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may be found, on investigation, to be well-marked species. The various forms deserve a careful examination, and I would beg to direct the attention of British botanists to the subject.

Descriptions of New Genera and Species of Diatoms from the South Pacific. By R. K. GREVILLE, LL.D., F.R.S.E., &c.* (Plate I).

The diatoms described in the present communication were all obtained from dredgings made on various coasts in the South Pacific, and kindly placed in my hands by my obliging correspondent Dr Roberts of Sydney. Many other novelties, of equal interest, contained in these dredgings, will (D.V.) form the subject of future papers.

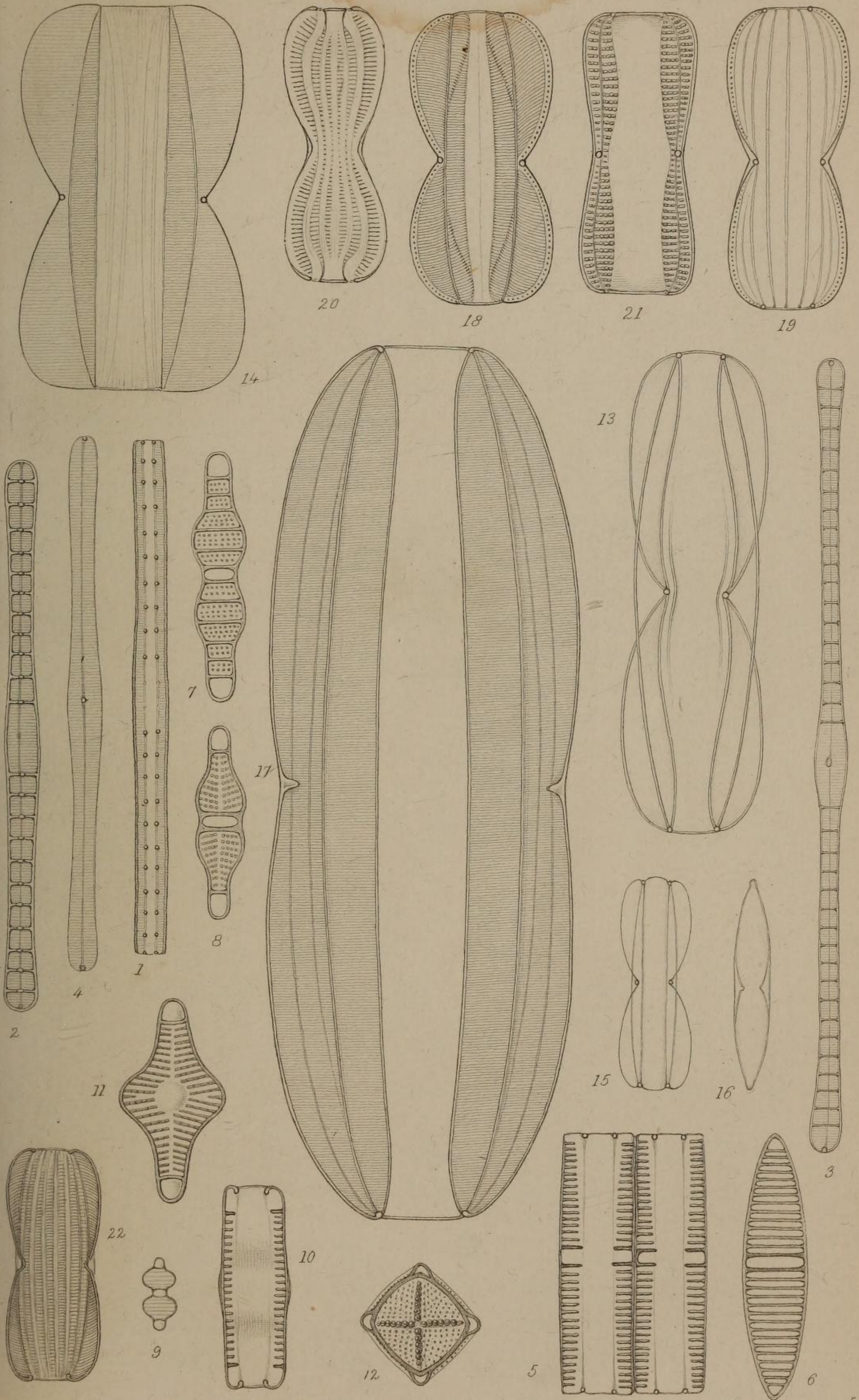
STICTODESMIS, nov. gen., Grev.

Frustules elongated (sessile?), in front view linear, rectangular, with two conspicuous rows of puncta disposed in pairs; side view linear, with terminal and central nodules, median line, and numerous transverse pervious septa.

It is difficult to indicate the systematic position of this curious diatom. The transverse septa, as shown in the lateral view, and very elongated form, are suggestive of some affinity with *Climacosphenia*: but from that genus and the other, *Licmophoræ*, it differs in the linearity of the frustules, and in the presence of nodules and a median line, as well as in the different nature of the septa themselves. With the *Fragillariæ* it might be compared in its pervious septa, conjoined with the similarity of both ends of the frustule; but *Stictodesmis* is not compressed in the lateral view; and here also the median line and nodule, and position of the septa, indicate a different structure and different relations. The genus, in fact, cannot be referred to any of the families as at present constituted.

Stictodesmis australis, n. sp., Grev.—(Pl. I. figs. 1-4).
Hab. Harvey Bay, Queensland, and at Port of France, New Caledonia; in dredgings communicated by Dr Roberts of Sydney.

* Read before the Botanical Society of Edinburgh, 14th May 1863.





Frustules much elongated, from $\cdot 0055''$ to $\cdot 0100''$, the breadth scarcely more than $\cdot 0004''$. Front view linear, rectangular, with two longitudinal rows of brilliant puncta in pairs, at some distance from the margin, the space between the rows and the margin very finely striated, while that between the rows forms a smooth, blank line. Lateral view linear, slightly dilated at the middle, and generally, also, more or less at the rounded ends, with a median line, and terminal and central nodules, the line being situated slightly nearer to one side than the other; transverse septa pervious, strong, subequidistant, numerous, upwards of twenty in the shorter frustules, nearly double that number in the longest; very fine transverse striæ also cover the whole space. Besides the above front and lateral views, the valve must be noticed separately, being distinguished by the median line and nodules and the fine striæ only, and is so thin and transparent that it is easily overlooked. The septa belong to an internal arrangement, being perceived in the front view to be placed at about a third of the entire breadth of the frustule from each side, or, in other words, from the valve. The puncta, which shine like brilliant points of light, are of course the sutural terminations of the septa viewed vertically. The shorter figures are from the Harvey Bay dredging, the long one from New California.

PLAGIOGRAMMA.

Plagiogramma costatum, n. sp., Grev.—Front view with nearly straight sides and sharp angles; valves lanceolate, with two central vittæ; striæ costate, pervious, 10 in $\cdot 001''$. Length about $\cdot 0030''$ (figs. 5, 6).

Hab. New Caledonia; in a dredging communicated by Dr Roberts.

This species is well distinguished by its clear costation and central pair of vittæ. It is by no means unfrequent in the dredging.

Plagiogramma spectabile, n. sp., Grev.—Valves constricted in the middle, then dilated and slightly lyriform; vittæ numerous (about twelve), with intermediate transverse lines of minute puncta. Length about $\cdot 0030''$. (fig. 7).

Hab. New Caledonia ; in a dredging communicated by Dr Roberts. Very rare.

Of this diatom I have only seen two examples ; but the characters are so remarkable, that there can be no doubt of its novelty as a species. The central constriction, it now appears, is not uncommon in this genus.

Plagiogramma constrictum, n. sp., Grev.—Valve constricted in the middle, then suddenly dilated and lyriform, with terminal and central vittæ ; striæ moniliform, interrupted, 11 in $\cdot 001''$. Length about $\cdot 0025''$ (fig. 8).

Hab. New Caledonia ; in a dredging communicated by Dr Roberts.

Allied to *P. lyratum*, but differing in the smaller size of the frustule, in the relatively much broader valve, more abrupt constriction, more approximated central vittæ, and much fewer striæ.

Plagiogramma Atomus, n. sp., Grev.—Very minute ; valve with terminal and central vittæ ; the intermediate spaces spherically dilated ; striæ few, pervious. Length, $\cdot 0005''$ (fig. 9).

Hab. Woodlark Island ; in a dredging communicated by Dr Roberts.

The smallest of the genus hitherto discovered, distinguished by the very deep constriction and spherical form of the dilated portions, each of which contains about half a dozen striæ.

OMPHALOPSIS, nov. gen., Grev.

Frustules united into a filament ; lateral view cruciform, with central nodule, terminal vittæ, and interrupted transverse striæ.

This genus is allied on the one hand to *Plagiogramma*, on the other to *Glyphodesmis*. From the former it differs in the absence of central vittæ ; from the latter, in the presence of terminal vittæ, as well as in difference of structure, the remarkable clathrate cellulation being wholly wanting. In the cruciform lateral view it resembles *Odontidium*, (?) *Harrisonii* of Smith, and *O. speciosum* of Brightwell (both placed by Ralfs in his genus *Dimere-*

gramma), but is far removed in structure by its vittæ and central nodule.

Omphalopsis australis, n. sp., Grev.—(Figs. 10, 11).

Hab. Woodlark Island ; in a dredging communicated by Dr Roberts. Not unfrequent.

Frustules varying considerably in size, but generally about $\cdot0022''$ in length, rectangular, the angles slightly rounded, and the striæ forming a very narrow marginal border; valve cruciform, about $\cdot0012''$ in breadth in the middle; nodule large, prominent, circular; striæ 11 in $\cdot001''$, strong, submoniliform, somewhat oblique, radiating in the centre, where a short one usually occurs at the outer margin, interrupted, leaving a narrow blank median space which terminates at the vittæ which cut off the rounded ends. At first sight, the large boss-like nodule and robust striæ convey an impression that the valve may belong to a species of *Glyphodesmis*, but, as already remarked, the terminal vittæ and different structure essentially separate it.

AMPHITETRAS.

Amphitetras parvula, n. sp., Grev.—Lateral view with the sides slightly convex, the angles rounded, containing a large pseudo-opening; centre marked by two cruciform lines of cellules which intersect each other in the middle and give off radiating lines of minute puncta. Breadth between the opposite angles $\cdot0015''$ (fig. 12).

Hab.—New Caledonia; in a dredging communicated by Dr Roberts. Very rare.

Frustule very small, quadrangular, the sides very slightly convex, the rounded angles being formed by the pseudo-openings which are very conspicuous, the true margin, continued on the inner side of the openings, strong and dark, outside of which the edge of the connecting zone appears constituting a secondary margin, which passes to the apices of the pseudo-openings. The internal space is equally divided by two lines crossing in the middle, composed of two contiguous rows of cellules, which are mostly visible in consequence of the shadow they produce, while from each side of these rows pass inclined lines of very minute puncta.

This exceedingly distinct little species is about the same size as *A. crucifera* of Kitton, and resembles it to a certain extent in the internal cruciform arrangement. But in the last-named species there are no pseudo-openings, the produced rounded angles being simply an extension of the internal surface. There is a difference also in the cruciform appearance, which in *A. crucifera* is produced by the position and larger size of puncta, similar to those which fill up the rest of the space, and which do not cause the line of shadow above mentioned. Although the form is exceedingly rare, I have seen and examined several specimens.

AMPHIPRORA.

Amphiprora eximia, n. sp., Grev.—Front view elongated, oblong, rounded at the ends, deeply constricted at the middle, one supplementary wing convex and widely overlapping the constriction, a second passing over the nodule where it is somewhat constricted, and within the nodule a short elevated longitudinal ridge. Length about $\cdot 0060''$ (fig. 13).

Hab.—Curteis Straits, Queensland; in a dredging communicated by Dr Roberts.

A singularly graceful species. Nothing can be more beautiful than the harmony of the various intersecting lines. As far as I can make them out, there are two supplementary wings, the largest very broad, arising at the terminal angles of the valve, and with a gentle curve overlapping the constriction so much as to bring the convexity of the supplementary wing almost into a line with the widest part of the frustule. The second supplementary wings (if they be truly wings) also arise from the same point, soon curve outwards, and then, becoming constricted at the nodule, have a somewhat lyrate appearance. Lastly, there is just within the nodule a little ridge (or abortive wing?) which is parallel to, and follows the curve of the second supplementary wing, and disappears at less than half way between the nodule and the ends. I have not been able to resolve the striæ.

Amphiprora lata, n. sp., Grev.—Front view very broad (breadth more than half the length), truncate at the ends,

with the corners very widely rounded, rather deeply and acutely constricted; supplementary wing narrow, convex, not reaching the constriction; central portion with faint lines or folds. Length about $\cdot 0040''$, breadth $\cdot 0028''$ (fig. 14).

Hab.—Curteis Straits, Queensland; in a dredging communicated by Dr Roberts.

It was not until I had seen a number of examples of this diatom that I began to regard it with any confidence. There can be no doubt that some of the *Amphiproræ* are liable to considerable variation; and the very broad, squat appearance of the frustules now before me made me suspect that they might turn out to be a variety of some large species. All the specimens, however, present precisely the same characters, and I am consequently prepared to offer it as a genuine species. From *A. maxima* of Gregory it differs not only in form, and in the much narrower supplementary wings, but very strikingly in the more truncated ends. The striæ are readily brought out.

Amphiprora delicatula, n. sp., Grev.—Minute, hyaline; front view oblong, with rotundato-truncate ends and deep lateral constriction; supplementary wing very narrow, slightly overlapping the nodule; lateral view lanceolate, the apices slightly produced and minutely truncate. Length about $\cdot 0025''$ (figs. 15, 16).

Hab.—Woodlark Island; in a dredging communicated by Dr Roberts. Not uncommon.

A most delicate and graceful species, easily overlooked on account of its small size and hyaline character. I have been unable to make out the striæ.

Amphiprora? superba, n. sp., Grev.—Very large; front view elongated oblong, slightly constricted, widest part about half way between the ends and middle, each extremity gradually converging to the angle of the connecting zone, which is truncate; supplementary wings rather broad, linear, directed inwards with two longitudinal lines between them and the margin. Length $\cdot 0108''$ (fig. 17).

Hab.—New Caledonia; in a dredging communicated by Dr Roberts. Extremely rare.

This fine diatom may perhaps be regarded as belonging

doubtfully to the present genus. In some respects it is not unlike a gigantic *Amphora*; but the position of the nodules, and the apparent existence of what I have called supplementary wings, are opposed to its being referred to that genus. There are, however, some very aberrant forms discovered by my friend the late Professor Gregory, and several more recently observed by myself, which render the generic discrimination of *Amphiprora*, in the absence of the valvular view, somewhat difficult. The panduriform outline in some instances disappears altogether, the constriction is occasionally scarcely perceptible, and the wing inconspicuous. The striæ in the present diatom are transverse, 27 in $\cdot 001''$, and sufficiently evident.

Amphiprora nitida, n. sp., Grev.—Small; front view panduriform, broadly rotundato-truncate at the ends, rather deeply and sharply constricted, margin with a row of minute puncta; supplementary wings linear, forming a nearly straight line, which passes within the constriction; another ridge-like line converging towards the middle at each end. Striæ conspicuous. Length from $\cdot 0020''$ to $\cdot 0035''$ (fig. 18).

Hab.—Curteis Straits, Queensland; in a dredging communicated by Dr Roberts.

A beautiful and apparently very distinct small species, characterised at once by the lines of the supplementary wings and the superficial ridges. The supplementary wing is linear, passing on each side from end to end in a very slight curve just within the nodules. At the ends it turns almost at a right angle to join the middle portion, and thus a sort of parallelogram is produced, which, when focussed for itself, is very striking. Another very characteristic line seems to be caused by an elevated ridge, commencing on each side at the angle of the middle portion or connecting zone, curves outwards until it reaches the margin of the supplementary wing, which it then follows for about a third of its length, when it leaves it and curves in a similar way towards the middle portion at the opposite end. The surface is thus much undulated, as is shown by the different directions taken by the striæ.

Amphiprora lineata, n. sp., Grev.—Front view oblong,

broadly rounded at the ends, and moderately constricted at the middle, with a marginal row of very minute puncta; surface marked with straight longitudinal lines or folds (about seven); striation obscure. Length about $\cdot 0038''$ (fig. 19).

Hab.—Woodlark Island; in a dredging communicated by Dr Roberts. Rare.

In this species we find no distinct trace of supplementary wings, but in their place a few equidistant longitudinal lines or folds, which cannot be prominent as they cast very little shadow.

Amphiprora? Clepsydra, n. sp., Grev.—Front view oblong, rotundato-truncate at the ends, much, but not sharply constricted at the middle; striæ coarse, forming a narrow intramarginal band, and two inner ones still narrower, the two outermost following the curve of the margin, and converging at the ends. Length $\cdot 0034''$ (fig. 20).

Hab.—Curteis Straits, Queensland; in a dredging communicated by Dr Roberts. Very rare.

Here, again, we have a diatom very different indeed from what has been regarded as typical of *Amphiprora*. It will be perceived that the system of striation is quite unlike, the outer band being distinctly radiate. The inner bands may be regarded as supplementary wings. The constriction is not sharp, as in most of the preceding species, but rather deeply concave.

Amphiprora? paradoxa, n. sp., Grev.—Front view quadrangular, with truncated ends, and rounded corners very slightly and gradually constricted at the middle; supplementary wings broader than the primary ones, and also constricted opposite the nodule; striæ robust, moniliform, 10 in $\cdot 001''$. Length $\cdot 0035''$ (fig. 21).

Hab.—Curteis Straits, Queensland; in a dredging communicated by Dr Roberts.

In the robust and distinctly moniliform striæ of this diatom we have another deviation from the ordinary structure of *Amphiprora*, so strongly marked as to render it evident, that although it may be convenient in the meantime to refer some of these forms to that genus, a re-arrangement will soon become necessary. The possession of the

valve might serve to show more exactly their relations ; but the probability of obtaining a side view of the frustule is so remote, that I prefer giving figures of these interesting objects at once, to laying them aside for an indefinite period. It only requires to be understood that their position in the genus is provisional. There is no reason why the same latitude should not be allowed in the publication of Diatoms as in that of other plants ; and especially of other algæ. For example, while engaged in the description of these *Amphiproræ*, the 49th Part of my friend Professor Harvey's admirable "Phycologia Australica" has appeared, in which, under *Cryptonemia decipiens*, he remarks, "In now referring it to *Cryptonemia*, I must be understood to do so provisionally, until the discovery of its fruit enable us to assign it its proper place in the system." This is a most reasonable privilege. It may be observed, with regard to the frustules now before me, that there is all the appearance of a distinct wing, which becomes narrower as it approaches the constriction, as in the known *Amphiproræ*.

Amphiproræ? undulata, n. sp., Grev.—Small ; front view quadrangular, with rounded angles, and nearly straight sides, and a slight, somewhat notch-like constriction ; surface rather coarsely striated, and undulated with longitudinal ridges, the two principal ones curving outwards, and passing just within the constriction. Length about '0030" (fig. 22).

Hab.—Curteis Straits ; in a dredging communicated by Dr Roberts.

This species is as rectangular in its outline as *A. pusilla* of Gregory. The two outer prominent ridges or folds evidently occupy the place of supplementary wings, while the inner ones are merely undulations, sufficiently decided, however, to throw the striæ which cross them out of focus. I have examined a number of examples, but have not succeeded in finding a valve. The latter would no doubt assist in determining the genus in the case of aberrant forms ; but I apprehend that in most instances the specific character will be best obtained from the front view.

DESCRIPTION OF PLATE I.

Fig. 1.	<i>Stictodesmis australis</i> ,	.	front view.
2. & 3.	„	„	side view.
4.	„	„	valve.
5.	<i>Plagiogramma costatum</i> ,		front view.
6.	„	„	side view.
7.	„	<i>spectabile</i> ,	side view.
8.	„	<i>constrictum</i> ,	side view.
9.	„	<i>Atomus</i> ,	side view.
10.	<i>Omphalopsis australis</i> ,		front view.
11.	„	„	side view.
12.	<i>Amphiteras parvula</i> ,	.	side view.
13.	<i>Amphiprora eximia</i> ,	.	front view.
14.	„	<i>lata</i> ,	front view.
15.	„	<i>delicatula</i> ,	front view.
16.	„	„	side view.
17.	„	? <i>superba</i> ,	front view.
18.	„	<i>nitida</i> ,	front view.
19.	„	<i>lineata</i> ,	front view.
20.	„	? <i>Clepsydra</i> ,	front view.
21.	„	? <i>paradoxa</i> ,	front view.
22.	„	? <i>undulata</i> ,	front view.

All the figures are $\times 400$ diameters.

On the question, Is Oxide of Arsenic, long used in a very small quantity, injurious to Man? By JOHN DAVY, M.D., F.R.SS. Lond. & Edin.*

The facts which led me to propose the above question were the following:—In Cumberland, within a stone's cast of the Coast's Railway, between Whitehaven and Broughton, is the little church of the parish of Whitbeck, and also the farm-house of Whitbeck-head,—names these derived from the small mountain stream which descends from Black Comb, and so rapidly as to be an almost white line of foam. The hamlet, situated at the foot of the hill, consists of the farm-house just mentioned, and of five cottages, each occupied by a family dependent for water on the rivulet, "the Beck," their inmates using no other. The same water is drunk by the cattle of the farm, and by the poultry, fowls, geese, and ducks; and, as regards all, with one excep-

* Read at the Meeting of the British Association in 1862.