and the edges then become feebly and distantly crenulated, or they present three or four prominent, thread-like lines. The concentric lines are numerous, irregular, fine and thread-like over the margins, rather thick and depressed over the middle and front parts of the whorl, and slightly wavy on the last whorl; the longitudinal ribs are short, oblique, curved, and very variable in different specimens, both in size and number, sometimes being moderately large and distant, sometimes small and crowded. The aperture is of an oblong-oval form, and terminates in front in a short, somewhat narrow, and nearly straight canal; the outer lip is very thin, much arched, and expanded towards the middle; the sinus is moderately wide, deep, with nearly parallel margins, and placed in the very front of the margin, immediately behind the shoulder.

The transverse lineation in the English specimens is, as is not unfrequently the case, of a coarser character than that found in the French shells; and there is also a slight difference in the condition of the posterior margins. These variations, however, do not appear to be of sufficient importance to justify the separation of the English shells.

Size.—Axis, 1 inch and 2-12ths (30 millim.); diameter, nearly 5-12ths of an inch (10 millim.).

Localities.—Stubington; *French:* Grignon, Parnes, Mouchy, Courtagon (fide *Desh.*), Saint-Felix, Uilly-Saint-Georges (fide *Graves*), la Vallée de l'Aisne (fide *Melleville*).

No. 184. PLEUROTOMA BRACHEIA. *F. E. Edwards.* Tab. XXIX, figs. 9, *a, b.*

P. testá parvá, sub-fusiformi, turrítá, longitudinaliter costatá, concentricè lineatá: spirá obtusiusculá aperturam in longitudine paullo superanti: anfractibus planulatis, ad humeros angulatis, postice concavis, et unicá serie nodulorum munitis; ultimo anfractu valde coarctato, in canalem breviusculum producto; costis numerosis, obliquis, angustis, fere ad basin tendentibus; lineis concentricis sub-distantibus, acutis, irregularibus: aperturá angustá, ovali; labro leviter arcuato, intús prope sinum calloso; sinu lato, brevi, in margine collocato.

Shell small, fusiform, turreted, longitudinally ribbed, concentrically lined: the spire rather thick, and moderately elevated, being a little longer than the aperture: the whorls flat-sided, angulated at the shoulders; the posterior margins narrow, channelled, and furnished with a single row of largish round knobs, alternating with the ribs; the last whorl is much contracted in front, and ends in a wide, somewhat short, and oblique canal. The longitudinal ribs are moderately thick, rounded on the surface, separated by concave spaces as wide as the ribs, oblique, tapering towards the front, and extending to the anterior canal; the concentric lines are distant, prominent, and thread-like. The aperture is of a narrow, oval shape; the outer lip slightly arched, sharp on the edge, thickened within near the apex of the sinus, and presenting two transverse, oblong callosities, similar to those which characterise *P. callifera*; the sinus is shallow, rounded, and wide, extending over the whole of the posterior margin.

The only specimen I possess has probably not attained its full growth, but it presents an union of characters which distinguishes it from all its congeners. It is apparently very rare.

Size.—Axis, 3·5-12ths of an inch; diameter, 1·5-12ths of an inch.

Locality.—Barton.

No. 185. PLEUROTOMA SINDONATA. *F. E. Edwards.* Tab. XXIX, fig. 12, *a, b.*

P. testá parvá, gracili, fusiformi, undique spiraliter lineatá, clathratá: spirá sub-conicá, acuminatá: anfractibus convexiusculis, ad humeros sub-carinatis, postice plicatis, marginatis; lineis spiralibus elevatis, filiformibus, irregularibus, suprâ margines fere obsoletis; lineá unicá humeros cingenti eminentiori, in juventá denticulatá: aperturá ovali, antice in canali indistincto exeunti; labro leviter arcuato, ad marginem posticam late sinuato.

A small, slender, fusiform shell, spirally lined, and having an elevated, nearly conical and pointed spire, formed of six or seven volutions; the whorls very slightly convex and sharply keeled round the shoulders; the posterior margins wide, sloping gently

backwards, slightly channelled, a little thickened on the sutural edge, and bordered by a thickish raised line, the space between which and the shoulder is ornamented with a series of rather closely set, curved plications, formed by the successive margins of the sinus. The spiral lines are very faint, scarcely visible to the naked eye, over the margins of the whorls, but elevated, thread-like, and irregular over the middle and front parts, where they are strongly decussated by the lines of growth, which are prominent and regular; the surface of the whorls is finely cancellated by these decussating lines, suggesting the idea of the shell being covered with very fine linen; whence the name. The posterior line, girding the shoulders, is more elevated than the rest, giving the whorls the appearance of being sharply carinated; on the early whorls this posterior line is broken into oblong denticulations, which disappear as the shell approaches maturity. The aperture is of an oval form, and terminates in front in a short, wide canal; the outer lip is slightly arched, and presents a moderately deep sinus, extending across the margin, and somewhat triangular in form.

This very pretty shell appears to be quite distinct; it is rare.

Size.—Axis, 5-12ths of an inch nearly; diameter, not quite 2-12ths of an inch.

Locality.—Stubbington.

No. 186. PLEUROTOMA GRANULATA. *Lamk.* Tab. XXVIII, fig. 4, *a—c*.

PLEUROTOMA GRANULATA. *Lamk.* 1804. *Ann. du Mus.*, vol. iii, p. 266, No. 21; vol. vii, t. 13, fig. 4, *a, b*.

— — *Lamk.* 1822. *Hist. nat., &c.*, vol. vii, p. 101, No. 26.

— — *Desh.* 1824-37. *Descr. des Coq. foss., &c.*, vol. ii, p. 476; t. 67, figs. 1—3.

NON PLEUROTOMA GRANULATUM. *Phil.* 1851. *Tert. foss. Magdeb.* (*Palæontograph.*, vol. i, p. 67, No. 127; t. 9, fig. 13).

Var. FORMOSA (Charlesw.). *P. testá elongato-fusiforimi, sub-turritá, longitudinaliter granulato-costellatá, concentricè lineatá: spirá productá, dimidium totius testæ in longitudine paullulo superanti: anfractibus convexiusculis, sub-angulatis, postice sub-caniculatis, ad suturam granulatis; costellis numerosis, undosis, fere ad basin tendentibus; lineis concentricis crebris, duabus vel tribus lineis posticis proeminentioribus: aperturá oblongo-ovali, in canali brevi, latiusculo exeunti; labro aliforme; sinu lato, sub-semicirculari, in margine collocato.*

Shell elongated, fusiform, ornamented with numerous longitudinal, narrow ribs, which are crossed by concentric, raised lines, and thickened into small, round knobs at the points of intersection, imparting a granulated character to the surface: the spire, formed of seven or eight volutions, is rather obtuse, and moderately elevated, somewhat

exceeding the aperture in length. The whorls are slightly convex; the posterior margins somewhat depressed and concave, giving a turruculate aspect to the spire; a single row of roundish or slightly oblique, oblong granulations runs round the sutural margin, the space between which and the shoulder is nearly equally divided by a raised line granulated by the prolongation of the costellæ over the margins; the costellæ, which are more or less curved in different individuals, extend a little beyond the middle of the whorls, and gradually attenuate as they recede from the shoulders; the concentric lines are prominent, numerous, and irregular; the two lines on the shoulder and on the margin being more elevated than the rest. The aperture is of an oblong, oval shape, and terminates in front in a short, moderately wide canal; the outer lip is thin, sharp on the edge, and wing-shaped; and the sinus, which is wide and nearly semicircular, occupies the whole breadth of the margin.

This *Pleurotoma* is one of the shells figured under the superintendence of Mr. Charlesworth, for the British Natural History Society, and the elegant ornamentation which characterises it, well merits the epithet selected for a specific name. The shell, however, in its general form and the character of the ornamentation, so closely resembles *P. granulata* (Lamk.), that it is difficult, if not impossible, satisfactorily to separate the two. It will be found, on comparison, that the English shell is broader, the spire not so pointed, and proportionately shorter, and the aperture, consequently, relatively longer than in the French shell. These distinctions may fairly be attributed to external conditions, and I therefore regard the English shell not as a separate species, but merely as a strongly marked local variety of *P. granulata*.

Size.—Axis, 5-12ths of an inch nearly (10 millim.); diameter, 2-12ths of an inch (4 millim.)

Localities.—Barton, Alum Bay (Stratum No. 29, Prestwich); Highcliff, where it occurs in such profusion that it may be regarded as one of the characteristic shells of that deposit; and Bracklesham Bay. *French*: Grignon, Parnes, Mouchy, Courtagnon (fide *Desh.*), Monneville, Varinfroy (fide *Graves*).

No. 187. PLEUROTOMA HEADONENSIS. *F. E. Edwards*. Tab. XXVIII, fig. 17, a—c.

PLEUROTOMA HEADONENSIS. (Edw. MSS.) *Morris*. 1856. Forbes's Tert. Fluv. Mar. Format., &c.; Mem. Geol. Surv., p. 155, t. 5, fig. 4.

P. testâ gracili, fusiformi, longitudinaliter semi-costellatâ, spiraliter sulcatâ: spirâ elevatâ, longitudine dimidium totius testæ paulo superanti: anfractibus convexiusculis, postice unico sulco profundo exaratis, ad suturam marginatis; costellis numerosis, perbrevis, angustis, obliquis; sulcis spiralibus regularibus, sub-distantibus: aperturâ elongato-ovali, in canali latiusculo, brevi, exeunti; labro leviter arcuato; sinu sub-triangulari, lato, minime profundo.

Shell slender, fusiform, longitudinally ribbed, and concentrically furrowed; spire pointed, elevated, forming rather more than half of the whole shell; whorls, six or seven, flatly convex; slightly thickened at the posterior edge, and bordered by a spiral, sharp, elevated, ridge-like line, which runs round the sutural margin, the space between which and the shoulder presents a deep, round furrow, obliquely plicated by the successive margins of the sinus. The longitudinal ribs are numerous, oblique, rounded, and very short, barely extending to the middle of the whorl, and frequently altogether lost on the last whorl; the spiral furrows are regular, moderately distant, and rather deep. The aperture is of a lengthened, ovate form, and terminates in front in a short, but distinct, and moderately wide, canal; the sinus is somewhat three-cornered in shape, wide, but not very deep, and placed in the margin.

Size.—Axis, 3-10ths of an inch; diameter, 1-8th of an inch.

Localities.—Headon Hill, Colwell Bay, Hordwell (Upper Marine formation), Lyndhurst; and Whitecliff Bay (fide *Forbes*).

NO. 188. PLEUROTOMA VICINA. *F. E. Edwards*. Tab. XXIX, fig. 10, *a, b*.

P. testá parvá, politá, gracili, fusiformi, omnino concentrice crebri-sulcatá: spirá sub-conicá: anfractibus planulato-convexis, in juventá costellatis et sub-angulatis; marginibus posticis declivis, vix cavatis, plicatis, unicá lineá elevatá prope suturam cinctis: aperturá angustá, ovali, antice in canali brevi, lato exeunti; labro acuto, arcuato; sinu lato, sub-trigono, anticá in margine collocato.

Shell small, polished, slender, fusiform, ornamented with numerous, close-set, shallow furrows: the spire elevated, forming rather more than half of the shell; the whorls, six or seven, very slightly convex; the posterior margins, which slope gently backwards, are nearly straight, giving a sub-conical shape to the spire, and are girt round the suture by a single elevated, ridge-like line, in front of which appears a series of numerous curved plications formed by the successive margins of the sinus. The early whorls are obliquely ribbed and slightly angulated at the shoulders, but both these characters disappear as the shell approaches maturity. The aperture is of a narrow, oval shape, and terminates in front in a short, wide canal; the outer lip is sharp on the edge, arched, projecting most towards the anterior extremity; and the sinus, which is wide, moderately deep, and sub-trigonal in form, is placed in the very front of the margin.

This shell very closely resembles *P. Headonensis*, of which it may perhaps prove to be merely a variety. It is distinguished by the more slender form, the shorter spire, the more closely furrowed and less convex whorls, the absence of the costellæ,

except in the young state, and the nearly straight margins of the whorls instead of the deeply furrowed margins which characterise that species.

Size.—Axis, 4-12ths of an inch; diameter, 1-8th of an inch.

Locality.—Alum Bay (No. 29, Prestwich); rare.

No. 189. PLEUROTOMA TURPIS. *F. E. Edwards*. Tab. XXVIII, fig. 2, *a—c*.

P. testá elongatá, fusiformi, spiraliter sulcatá, in juventá costellatá: spirá productá, bitrientes totius testæ in longitudine fere æquanti: anfractibus convexiusculis; ad humeros angulatis; postice declivis, late cavatis, ad suturam crenulatis; ultimo anfractu antice sensim attenuato, in canali perbrevis terminato; sulcis spiralibus crebris, undulatis, obscuris: aperturá oblongo-ovali; labro arcuato, acuto; sinu sub-triangulari, lato, medio-criter profundo, in margine collocato.

Shell long, fusiform, spirally sulcated, and, in the young state, longitudinally ribbed; the spire much produced, forming nearly two third parts of the whole shell; whorls, seven or eight, slightly convex, angulated at the shoulders; the posterior margins slope gently backwards, are plicated round the sutural edge, and are deeply channeled, imparting somewhat of a turreted character to the spire; the body-whorl tapers towards the front with so gradual a contraction as to be almost conical. In the young shell the whorls present rather numerous, nearly straight ribs, which are lost about the fourth or fifth whorl. The spiral furrows are shallow, close-set, slightly undulating, obscure, and frequently decussated by the lines of growth. The aperture is a lengthened, ovate form, and terminates in front in a short, wide, indistinct canal; the outer lip is arched, thin, sharp-edged, and smooth within; and the sinus is three-cornered in shape, not very deep, and wide, extending across the whole width of the margin.

This Pleurotoma presents a general resemblance to *P. pyrgota*; the latter species, however, may be easily distinguished by the finely crenulated and more sharply angulated shoulders of the whorls and the prominent, ridge-like line which borders the suture.

Size.—Axis, rather more than 1 inch; diameter, 1-3d of an inch.

Localities.—Clarendon, Southampton.

No. 190. PLEUROTOMA SUBULA. *F. E. Edwards*. Tab. XXIX, fig. 13, *a, b*.

P. testá subulatá, spiraliter obsolete lineatá, fere lævi: spirá elatá, sub-conicá: anfractibus antice planiusculis, postice cavatis, ad suturam sub-incrassatis, marginatis;

lineis spiralibus parum eminentibus, undulatis, supra margines posticas exilissimis, crebris, cæteris distantioribus: aperturá oblongo-ovali (?), in canali brevi exeunti; labro sub-recto; sinu lato, mediocriter profundo, sub-trigono, mediá in margine collocato.

Shell subulate, concentrically obscurely lined, almost smooth; spire nearly conical, elevated, equalling the aperture in length; whorls six (exclusive of a rather large, smooth pullus), depressedly convex, with gently sloping margins, widely channelled, slightly thickened round the suture, and girt by a narrow, raised band, rounded on the upper surface, and traversed by a single, faint, elevated line; the last whorl is much contracted in front, and terminates in a wide, short, but distinct, canal. The spiral lines are very faint, nearly obsolete, scarcely detracting from the otherwise smooth surface of the shell; over the margins they are close-set, but become more distant over the middle and front parts of the whorls. The aperture is concealed by the matrix, but, apparently, it is of a lengthened oval shape; the outer lip, as displayed by the lines of growth, is but slightly arched, nearly straight; and the sinus, which extends almost across the margin, is wide, moderately deep, and somewhat triangular in form.

The specimen figured is the only one I possess of this *Pleurotoma*; the nearly smooth surface, and tapering, conical spire, associated with the short, anterior canal and marginal sinus, distinguish it, however, from all its congeners.

Size.—Axis, 8-12ths of an inch nearly; diameter, not quite 3-12ths of an inch.

Locality.—Basingstoke.

NO. 191. *PLEUROTOMA LISSA*. *F. E. Edwards*. Tab. XXVIII, fig. 5, *a, b*.

P. testá brevi, latá, fusiformi, costellatá, concentrice obsolete sulcatá, politá: spirá sub-conicá, dimidium totius testæ vix æquanti: anfractibus planulato-convexis, postice canaliculatis, lævibus, marginatis; ultimo anfractu antice coarctato, in canalem brevissimum producto; sulcis transversis rotundatis, distantibus, sulcis anterioribus perspicuis, cæteris obsoletis: aperturá obovatá; labro arcuato, acuto; sinu lato, fere semicirculari, in margine collocato.

Shell short, wide, fusiform, with a smooth, shining surface, longitudinally ribbed, concentrically furrowed; spire rather short, barely equalling the aperture in length; whorls, six exclusive of the pullus, flatly convex on the sides; the posterior margins smooth, deeply furrowed, and bordered round the sutural edge by a thick, raised band rounded on the upper surface; the last whorl is slightly contracted in the front, and produced into a short, very wide, canal; the longitudinal ribs are vertical, short, thick, rounded, smooth on the upper surface, and separated by spaces equalling the ribs in breadth; the ribs themselves are lost on the last whorl of the mature shell; the concentric furrows are rather wide; they are rounded and perspicuous over the canal

and front part of the whorl, but become obsolete over the middle and upper parts, so as not to detract from the otherwise smooth and shining surface. The aperture is of a narrowish, oval form; the outer lip arched, projecting slightly towards the front, thin, sharp-edged, and smooth within; and the sinus wide, nearly semicircular, and extending across the whole width of the margin.

The characters of this *Pleurotoma* are sufficiently well marked to merit distinction. Although presenting a close resemblance to *Pleurotoma tereticosta* in the general appearance, yet the smooth and shining surface of the shell, the more obtuse spire, the greater width of the whorls, the thicker and more distant ribs, the more conical form of the body-whorl, and the different condition of the sinus, separate the two species.

Size.—Axis, 5-12ths of an inch; diameter, 2-12ths of an inch.

Locality.—Potter's Bar.

No. 192. PLEUROTOMA FISHERI. *F. E. Edwards.* Tab. XXXI, fig. 14, *a, b.*

P. testá elongatá, turriculatá, longitudinaliter costatá, concentricè lineatá: spirá productá, acuminatá: anfractibus brevibus, convexis, ad humeros angulatis; marginibus posticis latis, depressis, paululo cavatis, ad suturam tuberculatis; cæterúm lævibus; ultimo anfractu sub-conico; costellis latiusculis, rotundatis; lineis concentricis anticè distantibus; supra partes medianas anfractuum numerosioribus, irregularibus; supra margines posticas obsoletis: aperturá ovali, in canali brevi, lato excunti; sinu lato, sub-trigono, anticá in margine collocato.

Shell long, narrow, turreted, longitudinally ribbed, and spirally lined; the spire pointed and much produced, forming nearly two thirds of the whole length of the shell. The whorls, seven or eight without the pullus, are short, angular at the shoulders, and nearly conical in front; the posterior margins wide, depressed, a little concave, and smooth, except on the sutural edge, where they present a single row of rather large and distant rhomboidal knobs, divided by a transverse furrow across the middle. The longitudinal ribs are short, broad, nearly vertical, rounded on the upper surface, and separated by concave spaces as wide as the ribs, which, in the last whorl, become reduced to oblong tubercles. The transverse lines are sharp and elevated, distant, and separated by smooth, flat spaces over the front of the whorls, but they become more numerous and irregular as they ascend the whorl from the middle towards the shoulder, and are altogether lost on the posterior margins. The mouth is of an oval form, and terminates in front in a wide and short, but distinct canal; the outer lip is thin, sharp-edged, and slightly arched, and the sinus, which is placed in front of the margin, is wide and somewhat triangular in shape.

This *Pleurotoma* approaches most nearly to *P. gomphoidea*, but the more turreted

spire, the short, nearly conical whorls, the broad, upright ribs, the distant, transverse lineation, and the short, anterior canal, render it easily distinguishable. I dedicate the species to the Rev. Osmond Fisher, the rector of Elmstead, near Colchester, a zealous and indefatigable fellow-labourer in this branch of Eocene Palæontology, to whose researches I am indebted for the discovery of the locality from which the species has been obtained.

Size.—Axis, not quite 5-12ths of an inch; diameter, 2-12ths of an inch nearly.

Locality.—Brook (New Forest).

No. 193. PLEUROTOMA TALLAVIGNESII. *Rouault*. Tab. XXXIII, fig. 9, *a*, *b*.

PLEUROTOMA TALLAVIGNESII. *Rouault*, 1848. Descr. des Foss. du Terr. Eocène des Env. de Pau; (Mém. Soc. Géol. de France, vol. iii, 2d ser., p. 482, t. 16, figs. 18, 19.)

P. testá elongato-fusiforimi, turritá, transversim irregulariter lineatá, longitudinaliter costellatá: anfractibus convexiusculis, angulatis; postice concavis, ad suturam marginatis; costellis numerosis, angustis, obliquis, bifurcatis; aperturá elongato-angustá, in canalem rectum longiusculum productá; labro arcuato; sinu lato, sub-trigono, in margine collocato.

Shell elongated, fusiform, turreted, longitudinally ribbed, and concentrically lined; the spire moderately elevated, not equalling the last whorl in length: the whorls rather deep and slightly convex, almost flat-sided, and sharply angulated at the shoulders; the posterior margins wide, slanting, concave, and thickened along the sutural edge, where they present either three or four prominent, raised lines, or a narrow, ribbon-like band, sometimes bisected by a concentric furrow: the whole surface between the suture and the shoulders is ornamented by a series of curved plications, caused by the successive edges of the advancing sinus. The longitudinal ribs are numerous, narrow, oblique, much curved, and short, not extending beyond the middle of the whorls; they are not very prominent, and most frequently bifurcate shortly after their origin on the shoulders; the last whorl is much produced in front, where it forms a longish and moderately wide canal. The aperture is of a lengthened oval form; the outer lip is much arched, and presents in the posterior margin a widely sub-trigonal sinus.

The present species affords another instance of the identity of forms hitherto found only in the Lower Eocene deposits in England with forms characteristic of the Nummulitic Beds of France; but the English specimens agree so well with the figures and description given by Rouault, and more especially with his *Var. a*, that the identity can scarcely be questioned.

I have already pointed out the differences between the present species and *P. pyrgota*, the only English Pleurotoma which resembles it.

Size.—If the shell were perfect the axis would be about 1 inch and 4-12ths (34 millim.); diameter, 5-12ths of an inch (11 millim. nearly).

Localities.—Southend, Nuneham. *French:* Bos d'Arros (fide *Rouault*).

Additional Species.*—*Subdivision a. Canal elongated.*

No. 194. PLEUROTOMA LEHONII. *Rouault*. Tab. XXXI, fig. 13, *a, b*.

PLEUROTOMA LEHONII. *Rouault*. 1848. Foss. du Terr. Eocène des Env. de Pau; (Mém. Soc. Géol. de France, vol. iii, 2d ser., p. 485, t. 16, fig. 26.)

P. testá elongato-fusiforimi, transversim lineatá, longitudinaliter costellatá: anfractibus convexiusculis; marginibus posticis declivis, ad suturam leviter crenulatis; ultimo anfractu spiram in longitudine superanti; costellis obliquis, angustis; lineis transversis tenuibus, crebris, sub-regularibus: aperturá ovato-angustá, in canalem longum, angustum, sub-rectum, productá; sinu lato, sub-trigono, in margine collocato.

Shell long, narrow, fusiform, longitudinally ribbed, and ornamented with concentric, raised lines; the spire is moderately produced, not equalling the last whorl in length. The whorls are slightly convex, with rather wide, slanting margins, slightly thickened, and very finely crenulated by the lines of growth along the sutural edge. The longitudinal ribs are rather prominent, narrow, not very distant, oblique, and curved, corresponding with the lines of growth, short in front, barely passing beyond the middle of the whorls, but reaching backwards to the very suture; the concentric lines extend over the ribs, and are fine, close-set, regular, and nearly equal. The aperture is of a narrow, ovate form, and terminates in front in a long, narrow, and nearly straight canal; the sinus is wide, sub-trigonal, and placed in the margin.

The English shells agree so well with the description and figures given by *Rouault*, that there does not appear to be any reasonable doubt of their identity with the species described by that author.

Size.—Axis, 7-12ths of an inch, nearly (14 millim.); diameter, 2-12ths of an inch (4·5 millim.)

Localities.—Highgate Archway. *French:* Bos d'Arros (fide *Rouault*).

No. 195. PLEUROTOMA MACRURA. *F. E. Edwards*. Tab. XXXIII, fig. 8.

P. testá elongato-fusiforimi, sub-turritá, longitudinaliter costellatá, omnino concentric lineatá: spirá breviusculá, in longitudine trientem totius testæ vix superanti: anfractibus

* The following three species, Nos. 194, 195, and 196, have been obtained since the publication of the first subdivision of the section distinguished by the sinus being placed in the margin; they are now added in order that the present monograph may contain descriptions of all the known English Pleurotomæ.

convexiusculis, postice concavis, oblique plicatis; ultimo anfractu antice in canalem rectum. prælongum producto; costellis numerosis, rotundatis, brevibus; lineis transversis confertis, supra partes anticæ et medianas anfractuum inæqualibus, supra margines posticas tenuibus, regularibus: aperturâ obovatâ: labro leviter arcuato in margine late sinuato.

Shell long, fusiform, somewhat turreted, ribbed, and ornamented with concentric, raised lines, which cover the whole surface. The spire is pointed and short, scarcely exceeding one third of the whole length of the shell. The whorls are slightly convex, and bear on the shoulders a single row of rather closely set, short, oblique ribs, rounded on the upper surface, and separated by concave spaces as wide as the ribs; the posterior margins are broadly furrowed, and present a series of fine, curved plications, caused by the successive margins of the sinus; the last whorl is much contracted in front, and produced into a very long, straight canal. The transverse lines over the front and middle parts of the whorls are close-set, prominent, unequal, thickish, thread-like lines alternating with slender ones; over the posterior margins the concentric lines are very fine, numerous, equal, and granulated by the marginal plications. The aperture is of an oblong-oval form; the outer lip but slightly arched; and the sinus, which is placed towards the front of the margin, is wide, sub-trigonal, and not very deep.

This species appears to be very rare; and although my specimens are rather crushed, the long, narrow beak is too remarkable to be passed without notice.

Size.—Axis, 1 inch and 1-12th nearly; diameter, 4-12ths of an inch.

Locality.—Finchley.

No. 196. PLEUROTOMA COCHLIS. *F. E. Edwards.* Tab. XXXIII, fig. 6.

P. testâ elongato-fusiforâ, turratâ: spirâ acuminatâ: anfractibus convexis, brevibus, ad humeros obtuse angulatis; postice late excavatis, marginatis, transversim subtilissime lineatis, cæterum lævibus; ultimo anfractu repente coarctato, in canalem longum producto: aperturâ obovatâ; labro alæformi; sinu profundo, sub-trigono, mediâ in margine collocato.

A long, fusiform, turreted shell, with a much-produced, pointed spire, formed of nine or ten whorls: the whorls are convex, and obtusely angulated at the shoulders; the posterior margins remarkably wide, depressed, broadly furrowed, and ornamented with numerous, close-set, very fine, concentric, raised lines, nearly regular and equal, except those near the sutural edge, where five or six concentric lines, thicker and more prominent than the others, form a border round the suture; the middle and front parts of the whorls are smooth; the last whorl much contracted and produced in front into a long, straight canal. The aperture is of an oblong-oval form; the outer lip wing-shaped, projecting towards the front; and the sinus, which is placed in the middle of the margin, is deep and triangular.

This Pleurotoma, which is remarkable for the smooth surface and the short, cup-like form of the whorls, appears to be quite distinct; it presents a close resemblance to *P. regularis* (Van Bened.); but it is narrower, with a more pointed spire; and the whorls are shorter, wider, and with more depressed margins.

Size.—The extremity of the anterior canal is broken off; the axis of the perfect shell would be nearly 3 inches and 1.4th; diameter, 9-12ths of an inch.

Locality.—Shinfield.

SECTION I (*Shells fusiform*) continued.

B.—*Sinus on the shoulder of the whorl.*

a. *Canal elongated.*

No. 197. PLEUROTOMA ASPERA. *F. E. Edwards.* Tab. XXIX, fig. 14, a, b.

P. testá elongatá, fusiformi, sub-turritá, lineis elevatis longitudinalibus spiralibusque scese decussantibus undique asperatá: spirá elevatá: anfractibus antice planulatis, ad humeros obtuse carinatis, postice cavatis, marginatis; ultimo anfractu in canalem longum contortum, recurvum, producto; cariná taniolæformi, denticulatá: lineis longitudinalibus acutis undatis; lineis spiralibus præ-eminentibus, denticulatis: aperturá oblongo-ovatá; labro leviter arcuato, acuto, intús plicato; sinu oblongo, profundo, ad humerum collocato.

Shell oblong, fusiform, with a turreted, pointed spire, rather elevated, nearly equalling the aperture in length; the whole surface ornamented with numerous sharp, undulating, longitudinal, raised lines, decussated by concentric, raised lines, more prominent than the longitudinal lines, and denticulated at the points of decussation, imparting a rough character to the shell. The whorls are flat-sided, girt round the shoulders by a narrow, slightly raised, ribbon-like band, which gives to them the appearance of being obtusely keeled; and the posterior margins are concave, slightly thickened at the edge, and bordered by a sharp, elevated line, which runs round the suture; the band on the shoulders presents a series of narrow, vertical tubercles, corresponding with the longitudinal lines. The aperture is of an oblong-ovate form, and terminates in front in a long, narrowish, slightly curved canal, bent backwards at the anterior extremity; the outer lip is a little arched, thin, and sharp on the edge, thickened and strongly plicated within; and the sinus, which is placed on the shoulder, is oblong and very deep, with nearly parallel margins.

Occasionally specimens occur in which the posterior margins of the whorls, between the sutural ridge and the shoulders, are smooth; others, in which the margins

are covered by numerous very fine, closely set lines, either perfectly simple or feebly decussated by the longitudinal lines; and again, others in which the longitudinal lines are almost obsolete.

Size.—Axis, 1 inch; diameter, 4-12ths of an inch.

Localities.—Barton, Highcliff.

No. 198. PLEUROTOMA CONIFERA. *F. E. Edwards*. Tab. XXXI, fig. 3, *a, b*.

P. testá angustá, elongato-fusiforini, sub-turritá, undique spiraliter lineatá: spirá elevatá, acuminatá: anfractibus ad humeros sub-angulatis, in juventá tuberculatis, deinde angustá iæniolá cinctis; postice leviter cavatis, marginalis; antice planulatis, sub-conicis; ultimo anfractu in canalem latum, mediocriter longum, reflexum producto; lineis spiralibus elevatis, filiformibus, confertis, sæpe irregularibus: aperturá sub-quadratá; labro ad humerum sinuato; sinu latiusculo, profundo, sub-trigono; columellá contortá, antice cristatá.

Shell narrow, elongated, fusiform, sub-turreted, and ornamented with concentric raised lines; the spire pointed, elevated, rather exceeding the aperture in length; the whorls, seven or eight, exclusive of a small, smooth, sharply conical pullus of three volutions, are slightly channelled along the posterior margins, bluntly angulated at the shoulders, flatly convex at the sides, and tapering gradually towards the base; in the young state they present at the angle a row of small, vertical tubercles, but this ornament is lost on the third or fourth whorl, and is thence replaced by a narrow, smooth, ribbon-like band; the posterior margins are thickened round the sutural edge, which is crenulated and bordered by two spiral lines more prominent than the other marginal lines. The last whorl is produced in front into a long, wide canal, curved by the columella, and having the anterior extremity slightly bent backwards; the flattened sides and tapering form of the whorls impart to the spire the appearance of a succession of inverted cones, gradually diminishing in size, each being half concealed by the succeeding one. The elevated spiral lines are numerous and thread-like; sometimes they are regular and equal in size, but more frequently a very fine line intervenes between two thicker lines; and they are generally roughened by the prominent lines of growth. The aperture is sub-quadrate; the outer lip but little arched, thin, sharp-edged, and smooth within; the sinus is placed on the shoulder and is deep, rather narrow, and triangular in form; the columella is slightly twisted, and at the anterior extremity presents a small crest caused by the reflexion of the canal.

The present species appears to be well-marked; I do not know of any other Pleurotoma resembling it in the peculiar form of the spire, or in the elegant concentric lineation which adorns it. It is rare.

Size.—Axis, 10-12ths of an inch; diameter, 3-12ths of an inch.

Localities.—Bracklesham Bay, Bramshaw.

No. 199. PLEUROTOMA VOLGERI. *Phil.* Tab. XXX, fig. 13, a, b.

PLEUROTOMA VOLGERI. *Phillipi*. 1846. (*Tert. Foss. Magdeb.*) *Paleontogr.*, vol. i, p. 69;
t. 10 a, fig. 2.

— — *Morris*. 1854. *Cat. Brit. Foss.*, p. 271.

P. testá gracili, fusiformi, turritá, tuberculatá: spirá acuminatá: anfractibus convexis, ad humeros carinam acutam, serie tuberculorum dentiformium instructam, gerentibus; marginibus posticis latis, concavis, lævissimis; ultimo anfractu pluribus lineis spiralibus filiformibus, irregularibus, cincto, antice repente coarctato, in canalem longum producto: aperturá ovali; labro leviter arcuato; sinu latissimo, sub-profundo, triangulari, ad carinam collocato.

Shell slender, fusiform, turreted, tuberculated: spire pointed, elevated, nearly as long as the aperture: whorls, six or seven, exclusive of the pullus, convex, sharply carinated at the shoulders; keel prominent, armed with a single row of rather closely set, small, tooth-like tubercles; the posterior margins wide, concave, and very smooth; the last whorl, which is ornamented over the middle with several thread-like, moderately distant, and nearly equal, raised, concentric lines, is contracted suddenly towards the front, and produced into a long, straight, and rather wide canal. The aperture is oval, the outer lip slightly arched, and the sinus, which is placed on the keel, is very wide, moderately deep, and triangular in form.

In the English specimens, the spire is rather more slender than that of the specimen figured and described by Philippi, and the spiral lines on the last whorl are nearly equal; in all other respects the two shells agree perfectly.

Size.—Axis, 7-12ths of an inch nearly (14 millim.); diameter, rather more than 2-12ths of an inch (5 millim.)

Localities.—Potter's Bar, where this pretty species appears to be very rare. Philippi's specimen is from the neighbourhood of Magdeburg; but the precise locality is not known.

No. 200. PLEUROTOMA WATERKEYNII. *Nyst.* Tab. XXX, fig. 8.

PLEUROTOMA STRIATULA. *De Kon.* (non *Duj.*) 1837. *Coq. foss. de Baesele, &c.*, p. 27,
No. 28, t. i, fig. 6.

— WATERKEYNII. *Nyst.* 1843. *Bull. Soc. Géol. de France*, vol. xiv, p. 454, No. 29.

— — *Nyst.* 1843. *Coq., &c., foss. de Belgique*, p. 518, t. 41, fig. 4.

— STRIATULA. *Bronn.* 1848. *Index Palæont.*, p. 1010.

— WATERKEYNII. *D'Orb.* 1852. *Prod. de Paléontol.*, 26^e Étage, No. 195, k.

P. testá elongatá, sub-turritá, undique concentricè lineatá: spirá elevatá, acutá:

anfractibus convexiusculis, in medio obtuse carinatis; postice sub-concavis; lineis concentricis exilissimis, confertis, regularibus, lineis incrementi perspicuis decussatis: aperturá ovato-oblongá, antice in canali longo exeunti; labro alæforme, ad carinam sinuato; sinu angusto, profundo, trigono.

Shell oblong, sub-turreted, having the whole surface ornamented with concentric raised lines; the whorls, seven or eight exclusive of the pullus, are slightly convex, and bear on the shoulders an elevated widish-keel, rounded on the upper surface; the posterior margins are wide and slightly concave; and the last whorl, which is rather suddenly contracted in front, terminates in a moderately long, rather wide, and nearly straight canal. The concentric lines are slender, resembling very fine threads; regular, closely set, and decussated by the prominent lines of growth over the middle and front parts of the whorls; they are more distant and cancellated by the successive reflected margins of the sinus over the posterior margins. The aperture is of an oblong-oval form; the outer lip much arched, nearly semicircular, but projecting a little towards the front, thin and sharp at the edge, and smooth within; the sinus is placed on the shoulder, and is rather narrow, deep, and somewhat triangular in shape.

The ornamentation of the English shells varies from that of the Belgian specimens; in the former, the concentric lines are remarkably slender, crowded over the middle and front parts of the whorls, and more distant on the margins; in the foreign shells, on the other hand, they are thick and strong, and are distant over the middle of the whorls and crowded over the margins. The lines of growth in the English shells appear to be more prominent than in the Belgian specimens, and the concentric lines are therefore strongly decussated in the former, while in the latter they are described by M. de Koninck as *sub-clathratis*. In our specimens also, the successive lips of the sinus are very prominent, and the concentric lines over the margins are strongly decussated. In determining the identity of this shell, the distance in time must be taken into consideration, the Belgian shells belonging to the newer Eocene, and the English to the older Eocene; and notwithstanding the differences indicated, I believe that both are correctly referable to the same species.

The specific name, *striatula*, imposed by M. de Koninck had been previously applied by Dujardin to a Miocene *Pleurotoma* from Mantelin, and the name *Waterkeynii* substituted for it by M. Nyst, must therefore be adopted.

M. de Koninck describes the species as very rare in Belgium; it appears to be equally so in England.

Size.—Axis, 11-12ths of an inch nearly (23 millim.); diameter, 4-12ths of an inch nearly (8 millim.)

Localities.—Potter's Bar. *Belgian*: Basele, Anvers (fide *De Kon.*), Kleyn-Spauwen (fide *Nyst*).

No. 201. PLEUROTOMA MIXTA. *F. E. Edwards.* Tab. XXX, fig. 5, a, b.

P. testá elongato-fusiformi, turritá, costellatá, concentricè sulcatá simul atque omnino exilissime lineatá et cancellatá: spirá elevatá, obtusá: anfractibus depresso-convexis, obtuse angulatis, prioribus costatis, cæteris ad humeros fasciolá spirali cinctis; postice concavis, ad suturam marginatis; ultimo anfractu coarctato, in canalem longum, obliquum, producto; sulcis concentricis latis, minime profundis; lineis concentricis elevatis, irregularibus, lineis incrementi fortiter decussatis: aperturá oblongo-ovali; labro arcuato, sub-alæformi, ad humerum sinuato; sinu latiusculo, profundo, sub-trigono.

Shell lengthened, fusiform, turreted, ribbed, spirally furrowed, covered with fine, concentric, undulating, raised lines, and cancellated; the spire is rather thick and elevated, exceeding the aperture in length. The whorls are bluntly angulated at the shoulders, flatly convex at the sides, almost conical in front; the posterior margins concave, and slightly thickened and crenulated on the sutural edges, where they present two rather distant concentric lines, more elevated than the rest. The early whorls are obliquely costellated, but the costellæ become feeble and obscure on the penultimate whorl, and are altogether lost on the last whorl, their place being supplied by a smooth, narrow, ribbon-like band, which girds the whorls round the shoulders, and is defined by two prominent lines and traversed along the middle by a third. The last whorl contracts gradually towards the front, and terminates in a long, moderately wide, oblique canal, slightly bent backwards at the extremity. The concentric furrows are wide, rather shallow and rounded, and the concentric lines are numerous, irregular, thread-like, and strongly decussated by the very prominent lines of growth. The aperture is of a lengthened, oval shape; the outer lip much arched, wing-shaped, projecting towards the middle, and apparently smooth within; and the sinus, which is placed on the shoulder, is moderately wide, very deep, and nearly triangular in form.

In the shape of the whorls, this Pleurotoma somewhat resembles *P. conifera*; it is, however, a longer shell, and the mixed character of the ornamentation, different from that of any other English Pleurotoma, entitles it to specific distinction. It is apparently very rare.

Size.—Axis, 1 inch and a half; diameter, 5-12ths of an inch.

Locality.—Barton.

No. 202. PLEUROTOMA DIVISA. *F. E. Edwards.* Tab. XXXI, fig. 17, *a, b.*

P. testá fusiformi, longitudinaliter costellatá, spiraliter obscure lineatá: spirá obtusá, conicá: anfractibus convexis, postice sulco concentrico exilissime lineato exaratis; costellis crassis, rotundatis, obliquis, curvis, ad suturam tendentibus, sulco marginali divisis; lineis spiralibus confertis, obsoletis: aperturá ovali, antice in canali longiusculo exeunti; labro valde arcuato, ad humerum sinuato; sinu lato, paulo profundo, sub-trigono.

A wide, fusiform shell, longitudinally ribbed and concentrically lined; the spire thick, conical, and elevated, forming nearly one half of the entire length of the shell; the whorls, seven or eight, exclusive of the pullus, convex; the posterior margins narrow, hollowed out by a moderately wide and shallow spiral furrow, the concentric lines over which are more prominent and distinct than those over the other parts of the whorl; the last whorl contracts somewhat suddenly towards the front and terminates in a widish, moderately straight canal. The ribs are numerous, thick, rounded on the upper surface, arched and long, stretching backwards to the sutural margin, and extending in front to the canal; immediately behind the shoulder they are crossed by the marginal furrow, by which they are divided in two, giving to the spire the appearance of being girt by a double row of tubercles. The spiral lines on the early whorls are sharp and distinct; but on the later whorls, except over the marginal furrow, they are so feeble and obscure as scarcely to interfere with the smoothness of the surface. The aperture is oval; the outer lip much and regularly arched; and the sinus, which is placed on the shoulder, wide, shallow, and triangular in form.

The present species appears to be perfectly distinct; it is very rare.

Size.—Axis, 10-12ths of an inch; diameter, 4-12ths of an inch.

Locality.—Bracklesham Bay.

No. 203. PLEUROTOMA SELYSII. *De Koninck.* Tab. XXIX, fig. 17, *a—d.*

PLEUROTOMA SELYSII. *De Kon.* 1837. Coq. foss. de Basele, &c., p. 25, t. 1, fig. 4.

— ROSTRATA. — — Ibid., p. 24, No. 23 (non *Sol.*) (excl. syn.)

— ACUMINATA. — — Ibid., p. 24, No. 24 (non *Sow.*)

— SELYSII. *Nyst.* 1843. Coq. et Polyp. foss. de Belg., p. 515, t. 40, figs. 11 *a*, 11 *b*, and 12.

— — *Nyst.* 1843. Bull. Soc. Géol. de France, vol. xiv, p. 453.

P. testá fusiformi, turrítá, undique concentricè lineatá; spirá acuminatá: anfractibus convexiusculis, postice excavatis, crenulatis, ad humeros tuberculato-plicatis; ultimo anfractu in canalem longiusculum producto; lineis concentricis supra margines et humeros confertis, exilibus, regularibus; cæteris crassioribus, distantioribus, irregularibus; plicis flexuosis: aperturá oblongo-ovalí; sinu latissimo, triangulari, ad humerum collocato.

Shell fusiform, elongated, turreted, concentrically lined: the spire pointed, elevated; whorls, seven or eight, without the pullus, slightly convex; the posterior margins concave and plicated along the sutural edge, where they present two or three very fine, sharp, elevated lines; the shoulders obscurely angulated, and ornamented with a series of rather distant tubercles, which on the early whorls are elongated, straight, and vertical, but on the last whorl become pliciform and curved; the last whorl is much contracted in front and produced into a rather long and widish canal. The concentric lines over the posterior margins and shoulders are close-set, regular, slender, and not very prominent; over the middle and front parts of the whorls they become more elevated, thicker, and more distant, with very fine, thread-like lines occasionally intervening. The aperture is of a narrow, elongated, oval form; the outer lip slightly arched, simple and smooth within; and the sinus, placed on the shoulder, is very wide, moderately deep, and triangular.

A close comparison of the English shells with Belgian specimens has confirmed me in the conclusion at which Mr. Morris and myself had arrived when a series of the latter was first submitted to us by Sir Charles Lyell; the shells from the two localities agree so closely that I do not feel any doubt of their specific identity.

It is a rare shell in England, although apparently abundant in Belgium, and in case the position of the Limburg beds has been rightly determined, the occurrence of this species in England is attended with additional interest from its being another instance of the reappearance of shells of the London Clay period in the fauna of the Upper Eocene epoch under nearly analogous mineral conditions.

Size.—Axis, 1 inch and 7-12ths (40 millim.); diameter, 6-12ths of an inch (13 millim. nearly).

Localities.—Highgate; Hampstead Railway Tunnel; Finchley; Muswell Hill. *Belgian*: Basele, Boom, Anvers (fide *De Kon.*), Rupelmonde, Gremittingen (fide *Nyst.*)

No. 204. PLEUROTOMA KONINCKII. *Nyst.* Tab. XXIX, fig. 15, *a*, *b*.

PLEUROTOMA LEVIGATA. *De Kon.* (non *Sow.*) 1837. Coq. foss. de Basele, &c., p. 27, t. 1, fig. 5.

— KONINCKII. *Nyst.* 1843. Bull. Soc. Géol. de Fr., vol. xiv, p. 454.

— — *Nyst.* 1843. Coq. foss., &c., de Belg., p. 517, t. 41, fig. 3.

P. testá elongato-fusiforimi, concentrice lineáta: spirá elatá, acuminatá: anfráctibus convexis, ad humeros in juventá arcuato-plicatis, deinde inermibus; ad suturam, lineato-marginatis; ultimo anfractu antice gradatim attenuato; lincis concentricis confertis, sub-regularibus: aperturá oblongo-ovali; canali antico, longiusculo, angusto; labro leviter arcuato, ad humerum sinuato; sinu lato, mediocriter profundo, sub-trigono.

A long, fusiform shell, ornamented throughout with concentric, raised lines; the spire, formed of six or seven volutions without the pullus, is pointed and much

produced, equalling the aperture in length. The whorls are convex, and in the young state, the shoulders present a series of curved and rather oblique plications; but as the shell enlarges, these become gradually smaller and indistinct, and at length altogether disappear on the last two whorls. The posterior margins are bordered round the suture by a narrow, elevated band, formed of two fine, undulating, thread-like lines, feebly crenulated; the last whorl tapers gradually and symmetrically towards the front, and terminates in a moderately long and narrow canal; the concentric lines are very numerous, a little more crowded in the margins than over the rest of the whorls, where they are even and regular. The aperture is of a narrow, oval shape; the outer lip thin, and but slightly arched; and the sinus, which is on the shoulder, is wide, moderately deep, and triangular in form.

The present *Pleurotoma* agrees so closely with *P. Koninckii*, that the identification can scarcely be questioned.

Size.—Of the perfect shell, axis rather more than 1 inch and 2-12ths (30 millim. nearly); diameter, nearly 4·5-12ths of an inch (10 millim.)

Localities.—Highgate, Potter's Bar, Hampstead Tunnel. *Belgian*: Basele, Boom, and Lethen (fide *Nyst*).

No. 205. *PLEUROTOMA GENTILIS*. *Sowerby*. Tab. XXX, fig. 1, *a—c*.

PLEUROTOMA GENTILIS. *Sow.* 1850. *Dixon's Geol., &c., of Sussex*, p. 183, t. 6, fig. 25.

P. testá elongato-fusiforimi, turritá, acuminatá, spiraliter lineatá, longitudinaliter costatá: anfractibus antice convexis, postice concavis, ad suturam marginatis; costis numerosis, brevibus, rotundatis; lineis spiralibus supra margines posticas fere obsoletis, cæteris elevatis, irregularibus: aperturá late ovali, in canali longo, angusto, sub-recto exeunti; labro arcuato, acuto; sinu lato, sub-trigono, summum ad humerum collocato.

Var. VETUSTA; testá minori; marginibus posticis anfractuum plus cavatis; costis longitudinalibus crassioribus; lineis spiralibus exilioribus.

Shell fusiform, elongated, longitudinally ribbed, and spirally lined: the spire, consisting of eight or nine whorls, is pointed and moderately produced, nearly equalling the aperture in length: the whorls are convex at the sides, deeply concave round the posterior margins, and somewhat thickened along the sutural edge; the last whorl is much contracted in front, and produced into a long, nearly straight, narrowish canal. The longitudinal ribs are numerous, rounded, and short, barely extending over the middle of the whorl; the concentric lines are nearly obsolete over the hollowed margins, but very prominent over the other parts of the whorls, where they are rather thick and irregular, the lines in front of the shoulder being thicker and more elevated than the rest. The aperture is widely oval; the outer lip much arched, sharp on the edge, smooth within; and the sinus, which is placed at the very top of

the shoulder, almost in the margin, is wide, moderately deep, and somewhat three-cornered in shape.

Specimens occur in the London Clay in which the shell is smaller, the posterior margins of the whorls more roundedly concave, the ribs thicker and less numerous, and the concentric lines much finer and more closely set. I have described these as a variety of *P. gentilis*, but they may possibly be regarded as a distinct species.

Size.—Axis, 1 inch and 3-12ths; diameter, 5-12ths of an inch.

Localities.—Bracklesham Bay, Bramshaw, for the typical form; Clarendon, Alum Bay (Stratum No. 4, Prestwich), for the variety.

No. 206. PLEUROTOMA COMMA. *Sow.* Tab. XXX, fig. 2.

PLEUROTOMA COMMA. *Sow.* 1816. *Min. Con.*, vol. ii, p. 105, t. 146, fig. 5.

— — ? *Phil.* 1836. *Enum. Moll. Sic.*, vol. i, p. 200, No. 8.

— — ? *Phil.* 1844. *Faun. Moll. regn. utr. Sicil.*, p. 173, No. 11.

P. testá elongato-fusiforimi, turritá, costellatá, concentrice lineatá: anfractibus convexiusculis, postice concavis, medio lævibus, et ibi costellas numerosas, curvas gerentibus: aperturá ovatá, in canalem longiusculum, sub-rectum, productá; sinu ad humerum collocato (?).

Shell elongated, fusiform, turreted, ribbed, and concentrically lined; whorls but slightly convex; almost straight-sided, concave along the posterior margins, smooth in the middle, and bearing round the shoulders a row of close-set short ribs, swelled at the upper part, curved and pointed below, somewhat resembling a comma; from which circumstance the specific name was taken. The aperture is ovate, and terminates in front in a moderately long and slightly curved canal; sinus on the shoulder (?).

The specimen on which this species was founded formed part of a collection which belonged to the late Mr. Holloway, of Portsmouth, and was presented by him to the Portsmouth and Portsea Literary and Philosophical Society. I have myself carefully searched through the museum belonging to that institution, for the specimen, but without success; and as I do not know of any other specimen, the above description has been prepared and the figure taken, by the permission of Mr. Sowerby, from those contained in the 'Mineral Conchology.'

Philippi has referred some shells from the basaltic tufa of Militello, in Sicily, to *P. comma*; but in the uncertainty which attends the present species, from the imperfect figure given of it in the 'Mineral Conchology,' and the want of any existing specimen for comparison, the identification must be accepted with hesitation. De Koninck has also erroneously referred to it certain shells from Basele, which Nyst subsequently distinguished as *P. crenata*; and the species has been quoted, by both Nyst and Bellardi, but with doubt, as identical with Basterot's *P. denticula*. To this last-men-

tioned species *P. comma* certainly presents a general resemblance, but is separable from it by the short curved costellæ, which ornament the shoulders, instead of the quadrate tubercles which distinguish *P. denticula*. The English species most closely resembling *P. comma* is *P. obscurata*, a species which may be reasonably expected to occur in the nearly synchronous deposit at Stubbington, and in which the narrow, oblong, compressed tubercles approach very nearly in character to the short costellæ of *P. comma*; the principal distinction appears to be in the condition of the middle of the volutions, which in *P. obscurata* are transversely lined instead of being smooth as in *P. comma*; but, although this difference does not appear to be of much value, I have not ventured, in the absence of any specimen of *P. comma* for comparison, to regard the two species as identical.

Locality.—Stubbington.

No. 207. PLEUROTOMA PRESTWICHII. *F. E. Edwards*. Tab. XXX, fig. 3, *a—d*.

P. testá elongatá, sub-fusiforimi, longitudinaliter costatá; spiraliter lineatá: spirá elevatá acuminatá: anfractibus rotundato-convexis; costellis numerosis, curvis; lineis spiralibus confertis, irregularibus, supra partes medias anfractuum obsoletis; cæteris perspicuis: aperturá oblongo-ovali; labro arcuato, acuto; sinu ad humerum collocato, lato, profundo, sub-trigono.

Var. : testá anfractibus convexiusculis, ad humeros angulatis, antice sub-conicis.

Shell lengthened, fusiform, longitudinally ribbed, spirally lined: the spire pointed, elevated, rather exceeding the aperture in length: the whorls, eight or nine, roundedly convex, a little thickened round the suture, and very generally bordered by two or three raised lines; the last whorl is much contracted in front and produced into a long, open, narrow canal. The longitudinal ribs are numerous, varying in number in different specimens, rounded, curved, scarcely extending in front to the middle of the whorls, but continued backwards to the very suture; the concentric lines close set and irregular, almost obsolete over the middle of the whorls, but elsewhere prominent and well defined; for the most part they are thick and rounded, but frequently smaller thread-like lines intervene. The aperture is of an oblong-oval shape; the outer lip much arched, projecting at the middle, thin and sharp on the edge, smooth within; and the sinus, which is placed on the shoulder, very wide, rather deep, and triangular in form.

A variety occurs plentifully in which the whorls are less convex on the sides, giving a subconical character to the spire, and are bluntly angulated at the shoulder; and the front part of the last whorl is not so much contracted as in the type.

Size.—Axis, 1 inch and 4-12ths; diameter, rather more than 5-12ths of an inch.

Localities.—Clarendon, where both forms are abundant, and Alum Bay (Stratum No. 4, Prestwich).

No. 208. PLEUROTOMA SIMILLIMA. *F. E. Edwards.* Tab. XXX, fig. 4, a—c.

P. testá elongato-fusiformi, sub-turritá, costellatá, omnino spiraliter lineatá: spirá elatá, acuminatá: anfractibus convexiusculis, ad humeros obtuse angulatis; postice concavis, marginatis; costellis numerosis, angustis, sub-rectis; lineis spiralibus confertis, filiformibus, irregularibus: aperturá ovali, in canali longo exeunti; labro arcuato; sinu lato, medio-criter profundo, sub-trigono, ad humerum collocato.

Var. CRASSILINEA; testá anfractibus acute angulatis, tribus vel quatuor lineis supra medias partes cinctis.

A long, narrow, fusiform shell, ribbed and covered with elevated spiral lines: spire sub-turreted, pointed, equalling the aperture in length; whorls, seven or eight exclusive of the pullus, slightly convex, bluntly angulated at the shoulders, hollowed round the posterior margins and thickened at the sutural edges, which are bordered by one or two prominent raised lines. The ribs are numerous, narrow, nearly straight, short, not extending beyond the middle of the whorls, and becoming obsolete on the last whorl of the mature shell; the spiral lines are closely set, fine, thread-like and regular over the margins and shoulders of the whorls, but over the middle these lines alternate with others still more slender. The aperture is oval and produced in front into a long, narrowish, and nearly straight canal; the outer lip is arched, and presents at the posterior part on the shoulder of the whorl, a very wide and moderately deep sinus, triangular in shape.

In the variety noticed, the whorls are more sharply angulated, and they present over the middle, three or four coarse, elevated lines, with an occasional intervening slender line; but in other respects the shells agree with the typical form.

In the general aspect the present species closely resembles *P. Prestwichii*; but it may be distinguished from it by the turreted spire, the depressed concave posterior margins and the less convex sides of the whorls, and especially by the character of the longitudinal ribs, which are more numerous, straighter, and narrower, and do not extend backwards beyond the shoulders; whereas the coarse, obliquely curved ribs in *P. Prestwichii* reach up to the very suture; and the transverse lineation is also of a finer character. From *P. Wetherellii*, to which it also approaches, the present species is separated by the more slender form, the more vertical ribs, and the narrower posterior margins of the whorls.

Size.—Axis, rather more than 1 inch; diameter, 4-12ths of an inch.

Localities.—Highgate, Potter's Bar, Hampstead, Muswell Hill, Southampton, Alum Bay (Stratum No. 4, Prestwich), and Clarendon, at which latter place it is common. The variety occurs at Highgate, Potter's Bar, and Southampton.

No. 209. *PLEUROTOMA ZETA*. *F. E. Edwards*. Tab. XXXI, fig. 16.

P. testá oblongo-fusiforimi, sub-lævi: spirá sub-conicá: anfractibus convexiusculis; marginibus posticis angustis, concavis; ultimo anfractu antice repente coarctato, in canalem longum, angustum, producto, supra canalem obscure lineato: labro vix arcuato, fere recto; sinu lato, minime profundo, ad humerum collocato.

A nearly smooth, oblong-fusiform shell, with a somewhat conical spire; the whorls slightly convex, having narrow posterior margins, obscurely channelled, with a simple sutural edge; the last whorl much contracted in front, and terminating in a long, rather narrow canal, over which appear a number of close-set, irregular, and very obscure concentric raised lines; the outer lip is scarcely curved, nearly straight, projecting towards the front, and the sinus, which is placed on the shoulder, is wide and very shallow.

Although I possess but one specimen, and that imperfect, the smooth surface of the shell, and the narrow, nearly straight outer lip, are characters so uncommon among the fusiform *Pleurotomæ*, that the present species ought not to be passed without notice.

The outline of the outer lip, indented by the sinus, somewhat resembles the form of the Greek letter *zeta*, from which circumstance the specific name is taken.

Size.—Axis, estimated at 1 inch and 8-12ths; diameter, $\frac{1}{2}$ inch.

Locality.—Bracklesham Bay.

No. 210. *PLEUROTOMA TENIOLATA*. *F. E. Edwards*. Tab. XXX, fig. 13, *a—c*.

P. testá angustá, elongato-fusiforimi, sub-turritá, concentricè lineatá: spirá elatá, acuminatá: anfractibus depresso-convexis, ad humeros tæniolá cinctis, in juventá tuberculatis; marginibus posticis latis, concavis, obsolete regulariter sulcatis; ultimo anfractu in canalem longum prolongato; lineis concentricis supra medias partes anfractuum elevatis, sub-distantibus, supra canalem minoribus, crebrioribus, fere obsoletis: aperturá oblongo-ovali; labro sub-aliforme, ad humerum profunde sinuato.

A long, narrow, fusiform, and somewhat turreted shell, spirally lined; the spire pointed and much produced, considerably exceeding the aperture in length; the whorls, seven or eight without the pullus, are flatly convex, separated by a deep and very perspicuous suture, and girt round the shoulders by a narrow, slightly elevated, ribbon-like band, giving to the shell an appearance of being obscurely keeled; in the young state the shoulders present a series of small, rather closely set, tooth-like tubercles, which are lost in the later whorls. The posterior margins are concave, and very wide, sometimes concealing the preceding whorl up to the shoulder; the

hollow space between the suture and the shoulder is traversed by several irregular, shallow, almost obsolete furrows. The body whorl is much contracted in front, whence it tapers gradually to the base, forming a long, wide, and nearly straight canal: four or five concentric lines cross the middle of the last whorl; these lines are rounded, rather distant, and separated by wide concave spaces; over the front of the whorl, and as they descend the canal, the concentric lines become gradually closer and less prominent, and at last are almost obsolete on the anterior extremity of the canal. The aperture is of an oblong-oval form; the outer lip arched, somewhat wing-shaped, projecting slightly towards the posterior extremity; and the sinus, which is placed on the shoulder, is rather wide, very deep, and triangular.

In the series forming part of Mr. Wetherell's collection, two or three specimens occur in which the line of the suture being less decurrent, the margins of the whorls extend quite up to the shoulders; the shell, consequently, is a little wider, and the spire not so much elevated; but this difference appears to be accidental and scarcely constitutes a variety.

Size.—Axis, 1 inch and 1-8th; diameter, not quite 4-12ths of an inch.

Localities.—Highgate Archway, Cuffell.

No. 211. PLEUROTOMA WETHERELLI. *F. E. Edwards*. Tab. XXIX, fig. 16, *a—d*.

P. testá elongato-fusiforini, costellatá, undique spiraliter lineatá: spirá mediocriter elatá, sub-conicá: anfractibus sub-angulatis, suturá perspicuá separatis, antice convexiusculis; marginibus posticis latis, sub-rectis; costellis numerosis, curvis; lineis spiralibus medianis distantibus, crassis, præ-eminentibus; cæteris filiformibus, crebrioribus: aperturá oblongo-ovali, in canali longo exeunti; labro arcuato; sinu lato, profundo, ad humerum collocato.

Shell elongated, fusiform, ribbed and concentrically lined; the spire moderately elevated, rather thick, and nearly conical: the whorls, seven or eight, bluntly angulated at the shoulders, and slightly convex in front; the posterior margins wide and nearly straight. The ribs vary much in size, being more or less lengthened in the direction of the axis in different individuals; the concentric lines over the middle of the whorls are more or less distant, thick, and very prominent; over the shoulders and posterior margins they are finer, thread-like, more closely set, and irregular. The aperture is oblong-oval in shape, and terminates in front in a long, wide, and slightly oblique canal; the outer lip is much arched, thin and sharp on the edge, and smooth within; and the sinus is moderately wide, deep, sub-trigonal, and placed on the shoulder.

A variety occurs in which the posterior margins of the whorls are narrower, and the sutural edges slightly thickened.

The present species is found plentifully at Highgate, and I have dedicated it to my friend Mr. Wetherell, so long and so well known for his zealous labours in the London Clay, and his unrivalled collection of fossils from Highgate and the neighbourhood.

Size.—Axis, 1 inch and 7-12ths ; diameter, 6-12ths of an inch nearly.

Localities.—Highgate, Holloway.

No. 212. PLEUROTOMA FASCIOLATA. *F. E. Edwards.* Tab. XXX, fig. 12, *a, b.*

P. testá elongatá, fusiformi, sub-turritá, omnino spiraliter fasciolatá : spirá elevatá, in longitudine bi-trientes totius testæ superanti : anfractibus planulato-convexis, suturá perspicuá divisís, ad humeros obtuse carinatis ; marginibus posticis latissimis, sub-rectis, contra spiram expressis : fasciolis spiralibus confertis, crassis, rotundatis, sub-regularibus, lineis incrementi fortiter asperatis : aperturá ovato-oblongá, antice in canali longiusculo, patulo, exeunti ; labro aliforme, acuto ; sinu profundo, latiusculo, ad humerum collocato.

Shell elongated, fusiform, sub-turreted, having the whole surface covered with narrow spiral bands ; spire pointed, produced, fully equalling three fifths of the shell in length ; whorls, seven or eight exclusive of the pullus, flatly convex on the sides, separated by a deep, perspicuous suture, and bearing on the shoulders a wide, slightly prominent keel, rounded on the upper surface, from which the spire derives its turreted appearance ; the posterior margins are very wide, nearly straight, and extend up the spire almost to the keel on the preceding whorl ; the spiral bands are numerous, thick, rounded on the upper surface, nearly regular, and much roughened, almost cancellated, by the coarse, prominent lines of growth. The aperture is of an oblong-oval form, and terminates in front in a wide, moderately long canal ; the outer lip is much arched, and presents at the shoulder a deep and rather wide sinus.

Size.—Axis, 1 inch and 9-12ths ; diameter, 7-12ths of an inch nearly

Localities.—Highgate, Railway Tunnel, Kilburn.

No. 213. PLEUROTOMA DENTICULA. *Basterot.* Tab. XXX, fig. 7, *a—h.*

- PLEUROTOMA DENTICULA. *Bast.* 1825. *Descr. Géol. du Bass. tert. Sud-ouest de la France*, p. 63, t. 3, fig. 12.
 — — — *Defr.* 1826. *Dict. des Sciences nat.*, vol. xli, p. 396.
 — — — *Grat.* 1832. *Tab. des Coq. foss., &c., de Dax*, p. 320, No. 318.
 — — — *Grat.* 1838. *Catal. zool., &c., du Bass. de la Gironde*, p. 46, No. 388.
 — — — *Desm.* 1842. *Rev. de Pleurot.*, p. 47, No. 25.

- PLEUROTOMA DENTICULA. *Nyst.* 1843. *Descr. des Coq., &c., de la Belg.*, p. 526, t. 44, fig. 2.
- — *Bell.* 1845. *Monogr. Pleurot. foss. Piem.* (Mem. R. Accad. Sc. di Torino, 2d ser., vol. ix, p. 576, t. 3, fig. 7).
- — *Rouault.* 1848. *Foss. du terr. Eocene des Env. de Pau* (Mém. Soc. Géol. de France, 2d ser., vol. iii, p. 484, t. 16, fig. 22).
- SUBCARINATA? *Rouault.* 1848. *Ibid.*, t. 16, fig. 23.
- PLEBEIA. *Sow.* 1850. *Dixon's Geol., &c., of Sussex*, p. 184, t. 6, fig. 23.
- — *Morris.* 1854. *Catal. Brit. Foss.*, p. 270.
- — *Forbes.* 1856. *Mem. Geol. Surv. (Tert. fluv.-mar. form., &c.)*, p. 154, t. 5, fig. 1, *a, b* (excl. var. *b*, fig. 2).

P. testá fusiformi, turritá, concentrice lineatá: spirá elatá, acuminatá: anfractibus ad humeros carinatis, tuberculatis; postice concavis, ad suturam lined elevatá, acutá, cinctis; ultimo anfractu brevi, in canalem longiusculum, sub-rectum producto; tuberculis transversim oblongis, medio sulcatis; lineis concentricis supra canalem et margines posticas anfractuum filiformibus, sub-æqualibus, supra medias partes elevatioribus, irregularibus: aperturá obovatá; labro arcuato, acuto, ad humerum sinuato; sinu profundo, sub-trigono.

Var. 1, LONGÆVA (fig. 7d); *testá minori, angustiori: marginibus posticis anfractuum tuberculisque exilissime lineatis; tuberculis distantioribus, crassioribus.*

Var. 2, MACROBIA (fig. 7e); *testá breviori: ultimo anfractu tres vel quatuor lineas transversas eminentiores in medio gerenti.*

Var. 3, MUTICA; testá spirá obtusiusculá: lineis concentricis ad interstitia inter lineas majores et supra margines exilissimis, confertis, regularibus, æqualibus; tuberculis minoribus, ultimo anfractu sæpe obsoletis.

Var. 4, GRACILENTA (fig. 7f); *testá minori, graciliori: lineis concentricis elevatis, acutis, regularibus.*

Var. 5, CONULUS (fig. 7g); *testá graciliori: spirá elatiori, sub-conicá: marginibus posticis anfractuum paullo declivis, vix cavatis; tuberculis, minoribus, compressis, dentiformibus; lineis concentricis per lineas incrementi sub-decussatis, postice numerosioribus, regularibus, cæterum distantibus: canali antico breviori.*

Var. 6, ODONTELLA (fig. 7h); *testá minori, graciliori: lineis concentricis supra margines anfractuum exilissimis; tuberculis minimis, sub-dentiformibus.*

Shell fusiform, turreted, pointed, spirally lined, tuberculated: the spire, formed of eight or nine volutions, exclusive of a longitudinally ribbed conical pullus, is much produced, being nearly double the length of the aperture. The whorls are flatly convex at the sides, and rather broadly carinated at the shoulders, round which they present a series of transversely oblong tubercles, which are furrowed across the middle, and sometimes become obsolete on the last whorl; the posterior margins are narrow, concave, and bordered round the suture by a very prominent, sharp, ridge-like line; and one or two fine concentric lines traverse the hollow of the margins. The concentric lines over the anterior canal are rather close-set, thread-like, and nearly equal; over

the middle of the whorls they become more prominent, thicker, and irregular, very slender lines occasionally intervening between the larger ones: the last whorl is short, and terminates in front in a moderately long, narrow, and nearly straight canal. The aperture is obovate; the outer lip much arched, thin, sharp-edged, and most generally smooth and simple within, although in young specimens from Bramshaw the outer lip is occasionally plicated; the sinus, which is on the shoulder, is moderately wide, deep, and triangular in form.

The present species is widely spread, and in England ranges from the London Clay to the fluvio-marine deposits of Headon Hill; it is very variable, almost every locality presenting some modification of the dimensions or characteristic ornamentation of the shell. The typical forms described by Sowerby as *P. plebeia* are confined to the middle Eocene deposits; in the older deposits the species is represented by two varieties. In the first of these, var. *longava*, from Highgate, the shell is narrower, and the posterior margins of the whorls, as well as the tubercles, are ornamented with very slender raised lines; this variety is narrower than the shells from the Bolderburg, referred by Nyst to Basterot's species, but it agrees with them in all other respects, particularly in the peculiar modification of the transverse lineation which characterises the latter shells. In the other variety, *macrobia*, from Clarendon, the spire is shorter, the posterior margins of the whorls are smooth, or they only present one or two feeble concentric lines, and the tubercles on the shoulders are more distant, larger, and coarser than in the typical form. In this modification the shells agree with those from Bos d'Arros, forming Rouault's var. D of *P. denticula*; and with it I should also have unhesitatingly associated the shells from the same locality constituting that author's species *P. subcarinata*, were it not for the different condition attributed to them of the embryonal whorls, of which the last two are described as being smooth instead of longitudinally ribbed. But for this distinction, the mature shells could not be satisfactorily separated from those forming the var. D of *P. denticula*, the slight differences which exist in the condition of the transverse lineation and of the tubercles not being, of themselves, of specific value. May not the smooth surface be due to disintegration, the outer layer of shelly matter in the pullus being, in general, more susceptible of decomposition than that in the mature shell? Recognising, however, the value of the character pointed out by Rouault, I have cited his species with doubt.

Among the forms found in the middle Eocene deposits at Bracklesham Bay, Brook, and Bramshaw, are those constituting the variety *gracilentia*; in these the shell is smaller and slenderer, the concentric lines are acute and nearly even, and the tubercles are neither so wide nor so prominent. This variety presents a close resemblance to some shells from Cuise-Lamotte (Sab. inf.), presented to me by M. Deshayes, and by him named *P. denticulata*.

In the upper Eocene deposits at Lyndhurst, Hordwell, Colwell Bay, and Headon

Hill, the species is represented by the variety *odontella*; in this the shell is more slender and shorter than in the typical form; the posterior margins are smooth or very feebly lined, and the tubercles are smaller and more pointed.

Besides these varieties, other forms occur which apparently are confined to the middle Eocene deposits. In the first of these, constituting the variety *mutica*, from Highcliff, the spire is obtuse, the concentric lines over the posterior margins and in the spaces between the prominent lines in front are crowded and so fine as to be barely visible to the naked eye; and the tubercles are very small, close-set, and frequently obsolete on the later whorls, which then present a simple, keel-like line on the shoulders.

In another variety, *conulus*, from Highcliff and Barton, the shell, as in the varieties *gracilentata* and *odontella*, is smaller and more slender than in the type; the spire is more produced, the margins of the whorls are nearly straight, imparting a conical character to the spire; the concentric lines over the margins are sharp, regular, and decussated by the prominent lines of growth, while those over the middle of the whorls are thin, elevated, distant, and simple; the tubercles are small and compressed, frequently assuming a tooth-like appearance; and the anterior canal is short and somewhat oblique. In all these varieties, however, the essential specific characters are preserved.

This species forms one of a group of *Pleurotomæ* which present a very striking similarity in their general aspect and ornamentation; they are all distinguished by the lengthened spire, the prominent transverse lineation, and the obtuse, tuberculated carina on the shoulders of the whorls, caused by the successive thickened extremities of the labial sinus. To this group belong *P. (Murex) monilis* (Brocchi) and *P. trifasciata* (Bellardi); species which appear to be separable from the present, not so much by differences in the transverse lineation or the condition of the carina, as by the greater width of the shells and the shorter and more cup-like form of the whorls. These peculiarities are particularly noticeable in the figure of *P. denticula*, as figured by Basterot. I have not been able to procure any well-authenticated Bordeaux specimens of Basterot's species; but the typical form of the shells described by Sowerby as *P. plebeia* so closely resembles not only specimens from Léognan, referred to *P. denticula*, with which I have compared them, but also those from Tortona and the environs of Turin referred to the latter species by Bellardi, while the varieties *longæva* and *macrobia* agree so well with the shells from the Bolderberg recorded by Nyst, and those from Pau described by Rouault, that in my opinion the English shells cannot be satisfactorily regarded as specifically distinct. The differences will be found to lie chiefly in the transverse lineation, the condition of the tubercles, or the internal plication of the outer lip. Now, the transverse lineation is a very variable character in the present species, frequently differing in specimens from the same locality; the

tubercles, as already observed, are due to the thickening of the extremity of the sinus, for the more easy protrusion of the excurrent siphon, and they may be reasonably presumed to be liable to variation; and, with regard to the plication of the outer lip, I have adverted to the occurrence of specimens from Bramshaw, in which that character is found. On these grounds I have considered that the shells described by Sowerby as *P. plebeia* ought to be referred to Basterot's *P. denticula*, although the figure given by Basterot is well calculated to lead to a different conclusion.

Size.—Axis, rather more than 1 inch (26 millim.); diameter, not quite 4-12ths of an inch (8 millim.)

Localities.—*London Clay*: Highgate, Potter's Bar, Southampton, Clarendon, Alum Bay (Stratum No. 4, Prestw.) *Middle Eocene*: Bracklesham Bay, Stubbington, Brooke, Bramshaw, Highcliff, Barton, Alum Bay (Stratum No. 29, Prestw.), Brockenhurst. *Upper Eocene*: Lyndhurst, Hordwell, Colwell Bay, Headon Hill, St. Helen's. *French*: Environs of Bordeaux, Dax, Touraine. *Italian*: Tortona, Environs of Turin. *Belgian*: The Bolderberg, near Hasselt.

No. 214. PLEUROTOMA CREBRILINEA. *F. E. Edwards.* Tab. XXX, figs. 8, a—c.

P. testá elongato-fusiforimi, turrítá, omnino transversim subtiliter lineatá: spirá obtusiusculá, elevatá: anfractibus depresso-convexis, ad humeros fasciolá elevatá ceu cariná cinctis, postice concavis, marginatis; ultimo anfractu brevi, cyathiformi, antice valde coarctato: aperturá ob-ovató, in canali longiusculo exeunti; labro leviter arcuato, ad humerum sub-triangulariter sinuato.

A long, fusiform, turreted shell, ornamented with numerous concentric, raised lines; the spire, formed of eight or nine volutions, is rather obtuse, and moderately elevated, forming half the length of the entire shell. The whorls are very slightly convex on the sides, deeply furrowed round the posterior margins, and angulated at the shoulders, round which they are girt by an elevated, ribbon-like band, forming an obtuse keel; the last whorl is short and much contracted in front, which imparts to it a cup-like form. The whole surface of the whorls is covered with numerous, very fine, close-set, raised lines; these lines, over the posterior margins of the keel, are equal and regular, but over the middle and front parts of the whorls they become unequal, other lines, slightly thicker and more prominent, occasionally intervening between the slender lines. The aperture is nearly oval in form, and terminates in front in a moderately long and nearly straight canal; the outer lip is but slightly arched and smooth within, and it presents at the shoulder a wide, three-cornered sinus.

I feel much hesitation in separating this *Pleurotoma* from *P. denticula*, of which it

may be regarded as a variety. The shell, however, is wider, the spire more obtuse, and the body-whorl shorter and more contracted in front; these differences, joined to the peculiar transverse lineation and the smooth, untuberculated keel, have induced me to regard the species as distinct.

Size.—Axis, 10-12ths of an inch; diameter, 4-12ths of an inch nearly.

Locality.—Stubbington.

No. 215. *PLEUROTOMA CALLIFERA*. *F. E. Edwards*. Tab. XXX, fig. 9, *a, b*; fig. 10, *a, b*; fig. 11, *a, b*.

P. testá sub-turritá, omnino concentrice lineatá: spirá obtusiusculá: anfractibus depresso-convexis; ad humeros angulatis, fasciolá tuberculatá sulcoque spirali bipartitá cinctis; marginibus posticis concavis, ad suturam lineá elevatá marginatis; lineis concentricis supra medias partes anfractuum et canalem distantibus, irregularibus, per-elevatis, denticulatis; supra humeros et margines posticas exilibus, confertis: aperturá ovali, in canali breviusculo, obliquo exeunti; labro arcuato, ad humerum profunde sinuato, intús callos duos oblongos, alterum verticalem, alterum transversum, gerente; sinu lato, triangulari.

Var. RAPHIUM (fig. 11, *a, b*); *testá minori, angustiori; spirá graciliori; lineis concentricis sub-distantibus, regularibus, simplicibus.*

Var. MONILIGERA (fig. 10, *a, b*); *testá spirá elatiori: anfractibus postice granulato-marginatis; lineis transversis medianis distantioribus, præ-denticulatis.*

Shell elongated, turreted, ornamented with concentric, raised lines; the spire somewhat obtuse and elevated, exceeding the aperture in length; the whorls, seven or eight, flatly convex and angulated at the shoulders, round which runs a narrow, elevated band, traversed along the middle by a deep furrow, and presenting a series of close-set, regular, vertical tubercles, divided by the transverse furrow, and separated by concave spaces as wide as the tubercles; the posterior margins, which slope gently backwards, are concave and bordered round the suture by an elevated, sharp-edged, ridge-like line; the last whorl is much contracted towards the middle, and terminates in front in a rather short, moderately wide, oblique canal. The concentric lines are irregular, prominent, and evenly and rather strongly granulated; they are very fine and thread-like, close-set, regular, and simple, over the shoulders and posterior margins of the whorls; distant over the middle of the whorl, but more close over the canal. The aperture is ovate: and the outer lip, which is arched, thin, and sharp on the edge, presents within two oblong callosities; of these one is narrow, vertical, curved, and distant from the edge, and it extends from the sinus to the canal; the other is placed transversely, immediately over the posterior end of the vertical

callus, with the curved extremity of which it forms a wide, transverse groove, running into the sinus; the sinus is placed on the shoulder, and is wide, very deep, and triangular in form.

Specimens occur rather plentifully at Highcliff, constituting the variety *raphium*, in which the shell is smaller and narrower, the spire more slender and pointed, the margins of the whorls not so concave, and the concentric lines are moderately distant, even, regular, and smooth. Another variety, *moniligera*, is also found, but more rarely, in which the spire is longer, the elevated line bordering the posterior margins of the whorls is coarsely granulated, and the median transverse lines are more distant and more prominently denticulated.

In the general aspect of the shell and the character of the ornamentation, this *Pleurotoma* closely resembles the middle Eocene forms of *P. denticula*; but the callosities which present themselves on the inner surface of the outer lip indicate a peculiar modification of the excretory tube protruded through the sinus, which apparently entitles the present *Pleurotoma* to specific distinction.

Size.—Axis, 8-12ths of an inch; diameter, 3-12ths of an inch.

Localities.—Barton, Alum Bay (Stratum No. 29, Prestw.), Highcliff, where it is abundant, and Brook.

SECTION II. *Shells fusiform.*

B. *Sinus on the shoulder.*

b. *Canal short or indistinct.*

} continued.

No. 216. *PLEUROTOMA MONERMA.* F. E. Edwards. Tab. XXXII, fig. 1, a—c.

P. testá angustá, elongatá, turrítá, undique concentricè lineatá: spirá elevatá, in longitudine bitrientes totius testæ fere equanti, acuminatá: anfractibus convexiusculis, postice concavis, ad suturam bi-lineatis, ad humeros sub-angulatis, noduloso-plicatis; ultimo anfractu per-brevi, in canali lato, indistincto exeunti; plicis numerosis, verticalibus, arcuatis, utrâque extremitate sub-nodulosis; lineis concentricis supra margines posticas et humeros anfractuum exilibus, confertis, equalibus, cæterum prominentibus, distantibus, irregularibus: aperturá oblongo-ovali; labro arcuato, simplici; sinu lato, profundo, sub-trigono, ad humerum collocato.

Shell narrow, elongated, turreted, and ornamented with concentric, raised lines, which cover the whole surface; the spire, formed of seven or eight whorls, exclusive of a smooth, conical pullus of three volutions, is pointed and much produced, being nearly twice the length of the aperture. The whorls are slightly convex and obscurely angulated at the shoulders, where they present a series of regular, rather closely set, vertical plications, transversely furrowed along the middle, and swelled into small tubercles at

each extremity: these plications, which vary much in different individuals and frequently in the same specimen, become gradually less prominent as the shell approaches maturity, and are altogether lost on the last whorl. The posterior margins of the whorls are concave and bordered round the suture by two fine, thread-like, raised lines, frequently granulated by the lines of growth. The concentric lines over the posterior margins and shoulders of the whorls are very fine, closely set, equal, and but slightly raised; over the middle and front parts of the whorl they are distant, irregular, elevated, occasionally faintly granulated, and separated by broad, flat spaces, not infrequently traversed by single, very slender lines. The aperture is of an oblong-ovate form, and terminates in front in a wide, but short and indistinct, canal. The outer lip is much arched, rather wing-shaped, thin and sharp on the edge, and smooth and simple within; and the sinus, which is placed on the shoulder, is wide, very deep, somewhat triangular in form, with a broad extremity.

This *Pleurotoma* presents a remarkably close analogy with *P. uniserialis* (Desh.), to which species, in fact, it has generally been referred. It is, however, a wider and coarser shell, with a blunter spire, and the plications are more vertical, more irregular, and not so crescent-shaped as in the French shells; these variations, joined with the different condition of the sinus, which, in the French shell, is described as narrow, not deep, and with parallel margins, apparently justify a separation of the two shells.

Size.—Axis, one inch and 4-12ths; diameter, rather more than 5-12ths of an inch.

Localities.—*Middle Eocene*; Barton, Highcliff. *London Clay*, Clarendon.

No. 217. *PLEUROTOMA VARIANS*. *F. E. Edwards*. Tab. XXXI, fig. 12, *a, b*.

P. testá elongatá, turrítá, omnino concentricè lineatá: anfractibus sub-convexis; ad humeros obtuse angulatis, plicato-crenatis; antice repente coarctatis; marginibus posticis concavis, ad suturam marginatis; plicis angustis, cuneiformibus, obliquis; lineis concentricis posticis numerosis, equalibus; lineis medianis distantioribus, prominentioribus, granulatis: aperturá ovali, in canali patulo, brevi, exeunti; labro leviter arcuato, acuto, intús lævi; sinu ad humerum collocato sub-profundo, triangulari.

Shell elongated, turreted, concentrically lined; the spire, formed of six or seven volutions, is rather thick, pointed, almost mucronate, at the extremity, and much produced, equalling 3-5ths of the entire shell in length. The whorls are slightly convex, bluntly angulated at the shoulders, and ornamented with a single row of narrow, oblique, wedge-shaped crenulations, rather closely set in the early whorls, but becoming more distant on the penultimate and last whorls; the posterior margins are deeply furrowed and thickened round the suture, where they present a sharp, ridge-like line, frequently crenulated. The concentric lines over the posterior margins

and shoulders of the whorls are rather thick, equal, regular, and not very prominent; over the middle they are elevated, more distant, separated by concave spaces as wide as the lines themselves, and granulated; the last whorl is much contracted in front, and terminates in a wide and short, but distinct, canal. The aperture is widely ovate; the outer lip but slightly arched, thin, and sharp-edged, and smooth within; the sinus is moderately deep, rather wide and triangular in form, and placed on the shoulder.

The present *Pleurotoma* closely resembles *P. monerma*, but the plications on the shoulders of the whorls are very distinct in character, and the transverse lineation in this species is bolder, coarser, and more closely set; the aperture is more widely oval, and the sinus also is neither so deep nor so wide. These differences appear to be constant, for although possessing a good series of each species, I do not find specimens presenting intermediate characters, and in a comparison of the two series the eye at once recognises the distinctions.

Size.—Axis, 8-12ths of an inch; diameter, 3-12ths of an inch.

Locality.—Highcliff.

NO. 218. PLEUROTOMA ABNORMIS. *F. E. Edwards*. Tab. XXX, fig. 14, *a, b*.

P. testá sub-turritá, sub-conicá, longitudinaliter costatá, omnino concentricè sulcatá: spirá productá, obtusiusculá: anfractibus convexiusculis, postice canaliculatis, suturá undulatá, simplici divisís; ultimo anfractu in canali angusto, sub-obliquo terminato; costis sub-distantibus, longis, rotundatis, postice obliquis, ad humeros angulatis, antice curvis, attenuatis; sulcis numerosis, sub-æqualibus: aperturá ob-ovatá; labro leviter arcuato, acuto; sinu latissimo, minime profundo, triangulari, ad humerum collocato.

A turreted, nearly conical shell, longitudinally ribbed, and having the whole surface covered with concentric furrows: the spire rather obtuse and much produced, being nearly half as long again as the aperture. The whorls, eight or nine in number, are very slightly convex, channeled round the posterior margin, and separated by a simple suture, rendered undulating by the ribs of the preceding whorl. The ribs are rather numerous (twelve or thirteen), depressedly convex on the upper surface, long, extending from the suture to the canal, and separated by spaces equalling the ribs in width; on the margin the ribs are very oblique, but they are bent at a slightly obtuse angle when they reach the shoulder, whence they are prolonged, and become much attenuated towards the front of the shell, forming a gentle curve corresponding with the outline of the outer lip. The concentric furrows are numerous, regular, moderately deep, rather narrow, and separated by bands somewhat wider than the furrows, and rounded on the upper surface. The aperture is nearly oval, and terminates in front in a short, slightly oblique, and narrow canal; the outer lip is

slightly curved, projecting towards the front, thin, sharp-edged, and smooth within ; the inner lip is very thin ; the columella nearly straight and cylindrical ; and the sinus, which is placed on the shoulder, is very wide, shallow, and triangular.

This singular species appears to be exceedingly rare ; only four specimens are known to me, one of which (the figured specimen) is in my own collection, the other three form part of Mr. Wetherell's collection.

Size.—Axis, 1 inch and 3-12ths ; diameter, 5-12ths of an inch.

Locality.—Finchley.

No. 219. PLEUROTOMA SCALARATA. *F. E. Edwards.* Tab. XXXI, fig. 6, *a, b.*

P. testá elongato-fusiforimi, turritá, tuberculatá, spiraliter lineatá : spirá acuminatá, elevatá : anfractibus angulatis, brevibus, convexiusculis ; marginibus posticis angustis, depressis, ad suturam granulato-lineatis ; ultimo anfractu repente coarctato, antice in canalem brevem, obliquum, producto ; tuberculis numerosis, obliquis ; lincis spiralibus confertis, filiformibus, irregularibus, sub-clathratis : aperturá ovali ; labro leviter arcuato, ad humerum sinuato ; sinu latiusculo, sub-profundo, sub-trigono.

Shell elongate, fusiform, turreted, tuberculated, spirally lined ; spire pointed, much produced, being more than half as long again as the aperture ; whorls, eight or nine, exclusive of the pullus, angulated at the shoulders, and slightly convex in front ; the posterior margins very narrow, depressed, furrowed, and bordered round the suture by a narrow band, traversed by one or two raised, spiral lines, which are occasionally broken into small, roundish, oblong tubercles ; the last whorl is short, much contracted in front, and produced into a rather wide, short, but distinct, and oblique canal. The tubercles are numerous, oblong, narrow, slightly oblique, and a little compressed anteriorly. The spiral lines are crowded, thread-like, irregular, and unequal, slender lines frequently intervening between thicker lines ; and they are roughened, almost decussated, by the conspicuous lines of growth. The aperture is oval, the outer lip very slightly arched, sharp-edged, and smooth and simple within ; and the sinus, which is placed on the angle of the whorl, is moderately wide, not very deep, and somewhat triangular in form.

The coronated whorls, with their depressed, almost tabulated, margins, and the roughened lineation, give a marked character to this Pleurotoma, and will readily distinguish it from *P. obscurata*.

Size.—Axis, nearly 11-12ths of an inch ; diameter, 3-12ths of an inch.

Localities.—Bramshaw, where it is not uncommon, Brooke, and Stubbington.

No. 220. PLEUROTOMA OBSCURATA. *Sowerby*. Tab. XXXI, fig. 1, *a, b*.

PLEUROTOMA OBSCURATA. *Sow.* 1850. *Dixon's Geol., &c., of Sussex*, p. 184, t. 7, fig. 19.

— — — *Morris.* 1854. *Cat. Brit. Foss.*, p. 270.

P. testá angustá, turritá, omnino concentrice lineatá, undulato-costatá: spirá elevatá: anfractibus numerosis, convexiusculis; postice canaliculatis, ad suturam unicá serie tuberculorum cinctis; antice coarctatis; lineis concentricis crebris, exilibus, regularibus; costis numerosis, brevibus, curvis, ad humeros præ-eminentibus: aperturá ovali, in canali brevi, paullulo reflexo, exeunti; labro aliformi, ad humerum anguste et profunde sinuato; columellá sub-rectá.

A long, narrow, turreted shell, ornamented with numerous curved ribs, and having the whole surface covered with raised, spiral lines; the spire, which is formed of ten or eleven volutions, exclusive of the pullus, is much elevated, forming 3-5ths of the entire length of the shell; the whorls are flatly convex, and much contracted in front; and the posterior margins are slightly channeled, and thickened round the suture, where they present a single row of oblique, oblong tubercles. The ribs are numerous, short, and curved, following the outline of the outer lip; they are thick, rounded, and prominent on the shoulders, imparting somewhat of a turreted character to the spire, and they taper rapidly as they cross the middle of the whorls, where they are lost; the spiral, raised lines are thread-like, numerous, and irregular. The aperture is of a roundish-oval form, and terminates in front in a short, but distinct, rather wide, and nearly straight canal, having the anterior extremity slightly bent backwards; the outer lip is curved, wing-shaped, with the front part much projecting; the sinus, which is placed on the shoulder, is of a narrow, deep, oblong form; the columella nearly straight, and crested by the reflexure of the canal.

Size.—Axis, 1 inch and 3-12ths; diameter, rather more than 10-12ths of an inch.

Locality.—Bracklesham Bay.

No. 221. PLEUROTOMA LIMA. *F. E. Edwards*. Tab. XXXII, fig. 3, *a—c*.

P. testá elongatá, sub-turritá, longitudinaliter curvo-plicatá, concentrice scabro-lineatá, tuberculato-carinatá: spirá elatá, obtusá: anfractibus planulatis, ad humeros angulatis; postice concavis, ad suturam granulatis; ultimo anfractu brevi, antice coarctato, in canali brevi obliquo, terminato; plicis longitudinalibus numerosis, acutis, ad basin tendentibus;

lineis concentricis medianis granulato-nodosis, irregularibus, alternatim filiformibus et tænioliformibus; aperturá ob-ovali; labro aliformi; sinu angusto, profundo, marginibus sub-parallelis.

Shell elongated, slightly turreted, longitudinally plicated, concentrically lined; the spire obtuse, pointed at the extremity, and much produced, being half as long again as the aperture; the whorls, eight or nine, exclusive of a small, smooth pullus of two turns, are nearly straight-sided and angular on the shoulders, where they are girt by a narrow, slightly elevated band, which is furnished with a single row of small, close-set tubercles, in some few specimens rounded or oblong, but most generally narrow, curved, and pliciform; the posterior margins are narrow, concave, and bordered round the suture by a band, formed of two or three concentric lines more prominent than the rest, and presenting a series of small, oblong, or roundish tubercles; the last whorl is much contracted in front, where it forms a rather wide, short, but distinct, and oblique canal, notched at the extremity. The longitudinal plications are numerous, sharp, and curved, and they extend to the very base of the shell; the concentric lines over the shoulders and posterior margins are undulating, regular, even, rather thick, and separated by perspicuous furrows; over the middle and front parts of the whorls they are depressed, irregular, and unequal, narrow ribbon-like lines alternating with fine thread-like lines; at the points where they are intersected by the longitudinal plications, they rise into oblong tubercles, or become coarsely granulated, as the concentric line is more or less broad. The aperture is nearly oval; the outer lip wing-shaped, projecting most towards the posterior extremity, very thin and sharp on the edge, and smooth within; and the sinus, which is on the shoulder, is narrow and very deep, with nearly parallel margins.

The roughly granulated surface of this *Pleurotoma* has somewhat of the aspect of a coarse file, from which resemblance the specific name is taken. The species presents a very close analogy with the variety recorded by Deshayes of *P. bicatena* (Lamk.) In the French shells, however, the margins of the whorls are more depressed, and the spire, consequently, is slenderer, and tapers more regularly; the tubercles on the shoulders are longer, more prominent, and more distant, and the anterior canal is wider. In the shape and position of the sinus, as well as in the condition of the sutural tubercles and of the transverse sculpture, the shells agree, except that the decussation caused by the more prominent lines of growth have given to the English shells the scabrous aspect which characterises them. It may, perhaps, be considered as merely a strongly marked variety of Lamarck's species.

Size.—Axis, 10-12ths of an inch; diameter, 3-12ths of an inch.

Localities.—Barton, Alum Bay (Stratum, No. 29, Prestw.), and Highcliff, at all of which places it is somewhat rare.

No. 222. *PLEUROTOMA RETICULOSA*. *F. E. Edwards*. Tab. XXXII, fig. 4, *a, b*.

P. testá elongato-fusifirmi, undique concentrice lineatá: spirá acuminatá: anfractibus convexis, ad humeros sub-angulatis et tæniolá depressá, obsolete curvo-plicatá et sulco spirali angusto exarató, cinctis; postice concavis, ad suturam marginatis; ultimo anfractu in canalem latum brevem, antice reflexum, producto; lineis concentricis supra margines et humeros anfractuum confertis, tenuibus; cæterum fortibus, sub-distantibus, irregularibus; omnino lineis incrementi asperatis: aperturá oblongo-ovali; labro arcuato, acuto, ad humerum sinuato; sinu latiusculo, profundo, sub-trigono.

Shell elongated, fusiform, having the whole surface covered with spiral, raised lines; spire pointed, produced, nearly equalling the aperture in length. The whorls, six or seven in number, are convex and bluntly angulated at the shoulders, which present a depressed, narrow, ribbon-like band, bearing a series of rather closely set, faint, crescent-shaped plications, formed by the successive rounded extremities of the sinus, and which are divided along the middle by a narrow but perspicuous furrow; the posterior margins are slightly concave, and bordered round the sutural edge by a coarse, elevated line; the last whorl is produced in front into a short, very wide, and slightly curved canal, the anterior extremity of which is bent a little backwards. The concentric lines are numerous and irregular, slender, and rather closely set over the margins and shoulders, but distant, thread-like, and much elevated over the middle and front parts of the whorls; and they are decussated by the perspicuous lines of growth, whence the surface has somewhat the appearance of being covered with fine network. The aperture is of a lengthened, oval form; the outer lip arched, thin, sharp at the edge, and smooth within; the sinus, which is placed at the shoulder, is rather wide, deep, and somewhat triangular in form, with a rounded extremity; and the columella is nearly straight, and presents a small crest in front.

In the general character of the ornamentation this *Pleurotoma* resembles *P. conifera*; but the lineation is of a rougher and more decided character; the shell itself is wider, the spire relatively shorter, the whorls more convex, the anterior canal shorter and wider, and the sinus not so deep nor so narrow. These differences strike the eye at once on comparing the two; and as the present shell occurs in a newer and distinct formation, I have retained it as a distinct species.

From *P. crenata* (Nyst), with which it also presents a close analogy, it is separable by the wider and more concave margins, and the crenulated and tuberculated shoulders of the whorls in that species.

Size.—Axis, 1 inch and 1-12th; diameter, 5-12ths of an inch.

Locality.—Barton, where it is rare.

No. 223. PLEUROTOMA ROTELLA. *F. E. Edwards.* Tab. XXXI, fig. 4, *a, b.*

P. testá turritá, longitudinaliter arcuato-costellatá, undique transversim sulcatá: spirá elatá, acuminatá: anfractibus sub rectis, ad humeros angulatis; postice concavis, granulato-marginatis; ultimo anfractu antice repente coarctato, sub-angulato, in canalem brevem, latiusculum, emarginatum, producto; costellis distantibus, angustis, ad basin tendentibus, sæpe bifurcatis, postice sub-tuberculosis; sulcis transversis supra margines posticas et humeros confertis, angustis; cæterum latioribus, distantioribus: aperturá obovatá; labro arcuato; sinu lato, profundo, sub-semicirculari, ad humerum collocato.

A rather wide, turreted shell, longitudinally ribbed, and concentrically furrowed: the spire is pointed, much elevated, being nearly twice the length of the aperture, and formed of four or five volutions, exclusive of a smooth, lengthened, sub-cylindrical pullus. The whorls are nearly straight-sided, and angulated at the shoulders; the posterior margins narrow, concave, and slightly thickened round the suture, where they present a series of small, rounded, rather distant tubercles; the last whorl is suddenly contracted, so as to become obtusely angulated towards the front, and it terminates in a short, but distinct, and moderately wide canal, the anterior extremity of which is notched. The costellæ are rather distant, curved and narrow, and are swelled on the shoulders into small, oblong tubercles; thence they taper gradually, becoming sharp and elevated lines, not unfrequently furcated, towards the front, and they extend to the very base of the whorl; the concentric furrows are narrow, shallow, close-set, and regular over the posterior margins and shoulders, but are wider, deeper, and more distant over the middle and front of the whorls. The aperture is nearly oval; the outer lip thin, sharp-edged, and arched; and the sinus, which is on the shoulder, is wide, moderately deep, and rounded at the extremity.

This species presents some analogy with two *Pleurotomæ* from Cuise Lamotte, at present undescribed, but which have been named respectively *P. plicatella* and *P. normalis* by M. Deshayes, to whom I am indebted for specimens; in the first of these species, however, the shell is more slender, the spire more conical and pointed, the whorls more regularly convex, the posterior margins not so deeply channeled, the anterior canal longer, and the sinus wider and more trigonal; and in *P. normalis* the shell is wider, the spire more conical, the posterior margins of the whorls deeper and simple on the sutural edge, the costæ more distant and shorter, and the canal longer; the transverse ornamentation also consists of very slender, closely set, raised lines, and the sinus is placed in the margin.

Size.—Axis, 5-12ths of an inch; diameter, 2·5-12ths of an inch.

Localities.—Highcliff, where it is not uncommon, and Barton, where it appears to be very rare.

No. 224. PLEUROTOMA CEDILLA. *F. E. Edwards.* Tab. XXXI, fig. 5, *a, b.*

P. testá turritá, tuberculatá, undique transversim lineatá: anfractibus convexiusculis, ad humeros obscure angulatis, plicatis; postice concavis, tuberculato-marginatis; ultimo anfractu antice in canali lato, breviusculo, terminato; plicis numerosis, angustis, brevibus, arcuatis; lineis transversis regularibus; suprá margines et humeros confertis, filiformibus, æqualibus; cæterum crassioribus, distantioribus: aperturá oblongo-ovali; labro aliformi, ad humerum late breviterque sinuato.

Shell turreted, tuberculated, and concentrically lined; the spire pointed, moderately elevated, barely equalling the aperture in length; the whorls, six or seven, exclusive of a small, conical pullus of two volutions, slightly convex, obscurely angulated on the shoulders, and armed with a row of rather numerous, short, curved, pliciform tubercles; the posterior margins are slightly hollowed, and are thickened round the sutural edge, which is girt by a row of small, knob-like tubercles, not very distant from each other; the last whorl is much contracted in front, and produced into a rather wide and short but distinct, and oblique, canal, notched at the anterior extremity. The transverse lines over the shoulders and posterior margins of the whorls are slender, depressed, regular, equal, and close-set; those over the middle and front of the body whorl are coarser, and more distant, being separated by spaces as wide as themselves; they are somewhat undulating, and are roughened by the lines of growth. The aperture is of an oblong-oval form; the outer lip wing-shaped, projecting at the middle, thin, sharp-edged, and smooth within; and the sinus, which is wide, not very deep, and almost semicircular, is placed on the shoulder.

The present species is distinguished from *P. rotella* by the longer and more convex whorls, the short and curved folds on the shoulders, the wider and somewhat longer anterior canal, and the broader and shallower sinus. Like that species, it presents an analogy with *P. normalis* (Desh., *sp. ined.*), but the wider and straighter posterior margins, with their simple sutural edge, and the more sharply angulated shoulders of the whorls, the more slender and regular concentric lineation, and the marginal position of the sinus of the latter shell, render the two species easily separable.

Size.—Axis, 6-12ths of an inch; diameter, rather less than 3-12ths of an inch.

Localities.—Barton and Alum Bay (Strat. No. 29, Prestw.), at both of which places it appears to be rare.

NO. 225. PLEUROTOMA INSIGNIS. *F. E. Edwards.* Tab. XXXII, fig. 14, *a, b.*

P. testá sub-turritá, transversim denticulato-lineatá: anfractibus depresso-convexiusculis, ad humeros angulatis, tuberculatis; marginibus posticis canaliculatis, ad suturam fasciolá per-elevatá, fastigii-formi, cinctis; ultimo anfractu, antice costellato, in canalem breviusculum producto; tuberculis numerosis, pliciformibus, obliquis; lineis concentricis supra margines posticas et humeros exilibus, regularibus; supra medium ultimi anfractús distantibus, elevatis, scabratis: aperturá ovali; labro arcuato, ad humerum sinuato; sinu lato, triangulari.

A somewhat broad, turreted shell, ornamented with concentric, raised lines; the spire, which consists of five or six volutions, is pointed and moderately elevated, forming about half the length of the whole shell. The whorls are angulated at the shoulders, and armed with a series of closely set, narrow, laterally compressed, oblique tubercles; the posterior margins are deeply channeled and are girt near the suture by a much-elevated, ridge-like band, which is granulated in the earlier whorls; the last whorl is depressedly convex on the sides, much contracted towards the front, and terminates in a narrow and rather short canal. The concentric lines over the posterior margins and immediately in front of the shoulder, are slender and rather closely set, distinct, and regular: on the middle of the last whorl appear four or five regular, concentric, raised lines; of these, the one nearest the shoulder is granulated and separated from that next in front by a very narrow, concave furrow; the raised line, second from the shoulder, is transversely denticulated, and in front of this appear two other almost equally prominent and moderately distant lines, which are also denticulated; the intermediate spaces are nearly flat, and are traversed along the middle by very fine and scarcely perceptible raised lines, also denticulated. Three or four much elevated sharp, or faintly granulated, concentric lines traverse the canal. The bases of the denticulations on the posterior median line, are prolonged into rather broad, flat, longitudinal ribs, which extend to the origin of the canal. The aperture is oval; the outer lip arched and indented at the shoulder by a very wide, moderately deep, sub-trigonal sinus.

This species presents some analogy with *P. denticula*; but the shell is broader, the spire shorter, the tubercles on the shoulder narrow and fold-like, the sinus much wider, and the sculpture different in character. It is apparently very rare.

Size.—Axis, rather more than 4-12ths of an inch; diameter, 2-12ths of an inch.

Locality.—Alum Bay (Strat. No. 4, Prestw.)

No. 226. PLEUROTOMA FLEXUOSA. *Münster*. Tab. XXXII, fig. 8, *a—c*.

PLEUROTOMA FLEXUOSA. *Munst.* 1835. Leonh. and Bronn, Jahrbuch, p. 449.

— — *Goldf.* 1826—1844. Petrefacta Germ., vol. iii, p. 21, t. 171, fig. 7.

P. testá elongato-fusiforimi, longitudinaliter flexuoso-plicatá, spiraliter lineatá: spirá elatá, sub-conicá: anfractibus depresso-convexiusculis; postice ad suturam sulco angusto exaratis, lineato-marginatis, nonnunquam granulatis: aperturá oblongo-ovali, antice in canalem breviusculum, ad basin emarginatum, productá; labro leviter arcuato, ad humerum late sinuato; sinu mediocriter profundo, triangulari.

A long, narrow, fusiform shell, ornamented with numerous longitudinal plications and spiral raised lines; the spire is pointed and elevated, forming almost three fifths of the entire length. The whorls, seven without the pullus, are depressedly convex, nearly flat-sided, imparting a conical aspect to the spire; the posterior margins are rather deeply, but not widely, channeled, and are bordered round the suture by a sharp, prominent line, generally simple, but sometimes crenulated by the lines of growth; the last whorl is much contracted towards the front, and terminates in a wide and short, but distinct, canal, slightly notched at the extremity. The longitudinal plications are narrow and curved, and extend from the sutural border to the middle of the whorl; the spiral lines are numerous, slender, nearly equal, and rounded on the surface. The aperture is of an oblong-oval form, the outer lip very slightly arched, and the sinus, which is on the shoulder, is wide, not very deep, and triangular in shape.

The present species presents a close analogy with *P. Prestwickii*, but it is a narrower and slenderer shell, with a longer spire and less convex whorls, a straighter outer lip, and a shorter anterior canal. Our English specimens agree closely with a specimen of *P. flexuosa* from Hermsdorf, part of a series from the older Tertiaries of Germany, presented by Dr. Wedding to the British Museum.

Size.—Axis, 8-12ths of an inch; diameter, 3-12ths of an inch, nearly.

Localities.—Shenfield, Southampton, Clarendon, Highgate? Alum Bay (No. 4, Prestw.) *German:* Sternberg (fide Goldf.), Hermsdorf (fide Wedding).

No. 227. PLEUROTOMA PUPOIDES. *F. E. Edwards*. Tab. XXXII, fig. 11, *a, b*.

P. testá elongato-fusiforimi, omnino concentricè sulcatá: spirá elatá, conoideá: anfractibus sub-convexis, inermibus, postice cavatis; ultimo anfractu ad humerum fasciolá angustá cincto, antice in canalem brevem obliquum prolongato; sulcis concentricis confertis, regu-

laribus, æqualibus: aperturá oblongo-ovali; labro fere recto; sinu lato, mediocriter profundo, rotundato, ad humerum collocato.

Shell elongated, fusiform, concentrically furrowed; the spire nearly conical and moderately elevated, not quite equalling the aperture in length. The whorls, seven or eight without the pullus, are depressedly convex and are smooth and without ornament on the shoulders; the posterior margins, which slope very gently backwards, are traversed by a rather wide and deep concave furrow, and their sutural edge is simple; the last whorl is girt round the shoulder by a narrow, riband-like band, scarcely elevated above the surface; it is much contracted towards the front, and terminates in a wide and short, but distinct, canal, notched at the anterior extremity. The concentric furrows are numerous, not very deep, even, and regular, and are separated by ridges of equal width with themselves, and rather depressed on the upper surface. The aperture is of an oblong-oval shape; the outer lip is very little arched, nearly straight, and situated on the shoulder; and the sinus is wide, moderately deep, and rounded at the extremity.

This species is closely analogous with *P. flexuosa* (Münst.), of which, perhaps, it may be considered a variety; but the posterior margins are wider and more broadly furrowed, and the whorls do not present the curved costellæ, nor are they bordered round the suture by the sharp, elevated line, found in that species.

Size.—Axis, 9-12ths of an inch, nearly; diameter, not quite 3-12ths of an inch.

Localities.—Clarendon, Alum Bay (Stratum No. 4, Prestwich), and Potter's Bar.

No. 228. PLEUROTOMA VARIATA. *F. E. Edwards.* Tab. XXXI, fig. 11.

P. testá elongatá, angustá, sub-cylindricá, sub-turritá, longitudinaliter obsolete plicatá, transversim irregulariter sulcatá: spirá elatá, bi-trientes totius testæ fere æquanti: anfractibus convexiusculis; marginibus posticis paullulo cavatis, ad suturam granoso-lineatis; sulcis transversis supra margines posticas et humeros angustis, confertis; cæterum latioribus, distantioribus: aperturá ob-ovali, in canali brevi, obliquo exeunte; labro valde arcuato; sinu lato, profundo, ad humerum collocato.

Shell long, narrow, somewhat turreted, and ornamented with obscure longitudinal plications, and irregular concentric furrows: the spire is obtuse, sub-cylindrical, and much produced, being nearly double the length of the aperture. The whorls are depressedly convex; the posterior margins, which slope gently backwards, are very slightly furrowed, and are bordered round the suture by a single row of very small granulations. The transverse furrows over the posterior margins and shoulders of the whorls are narrow, shallow, and irregular, those near the suture being more closely set than the others; over the middle and front parts of the whorls the furrows are broader and

wider apart, being separated by spaces as wide as themselves ; they are flattened on the upper surface and roughened by the lines of growth. The whorls present a series of faint, almost obsolete, longitudinal, curved plications, representing the successive edges of the outer lip, and which on the last whorl extend almost to the base. The aperture is nearly oval, and terminates in front in a wide, short, and oblique canal ; the outer lip is much arched, thin, and sharp-edged ; and the sinus, which is placed on the shoulder, is very wide, deep, and almost semicircular in shape.

Size.—Axis, nearly 6-12ths of an inch ; diameter, not quite 2-12ths of an inch.

Locality.—Clarendon, where it apparently is very rare.

No. 229. PLEUROTOMA WOODII. *F. E. Edwards.* Tab. XXXII, fig. 10, *a, b.*

P. testá turriculatá, omnino concentrice lineatá : spirá elevatá, acuminatá : anfractibus planulatis, ad humeros obtuse angulatis, et cariná latissimá, rotundatá, in medio spiraliter sulcatá, instructis ; marginibus posticis angustissimis, depressis : lineis concentricis supra partes medias et anticæ anfractuum sub-distantibus, latis, depressis ; supra carinam et margines posticas fere obsoletis : aperturá sub-quadratá, in canali brevi exeunte : labro parum arcuato ; sinu semicirculari, ad carinam collocato.

Shell turreted and spirally lined, with a pointed, elevated spire, rather longer than the aperture ; whorls, eight, exclusive of the pullus, nearly straight at the sides, and obtusely angulated at the shoulders, where they present a very broad, prominent, rounded keel, traversed along the middle by a narrow and shallow furrow, representing the progress of the extremity of the sinus ; the posterior margins are exceedingly narrow, depressed, and concave, and are simple on the sutural edge. The concentric lines over the middle and front parts of the whorls are rather numerous, regular, band-like, depressedly convex on the upper surface, and separated by deep concave furrows, equalling the bands in width ; over the keel and posterior margins the concentric lines are nearly obsolete. On the early whorls the lines of growth are very perspicuous, resembling small, oblique costæ ; these are lost on the last two whorls. The aperture, owing to the somewhat flat sides and the depressed posterior margin of the whorls, is subquadrate in form, and terminates in front in a short, moderately wide canal, rendered slightly oblique by the curve of the columella ; the outer lip is very little arched, almost straight, and is smooth within ; and the sinus, which is on the keel, is moderately wide and semicircular.

This well-marked Pleurotoma is extremely rare ; I have dedicated it to Mr. Searles Wood, by whom it was discovered, and to whose liberality I am indebted for the specimen figured.

Size.—Axis, 5-12ths of an inch, nearly ; diameter, 2-12ths of an inch.

Locality.—Headon Hill.

No. 230. PLEUROTOMA CURTA. *F. E. Edwards.* Tab. XXXI, fig. 2, *a, b.*

P. testá parvá, subfusiformi, turrítá, tuberculo-plicatá, undique transversim sulcatá: spirá sub-conicá, acuminatá; anfractibus convexiusculis, ad humeros sub-angulatis, tuberculatis; postice concavis, granulato-marginatis; ultimo anfractu repentissime coarctato, in canalem brevem producto; tuberculis sub-distantibus, oblongis, bifurcis, plicas duas arcuatas formantibus; sulcis transversis confertis, supra canalem perspicuis, cæterum fere obsoletis: aperturá obovali; labro leviter arcuato; sinu lato, brevi, sub-trigono, ad humerum collocato.

Shell small, rather fusiform, turreted, tuberculous, and concentrically furrowed: the spire, somewhat conical, pointed, and moderately elevated, being of equal length with the aperture. The whorls are very slightly convex, and bluntly angulated at the shoulders, where they are furnished with a row of short, vertical, oblong tubercles, which bifurcate in front, and are produced into two narrow, oblique, unequally arched, fold-like costellæ, which extend to the beginning of the canal; the posterior margins are rather deeply channeled and bordered round the suture by a single row of small, round granulations, corresponding with the tubercles on the shoulders; the last whorl is suddenly and much contracted towards the front, resembling that of *P. coarctata*; the transverse furrows are numerous, perspicuous over the canal, but elsewhere nearly obsolete. The aperture is rather widely oval; the outer lip moderately arched; and the sinus, which is placed on the shoulder, is wide, rather deep, and semi-elliptical in form.

I know only the figured specimen of this species, and this is probably an immature individual. It presents a close resemblance to *P. bracheia*, with which, without a careful examination, it may be easily confounded. On comparing the two shells, however, it will be seen that in the present species the spire is more regularly tapering, the posterior margins a little more depressed and more deeply channeled; the granulations round the suture smaller, and placed opposite to the tubercles on the shoulders, and the body whorl much more contracted. These differences, with the bifurcated tubercles, the different character of the transverse ornamentation, and especially the shape and position of the sinus, are sufficient to entitle the present shell to specific distinction.

Size.—7-24ths of an inch; diameter, 3-24ths of an inch.

Locality.—Alum Bay (Strat. No. 29, Prestw.)

No. 231. PLEUROTOMA PUELLA. *F. E. Edwards.* Tab. XXXI, fig. 15, *a, b.*

P. testá elongato-fusiformi, spiraliter granoso-lineatá: spirá elevatá, obtusiusculá, sub-conicá; anfractibus convexiusculis, ad humeros unicá serie tuberculorum brevium ornatis;

postice sulco spirali, exilissime lineato, exaratis; ad suturam duplici lined elevatá undulatá marginatis; ultimo anfractu in canali brevi, latiusculo, recurvo, desinente: lineis spirali-bus alternatim crassis et tenuissimis; lineis crassis per-elevatis et per lineis incrementi granulatis: aperturá ovali; labro leviter arcuato; sinu lato, mediocriter profundo, sub-trigono, ad humerum collocato; columellá arcuatá, cristatá.

Shell elongate, fusiform, and ornamented with concentric, granulated, raised lines; spire thick, nearly conical, and much produced, fully equalling three fifths of the entire shell in length. The whorls, eight exclusive of the pullus, are slightly convex, and girt round the shoulders by a single row of small, oblong, curved, comma-like tubercles; the posterior margins are nearly straight, and furrowed by a broad, deep sulcus, which is traversed by a few concentric lines, so faint as scarcely to detract from the smoothness of the surface; the sutural edge is thickened, and bordered by two closely set, undulating, sharp, raised lines; the last whorl contracts somewhat suddenly in front and terminates in a short, rather wide, and curved canal, slightly bent backwards at the anterior extremity. The spiral lines are unequal, thick prominent lines alternating with very slender, thread-like lines; the larger lines are granulated with much regularity by the successive margins of the outer lip; the smaller lines are but faintly decussated. The aperture is rather widely oval; the outer lip slightly arched and sinuated at the shoulder; the sinus very wide, moderately deep, and triangular in form; and the columella, which is a little twisted, presents a small crest in front.

This species presents an elegant ornamentation, quite distinct in character from that of any other English Eocene Pleurotoma. It appears to be exceedingly rare.

Size.—Axis, 11-12ths of an inch; diameter, 4-12ths of an inch, nearly.

Locality.—Barton.

No. 232. PLEUROTOMA ACUTISINUATA. *F. E. Edwards.* Tab. XXXII, fig. 5, *a, b.*

P. testá elongato-fusiforimi, gracili, sub-turritá, acuminatá, undique spiraliter lineatá: anfractibus convexiusculis, ad humeros angulatis, postice declivis, concavis; lineis spiralibus confertis, irregularibus: aperturá sub-quadratá, in canali brevi exeunte; labro paululum arcuato; sinu ad humerum collocato, latissimo, minime profundo, trigono, ad apicem acute angulato.

Shell slender, oblong-fusiform, somewhat turreted, and ornamented with concentric, raised lines, which cover the whole surface; spire pointed, elevated, exceeding the aperture in length. The whorls, seven or eight in number, are depressedly convex at the sides, and sharply angulated, almost keeled, at the shoulders; and the posterior margins which slope gently backwards, are slightly channeled and girt by a single raised line round the suture. The spiral lines are close-set, threadlike, equal,

and regular on the posterior margins and shoulders ; over the middle of the whorls four or five thicker and coarser lines appear, between which finer lines intervene ; and over the front of the last whorl and the canal the lines again become close-set, equal, and regular ; the whole are roughened, those over the margins almost decussated, by the lines of growth. The aperture is subquadrate, and terminates in a short, moderately wide, and nearly straight canal ; the outer lip is very slightly arched, almost straight ; and the sinus, which is very wide, shallow, and pointed at the extremity, is placed on the shoulder.

The transverse lineation, associated with the acutely angular whorls and the wide, pointed sinus, distinguish this *Pleurotoma* from all its congeners ; the species is apparently very rare.

Size.—Axis, rather more than 9-12ths of an inch ; diameter, 3-12ths of an inch.

Locality.—Bracklesham Bay.

No. 233. *PLEUROTOMA ROTUNDATA*. *F. E. Edwards*. Tab. XXXI, fig. 9, *a, b*.

P. testá oblongo-fusiformi, turrítá, omnino spiraliter cæilissime lineatá; anfractibus depresso-convexis, ad humeros rotundatis vel obtuse angulatis, in juventá arcuato-crenulatis, deinde inermibus; postice sub-depressis, concavis, plicato-marginatis; ultimo anfractu in canalem longiusculum angustum producto; lineis spiralibus confertis, cæilibus, inæqualibus, irregularibus: aperturá oblongo-ovali; labro leviter arcuato, ad humerum sinuato; sinu latiusculo, mediocriter profundo, sub-semi-elliptico.

An oblong, fusiform, turreted shell, covered with very fine transverse lines ; the spire is somewhat cylindrical, pointed, and produced, nearly equalling the aperture in length. The whorls, six or seven, are depressedly convex, and rounded at the shoulders, which in the young state present a close-set series of narrow, crescent-shaped plications, but which afterwards become round and simple, or occasionally are girt with a very narrow and slightly elevated, keel-like band, imparting an obscurely angulated appearance to the shoulder ; the posterior margins are slightly depressed, deeply concave, and bordered round the suture by a prominent band, formed of two or three undulating, raised lines, finely plicated ; the last whorl is much contracted about the middle, whence it tapers gradually towards the base, forming a moderately long and rather narrow canal. The spiral lines are very fine, even, and close-set over the posterior margins and shoulders of the whorls ; over the middle and front parts they are more distant and irregular, broader and somewhat depressed lines alternating with exceedingly slender lines ; and all are more or less feebly granulated by the lines of growth. The aperture is of an oblong-oval shape ; the outer lip moderately arched, and the sinus, which is placed on the shoulder, is rather wide, not very deep, rounded at the extremity, and of a nearly semi-elliptical shape.

This species approaches nearly to *P. granata*; but the depressed and deeply concave margins and rounded shoulders of the whorls give a peculiar character, by which it may readily be distinguished. It also presents a close resemblance to a *Pleurotoma* from the upper and middle Eocene deposits of Germany, figured by Beyrich ('*Die Conchylien des norddeutschen Tertiärgebirges*,' tab. xxix, fig. 4); but descriptions by that author of the *Pleurotomæ* figured by him have not been yet published, and without them, or a comparison of the shells themselves, it is unsafe to express any opinion as to the identity of the two species.

Size.—Axis, 11-12ths of an inch, nearly; diameter, rather more than 4-12ths of an inch.

Localities.—Highgate, Potter's Bar, Chalk Farm.

NO. 234. PLEUROTOMA GRANATA. *F. E. Edwards*. Tab. XXXI, fig. 7, *a—c*.

P. testá oblongo-fusiforimi, turritá, undique transversim granoso-lineatá: anfractibus depresso-convexis, ad humeros obtuse carinatis, noduloso-crenatis; marginibus posticis latis, profunde cavatis, ad suturam incrassatis, lineatis, plicatis; ultimo anfractu antice subconico, in canali lato, brevi, desinente; lineis transversis supra margines et humeros anfractuum exilibus, numerosis, regularibus; supra medias partes crassioribus, inæqualibus, lineis majoribus minoribusque alternantibus; omnino lineis incrementi elegantissime granulatis: aperturá ob-ovatá; labro tenui, valde arcuato; sinu lato, mediocriter profundo, ad humerum collocato; columellá contortá, callosá.

A broad, fusiform shell, the whole surface of which is beautifully ornamented with finely granulated, concentric, raised lines; the spire, formed of five or six volutions exclusive of the pullus, is turreted, pointed, and moderately elevated, not quite equalling the aperture in length. The whorls are bluntly and obscurely keeled round the shoulders, on which they present a series of rather closely set, oblong, obliquely curved plications, variable in size in different specimens, and frequently lost on the last whorl; the posterior margins are wide, embracing the preceding whorls nearly up to the shoulders, deeply channeled, thickened and finely plicated round the suture, where, occasionally, they are girt with one or two raised lines more prominent than the rest. The suture itself is deep and very perspicuous, owing to the great width of the margin of the whorl. The last whorl is flatly convex and much contracted towards the front, whence it tapers nearly regularly to the base, presenting somewhat of a conical form; and the anterior canal is wide and short, but distinct. The concentric lines over the margins and shoulders of the whorl are numerous, regular, very slender, and thread-like; over the middle and front parts they are thicker and more prominent, closely set, and unequal, larger lines alternating with smaller ones; all are very regularly and closely granulated by the lines of growth. The aperture is of a wide, oval form; the outer lip thin and sharp on the edge, and much arched; the sinus, which is wide, moderately

deep, and triangular, is placed on the shoulder, and the columella is twisted, and bears a single, oblique, and obscure, fold-like callus near the middle.*

This, as well as the preceding, species presents a close analogy with a *Pleurotoma* from the lower Eocene deposits of Germany, figured, but not as yet described, by Beyrich ('*Norddeuts. Tertiärgeb.*,' tab. xxix, fig. 3); and for the reasons before stated, the identity cannot be satisfactorily ascertained.

Size.—Axis, 7-12ths to 9-12ths of an inch, nearly; diameter, rather more than 3-12ths of an inch, nearly 4-12ths.

Localities—Highgate, Potter's Bar.

NO. 235. *PLEUROTOMA PARILIS*. *F. E. Edwards*. Tab. XXXI, fig. 10, *a—c*.

P. testá oblongo-fusiformi, undique concentricè lineatá: spirá sub-conicá elevatá: anfractibus convexiusculis, ad humeros obtuse angulatis, inermibus; marginibus posticis latis, concavis, ad suturam exilissime crenulatis; ultimo anfractu sub-conico, in canalem brevem, latiusculum, prolongato; lineis concentricis confertis, supra partes anticæ mediasque anfractuum inæqualibus, lineis incrementi asperatis; supra margines regularibus, granulatis: aperturá oblongo-ovali; labro tenui, sub-semicirculari; sinu profundo, marginibus sub-parallelis, ad humerum collocato; columellá contortá, callosá.

Shell elongated, fusiform, and covered with numerous, fine, concentric, raised lines; the spire, formed of seven or eight volutions exclusive of the pullus, is pointed, nearly conical, and moderately elevated, equalling the aperture in length. The whorls are slightly convex, with broad, concave margins, and are separated by a deep, well-defined suture, along the edge of which they present a series of fine crenulations, which give a wrinkled appearance to the margin; in the early whorls the margins overlap the preceding whorls up to the shoulders, but in the later whorls the shoulders are more exposed. The last whorl is nearly conical, and terminates in front in a moderately wide and short, but distinct, canal. The concentric lines are closely set; over the front and middle of the whorls they are irregular and unequal, very slender lines alternating with thicker, thread-like lines, and they are roughened, almost granulated, by the lines of growth; over the margins and shoulders, the concentric lines are even, regular, and finely granulated. The aperture is of an oblong-oval form; the outer lip is much arched, almost semicircular, thin, sharp on the edge, and smooth within, and it presents at the shoulder a wide and very deep sinus, with nearly parallel margins and a rather widely rounded extremity; the columella is slightly twisted, and bears about the middle an obscure, oblique, fold-like callus.

* The callus on the columella of *P. granata*, *P. parilis*, and of some other shells referred to *Pleurotoma*, suggests the propriety of placing those species among the *Borsoniæ*; but this callus is not, in fact, a true fold, but merely a thickening caused by the contortion of the columella; and, therefore, the species in which it is found are carefully excluded by Bellardi from his genus.

The close resemblance which this *Pleurotoma* presents to *P. granata*, both in form and in ornamentation, would lead to its being regarded rather as a variety of, than as distinct from, that species; but the narrower and less concave margins, and the simple, rounded shoulders of the whorls, the more conical form of the spire and of the last whorl, and especially the deep, oblong sinus, distinguish it.

Like *P. rotundata* and *P. granata*, this species presents a close analogy with certain shells from the lower Eocene deposits of Germany, figured, but not as yet described, by Beyrich ('*Norddeutschen Tertiärgeb.*,' tab. xxix, fig. 2); but on the grounds before mentioned, it would be hasty to assume the identity of the English and German shells.

Size.—Axis, 10-12ths of an inch; diameter, 4-12ths of an inch.

Localities.—Highgate, Potter's Bar.

No. 236. PLEUROTOMA LÆVIUSCULA. *F. E. Edwards.* Tab. XXXII, fig. 9, *a, b.*

P. testá elongato-fusiformi, sub-turritá, læviusculá: anfractibus convexiusculis; ad humeros in juvená tuberculatis, deinde simplicibus, postice et antice transversim lineatis, cæterum lævibus; marginibus posticis canaliculatis: aperturá oblongo-ovali, in canali angusto, brevi, exeunte; labro leviter arcuato, tenui; sinu lato, breviusculo, sub-trigono, ad humerum collocato.

Shell elongated, fusiform, nearly smooth; the spire, formed of six or seven volutions, is rather thick and pointed, and is nearly as long as the aperture. The whorls are slightly convex, and in the early stages of growth present on the shoulders a series of close-set, oblong tubercles, which become obliterated on the third or fourth whorl, after which the shoulders are smooth; the posterior margins are ornamented by three or four concentric, raised lines; of these the one nearest the suture is sharp and ridge-like, and more prominent than the others, and immediately in front of this the margin is traversed by a rather deep, narrow channel; the other marginal lines are feeble and somewhat obscure; the middle of the whorls is smooth; the front parts and base are covered with numerous, close-set, raised lines, rounded on the upper surface; these lines are irregular and unequal, fine lines alternating with thicker ones. The aperture is of an oblong-oval form, and terminates in front in a narrow, short, but distinct canal; the outer lip is thin, smooth within, and but slightly arched; and the sinus, which is on the shoulder, is wide, not very deep, and somewhat three-cornered.

The smooth surface of this *Pleurotoma* is not a common character, and entitles it to specific distinction.

Size.—Axis, rather more than 7-12ths of an inch; diameter, 5-24ths of an inch.

Locality.—Brockenhurst.

No. 237. PLEUROTOMA TURBIDA. *Solander*. Tab. XXXII, fig. 2, a—c.

- MUREX TURBIDUS. *Sol.* 1766. *Brand.*, *Foss. Hanton*, p. 19, fig. 31.
 PLEUROTOMA COLON. *Sow.* 1816. *Min. Con.*, vol. ii, p. 106, t. 146, f. 7, 8.
 — CATAPHRACTA. *Morr.* 1843. *Cat. Brit. Foss.* (1st Edit.), p. 157; (non *Brocc.*)
 — COLON. *Morr.* 1843. *Cat. Brit. Foss.* (1st Edit.), p. 157.
 — TURBIDA. *Morr.* 1843. *Cat. Brit. Foss.* (1st Edit.), p. 157.
 — COLON. *Bronn*, 1848. *Index Palæont.*, p. 1003.
 — TURBIDA. *Bronn*, 1848. *Index Palæont.*, p. 1011.
 — COLON. *D'Orb.* 1852. *Prod. de Paléont.*, 25^e Etage, p. 359, No. 409.
 — TURBIDUS. *D'Orb.* 1852. *Prod. de Paléont.*, 25^e Etage, p. 359, No. 413.
 — COLON. *Morr.* 1854. *Cat. Brit. Foss.*, p. 269.
 — TURBIDA. *Morr.* 1854. *Cat. Brit. Foss.*, p. 270.
 Nec. PLEUROTOMA TURBIDA. *Lam.* *Encycl. Méthod.*, t. 451, f. 8.
 Nec. — — *Lam.* *Anim. sans Vert.*, vol. vii, p. 97, No. 5.
 Nec. — COLON. *Desh.* 1824-37. *Coq. foss., &c.*, de Paris, vol. ii, p. 492, t. 66, f. 4, 7.
 Nec. — — *Nyst*, 1835. *Rech. coq. foss. d'Anvers*, p. 28, No. 26.
 Nec. — — *Nyst*, 1836. *Rech. coq. foss. de Hoesselt, &c.*, p. 30, No. 78.
 Nec. — — *De Kon.* 1837. *Coq. foss. de Basele, &c.* p. 20, No. 19.
 Nec. — TURBIDA. *Nyst*, 1843. *Coq., &c., foss. de Belg.*, p. 513, t. 40, f. 8.
 Nec. — — *Grat.* 1847. *Conch. foss., &c.*, de l'Adour, Atlas, t. 3, No. 21, f. 26.

P. testá oblongá, sub-fusiformi, turritá, undique concentrice lineatá: spirá elevatá, obtusá: anfractibus depresso-convexis ad humeros in juventá carinam obtusam crenatam transversim sulcatam, gerentibus, deinde curvo-plicatis; marginibus posticis concavis, ad suturam scabro-plicatis et duabus vel tribus lineis elevatis, acutis, cinctis; ultimo anfractu sub-conico; lineis concentricis supra margines et humeros anfractuum confertis, exilissimis, sub-æqualibus; supra medias partes nonnullis crassis, prominentibus, fastigiiformibus, distantibus, cæterum exilibus; omnino sub-clathratis: aperturá elongato-ovali, in canali brevissimo, ad basin profunde emarginato, exeunte; labro tenui, sub-semicirculari; columellá contortá, callosá, cristatá; sinu latiusculo, profundo, marginibus sub-parallelis, ad humerum collocato.

Var. β testá anfractibus ad humeros fortiter tuberculatis; lineis concentricis medianis et anticis sub-denticulatis.

Shell oblong, sub-fusiform, turreted, concentrically ridged and lined; spire rather thick, pointed, and much elevated, forming nearly 3-5th parts of the entire length. The whorls, nine or ten without the pullus, are depressedly convex; in the young state they present round the shoulders an obscure, obtuse keel, bearing a closely set series of narrow, vertical, slightly curved tubercles, defined at each end, and occasionally also traversed by fine, raised, thread-like lines; these tubercles and the keel gradually become less prominent as the shell enlarges, and frequently altogether disappear on the last two or three whorls, which then present only a series of numerous very fine, thread-like, curved plications, formed by the successive, rounded extremities of

the sinus ; the posterior margins are rather deeply channeled, and are thickened round the suture, where they are girt by two or three fine, raised lines, decussated by numerous, rather coarse plications. The concentric lines in the hollow part of the margins and over the shoulders are numerous, slender, sharp, and regular ; over the middle and front parts of the whorls rise several prominent, rather thick, ridge-like lines, varying in number and thickness in different individuals ; and over the intermediate spaces two or three fine, thread-like lines are generally found, although in some specimens, in which the ridges approach more closely, these intermediate lines are wanting ; all the lines are decussated by the sharp, perspicuous lines of growth giving a finely reticulated aspect to the surface of the shell. The aperture is of a long, narrow-oval shape, and terminates in front in a wide, very short, and indistinct canal, deeply notched at the extremity ; the outer lip is almost semicircular, thin, sharp on the edge, and smooth within ; the inner lip is rather thick, projecting, and curved outwards at the anterior extremity ; the columella is very slightly twisted and bears, about the middle, a single, obscure, fold-like callus ; the front part presents a strongly marked crest, due to the anterior notch. The sinus is placed on the shoulder of the whorl, and is deep and moderately wide, with nearly parallel margins.

The present species is very variable in the ornamentation ; the most common and most strongly marked variety (*Var. β*) is the one figured in 'Mineral Conchology' (tab. cxlvi, fig. 8), in which the tubercles on the shoulders are prominent and without the transverse furrow found in the typical form ; and the concentric lines over the middle and front parts of the whorls are obscurely denticulated.

The shells figured and described by Sowerby as *P. colon* are, as that author suggested, the young of Solander's species. In the young state the proportions of the spire and of the body whorl are nearly equal, and the character of the ornamentation on the shoulders of the whorls is more strongly marked ; and in the figure given by Brander, *P. turbida* is represented as having a wider shell and a more pointed and slenderer spire than, in fact, characterise the species. Without an examination of the shell in all stages of growth, therefore, a doubt of the identity might reasonably be entertained.

The shell described by Lamarck as *P. turbida*, in forgetfulness, probably, of that name having been already used by Solander, is a Sub-Apennine shell, which had already been named *Murex cataphractus* by Brocchi ; and this circumstance may have led to the English shell having been at one time referred to Brocchi's species, from which, however, it is quite distinct.

Deshayes also has referred to *P. colon* some shells from the Soissonais, which, although presenting a close resemblance to the present species, are specifically distinct ; the prominent and strongly crenulated band round the suture of those shells, resembling that found in *P. alligata*, is quite different in character to the margination in *P. turbida* ; and although the crenulation on the shoulders of the whorls resembles that which is found in the present species, it may have arisen from some variation of

form in the animal, and is not due, as in *P. turbida*, to the successive terminations of the sinus, which in the French shells is placed in the margin of the whorl, and not on the shoulder, as in this species. These two shells, therefore, cannot, with propriety, be referred to the same species; and D'Orbigny has in fact distinguished the French shells by the specific name *pseudo-colon*.

The shells from Basele, Boom, Schelle, and Antwerp, referred in the first instance by Nyst, and afterwards by De Koninck, to *P. colon*, are also specifically distinct, and have been subsequently separated by Nyst, under the name of *P. crenata*.

There still remain to be noticed certain shells from Vliermael and Lethen; these, in the first instance, were also referred by Nyst to *P. colon*; but that author, in his description of the fossils of Belgium, has erroneously considered *P. colon* of Sowerby as specifically distinct from *P. turbida* of Solander, and has treated the shells in question as belonging to *P. turbida*. I have not seen any specimens of the Vliermael and Lethen shells; but, judging from the specimen figured in Nyst's work, apparently a full-grown shell, I do not consider that it has been correctly referred to the present species; the spire is shorter and more conical, the whorls are more convex, the posterior margins wider and less depressed, and the sutural edges not thickened nor girt by the prominent, raised lines found in the present species; the tubercles on the shoulder are much less prominent, the body whorl is contracted in front into a narrow, somewhat lengthened, canal, the outer lip is not so much curved, and the sinus is apparently triangular and much wider and shallower.

Size.—Axis, 1 inch and 11-12ths; diameter, rather more than 7-12ths of an inch.

Localities.—Barton and Highcliff, at both of which places it is very common. In Morris's catalogue, Highgate is also given as a locality for *P. colon*; but I am not aware of the present species having been found there.

No. 238. PLEUROTOMA LIGATA. *F. E. Edwards*. Tab. XXXII, fig. 12 *a, b*.

P. testá scabrá, elongato-turbinatá, sub-fusiforimi, concentrice fasciolis crassis, quasi funiculis, ligatá: anfractibus convexiusculis, ad humeros curvi-crenatis; marginibus posticis latis, transversim tenuiter lineatis, et sulco profundo exaratis, ad suturam incrassatis, longitudinaliter crasse plicatis; ultimo anfractu conoideo, in canalem latum, brevem, ad basin paululo emarginatum, producto; fasciolis concentricis crassis, præminentibus, sub-distantibus, rotundatis, interstitiis sub-planis: aperturá oblongo-ovali; labro valde arcuato, acuto: sinu latiusculo, profundo, marginibus parallelis, ad humerum collocato; columellá contortá sub-callosá, antice cristatá.

Shell rugged, elongated, fusiform, and ornamented with thick, rounded bands, as if bound with cords; the spire, formed of eight or nine volutions, is nearly conical, and moderately elevated, being as long as the aperture. The whorls present round the

shoulders a series of slightly curved, irregular crenulations, more or less closely set in different specimens; the posterior margins are very wide, covering the preceding whorls up to the shoulders; they are deeply channelled, and much thickened round the sutural edge, so as to form a broad, elevated band, which is crossed by numerous narrow, vertical plications, corresponding with the crenulations on the shoulders; the whole surface of the margins, and also the shoulders, are covered with fine, concentric, raised lines, which are most prominent over the sutural band; the body whorl is flatly convex, nearly conical, and terminates in front in a wide, short, but distinct canal, rather deeply notched at the anterior extremity. The concentric bands are thick and very prominent, rounded on the upper surface, and rather distant; the intervening spaces are flat, and traversed, in some specimens, by one or more thread-like raised lines, and in others by flattened bands, similar in character to the principal bands, but much narrower and less prominent. The aperture is of an oblong-oval form; the outer lip much arched, almost semicircular, thin and sharp on the edge, and smooth within; the sinus, which is placed on the shoulder, is deep and not very wide, with nearly parallel margins; and the columella is slightly twisted, and presents near the middle an obscure callus.

This strongly marked species is, I believe, peculiar to Bramshaw; at least I have not met with it elsewhere. In its general aspect and the character of the ornamentation, it strongly resembles the Soissonnais shells referred by Deshayes to Solander's *P. colon*; but, as I have already pointed out, the sinus in those shells is placed in the marginal furrow, and not on the shoulder, as in the present species.

Size.—Axis, rather more than $1\frac{1}{2}$ inch; diameter, 7-12ths of an inch.

No. 239. PLEUROTOMA HEMILEIA. *F. E. Edwards*. Tab. XXXII, fig. 13, *a, b*.

P. testá fusiformi, utrinque sub-conicá, transversim fasciolatá: anfractibus ad humeros obtuse angulatis, in juventá plicatis, deinde levibus; antice planulatis, postice declivis, paulo concavis, ad suturam concentricè lineatis; cæterum levibus; fasciis transversis sub-distantibus, parum elevatis, interstitiis concavis; ultimo anfractu ad basin emarginato: aperturá angustá, sub-quadratá, in canali patulo, indistincto, exeunte; labro leviter arcuato; sinu ad humerum collocato, lato, profundo, marginibus sub-parallelis; columellá leviter contortá.

Shell fusiform, rather narrow, presenting somewhat of the appearance of two cones placed base to base, transversely furrowed and banded, but with the surface smooth and shining: the spire, formed of seven or eight volutions, is elevated, equalling the aperture in length. The whorls are obtusely angulated at the shoulders, round which, in the very young state, they present a series of regular, closely set, long, narrow, vertical plications, which gradually become more and more faint as the shell is enlarged, and ultimately disappear on the fourth or fifth whorl, after

which the shoulders are without ornament; the sides of the whorls in front of the shoulders are very nearly straight; the posterior margins slope gently backwards, and are very slightly channelled. The sutural edge presents either a single, sharp, ridge-like line, or, more generally, two sharp and very slender, raised lines, separated by a concave furrow; in the early whorls it is strongly crenulated, but the crenulations afterwards become faint and almost obsolete; the hollow space between the margin and the shoulder, and the shoulders themselves in the later whorls, are smooth and shining. The concentric bands are depressed, more or less broad in different specimens, and separated by rather deep, concave furrows, which are frequently traversed by a single, very fine, raised line. The last whorl, which is nearly conical, is slightly notched at the base and feebly crested in front. The aperture is narrow, long, and sub-quadrate, and terminates in front in a wide, short, indistinct canal; the outer lip is moderately arched, thin-edged, and smooth within; the sinus is wide and deep, with nearly parallel margins, and is placed on the shoulder; and the columella is cylindrical and very slightly twisted.

This *Pleurotoma* has a close analogy with *P. turbida*, for which, in the young state, it may be mistaken; but the greater narrowness, and the smooth, shining surface, of the shell, the more conical form as well of the spire as of the body whorl, the unornamented shoulders of the later whorls, and the narrow, subquadrate aperture, sufficiently distinguish it from that species.

Size.—Axis, 1 inch and 2-12ths, nearly; diameter, rather more than 5-12ths of an inch.

Locality.—Alum Bay (Stratum No. 29, Prestw.)

NO. 240. PLEUROTOMA HANTONIENSIS. *F. E. Edwards*. Tab. XXXI, fig. 8, a—c.

PLEUROTOMA PLEBEIA, var. *b*. *Forbes*. 1856. Tert. fluvio-mar. form., &c. (Mem. Geol. Surv.), p. 154, t. 5, f. 2.

P. testá turrítá, transversim lineis elevatis crassis cinctá: spirá acuminatá: anfractibus depresso-convexis, cariná obtusá, nodoso-crenatá, bipartitis; marginibus posticis sub-depressis, excavatis, transversim exilissime lineatis, ad suturam crenulatis; ultimo anfractu antice valde coarctato, in canalem patulum, ad extremitatem emarginatum, producto; lineis transversis supra medias partes anfractuum crassis, præminentibus, sub-distantibus, irregularibus; interstitiis sæpe exiliter lineatis: aperturá oblongo-ovali; labro tenui, simplici, valde arcuato: columellá contortá, obscure callosá; sinu latiusculo, triangulari, ad carinam collocato.

Shell turreted, concentrically and coarsely lined: spire pointed, elevated, a little exceeding the aperture in length. The whorls, eight or nine exclusive of a smooth, conical pullus, are depressedly convex, divided unequally at the shoulder by an obtuse

keel, bearing a row of moderately distant, nodulous tubercles ; the posterior margins are depressed, concave, bordered round the suture by two sharp, elevated lines, crenulated by the lines of growth ; the hollow space between these lines and the shoulder is traversed by numerous very slender lines, so fine as scarcely to be visible without the aid of a magnifying glass or to detract from the otherwise smooth aspect of the surface ; the concentric lines over the middle of the whorls are very prominent, thick, cord-like, rather distant, and irregular ; two or three fine, thread-like lines very often appear in the intervening spaces. The last whorl is much contracted towards the front, and terminates in a short, distinct, and very wide canal, rather deeply notched at the anterior extremity. The aperture is of an elongated, oval form ; the outer lip much arched, thin and sharp on the edge, and smooth within ; the sinus, which is placed on the keel, is very wide, moderately deep, and triangular in shape ; and the columella is slightly twisted, and presents about the middle a very obscure callus, and at the anterior extremity the crest, which usually accompanies a well-defined, anterior notch.

This *Pleurotoma* is, as Professor E. Forbes (*loc. cit.*) has observed, much thicker, wider, and larger than *P. plebeia (denticula)*, of which, nevertheless, from an assumed identity of sculpture in all essential points in both shells, that author considered it to be merely a variety. In this opinion I cannot concur. Without attaching too much weight to the great differences in the size and relative proportions of the two shells, although, when associated with other distinctions, these are not without importance, it will be seen that, in fact, the sculpture is not identical with that of *P. denticula*, and that there are other dissimilarities sufficient to separate the present *Pleurotoma* from that species. With regard to the crenulation on the shoulders of the whorls, that character is due, as before observed, to the thickening of the shell at the extremity of the sinus, and a greater or less similarity in that ornament must necessarily prevail in all the species forming the group to which the *Pleurotomæ* in question belong ; but in this species, the crenulations are more transversely oblong and nodulous than those which characterise the upper Eocene forms of *P. denticula* ; the spire also is more pointed and shorter, the posterior margins more depressed, the transverse lineation much more coarse and prominent, and the anterior canal shorter and wider, and deeply notched at the extremity. On these grounds, therefore, I have separated the present species from *P. denticula*, although I have much hesitation in dissenting from the opinion of Professor E. Forbes. I may add that I possess a series of each form from the same locality, Lyndhurst, in which the distinguishing characters of the two species are constantly maintained, without the occurrence of any intermediate form.

Size.—Axis, 1 inch and 8-12ths ; diameter, 8-12ths of an inch.

Localities.—Brockenhurst, Lyndhurst, Roydon, and Whitecliff Bay (fide Forbes).

No. 241. PLEUROTOMA ZONULATA. *F. E. Edwards.* Tab. XXXII, fig. 6, *a, b.*

P. testá parvá, elongato-fusiforimi, sub-turritá, omnino concentricè lineatá: anfractibus depresso-convexis; marginibus posticis sulcatis; ultimo anfractu sub-conico, in canali lato brevi terminato; lineis concentricis crassiusculis, per-elevatis, sub-distantibus: aperturá ovali; labro sub-recto, acuto, intús plicato; sinu lato, profundo, sub-trigono, ad humerum collocato.

Shell small, elongate, fusiform, and concentrically lined; the spire is elevated, exceeding the aperture in length, and somewhat turreted; the whorls are flatly convex, and furrowed round the posterior margins, the sutural edge of which is bordered by a single prominent line; the last whorl is nearly conical, and terminates, anteriorly, in a very wide, short, but distinct and oblique, canal; the concentric lines are rather thick, much elevated, moderately distant, and nearly equal over the whole surface. The aperture is of a widely ovate form; the outer lip nearly straight, thin and sharp on the edge, and plicated within; the sinus is placed on the shoulder, and is very wide, deep, and sub-trigonal in shape, with a much-rounded apex; and the columella is slightly twisted.

A very pretty and somewhat rare shell, the prominent and nearly equal transverse lineation of which gives to it a screw-like appearance. It appears to be quite distinct.

Size.—Axis, 4-12ths of an inch; diameter, 1-8th of an inch.

Localities.—Highcliff, Barton, Alum Bay (Stratum, No. 29, Prestw.)

No. 242. PLEUROTOMA CONOIDES. *Solander.** Tab. XXXIII, fig. 5, *a, b.*

MUREX CONOIDES. *Sol.* 1766. *Brand.*, *Foss. Hanton*, p. 14, fig. 17.

— — *Morr.* 1854. *Cat. Brit. Foss.*, p. 270.

Non. PLEUROTOMA CONOIDEA. *Nyst*, 1843. *Descr. des coq., &c., de Belg.*, p. 515, t. 40, fig. 9.

P. testá utrinque sub-conicá, sub-turritá, longitudinaliter denticulato-plicatá, concentricè lineatá: spirá elevatá, acuminatá; anfractibus ad humeros acute angulatis, marginibus posticis declivis, valde cavatis, ad suturam unicá lineá, aliquando fastigiiformi, aliquando

* The descriptions of this and the following two species, *P. biconus* and *P. helicoides*, have been, accidentally, misplaced; the species form part of the first section, in which the sinus is placed in the margin of the whorls.

denticulatá, cinctis, cæterum lævibus; ultimo anfractu conico, antice in canali patulo indistincto, terminato, ad basin emarginato: aperturá angustá, sub-quadratá; labro arcuato, acuto, intús plicato; sinu latiusculo, sub-semicirculari, in margine collocato.

Shell fusiform, somewhat turreted, longitudinally plicated, and transversely lined; the spire conical, pointed, elevated, forming rather more than half of the shell. The whorls are sharply angulated at the shoulders; the posterior margins slope gently backwards; they are deeply channelled, and are bordered round the suture by an elevated line, which, in some specimens, is sharp and ridge-like, in others denticulated; the hollow space between this line and the shoulders is smooth; the last whorl is nearly conical, and terminates in front in a wide, indistinct canal, slightly emarginate at the extremity; this form of the body whorl, with the conical spire, imparts to the shell the appearance of two cones placed base to base. The longitudinal plications, which extend to the very base of the shell, are numerous, narrow, oblique, curved, and thickened at the points, where they are crossed by the transverse lines, into small, tooth-like tubercles; the transverse lines are moderately distant and sharp. The aperture is very narrow and subquadrate, resembling that of the cones; the outer lip is moderately arched, sharp-edged, and strongly plicated within; the sinus, which is placed in the margin, is rather wide and nearly semicircular.

Some shells from Lethen and Vliermael have been referred by Nyst to this species, although with doubt; judging from the figure given by that author, the margins of the whorls in those shells appear to be narrower, and the longitudinal plications thicker and less numerous, than in this species, and the body whorl is convex, contracted in front, and terminates in a perspicuous canal; the shells in question are, in fact, quite distinct from the "*testa ecaudata, utrinque sub-conica*," described by Solander, and D'Orbigny has distinguished them as *P. sub-conoides*.

Size.—Axis, 9-12ths of an inch; diameter, nearly 4-12ths of an inch.

Localities.—Barton, Highcliff, Alum Bay (No. 29, Prestwich).

NO. 243. PLEUROTOMA BICONUS. *F. E. Edwards*. Tab. XXXIII, fig. 7, *a, b*.

P. testá biconicá, concentricè lineatá: spirá sub-turritá, acuminatá: anfractibus ad humeros angulatis, granoso-tuberculatis; postice cavatis, ad suturam lineá fastigiiformi cinctis, cæterum lævibus; antice sub-rectis: lineis concentricis elevatis, acutis, sub-distantibus, interstitiis concavis: aperturá angusto-ovali, in canali patulo indistincto exeunte; labro leviter arcuato, acuto, intús plicato; sinu lato, breviusculo, sub-trigono, in margine collocato.

Shell doubly cone-shaped and concentrically lined; the spire, which is a little shorter than the aperture, is somewhat turreted and pointed. The whorls, five or six without the pullus, are rather sharply angulated at the shoulders, which present

a series of very small, closely set, regular, rounded tubercles, frequently lost on the last whorl of the adult shell; the posterior margins are channelled and bordered round the suture by a single elevated, sharp, ridge-like line, the space between which and the suture is smooth; the body whorl is nearly straight-sided, and tapers gradually towards the front, assuming a nearly conical shape, and it terminates in a wide and indistinct canal, slightly notched at the extremity. The aperture is narrow, and of an oblong-oval shape; the outer lip very slightly arched, thin and sharp on the edge, and plicated within; and the sinus, which is wide, very shallow, and sub-triangular in form, is placed in the margin of the whorl.

This *Pleurotoma*, in its general aspect, presents a very close analogy with *P. conoides*, of which, on a cursory inspection, it might be regarded as a variety merely. It is, however, a broader shell, the spire is not so much produced, and the sculpture consists of simple, transverse lineation, without the denticulated, longitudinal plication which distinguishes that species; the outer lip also is much less arched, and the sinus is wider, shallower, and more triangular.

Size.—Axis, 7-12ths of an inch; diameter, 3-12ths of an inch.

Locality.—Highcliff.

No. 244. PLEUROTOMA HELICOIDES. *F. E. Edwards*. Tab. XXXII, fig. 7, *a, b*.

PLEUROTOMA TURRELLA. *Morr*. 1854. Cat. Brit. Foss., p. 270 (non *Lam.*).

P. testá elongato-fusiformi, angustá, transversim lineatá: spirá elevatá, sub-conicá, acuminatá: anfractibus numerosis, ad humeros et prope suturam bi-carinatis; marginibus posticis latiusculis, paululo declivis, sub-rectis; ultimo anfractu brevi, convexiusculo, in canali patulo indistincto exeunte, ad extremitatem profunde emarginato; lineis transversis omnino lineis incrementi eleganter clathratis; suprá margines posticas crebis, exilissimis, regularibus; cæterum elevatis, acutis, irregularibus: aperturá angusto-ovali; labro arcuato; sinu lato, brevi, triangulari, anticá in margine collocato.

Shell long, narrow, fusiform, transversely lined: the spire nearly conical, pointed, and much elevated, being almost twice the length of the aperture. The whorls, nine or ten in number, present a narrow, elevated keel round the shoulders, and a sharp, raised, ridge-like line, like a second keel, round the edge of the whorls, at a little distance from the suture; these keels give to the spire a screw-like appearance; in the early whorls the keel on the shoulders is transversely denticulated. The posterior margins, which slope but slightly backwards, are wide, covering the preceding whorl up to the shoulder, and are very obscurely channelled, almost straight; the last whorl is short, convex, and produced in front into a wide and somewhat indistinct canal, deeply notched at the extremity. The concentric lines over the margins are rather

close-set, regular, and very slender; over the middle and front parts of the whorls they are sharp, rather distant, unequal and irregular, slender and slightly raised lines alternating with other lines thicker and more prominent; all are beautifully decussated by the prominent lines of growth. The aperture is of a narrow, oval form; the outer lip moderately arched, thin and sharp on the edge, and smooth within; the sinus, which is wide, short, and triangular, is placed in the front of the margin, the apex being immediately behind the keel; and the columella is slightly twisted, and crested in front. In the specimens from Highcliff the shell is comparatively wider, with a shorter spire, but the sculpture is identical.

This *Pleurotoma* presents a close resemblance to *P. turrella* (Lamk.) from the Calcaire Grossier, with which, in fact, I had formerly associated it; but a careful examination of a larger series of specimens than I then possessed has induced me to change that opinion. In the French species the shell is smaller, the spire much less produced, the whorls more convex, the posterior margins more slanting, the body whorl more conical, the keel on the shoulder not so prominent, the transverse lineation more crowded and less bold and decided in character, and the sinus narrower, deeper, and placed in the middle of the margin. The English shells present altogether a character so distinct, that I am unwilling to regard them even as varieties of Lamarck's species.

Size.—Axis, 15-24ths of an inch (16 millim.); diameter, not quite 5-24ths (5 millim.).

Localities.—Barton and Highcliff, at both of which places it is somewhat rare, but rather less so at the latter locality.

Section II.—*Shells coniform.*

No. 245. PLEUROTOMA PRISCA. *Solander*. Tab. XXXIII, fig. 1, *a—e*.

- MUREX PRISCUS. *Sol.* 1766. Brander, Foss. Hanton, p. 16, f. 25 and 44.
 PLEUROTOMA CLAVICULARIS. *Lamk.* 1802. Ann. du Mus., vol. iii, p. 165, No. 3.
 — — *Roissy*, 1804. Buffon, Moll., vol. vi, p. 73.
 — — *Lamk.* 1816. Tab. Encyclop. et Méthod., t. 440, f. 4.
 — — *Lamk.* 1822. Anim. sans Vert., vol. vii, p. 98.
 — PRISCUS. *Sow.* 1823. Min. Con., vol. iv, p. 119, t. 386.
 — CLAVICULARIS. *Brongn.* 1823. Terr. tert. du Vicent., p. 73.
 — — *De Blainv.* 1826. Dict. des Sci. nat., vol. xli, p. 388.
 — PRISCA. *De Blainv.* 1826. Idem.
 — — *Bronn*, 1831. Ital. Tertiärgeb., p. 47, No. 321.

- PLEUROTOMA CLAVICULARIS. *Desh.* 1832. *Encyclop. Méthod. (Vers.)*, vol. iii, p. 796, No. 12.
- — — *Desh.* 1824-37. *Coq. foss., &c.*, de Paris, vol. ii, p. 437, t. 69, f. 9, 10, and 15-18.
- PRISCA. *Desh.* 1824-37. *Idem*, vol. ii, p. 436, t. 69, f. 1, 2.
- CLAVICULARE. *Phil.* 1846. *Tert. foss. Magdeburg*, p. 63, No. 113.
- CLAVICULARIS. *Bronn*, 1848. *Index Palæontol.*, p. 1002.
- PRISCA. *Bronn*, 1848. *Idem*, p. 1008.
- CLAVICULARIS. *Rouault*, 1848. *Foss. du terr. éoc., &c.*, de Pau (*Mém. Soc. Géol. de France*, 2d ser., vol. iii, p. 481), No. 83.
- PRISCA. *Sow.* 1850. *Dixon's Geol., &c.*, of Sussex, p. 102, t. 7, fig. 24; and p. 119, t. 14, fig. 30.
- — — *Bell.* 1851. *Foss. Nummul. du Comté de Nice* (*Mém. Soc. Géol. de France*, 2d ser., vol. iv, p. 222), No. 86.
- CLAVICULARIS. *Bell.* 1851. *Idem*, No. 87.
- — — *D'Orb.* 1852. *Prod. de Paléontol.*, vol. iii, p. 359; 25^e Etage; Parisien, A, No. 404.
- PRISCA. *D'Orb.* 1852. *Idem*, vol. iii, p. 416; 25^e Etage; Parisien, B, No. 1475.
- CLAVICULARIS. *Nyst.* 1836. *Coq. foss. de Hoesselt, &c.*, p. 31, No. 79.

P. testá elongato-fusiformi, sub-glabrá: spirá elatá, sub-conicá, acuminatá: anfractibus ventricosis, postlice lineato-marginatis, ad basin transversim sulcatis, cæterum lævibus; ultimo anfractu in canali lato, indistincto, excunte, ad extremitatem sub-profunde emarginato: aperturá oblongo-ovali; labro aliformi, tenui, acuto; sinu lato, breviusculo, sub-trigono, anticam in marginem collocato; labio antice incrassato, reflexo: columellá leviter contortá, antice cristatá.

Shell elongated, fusiform, nearly smooth; the spire almost conical, pointed, and moderately elevated, being of equal length with the aperture. The whorls are slightly ventricose; when young, the whole surface is covered with moderately distant, concentric, raised lines, in which state it resembles *P. filosa* (Lamk.); these lines, however, are lost on the fourth or fifth volution, and the whorls afterwards become smooth and shining, except at the base and over the posterior margins, round the sutural edges of which last run three or four fine threadlike, raised lines, occasionally replaced by two or three shallow, obscure furrows; the last whorl is nearly conical, obscurely sulcated at the base and deeply notched at the extremity; the anterior canal is wide, very short, and indistinct. The aperture is narrow and of an oblong-oval form; the outer lip wing-shaped, projecting towards the front, thin and sharp on the edge, and smooth within; the sinus, which is in the very front of the margin, is wide, moderately deep, somewhat triangular in form, and widely rounded at the extremity; the inner lip is much thickened, and is produced and bent outwards in front, giving an umbilicated appearance to the columella, which is slightly twisted and prominently crested towards the base.

It appears to me to be impossible, satisfactorily, to separate *P. clavicularis* from

the *P. prisca* of Solander. It is true that in Lamarck's species the shell is smaller and narrower, the spire more tapering, the whorls not so ventricose, and the sinus rather wider and shallower; but whether these differences, even when constant, are by themselves of specific value may be questionable: and it must be stated that the English shells are variable in the length of the spire and the condition of the whorls, which, in some specimens, are less convex than in others, and, in fact, I have, in my collection, a Barton specimen which, so far as the proportions and shape of the shell may be relied on, cannot be regarded as specifically distinct from *P. clavicularis*. The only distinction to which, apparently, any consideration is due, lies in the condition of the sinus. In the shell figured by Deshayes as *P. prisca*, the sinus is represented as placed in the front of the margin with the apex almost on the shoulder, and as being deep and rather narrow, with nearly parallel margins; now, this does not correspond with the sinus in Solander's species, which, although similarly placed, is intermediate in form between the sinus in *P. prisca* of Deshayes and that in *P. clavicularis*. I have already suggested that the sinus may be, reasonably, expected to be liable to variation in its dimensions, and too much importance, therefore, must not be attributed to mere differences in size and proportion. On these grounds, I have, notwithstanding the array of authorities against me, considered *P. clavicularis* of Lamarck as merely a variety of Solander's species.

Size.—Axis, 2 inches and 11-12ths (74 millim.); diameter, 11-12ths of an inch (23 millim.) The specimen represented by fig. 1 *d*, is upwards of 3 inches in length; but the body of the shell having been twice broken and repaired by the animal, the diameter cannot be accurately stated.

Localities.—Barton, Highcliff, Bramshaw, Stubbington, Bracklesham Bay. *French*: Grignon, Parnes, Mouchy, Courtagnon, Valmondois, Acy, Tanerou (fide Desh.), Cuisse-Lamotte, Marquemont, Saint Félix, Gomerfontaine, Les Groux, Hermes, Châteaurouge, Mouy, Monneville, Neuvillebosc (fide Graves), Bos d'Arros (fide Rouault). *Italian*: Palarea (Nice), (fide Bellardi), Montecchio-Maggiore on the Vicentin (fide Brongniart).

No. 246. PLEUROTOMA AMPHICONUS. *Sow.* Tab. XXXIII, fig. 2, *a*, *b*.

PLEUROTOMA AMPHICONUS. *Sow.* 1850. Dixon's Geol., &c., Sussex, p. 183, t. 8, f. 7 and 8.

P. testá glabrá, angulo obtuso inæqualiter bipartitá, utrinque conicá; anfractibus postice et antice undulato-sulcatis, cæterum lævibus: aperturá angustá, marginibus sub-parallelis, in canalem brevem, ad extremitatem profunde emarginatum, productá; labro arcuato, ad humerum late breviterque sinuato; labio antice producto, reflexo; columellá cristatá.

Shell nearly smooth, obtusely angulated at the shoulders, presenting the appearance

of two unequal cones placed base to base, the smaller one of which is represented by the spire; the whorls, seven or eight without the pullus, are straight on the sides and taper regularly towards the base; the posterior margins slope gently backwards, concealing the preceding whorl up to the angle of the shoulder, giving a straight-sided, conical shape to the spire, which forms about two fifths of the entire length of the shell. Two or three narrow, obscure furrows traverse the space between the suture and the shoulders; and the front of the last whorl also presents numerous transverse, undulating furrows, the ridges between which are a little roughened by the lines of growth; the remaining surface of the whorls is smooth and shining. The aperture is long and narrow, with nearly parallel margins, resembling that of a *Cone*, and terminates in front in a wide, short, and indistinct canal, deeply notched at the anterior extremity. The outer lip is much arched, and presents on the shoulder a very wide, shallow sinus, with a broadly rounded apex; the inner lip is elevated and bent outwards at the base, giving an umbilicated appearance to the front of the shell; and the columella is cylindrical and strongly crested.

The present species is distinguished by the inequality of the two cones of which it appears to be formed, and by that character and by the wide, shallow sinus it may be easily separated from *P. prisca*, which, in other respects, it resembles. It does not appear to have an analogue among the French coniform *Pleurotomæ*.

Size.—Axis, $2\frac{1}{2}$ inches; diameter, 1 inch.

Locality.—Bracklesham Bay, to which it appears to be peculiar. I have not met with it elsewhere, not even at Stubbington or Bramshaw.

No. 247. PLEUROTOMA SEMISTRIATA. *Deshayes*. Tab. XXXIII, fig. 3 a, 3 b.

PLEUROTOMA SEMISTRIATA. *Desh.* 1824-37. Desc. des Coq. foss., &c., vol. ii, p. 443, t. 69, figs. 5, 6.

Non PLEUROTOMA SEMISTRIATA. *Partsch.* 1837. v. Hauer. Vorkomm. foss. Thierr. tert. Beck. v. Wien; Jahrb., p. 419, No. 107.

P. testá biconicá, transversim obsolete lineatá; spirá elatá, acuminatá; anfractibus convexiusculis, postice obsolete sulcatis; ultimo anfractu gradatim attenuato, conoideo, concentricè distanter et exilissime lineato, antice transversim sulcato, ad basin sub-profunde emarginato: aperturá elongato-angustá; labro acuto, aliforme, arcuato; sinu lato, triangulari, in margine collocato.

Shell elongated, fusiform, tapering gradually towards each extremity and presenting the appearance of two cones placed base to base; the spire moderately elevated, nearly equalling the last whorl in length, and pointed. The whorls, seven without the pullus, are slightly convex, smooth and shining; the posterior margins, which slope gently backwards, present two or three very shallow, nearly obsolete, concentric furrows; the last

whorl is obscurely angulated at the shoulder, and tapers gradually and equally towards the base; it presents, in front, several shallow, obliquely transverse furrows, which become more and more feeble as they ascend towards the middle of the whorl, where they are replaced by some distant, very slender, scarcely perceptible, raised lines; the anterior canal is wide, indistinct, and rather deeply notched at the extremity. The aperture is of a long, narrow, oval shape; the outer lip much arched, projecting a little towards the anterior extremity; the sinus, which is placed in the margin, is wide, moderately deep, and triangular in form; the columella is cylindrical and slightly oblique; and the columellar lip is elevated and bent outwards, imparting somewhat of an umbilicated character to the base of the shell.

Although presenting a close analogy with *P. prisca*, this *Pleurotoma* is more symmetrical in its outline; the last whorl is more regularly conical, and the sinus wider, shallower, and more trigonal; these differences and the delicate, transverse lineation, confined to the middle and upper parts of the whorls, apparently separate the present species from Solander's.

The shells from Baden, to which Partsch gave the specific name *semistriata*, are fusiform, costellated shells, sharply angulated at the shoulders, and having depressed, concave margins; they are referred to by D'Orbigny, in his 'Prodrome,' as *P. sub-semistriata*, while some shells from Tortona, which Bellardi has regarded as also belonging to Partsch's species, have been named by him *P. Lamarcki*.

Size.—Of the specimen figured, axis, rather more than 11-12ths of an inch, (24 millim.); diameter, 4-12ths of an inch (9 millim.)

Localities.—Bramshaw. *French*: Parnes, Mouchy (fide Deshayes), Gomerfontaine, Gypsevil, Amblainville, Chateaurouge, Hermes, Saint Félix, Acy-en-Mulcien (fide Graves).

No. 248. PLEUROTOMA GLABRATA. *Lamarck*. Tab. XXXIII, fig. 4.

PLEUROTOMA GLABRATA. *Lamk.* 1802. Ann. du Mus., vol. iii, p. 184, No. 4.

— — *Lamk.* 1822. Anim. sans Vert., &c., vol. vii, p. 98, No. 9.

— — *Desh.* 1824-37. Descr. des Coq. foss., &c., vol. ii, p. 439, t. 69, f. 7, 8.

P. testá utrinque sub-conicá, sub-turritá, glabrá: spirá acuminatá, ultimo anfractu breviori: anfractibus convexiusculis, obtuse angulatis; marginibus posticis angustis, cavatis, concentricè lineatis; ultimo anfractu antice transversim sulcato, ad basin emarginato: aperturá elongato-angustá; labro tenui, dilatato; labio antice producto, reflexo; columellá cylindraccá, cristatá: sinu lato, brevissimo, in margine collocato.

Shell doubly conical, somewhat turreted, nearly smooth; the spire pointed, moderately elevated, forming nearly two fifths of the whole length. The whorls, eight or nine

without the pullus, are slightly convex and bluntly angulated at the shoulders ; the posterior margins are narrow, rather deeply channelled, very finely plicated round the suture, and ornamented with several transverse raised lines, of which the one nearest the edge is the most prominent ; the whorls in front of the shoulders are smooth ; the last whorl tapers gradually towards the base, and is nearly conical, and over the front part presents numerous transverse furrows, which become gradually obsolete as they mount towards the middle of the whorl ; the anterior canal is wide, indistinct, and notched at the extremity. The aperture is long, narrow, with straight, nearly parallel sides, and, like that of *P. amphiconus*, resembles the aperture of a *Cone* ; the outer lip is much expanded, approaching nearly to a semicircle in form, and is thin and sharp-edged ; the columellar lip is thickened and produced in front ; the columella is nearly cylindrical, and presents a prominent ridge or crest at the anterior extremity ; and the sinus, which is placed in the margin of the whorl, is wide, but very shallow, resembling in appearance that which characterises Bellardi's section, *Pseudotomata*.

I possess only one specimen of this *Pleurotoma* ; it has attained a larger size than that attributed by Deshayes to the French shells, but the relative proportions are the same in both. The transverse furrows over the base of the English shell are coarser, and extend higher up the whorl than in the French shells, but in other respects, and particularly in the narrow, concave, posterior margins of the whorls and the peculiar character of the sinus, the two agree.

Size.—Axis, 1 inch and 9-12ths (45 millim. nearly) ; diameter, 9-12ths of an inch (19 millim.)

Localities.—Bracklesham Bay, where it is very rare. *French* : Grignon, Parnes, Mouchy (fide Desh.), Chaumont, Lattainville, Gomerfontaine, Mouy, Saint-Félix, Uilly-Saint-Georges, La Croix blanche near Chambors (fide Graves).

Genus 27th. BORSONIA. *Bellardi*, 1837.

CORDIERIA. *Rouault*, 1848.

Among the fossil shells found in the Miocene beds of Turin, occurs one species possessing all the general characters of *Pleurotoma*, that is to say, an elevated, pointed spire, a lengthened straight anterior canal, and a wide semicircular sinus, placed in the depressed posterior margin of the whorl, but distinguished from the true *Pleurotoma* by the presence of a single fold on the columella ; and Bellardi, influenced by the importance generally attributed to the presence or absence of undoubted folds on the columella, was induced to establish the present genus for the reception of the species in question. It has been seen that among the English *Pleurotomæ* before described are

several, the columellæ of which present an oblique, obscure, fold-like callus, similar to that which characterises the columella of *P. cataphracta* (Brocc.) and *P. Delucii* (Nyst.); but in these instances the character is due to a callosity occasioned by the contortion of the columella. The fold presented by Bellardi's species (*Borsonia prima*) is nearly transverse, sharp, and well defined, and appears to be a true columellar fold, quite distinct in character from the callosity to which I have referred. That author, therefore, in defining his genus, has carefully excluded those species which present merely a callus-like prominence, distinct from and not to be confounded with the elevated and clearly defined fold, characteristic of *Borsonia*.

Subsequently other Pleurotomoid shells, from the Eocene formations in the environs of Pau, were noticed by M. Rouault, on the columella of which two or three folds were found; and that author, misapprehending apparently the true character of the fold in *Borsonia*, which he says appears to be only a small ridge on the left margin, and not a part of the columella, proposed the genus *Cordieria* for such Pleurotomoid shells as possessed two folds or more on the columella. The careful manner in which Bellardi has restricted the character of the fold in *Borsonia*, and the absolute want of any distinct generic value in the presence of one or more additional folds, appear to render the further division of the group proposed by Rouault unnecessary.

The genus *Borsonia* is not admitted by D'Orbigny; but, without entering into the question whether and under what conditions the presence or absence of clearly defined folds on the columella is to be regarded of generic value, it is convenient, at all events for the present, to retain *Borsonia* as a well-marked section of a genus already overcrowded with species.*

Two representatives of the genus are found still living, both inhabitants of tropical seas. In addition to the species noticed by Bellardi, three other *Borsoniæ* from Biarritz and Bos d'Arros, in the neighbourhood of Pau, have been recorded by Rouault. With one of these (*B. Biaritzana*), a species from the middle Eocene beds in England, described by Sowerby as *Pleurotoma curvicosta* in Dixon's 'Geology' &c., of Sussex, corresponds so closely that I have not ventured to retain it as distinct. Certain shells from Grignon and Parnes, described by Deshayes as *Pleurotoma nodularis*, present two folds on the columella, and will therefore belong to the present genus; and the description of a sixth species (*Borsonia sulcata*), from the upper Eocene beds, has also been given in Professor E. Forbes's memoir on the tertiary fluvio-marine of the Isle of Wight. To these two more species are now added.

* The genus in question establishes a passage between *Pleurotoma* and *Fasciolaria*, or rather *Turbinella*, the folds being higher up the columella and more transverse than those of *Fasciolaria*, and approaching more nearly in position and character to those of *Turbinella*.

No. 249. BORSONIA BIARITZANA. *Rouault*. Tab. XXXIII, fig. 11, *a*, *b*.

BORSONIA BIARITZANA. *Rou.* 1848. Bull. de la Soc. Géol. de France, 2^e série, vol. v, p. 207.

— PALENSIS. *Rou.* 1848. Idem.

CORDIERIA BIARITZANA. *Rou.* 1848. Desc. des Foss. du terr. Eocene, des Env. de Pau (Mem. Soc. Géol. de France, 2d series, vol. iii, p. 488, tab. 17, fig. 5, *a*, 6, *a*).

PLEUROTOMA CURVICOSTA. *Sow.* (non *Lamk.*) 1850. Dixon's Geol., &c., Sussex, p. 183, tab. 7, fig. 17.

— — *Morris*, 1854. Cat. Brit. Foss., p. 270.

FASCIOLARIA BIPLICATA. *Sow.* 1850. Dixon's Geol., &c., Sussex, p. 184, t. 5, fig. 7.

— — *Morris*, 1854. Cat. Brit. Foss., p. 248.

B. testá elongato-fusiformi, turrítá, longitudinaliter nodoso-costatá, spiraliter lineatá: spirá acuminatá, elevatá, in longitudine aperturam paullo superanti: anfractibus convexis, postice canaliculatis; costis latis, rotundatis, brevibus; lineis spiralibus crebris, filiformibus: aperturá oblongo-ovatá, antice in canali lato brevique exeunte; labro sub-recto, in margine sinuato; sinu lato, mediocriter profundo, semicirculari; columellá sub-cylindricá, buplicatá.

Shell elongated, fusiform, ribbed, and spirally lined; the spire pointed and elevated, somewhat exceeding the aperture in length. The whorls, eight or ten without the pullus, are convex, and bluntly angulated at the shoulders, and the posterior margins slope gently backwards and are concentrically furrowed. The longitudinal ribs are distant, very broad, rounded, and somewhat swelled, so as to become almost nodulous, on the shoulder; the concentric lines are numerous and thread-like, even and regular on the posterior margins and shoulders of the whorls; elsewhere they are unequal, more prominent lines alternating with the slender lines, and all are more or less strongly decussated by the lines of growth. The aperture is of an oblong ovate form, and terminates in front in a very wide and short, but distinct, canal; the outer lip is nearly straight, and presents a wide but not very deep sinus, placed in the posterior margin of the whorl; the columella is somewhat cylindrical and nearly straight, and presents, a little behind the middle, two slightly oblique, narrow folds, which do not extend to the front of the columella, and which, consequently, are scarcely visible unless the outer lip is broken off.

The specimen figured and described by Mr. Sowerby (loc. cit.) as *P. curvicosta*, forms part of my collection; at that time the aperture was closed by the matrix, and the columellar folds, therefore, were not detected. These folds have since been exposed to view, and there cannot be now any doubt of the identity of *Pleurotoma curvicosta* (Sow.) and *Fasciolaria buplicata*.

The shells from Bos d'Arros, described by Rouault, apparently do not attain so large a size as our English shells; in them the last whorl is longer, apparently, than

the spire, one of the transverse lines near the middle is more elevated than the others, and the columella sometimes presents a third fold, much smaller than the other two. In all other respects the shells from the two localities agree perfectly, and the differences do not appear to me to be sufficient to justify their being considered as specifically distinct.

The shells which Rouault, in the first instance, separated under the specific name *Palensis* were subsequently ascertained by that author to be the adult shells of *B. Biaritzana*, and were united by him to that species.

Size.—Axis, 1 inch and 5-12ths; diameter, 7-12ths of an inch, nearly.

Localities.—Bracklesham Bay and Bramshaw, at both of which places it is not uncommon. *French*: Bos d'Arros.

No. 250. *BORSONIA SULCATA*. *F. E. Edwards*. Tab. XXXIII, fig. 12, *a, b*.

BORSONIA SULCATA. *Morris*, 1856. *Forbes's Tert. fluvio-mar. Form., &c.*, p. 154, t. 5, fig. 3, 3 *a*, 3 *b*.

B. testá ovato-fusiformi, semi-costatá, transversim sulcatá; spirá sub-turritá, acuminatá: anfractibus convexiusculis; marginibus postices excavatis, ad suturam marginatis, cæterum lævibus; costis crassiusculis, rotundatis; sulcis transversis sub-distantibus, irregularibus: aperturá oblongo-ovatá, in canali perbrevis, latissimo, exeunte; labro arcuato, postice sinuato, intús plicato; sinu lato, paululum profundo, rotundato: columellá oblique biplicatá, plicis sub-æqualibus.

A small, ovately fusiform shell, longitudinally ribbed and spirally furrowed; the spire, formed of from six to eight volutions, is moderately elevated, rather exceeding the last whorl in length, and is somewhat turreted. The whorls are slightly convex; a deep, smooth furrow runs round the posterior margins, which are bordered round the suture by an elevated, ridge-like line; the last whorl is nearly conical, and terminates in front in a short, but distinct, and very wide canal. The longitudinal ribs are rather broad, very short, not extending beyond the middle of the whorls, and are lost on the last whorl of the mature shell; the spiral furrows are wide, rather deep, concave, somewhat distant, and separated by spaces wider than themselves, and rounded on the upper surface. The aperture is of an oblong-ovate form; the outer lip is moderately arched, sharp on the edge, and plicated within; and it presents, at the posterior extremity, in the marginal furrow, a wide, but not very deep, rounded sinus; and the columella is slightly arched, and bears, about the middle, two nearly equal, moderately oblique folds.

In general aspect this species presents a strong resemblance to *Borsonia (Pleurotoma) nodularis* (Desh.); but in that species the shell is wider and shorter, and the surface is nearly smooth, except over the canal, which is traversed by a few concentric,

raised lines, so faint as to be scarcely visible to the naked eye; the longitudinal ribs also are thicker and more distant, and they extend to the very front of the whorl.

Size.—Axis, rather more than 6-12ths of an inch; diameter, rather more than 2-12ths of an inch.

Localities.—Headon Hill, and Colwell Bay, Isle of Wight; and Hordwell.

NO. 251. *BORSONIA SEMICOSTATA*. *F. E. Edwards*. Tab. XXXIII, fig. 13, *a, b*.

B. testá ovato-fusiforimi, semi-costatá, omnino spiraliter lineatá: spirá elatá, turrítá: anfractibus convexiusculis, postice canaliculatis; costis numerosis, rotundatis; lineis spirálibus elevatis, acutis, supra margines anfractúum exilibus, regularibus; cæterúm irreguláribus, sub-distantibus, duabus sub-medianis elatioribus: aperturá oblongo-ovali, in canalém latum perbrevev productá; labro leviter arcuato, postice sinuato, intus lævi; columellá oblique inequalitér buplicatá, plicá anticá minori.

Shell small, ovately fusiform, longitudinally ribbed, and covered with raised, concentric lines; the spire turreted and elevated, exceeding the aperture in length. The whorls, which are six in number without the pullus, are convex, and channelled round the posterior margins; the last whorl is rather suddenly contracted towards the front, tapering thence gradually towards the base, where it terminates in a very short, wide canal. The ribs are rather numerous, not very broad, rounded on the upper surface, of equal thickness, and short, ending abruptly where the whorl contracts; the transverse lines over the posterior margins are very fine, even, and regular; a sharp, elevated line crosses the shoulders, in front of which appear four other elevated lines, which gradually become more and more prominent and distant as they recede from the shoulders; the front two are more prominent and wider apart than the rest; they are separated by a broad, concave furrow, and swelled into small, tooth-like knobs, where they cross the longitudinal ribs; the lines over the front part of the whorl and the canal are irregular and very obscure, almost obsolete. The aperture is of an oblong-oval shape; the outer lip is very slightly arched, and presents a shallow and not very wide, rounded sinus, placed in the marginal depression; the columella is nearly straight, and furnished with two unequal, oblique folds, placed near the middle, the front one of which is the smaller.

In general aspect, this shell so closely resembles *Borsonia sulcata*, that a doubt may fairly be raised whether it ought not to be regarded as a variety of that species. It will be seen, however, on comparison, that in *B. sulcata* the spire is longer, that the posterior margins are not so wide nor so deeply channelled, and that they are spirally lined, and not smooth; that the costæ are narrower and more numerous, and the transverse ornamentation quite distinct in character; that the outer lip is not so

much arched, and is smooth within; and that the columellar folds are more oblique, more unequal, and not so prominent.

Size.—Axis, 4-12ths of an inch; diameter, rather less than 2-12ths of an inch.

Locality.—Barton, where, apparently, it is rare.

No. 252. *BORSONIA LINEATA*. *F. E. Edwards*. Tab. XXXIII, fig. 14, *a, b*.

B. testá parvá, ovato-fusifórmi, sub-turritá, lineis spirálibus costellisqúe longitudinalibus sese decussantibus, omnino clathratá: anfractibus convexis, postice sulco concentrico profunde exaratis, ad suturam lineato-marginatis; lineis spirálibus elevatis, irregularibus; costellis numerosis, angustis, pliciformibus, arcuatis: aperturá oblongo-ovali, antice in canali brevi, latiusculo, exeunte; labro sub-recto, postice profunde sinuato, intús plicifero; columellá parum tortuosá, buplicatá.

Shell small, ovately fusiform, sub-turreted, and ornamented with concentric lines and longitudinal ribs, imparting to the surface, by their decussation, the appearance of a fine lattice-work; the spire is of equal length with the aperture, and is rather thick and pointed. The whorls, five or six without the pullus, are convex; the posterior margins slope very gently backwards, and are traversed by a deep, but not very wide, furrow, feebly crenulated; the sutural edge is bordered either by a single, rather thick, elevated line, sometimes granulated, or by a narrow band, formed of two elevated lines, separated by a shallow, but perspicuous furrow; the longitudinal ribs, which are subordinate in character to the concentric lines, are not very prominent, but numerous, narrow, fold-like, oblique, slightly arched, and sharply defined at their posterior extremities by a concentric line, which borders the marginal furrow and gives an angulated appearance to the shoulders; in front of this are two equal, closely set, not very prominent lines, and to these succeed other sharp, equal, transverse lines, which become gradually more distant until they reach the anterior canal, over which the transverse lines again approach more closely. The aperture is of a rather narrow, oblong-oval form, and is produced in front into a short, moderately wide, canal; the outer lip is nearly straight, and presents, at the posterior margin, a deep, semi-elliptical sinus; the columella is slightly twisted, and bears at the middle two oblique and nearly equal folds.

This well-marked species is found at Highcliff; it is somewhat rare.

Size.—Axis, 7-24ths of an inch; diameter, 2-12ths of an inch.

CONIDÆ.

LIST OF GENERA AND SPECIES.

	PAGE		PAGE
CONUS, <i>Linn.</i>	187	<i>Pleurotoma crassicosta</i> , <i>Edw.</i> , t. 26, fig. 10, <i>a, b</i>	225
<i>Conus antediluvianus</i> , <i>Desh. (nec Brug. nec Lamk.)</i>	194	<i>curvicosta</i> , <i>Sow.</i>	327
<i>concinus</i> , <i>Sow.</i> , t. 24, fig. 13, <i>a—c</i>	196	<i>cymæa</i> , <i>Edw.</i> , t. 26, fig. 4, <i>a, b</i> ; and	
<i>corculum</i> , <i>Sow.</i>	199	t. 27, fig. 9	215
<i>deperditus</i> , <i>Brug.</i> , t. 25, fig. 2, <i>a—c</i>	191	<i>dentata</i> , <i>Lamk.</i> , t. 26, fig. 5	220
<i>deperditus</i> , <i>Sow. (non Brug.)</i>	194	<i>desmia</i> , <i>Edw.</i> , t. 27, fig. 5	240
<i>diadema</i> , <i>Edw.</i> , t. 24, fig. 8, <i>a—d</i>	190	<i>dilinum</i> , <i>Edw.</i> , t. 28, fig. 15, <i>a, b</i>	252
<i>diversiformis</i> , <i>Sow.</i>	190	<i>dissimilis</i> , <i>Edw.</i> , t. 28, fig. 7, <i>a—c</i>	246
<i>Lamareckii</i> , <i>Edw.</i> , t. 25, fig. 3, <i>a—c</i>	194	<i>exorta</i> , <i>Sol.</i> , t. 26, fig. 12, <i>a, b</i>	223
<i>pyriformis</i> , <i>Sow.</i>	190	<i>Fisheri</i> , <i>Edw.</i> , t. 31, fig. 14, <i>a, b</i>	269
<i>lineatus</i> , <i>Sol.</i> , t. 24, fig. 10, <i>a—c</i>	199	<i>formosa</i> , <i>Charlesw.</i>	264
<i>scabriculus</i> , <i>Sol.</i> , t. 24, fig. 9, <i>a—c</i>	198	<i>fusiformis</i> , <i>Sow.</i> , t. 27, fig. 1, <i>a, b</i>	228
<i>velatus</i> , <i>Sow.</i> , t. 24, fig. 12	193	<i>gomphoidea</i> , <i>Edw.</i> , t. 28, fig. 13, <i>a—f</i>	247
CONORBIS, <i>Swains</i>	202	<i>gonicea</i> , <i>Edw.</i> , t. 25, fig. 10	213
<i>Conorbis alatus</i> , <i>Edw.</i> , t. 25, fig. 1, <i>a, b</i>	202	<i>granulata</i> , <i>Lamk.</i> , t. 28, fig. 4, <i>a—c</i>	264
<i>dormitor</i> , <i>Sol.</i> , t. 24, fig. 11, <i>a—c</i>	200	<i>Headonensis</i> , <i>Edw.</i> , t. 28, fig. 17, <i>a—c</i>	265
PLEUROTOMA, <i>Lamk.</i>	203	<i>helicoidea</i> , <i>Edw.</i> , t. 32, fig. 7, <i>a, b</i>	319
SECT. I.— <i>Shells fusiform.</i>		<i>helix</i> , <i>Edw.</i> , t. 25, fig. 7, <i>a, b</i>	209
A. Sinus in the posterior margin of the whorl.		<i>inarata</i> , <i>Sow.</i> , t. 25, fig. 6	208
<i>Pleurotoma acuminata</i> , <i>Sow.</i> , t. 27, fig. 3, <i>a—d</i>	230	<i>inflexa</i> , <i>Lamk.</i> , t. 28, fig. 3, <i>a—c</i>	242
<i>acuticosta</i> , <i>Nyst</i> , t. 28, fig. 14, <i>a—c</i>	249	<i>innexa</i> , <i>Sol.</i> , t. 28, fig. 1, <i>a—c</i>	241
<i>attenuata</i> , <i>Sow.</i> , t. 27, fig. 6, <i>a—c</i>	237	<i>Keelei</i> , <i>Edw.</i> , t. 26, fig. 6	219
<i>biconus</i> , <i>Edw.</i> , t. 33, fig. 7, <i>a, b</i>	318	<i>lævigata</i> , <i>Sow.</i> , t. 26, fig. 9, <i>a, b</i>	227
<i>bracheia</i> , <i>Edw.</i> , t. 29, fig. 9, <i>a, b</i>	263	<i>lanceolata</i> , <i>Edw.</i> , t. 26, fig. 11, <i>a, b</i>	226
<i>brevirostrum</i> , <i>Sow.</i> , t. 29, fig. 6, <i>a, b</i>	258	<i>Lehonii</i> , <i>Rou.</i> , t. 31, fig. 13, <i>a, b</i>	271
<i>coarctata</i> , <i>Edw.</i> , t. 28, fig. 12, <i>a—c</i>	245	<i>lepta</i> , <i>Edw.</i> , t. 28, fig. 10, <i>a—c</i>	244
<i>cocciphora</i> , <i>Edw.</i> , t. 26, fig. 2	217	<i>lissa</i> , <i>Edw.</i> , t. 28, fig. 5, <i>a, b</i>	268
<i>cochlis</i> , <i>Edw.</i> , t. 33, fig. 6	272	<i>macilenta</i> , <i>Sol.</i> , t. 26, fig. 13, <i>a, b</i>	224
<i>conica</i> , <i>Edw.</i> , t. 27, fig. 8	239	<i>macrura</i> , <i>Edw.</i> , t. 33, fig. 8, <i>a, b</i>	271
<i>conoides</i> , <i>Sol.</i> , t. 33, fig. 5, <i>a, b</i>	317	<i>microcheila</i> , <i>Edw.</i> , t. 28, fig. 8, <i>a—f</i>	245
<i>constricta</i> , <i>Edw.</i> , t. 29, fig. 1, <i>a—c</i>	256	<i>microdonta</i> , <i>Edw.</i> , t. 27, fig. 4	236
<i>crassa</i> , <i>Edw.</i> , t. 26, fig. 1, <i>a—d</i>	212	<i>nodosaria</i> , <i>Edw.</i> , t. 29, fig. 8, <i>a, b</i>	261
		<i>nodulosa</i> , <i>Lamk.</i> , t. 29, fig. 7, <i>a—c</i>	260
		<i>planetica</i> , <i>Edw.</i> , t. 26, fig. 3	212

CONIDÆ—LIST OF GENERA AND SPECIES.

	PAGE
<i>Pleurotoma plicata</i> , Lamk., t. 28, fig. 11, a—c .	248
pupa, Edw., t. 28, fig. 9, a—c .	253
pyrgota, Edw., t. 28, fig. 16, a—c .	257
pyrulata, Desh., t. 27, fig. 7, a, b .	232
rostrata, Sol., t. 26, fig. 8, a—c .	218
scabriuscula, Edw., t. 29, fig. 2, a—c .	254
semicolon, Sow.	242
sindonata, Edw., t. 29, fig. 12, a, b .	263
stena, Edw., t. 25, fig. 4, a, b .	207
subula, Edw., t. 29, fig. 13, a, b .	267
sulculosa, Edw., t. 27, fig. 2, a—c .	229
symmetrica, Edw., t. 25, fig. 5, a, b .	209
Tallavignesii, Rou., t. 33, fig. 9, a, b .	270
terebialis, Lamk., t. 27, fig. 10, a—k .	233
tereticosta, Edw., t. 29, fig. 5, a—d .	250
teretrium, Edw., t. 25, fig. 8 a—h .	210
textiliosa, Desh., t. 26, fig. 7 .	222
transversaria, Lamk., t. 25, fig. 9, a, b .	214
transversaria, Sow. (non Lamk.) .	213
tricincta, Edw., t. 28, fig. 6, a, b .	232
turgidula, Edw., t. 29, fig. 4, a—c .	251
turpis, Edw., t. 28, fig. 2, a—c .	267
turrella, Morr. Cat. (non Lamk.) .	319
undata, Lamk., t. 29, fig. 11, a, b .	261
verticillum, Edw., t. 29, fig. 3, a—c .	255
vicina, Edw., t. 29, fig. 10, a, b .	266

SECT. I.—Shells fusiform (continued).

B. Sinus on the shoulder of the whorl.

<i>Pleurotoma abnormis</i> , Edw., t. 30, fig. 14, a, b .	294
acutisinuata, Edw., t. 32, fig. 5, a, b .	306
aspera, Edw., t. 29, fig. 14, a, b .	273
callifera, Edw., t. 30, figs. 9, 10, 11, a, b .	291
cataphracta, Morr. Cat. 1st Edit. (non Brocc.)	311
cedilla, Edw., t. 31, fig. 5, a, b .	300
colon, Sow.	311
comma, Sow., t. 30, fig. 2 .	281
conifera, Edw., t. 31, fig. 3, a, b .	274
crebrilinea, Edw., t. 30, fig. 6, a—c .	290
curta, Edw., t. 31, fig. 2, a, b .	305
denticula, Bast., t. 30, fig. 7, a—h .	286
divisa, Edw., t. 31, fig. 17, a, b .	278
fasciolata, Edw., t. 30, fig. 12, a, b .	286
flexuosa, Munst., t. 32, fig. 8, a—c .	302

	PAGE
<i>Pleurotoma gentilis</i> , Sow., t. 30, fig. 1, a—c .	280
granata, Edw., t. 31, fig. 7, a—c .	308
Hantoniensis, Edw., t. 31, fig. 8, a—c .	315
hemileia, Edw., t. 32, fig. 13, a, b .	314
insignis, Edw., t. 32, fig. 14, a, b .	301
Konineckii, Nyst, t. 29, fig. 15, a, b .	279
læviuscula, Edw., t. 32, fig. 9, a, b .	310
ligata, Edw., t. 32, fig. 12, a, b .	313
lima, Edw., t. 32, fig. 3, a—c .	296
mixta, Edw., t. 30, fig. 5, a, b .	277
monerma, Edw., t. 32, fig. 1, a—c .	292
obscurata, Sow., t. 31, fig. 1, a, b .	296
parilis, Edw., t. 31, fig. 10, a—c .	309
plebeia, Sow.	286
Prestwichii, Edw., t. 30, fig. 3, a—d .	282
puella, Edw., t. 31, fig. 15, a, b .	305
pupoides, Edw., t. 32, fig. 11, a, b .	302
reticulosa, Edw., t. 32, fig. 4, a, b .	298
rotella, Edw., t. 31, fig. 4, a, b .	299
rotundata, Edw., t. 31, fig. 9, a, b .	307
scalarata, Edw., t. 31, fig. 6, a, b .	295
Selysii, De Kon., t. 29, fig. 17, a—d .	278
simillima, Edw., t. 30, fig. 4, a—c .	283
tæniolata, Edw., t. 30, fig. 13, a—c .	284
turbida, Sol., t. 32, fig. 2, a—c .	311
varians, Edw., t. 31, fig. 12, a, b .	293
variata, Edw., t. 31, fig. 11 .	303
Volgeri, Phil., t. 30, fig. 15, a—c .	275
Waterkeynii, Nyst, t. 30, fig. 8, a—c .	275
Wetherellii, Edw., t. 29, fig. 16, a—d .	285
Woodii, Edw., t. 32, fig. 10, a, b .	304
zeta, Edw., t. 31, fig. 16 .	284
zonulata, Edw., t. 32, fig. 6, a, b .	317

SECT. II.—Shells coniform.

<i>Pleurotoma amphiconus</i> , Sow., t. 33, fig. 2, a, b .	322
clavicularis, Lamk.	320
glabrata, Lamk., t. 33, fig. 4 .	324
prisca, Sol., t. 33, fig. 1, a—e .	320
semistriata, Desh., t. 33, fig. 3, a, b .	323
BORSONIA, Bell.	325
Borsonia Biaritzana, Rou., t. 33, fig. 11, a, b .	327
lineata, Edw., t. 33, fig. 14, a, b .	330
semicostata, Edw., t. 33, fig. 13, a, b .	329
sulcata, Edw., t. 33, fig. 12, a, b .	328

ADDENDA AND CORRIGENDA.

- Page 255, line 13, *dele* Barton.
,, 274, last line, *add* Brook.
,, 275, first line, *for* fig. 13, *a, b*, *read* fig. 15, *a, b*.
,, 279, line 25, *for* Hampstead Railway Tunnel, *substitute* Potter's Bar.
,, 282, last line, *add* Highgate, Potter's Bar, and Southampton.
,, 285, line 17, *add* Hornsey.
,, 290, line 16, *for* fig. 8, *a—c*, *read* fig. 6, *a—c*.
,, 295, line 8, *add* Highgate.
,, 300, last line, *add* Highcliff.

TAB. XXVIII.

NOTE.—*The lines indicate the actual dimensions of the specimens.*

Fig.

1. *Pleurotoma innexa*. No. 162, *p.* 241.
 - a.* Side view of young shell, nat. size; from Barton.
 - b.* Ditto of adult shell, nat. size.
 - c.* Ditto of body-whorl, magnified.

2. *Pleurotoma turpis*. No. 189, *p.* 267.
 - a.* Side view, nat. size; from Clarendon.
 - b.* Ditto of body-whorl, magnified.
 - c.* Back view, nat. size.

3. *Pleurotoma inflexa*. No. 163, *p.* 242.
 - a.* Front view, nat. size; from Bracklesham Bay.
 - b.* Back view, ditto; from Bramshaw.
 - c.* Side view of body-whorl, magnified.

4. *Pleurotoma granulata*. No. 186, *p.* 264.
 - a.* Back view, magnified; from Highcliff.
 - b.* Front view, ditto.
 - c.* Side view of body-whorl, magnified.

5. *Pleurotoma lissa*. No. 191, *p.* 268.
 - a.* Back view, magnified; from Potter's Bar.
 - b.* Front view, ditto.

6. *Pleurotoma tricincta*. No. 174, *p.* 252.
 - a.* Back view, magnified; from Potter's Bar.
 - b.* Ditto of body-whorl and part of the spire, magnified.

7. *Pleurotoma dissimilis*. No. 167, *p.* 246.
 - a.* Side view, magnified; from Highcliff.
 - b.* Front view, ditto.
 - c.* Ditto of body-whorl, magnified.

8. *Pleurotoma microcheila*. No. 166, *p.* 245.
 - a.* Back view, magnified; from Highcliff.
 - b.* Front view, magnified.
 - c.* Side view of body-whorl, and part of the spire, magnified.
 - d.* Front view, magnified (*var. producta*); from Highcliff.
 - e.* Back view, magnified (ditto).
 - f.* Front view of body whorl, magnified (ditto).

Fig.

9. *Pleurotoma pupa*. No. 175, *p.* 253.
 - a.* Side view, magnified; from Highcliff.
 - b.* Ditto of body-whorl, magnified.
 - c.* Front view, magnified.

10. *Pleurotoma lepta*. No. 164, *p.* 244.
 - a.* Side view, magnified; from Stubbington.
 - b.* Ditto of body-whorl, magnified.
 - c.* Back view, magnified.

11. *Pleurotoma plicata*. No. 169, *p.* 248.
 - a.* Front view, nat. size; from Bramshaw.
 - b.* Ditto of body-whorl, and part of the spire, magnified.
 - c.* Back view, nat. size.

12. *Pleurotoma coarctata*. No. 165, *p.* 245.
 - a.* Back view, magnified; from Highcliff.
 - b.* Front view, ditto.
 - c.* Side view of body-whorl, magnified.

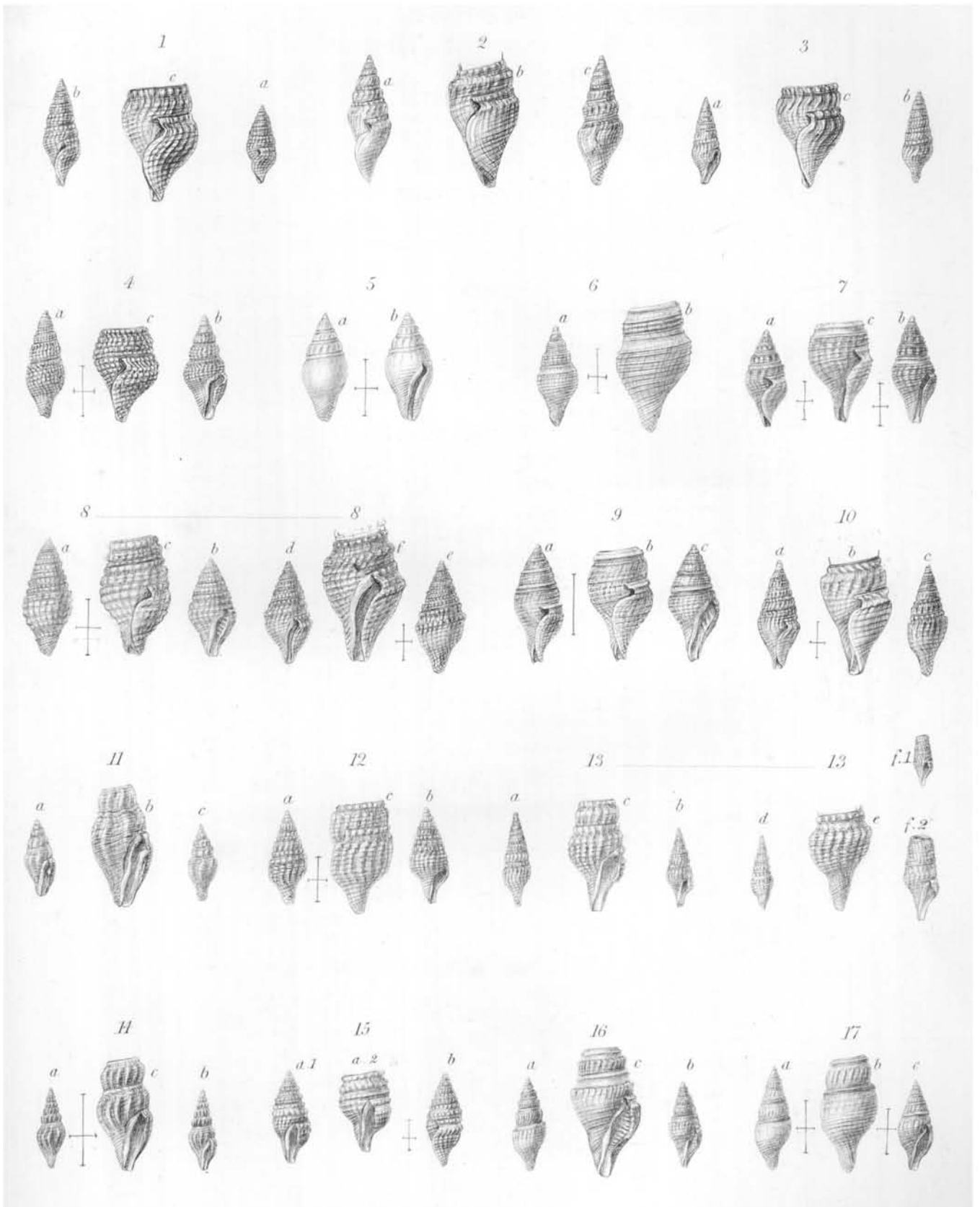
13. *Pleurotoma gomphoidea*. No. 168, *p.* 247.
 - a.* Back view, nat. size; from Highcliff.
 - b.* Front view, ditto.
 - c.* Ditto of body-whorl, and part of the spire, magnified.
 - d.* Back view, nat. size; from Clarendon.
 - e.* Ditto of body-whorl, magnified.
 - f*¹. Front view (var. *avita*), nat. size; from Southampton.
 - f*². Ditto (ditto) magnified.

14. *Pleurotoma acuticosta*. No. 170, *p.* 249.
 - a.* Back view, nat. size; from Barton.
 - b.* Front view, ditto.
 - c.* Ditto of body-whorl, and part of the spire, magnified.

15. *Pleurotoma dilinum*. No. 173, *p.* 252.
 - a*¹. Front view, magnified; from Alum Bay (Strat. No. 29, Prestw.)
 - a*². Side view, magnified.
 - b.* Ditto of body-whorl, magnified.

16. *Pleurotoma pyrgota*. No. 179, *p.* 257.
 - a.* Back view, nat. size; from Bramshaw.
 - b.* Front view, ditto.
 - c.* Ditto of body-whorl, and part of the spire, magnified.

17. *Pleurotoma Headonensis*. No. 187, *p.* 265.
 - a.* Back view, magnified; from Headon Hill.
 - b.* Ditto of body-whorl, and part of the spire, magnified.
 - c.* Front view, magnified.



TAB. XXIX.

NOTE.—*The lines indicate the actual dimensions of the specimens.*

Fig.

1. *Pleurotoma constricta*. No. 178, *p.* 256.
 - a.* Side view, natural size ; from Barton.
 - b.* Ditto of body-whorl, magnified.
 - c.* Front view, nat. size.

2. *Pleurotoma scabriuscula*. No. 176, *p.* 254.
 - a.* Back view, magnified ; from Highcliff.
 - b.* Side view, ditto.
 - c.* Ditto, ditto.

3. *Pleurotoma verticillum*. No. 177, *p.* 255.
 - a.* Back view, nat. size ; from Barton.
 - b.* Ditto of body-whorl, and part of the spire, magnified.
 - c.* Front view, nat. size.

4. *Pleurotoma turgidula*. No. 172, *p.* 251.
 - a.* Back view, nat. size ; from Alum Bay (Strat. No. 29, Prestw.?)
 - b.* Side view, ditto.
 - c.* Ditto of the body-whorl, magnified.

5. *Pleurotoma tereticosta*. No. 171, *p.* 250.
 - a.* Back view, nat. size ; from Highgate.
 - b.* Ditto, magnified.
 - c.* Ditto, (var. *soror*), nat. size ; from Southampton.
 - d.* Ditto, (ditto) magnified.

6. *Pleurotoma brevirostrum*. No. 180, *p.* 258.
 - a.* Back view, nat. size ; from Muddiford? (*Mus. Sow.*)
 - b.* Front view, ditto.

7. *Pleurotoma nodulosa*. No. 181, *p.* 260.
 - a.* Back view, nat. size ; from Stubbington.
 - b.* Front view, ditto.
 - c.* Side view, magnified.

8. *Pleurotoma nodosaria*. No. 182, *p.* 261.
 - a.* Back view, magnified ; from Southampton.
 - b.* Front view, ditto.

Fig.

9. *Pleurotoma bracheia*. No. 184, *p.* 263.
 - a.* Side view, magnified; from Barton.
 - b.* Ditto, ditto.

10. *Pleurotoma vicina*. No. 188, *p.* 266.
 - a.* Side view, magnified; from Alum Bay (Strat. No. 29, Prestw.)
 - b.* Front view, ditto.

11. *Pleurotoma undata*. No. 183, *p.* 261.
 - a.* Back view, nat. size; from Stubbington.
 - b.* Front view, ditto.

12. *Pleurotoma sindonata*. No. 185, *p.* 263.
 - a.* Side view, magnified; from Stubbington.
 - b.* Front view, ditto.

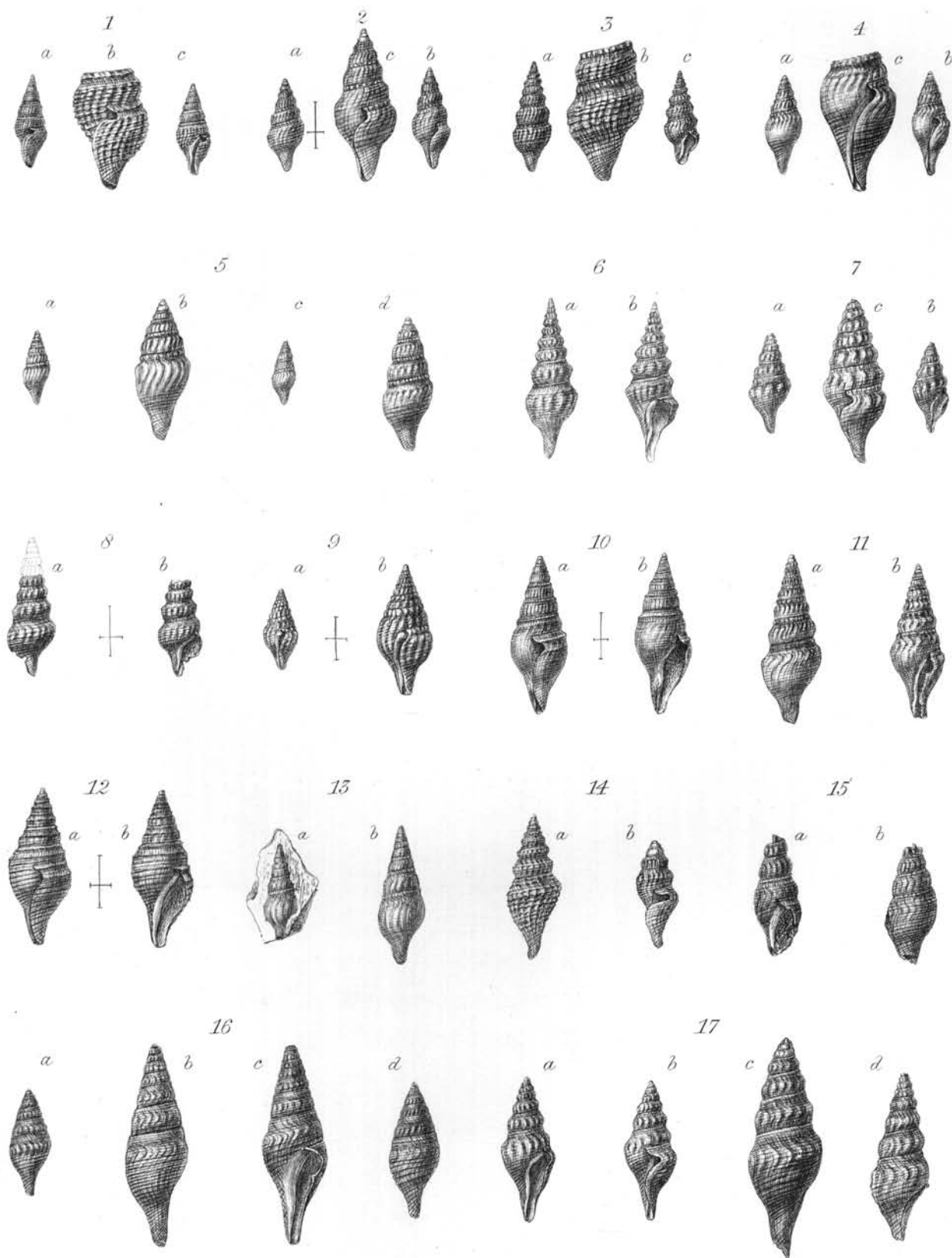
13. *Pleurotoma subula*. No. 190, *p.* 267.
 - a.* Back view, nat. size; from Basingstoke.
 - b.* Ditto, magnified.

14. *Pleurotoma aspera*. No. 197, *p.* 273.
 - a.* Back view, nat. size; from Barton.
 - b.* Side view, ditto; from Highcliff.

15. *Pleurotoma Koninckii*. No. 204, *p.* 279.
 - a.* Front view, nat. size; from Railway Tunnel, Hampstead.
 - b.* Back view, ditto.

16. *Pleurotoma Wetherellii*. No. 211, *p.* 285.
 - a* and *d.* Back views of young shells, nat. size; from Highgate.
 - b.* Back view of adult shell, ditto; (*Mus. Weth.*)
 - c.* Front view of ditto.

17. *Pleurotoma Selysii*. No. 203, *p.* 278.
 - a.* Front view of shell of mid-growth, nat. size; from Muswell Hill
(*Mus. Weth.*)
 - b.* Side view ditto, ditto.
 - c.* Back view of adult shell, nat. size (*Mus. Weth.*)
 - d.* Ditto of shell of mid-growth, ditto (*ditto*).



TAB. XXX.

NOTE.—*The lines indicate the actual dimensions of the specimens.*

Fig.

1. *Pleurotoma gentilis*. No. 205, *p.* 280.
 - a.* Front view, natural size ; from Bracklesham Bay.
 - b.* Back view, ditto.
 - c.* Part of the body-whorl, magnified.
2. *Pleurotoma comma*. No. 206, *p.* 281.

Front view, nat. size ; from Stubbington.
3. *Pleurotoma Prestwichii*. No. 207, *p.* 282.
 - a.* Back view, nat. size ; from Clarendon.
 - b.* Part of the body-whorl, magnified.
 - c.* Back view (var.), nat. size.
 - d.* Side view (var.), ditto.
4. *Pleurotoma simillima*. No. 208, *p.* 283.
 - a.* Back view, nat. size ; from Clarendon.
 - b.* Side view, ditto.
 - c.* Part of the body-whorl, magnified.
5. *Pleurotoma mixta*. No. 201, *p.* 277.
 - a.* Back view, nat. size ; from Barton.
 - b.* Front view, ditto.
6. *Pleurotoma crebrilinea*. No. 214, *p.* 290.
 - a.* Back view, nat. size ; from Stubbington.
 - b.* Front view, ditto.
 - c.* Part of the body-whorl, magnified.
7. *Pleurotoma denticula*. No. 213, *p.* 286.
 - a.* Back view, nat. size ; from Bracklesham Bay.
 - b.* Part of the body-whorl, magnified.
 - c.* Back view, nat. size ; from Barton.
 - d.* Ditto (var. *longæva*), nat. size ; from Highgate.
 - e.* Ditto (var. *macrobia*), ditto ; from Clarendon.
 - f.* Ditto (var. *gracilentata*), ditto ; from Brook, in the New Forest.
 - g.* Side view (var. *conulus*), ditto ; from Barton.
 - h.* Back view (var. *odontella*), ditto ; from Colwell Bay.

Fig.

8. *Pleurotoma Waterkeynii*. No. 200, p. 275.
 - a. Front view, nat. size ; from Potter's Bar.
 - b. Back view, ditto.
 - c. Part of the body-whorl, magnified.

9. *Pleurotoma callifera*. No. 215, p. 291.
 - a. Front view, magnified ; from Highcliff.
 - b. Side view, ditto.

10. *Pleurotoma callifera*, var. *monilifera*. No. 215, p. 291.
 - a. Back view, nat. size ; from Barton.
 - b. Front view, ditto.

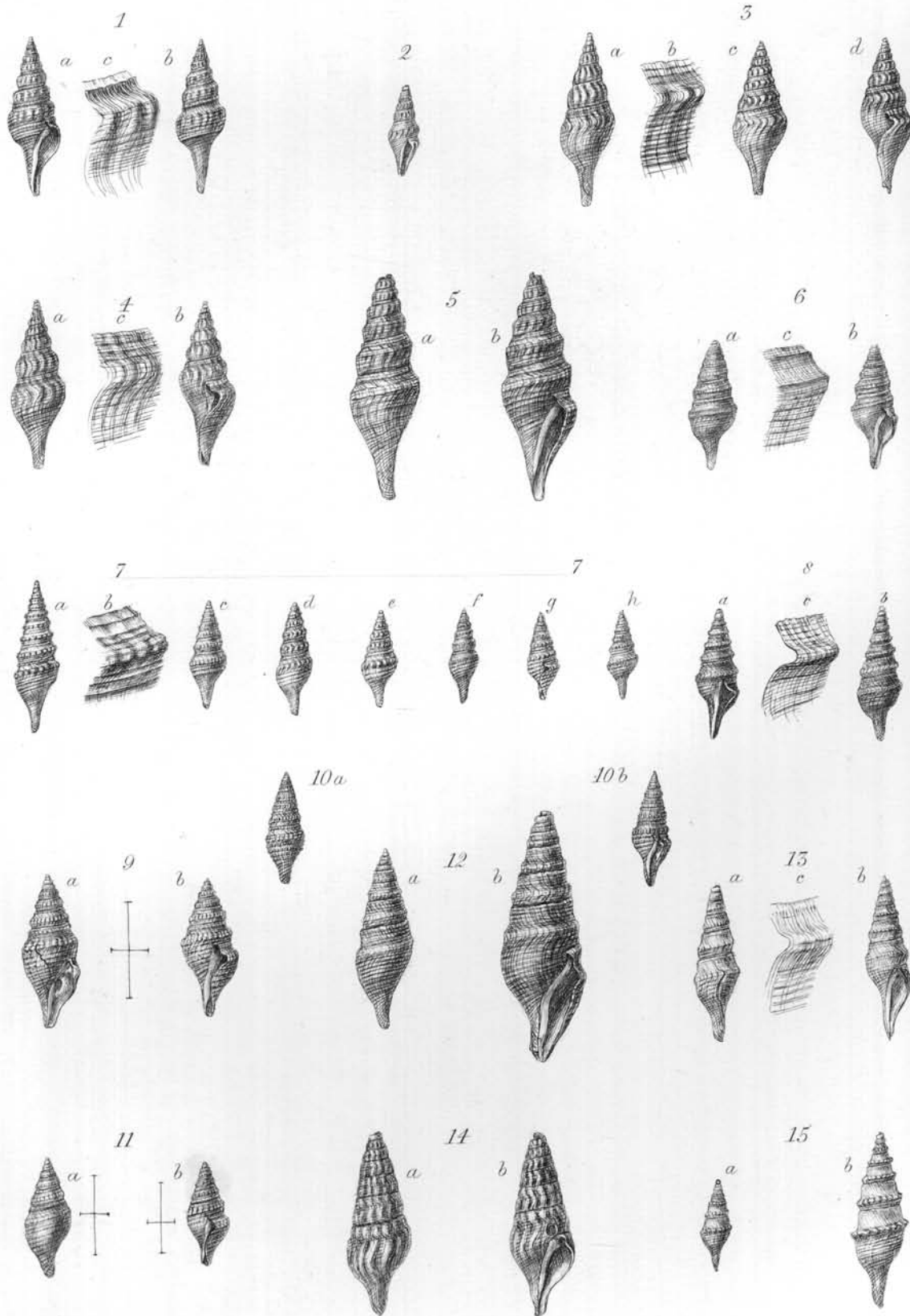
11. *Pleurotoma callifera*, var. *raphium*. No. 215, p. 291.
 - a. Back view, magnified ; from Highcliff.
 - b. Side view, ditto.

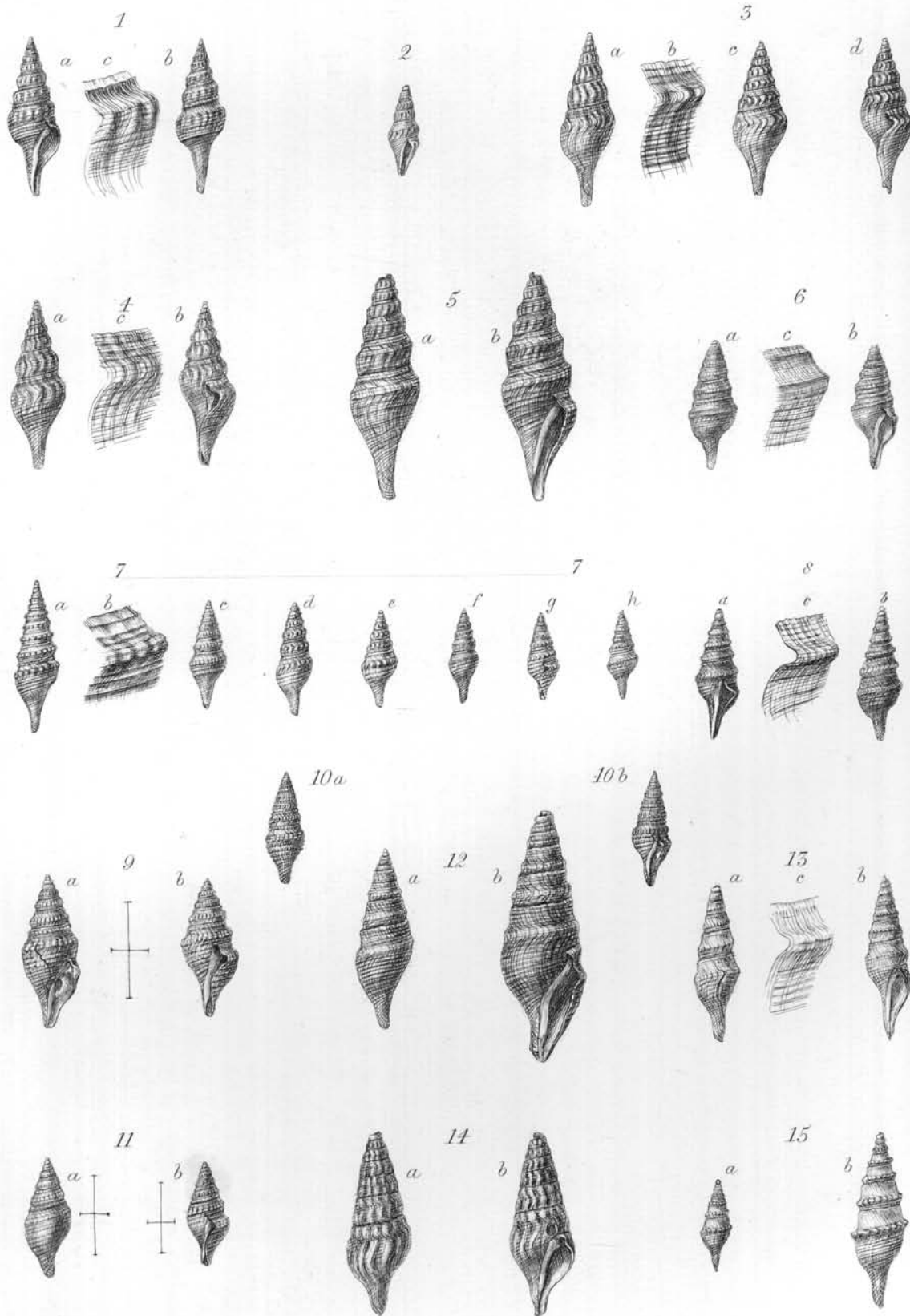
12. *Pleurotoma fasciolata*. No. 212, p. 286.
 - a. Back view, shell of mid-growth, nat. size ; from Highgate.
 - b. Front view, adult shell, ditto ; from Railway Cutting, at Kilburn.

13. *Pleurotoma tæniolata*. No. 210, p. 284.
 - a. Back view, nat. size ; from Cuffell (*Mus. Prestw.*)
 - b. Front view, ditto.
 - c. Part of the body-whorl, ditto.

14. *Pleurotoma abnormis*. No. 218, p. 294.
 - a. Back view, nat. size ; from Highgate.
 - b. Front view, ditto.

15. *Pleurotoma Volgeri*. No. 199, p. 275.
 - a. Back view, nat. size ; from Potter's Bar.
 - b. Ditto, magnified.





TAB. XXXI.

NOTE.—*The lines indicate the actual dimensions of the specimens.*

Fig.

1. *Pleurotoma obscurata*. No. 220, *p.* 296.
 - a.* Front view of shell of mid-growth, nat. size ; from Bracklesham Bay.
 - b.* Back view of adult shell, ditto.

2. *Pleurotoma curta*. No. 230, *p.* 305.
 - a.* Back view, magnified ; from Alum Bay (Strat. No. 29, Prestw.)
 - b.* Front view, ditto.

3. *Pleurotoma conifera*. No. 198, *p.* 274.
 - a.* Back view, nat. size ; from Bracklesham Bay.
 - b.* Front view, ditto ; from Bramshaw.

4. *Pleurotoma rotella*. No. 223, *p.* 299.
 - a.* Back view, magnified ; from Highcliff.
 - b.* Side view, ditto.

5. *Pleurotoma cedilla*. No. 224, *p.* 300.
 - a* and *b.* Back views, magnified ; from Barton.

6. *Pleurotoma scalarata*. No. 219, *p.* 295.
 - a.* Back view, nat. size ; from Bramshaw.
 - b.* Side view, ditto.

7. *Pleurotoma granata*. No. 234, *p.* 308.
 - a.* Front view, nat. size ; from Highgate.
 - b.* Back view, ditto.
 - c.* Part of the body-whorl, magnified.

8. *Pleurotoma Hantoniensis*. No. 240, *p.* 315.
 - a.* Back view, shell of mid-growth, nat. size ; from Lyndhurst.
 - b.* Side view, ditto, ditto ; from Brockenhurst.
 - c.* Front view, adult shell, ditto.

Fig.

9. *Pleurotoma rotundata*. No. 233, *p.* 307.
 - a.* Front view, nat. size; from Highgate.
 - b.* Front view, ditto; from Potter's Bar.

10. *Pleurotoma parilis*. No. 235, *p.* 309.
 - a.* Side view, nat. size; from Highgate.
 - b.* Part of the body-whorl, magnified.
 - c.* Front view, nat. size.

11. *Pleurotoma variata*. No. 228, *p.* 303.

Front view, magnified; from Clarendon.

12. *Pleurotoma varians*. No. 217, *p.* 293.
 - a.* Side view of young shell, magnified; from Highcliff.
 - b.* Back view, adult shell, nat. size.

13. *Pleurotoma Lehonii*. No. 194, *p.* 271.
 - a.* Back view, nat. size; from Highgate (*Mus. Weth.*)
 - b.* Back view, magnified.

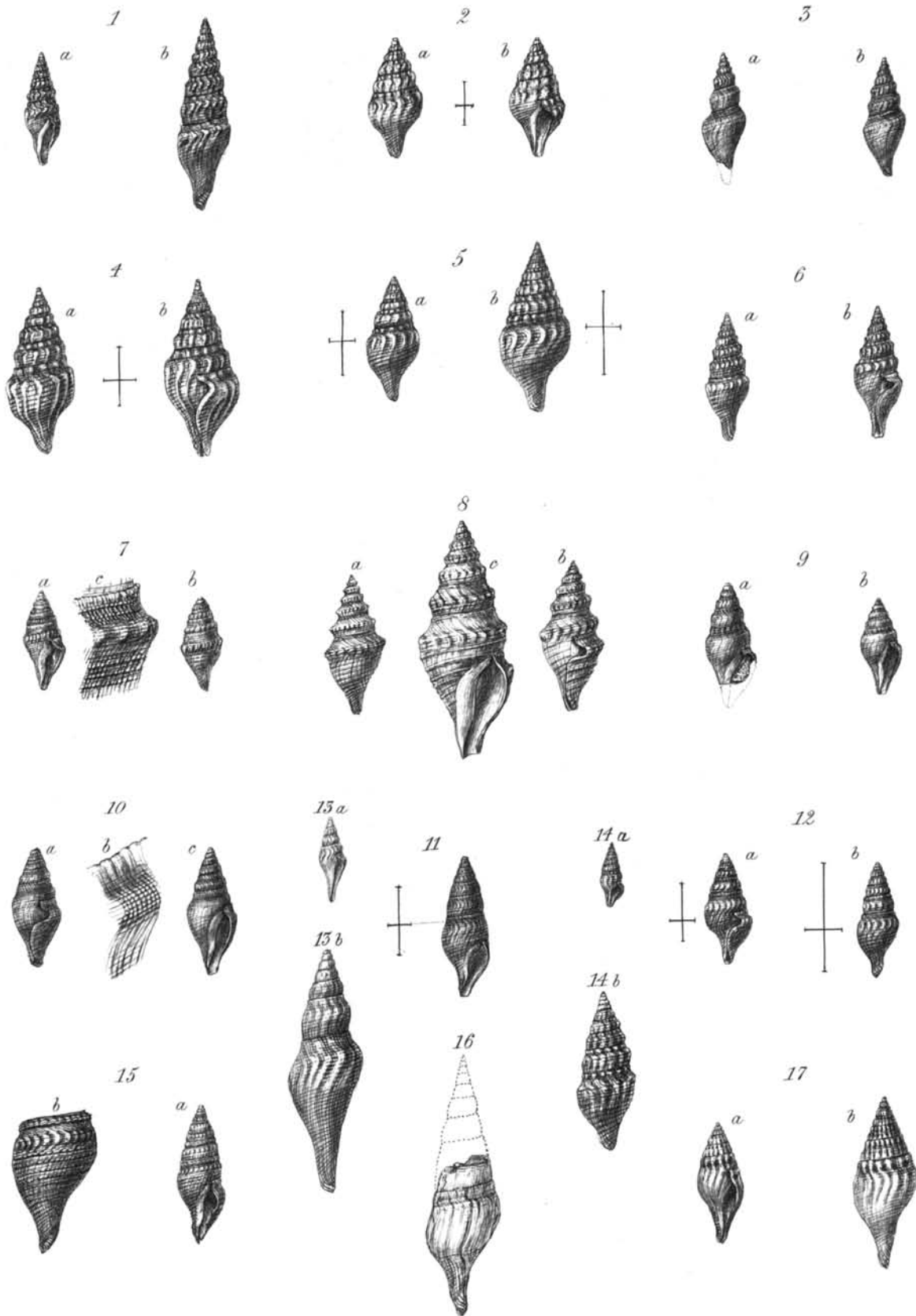
14. *Pleurotoma Fisheri*. No. 192, *p.* 269.
 - a.* Front view, nat. size; from Brook (New Forest).
 - b.* Back view, magnified.

15. *Pleurotoma puella*. No. 231, *p.* 305.
 - a.* Front view, nat. size; from Barton.
 - b.* Back view of the body-whorl, magnified.

16. *Pleurotoma zeta*. No. 209, *p.* 284.

Back view, nat. size; from Bracklesham Bay.

17. *Pleurotoma divisa*. No. 202, *p.* 278.
 - a.* Front view, shell of mid-growth, nat. size; from Bracklesham Bay.
 - b.* Back view, adult shell, ditto.



TAB. XXXII.

NOTE—*The lines indicate the actual dimensions of the specimens.*

Fig.

1. *Pleurotoma monerma*. No. 216, *p.* 292.
 - a.* Back view, young shell, nat. size ; from Highcliff.
 - b.* Side view, adult shell, ditto.
 - c.* Part of the body-whorl, magnified.

2. *Pleurotoma turbida*. No. 237, *p.* 311.
 - a.* Side view, adult shell, nat. size ; from Barton.
 - b.* Back view, shell of mid-growth, nat. size.
 - c.* Side view, ditto ditto ; from Highcliff.

3. *Pleurotoma lima*. No. 221, *p.* 296.
 - a.* Side view, shell of mid-growth, nat. size ; from Barton.
 - b* and *c.* Back views, adult shells ; ditto.

4. *Pleurotoma reticulosa*. No. 222, *p.* 298.
 - a.* Side view of young shell, nat. size ; from Barton.
 - b.* Back view, adult shells, ditto.

5. *Pleurotoma acutisinuata*. No. 232, *p.* 306.
 - a.* Side view, nat. size ; from Bracklesham Bay.
 - b.* Outer lip, showing the sinus, magnified.

6. *Pleurotoma zonulata*. No. 241, *p.* 317.
 - a.* Back view, magnified ; from Barton.
 - b.* Side view, ditto.

7. *Pleurotoma helicoides*. No. 244, *p.* 319.
 - a.* Side view of young shell, magnified ; from Barton.
 - b.* Ditto of adult shell, ditto.

8. *Pleurotoma flexuosa*. No. 226, *p.* 302.
 - a.* Front view, nat. size ; from Shinfield (*Mus. Prestw.*)
 - b.* Back view, ditto, from Clarendon.
 - c.* Front view of the body-whorl of fig. *a.*, magnified.

Fig.

9. *Pleurotoma læviuscula*. No. 236, *p.* 310.
 - a.* Back view, nat. size; from Brockenhurst.
 - b.* Ditto of the body-whorl, magnified.

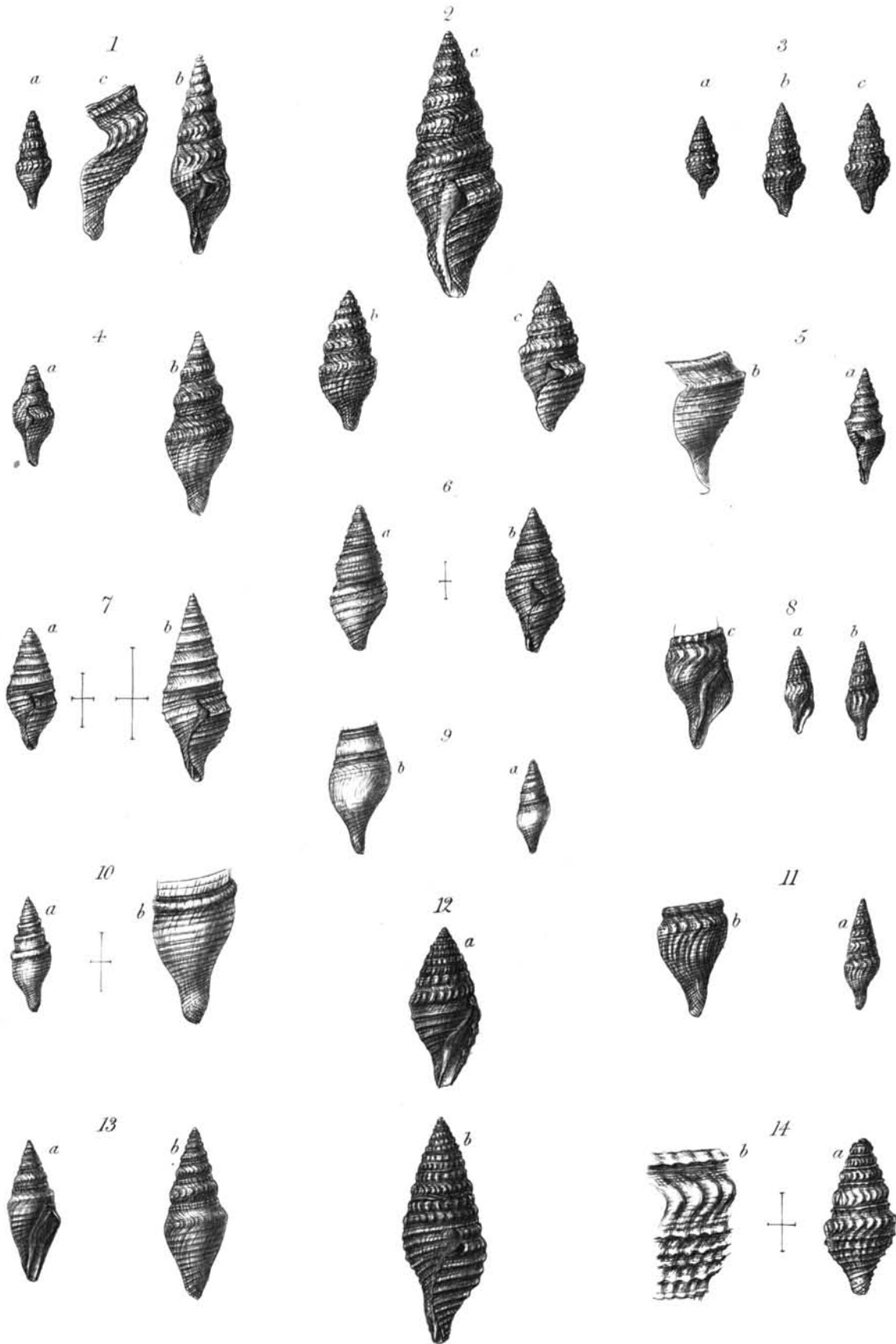
10. *Pleurotoma Woodii*. No. 229, *p.* 304.
 - a.* Back view, magnified; from Headon Hill.
 - b.* Ditto, of the body-whorl, magnified.

11. *Pleurotoma pupoides*. No. 227, *p.* 302
 - a.* Back view, nat. size; from Clarendon.
 - b.* Ditto of the body-whorl, magnified.

12. *Pleurotoma ligata*. No. 238, *p.* 313.
 - a.* Front view of shell of mid-growth, nat. size; from Bramshaw.
 - b.* Side view of adult shell, ditto.

13. *Pleurotoma hemileia*. No. 239, *p.* 314.
 - a.* Front view, nat. size; from Alum Bay (Strat. No, 29, Prestw.)
 - b.* Back view, ditto.

14. *Pleurotoma insignis*. No. 225, *p.* 301.
 - a.* Back view, magnified; from Alum Bay (Strat. No. 4, Prestw.)
 - b.* Part of the body-whorl, much magnified.



TAB. XXXIII.

NOTE.—*The lines indicate the actual dimensions of the specimens.*

Fig.

1. *Pleurotoma prisca*. No. 245, p. 320.
 - a. Side view of adult shell, nat. size ; from Barton.
 - b. Side view of young shell, ditto.
 - c. Front view of adult shell, nat. size ; from Bramshaw.
 - d. Front view ditto, ditto ; from Barton.
 - e. Side view of shell of mid-growth, ditto ; from Bracklesham Bay.

2. *Pleurotoma amphiconus*. No. 246, p. 322.
 - a. Side view of shell of mid-growth, nat. size ; from Bracklesham Bay.
 - b. Back view of adult shell, ditto.

3. *Pleurotoma semistriata*. No. 247, p. 323.
 - a. Back view, nat. size ; from Bramshaw.
 - b. Front view, ditto.

4. *Pleurotoma glabrata*. No. 248, p. 324.

Front view, nat. size ; from Bracklesham Bay.

5. *Pleurotoma conoides*. No. 242, p. 317.
 - a. Back view of adult shell, nat. size ; from Barton.
 - b. Side view of shell of mid-growth ; ditto.

6. *Pleurotoma cochlis*. No. 196, p. 272.

Back view of adult shell, nat. size ; from Shinfield (*Mus. Prestw.*)

7. *Pleurotoma biconus*. No. 243, p. 318.
 - a. Back view of adult shell, magnified ; from Highcliff.
 - b. Side view, ditto.

8. *Pleurotoma macrura*. No. 195, p. 271.
 - a. Back view of shell in the matrix, nat. size ; from Finchley.
 - b. Part of the body-whorl, magnified.

Fig.

9. *Pleurotoma Tallavignesii*. No. 193, *p.* 270.

a. Side view of young shell, magnified; from Nuneham.

b. Back view of adult shell, nat. size; from Southend (*Mus. Prestw.*)

10. *Metula juncea*.

a. Back view, nat. size; from Barton.

b. Side view, ditto.

c. Front view, ditto.

11. *Borsonia Biaritzana*. No. 249, *p.* 327.

a. Front view, nat. size; from Bramshaw.

b. Back view, ditto; from Bracklesham Bay.

The specimen represented by fig. 11, *b*, is that figured and described in Dixon's 'Geology, &c., of Sussex,' as *Fasciolaria biplicata*.

12. *Borsonia sulcata*. No. 250, *p.* 328.

a. Front view, magnified; from Colwell Bay.

b. Back view, ditto.

13. *Borsonia semicostata*. No. 251, *p.* 329.

a. Front view, magnified; from Barton.

b. Side view, ditto.

14. *Borsonia lineata*. No. 252, *p.* 330.

a. Front view, magnified; from Highcliff.

b. Side view, ditto.

