

DIMENSIONS.		inches. lines.	
Diameter of orbit .....		1	2
Length of ventral fins.....		4	6
———— pectorals.....		3	0
———— caudal .....		3	0
Height of anal .....		3	3
———— dorsal, measured directly .....		2	7
———— dorsal, measured along the rays .....		4	6
———— body between fore-part of dorsal and anus .....		10	2
———— fish including anal and dorsal .....		14	2

[To be continued.]

IX.—*Observations on the genera Zygnema, Tyndaridea, and Mougeotia, with descriptions of new Species.* By ARTHUR HILL HASSALL, Esq., M.R.C.S.L., Corresponding Member of the Dublin Natural History Society.

It is the general belief of Cryptogamic physiologists that union of the filaments of the different species composing the genera *Zygnema*, *Tyndaridea*, and *Mougeotia* is indispensable to the production of fertile spores. This belief I consider to be erroneous so far as the genus *Zygnema* is concerned, as I think that I have the means of satisfactorily proving. In three species of *Zygnema* which I have recently met with, and which I have named *Zygnema quadratum*, *Z. intermedium* and *Z. angulatum*, the filaments do not unite, and yet all equally produce spores, only two of which, however, it is remarkable to observe, are placed in contiguous cells, and on one side of each of these a cell void of contents is invariably situated, a channel of communication being set up between every two cells, that is, between an empty one, and that which contains a seed, by means of a hollow process, situated at the point of junction of the cells, through which the contents of one cell passes into and mingles with those of the other\*.

From a consideration of the structure of these species, the accuracy of which cannot be doubted, it is evident that conjugation is not essential to the production of spores, and therefore, that the supposition entertained by some that the entire of one filament contains fertilizing matter, and the other that which is to be fertilized, is erroneous; while it is apparent from the disposition of the spores, not more than two being juxtaposed, and of empty cells, that each filament includes both forms of reproductive matter so disposed as to lie in adjacent cells.

Should future observation disclose the fact, that this alter-

\* A species of *Mougeotia*. *M. notabilis* likewise produces spores without conjugation of the filaments.—A. H. H.



nate disposition of spores and empty cells does not invariably prevail, this will not affect the truth of the statement that spores are sometimes formed without union of the filaments, for that is incontestably proved by reference to the species of *Zygnemata* spoken of above; nor does it disprove the theory of the formation of spores by the mingling of the contents of two adjacent cells, the one of which is provided with fertilizing matter, the other with that which is to be fertilized; for in the supposed instances of departure from the arrangement referred to, it might be fairly inferred that those spores not in communication with an empty cell would not be fertile. It must be borne in mind, likewise, that the material contained in the spiral tubes previous to its passage from one cell to the other, contracts itself into a little mass not usually of a regular form, but which might assume the appearance of a spore without possessing the fertile properties of one. This must be discriminated from the true spore.

The formation of spores without union of the filaments is not confined to these three species, but occasionally happens with some other species of the genus, more especially with what is to be regarded as a variety or condition of *Zygnema porticale* (*Z. quininum* of Agardh). In this the same disposition of spores and empty cells is remarked, but there is no direct channel of communication between the cells, the coalition of the contents of which being brought about by the rupture of the partitions which separate them, when these do not give way, the cells swell up and assume a remarkable moniliform appearance not peculiar to the species, but occurring in several others where union is prevented by any cause. It is curious to notice also that many of the cells throw out irregular and blind processes, thus evincing a strong tendency towards union with the cells of other filaments, which union would appear to have been frustrated by the operation of some unexplained cause; perhaps the motion of the water in which the species was growing.

In a species of *Zygnema* which I have named *Z. polymorphum*, the spores are likewise formed in some of the filaments without union, but somewhat differently from the manner in which this is brought about in the species hitherto spoken of. In this there is no alternate arrangement of spores and empty cells, a spore being placed in every cell; but these cells it is to be observed are twice as long as those which contain spores formed in the usual way by the union of the cells of different filaments; so that each spore contained in these elongated cells is constituted of the same quantity of material as the regularly formed spores, but that the elongated cells at the period of the formation of



the spores in them had still to undergo a further and final division. It would be an interesting, but not an easy task, to determine whether spores formed in this manner are productive or not.

The length of the cells is very variable, not only in the species of this genus, but in all *Confervæ*, both marine and freshwater, simple and branched, this being the necessary result of their principal mode of development, viz. by the continued growth and subdivision of the cells composing them\*. Such is the extent of this variation in the length of the cells, that some are twice as long as others in the same filament with every intermediate shade of length. Uncertain as is the length of the cells during the growth of any species of *Conferva*, yet this will be found to be pretty uniform when the growth has ceased, and the state of conjugation commenced; and when in the following descriptions mention is made of the length of the cells, it is to be understood that the reference relates to their length in that state, unless when otherwise indicated.

#### Genus ZYGNEMA.

- \* Conjugation parallel; spores oval, and contained within the cells of one or other filament.

*Zygnema maximum.* Filaments highly mucous, and of a light green colour, their diameter and length being very considerable; cells when in a state of conjugation a little longer than broad, prior to which however they are frequently not half so long as broad: winding round the interior of these are about eight spiral tubes filled with granular matter, the granules being small.

This is the finest and largest of all the *Zygnemata* hitherto described, the diameter of the filaments greatly exceeding those of *Zygnema nitidum*, *Conjugata princeps* of Vaucher. I have met with it several times, and have found it in considerable quantities in two localities in a pond on Nazing Common, Essex, and in a slow stream near Enfield Highway. There is no *Conferva* known to me with which it can possibly be confounded. When kept in a small vessel of water, it, like the following species, passes into decay in a few hours.

*Zygnema bellis.* Filaments about a foot in length, with truncate extremities, of considerable diameter, mucous, glossy, and of a deep and beautiful green colour; investing membrane of the cells very evident and transparent; in some filaments, five or six lax spiral tubes may be faintly dis-

\* See Annals for July 1842, upon the subject of the growth of *Confervæ*.



cerned winding round the interior of the cells : these contain the reproductive globules, which are large and distinct, with a dark central nucleus ; cells in the young filaments scarcely so long as broad, but rather longer than broad in those which have conjugated. Seeds oval, sometimes almost circular, lying in inflated cells, the cavity of which they do not fill.

This well-marked species has occurred to me in several localities in the vicinity of Cheshunt, in one of which, viz. in two sheltered ponds, communicating with each other by a narrow channel, opposite to Sir Henry Meux's house, it is very abundant—not floating upon the surface, but diffusing itself through the water, to which it imparts a rich emerald green colour. The diameter of the filaments is little less considerable than that of *Z. nitidum*, whose equal, if not superior in beauty, this fine species may be fairly considered.

*Zygnema quadrispirale*? Filaments of somewhat less diameter than those of *Zygnema nitidum* ; cells from three to five times as long as broad ; winding round the interior of these are spiral tubes, usually four in number.

*Zygnema neglectum*. Filaments of considerable diameter and length ; cells rather longer than broad, lining the interior of which are spiral tubes, usually three in number, which in the young filaments perform collectively within each cell about six revolutions, but in the more aged filaments a smaller number. Spores occasioning no inflation of the cells.

I should have but little hesitation in referring this species to the *Conjugata adnata* of Vaucher ; but abundant as it is, and frequently as I have observed it, I have never met with it attached to any object, but invariably free and floating, sometimes unmixed with any other species, but more frequently entangled among the filaments of *Z. nitidum* and *Z. quininum*. It is for this reason therefore that I hesitate to regard it as identical with that species. The filaments are intermediate in diameter between that of *Zygnema nitidum* and *Z. decimium*, to both of which it bears outwardly some resemblance. The number of spiral tubes varies, but is usually three ; while in *Zygnema nitidum* the prevailing number is four, and in *Z. decimium* but two.

Abundant in the neighbourhood of Cheshunt.

*Zygnema pellucidum*. Filaments of more considerable diameter than those of *Zygnema rivulare* ; cells usually seven or eight times as long as broad, never less than five, and frequently as many as ten times : four faint spires scarcely at all visi-



ble in the more aged filaments wind round the interior of each cell.

I suspect that the mode of conjugation of this species is angular, resembling that of *Zygnema curvatum*; but I am not certain that it is so.

In a pond in Mr. Yorke's brick-field near Cheshunt.

*Zygnema rivulare*. Filaments seven or eight inches in length, usually attached; cells varying in length from eight to four times their breadth, being at the period of conjugation nearly four times as long as broad: three spiral tubes wind round the interior of each cell, performing in those cells whose length exceeds the diameter by eight times from sixteen to twenty revolutions, and in those half as long as the preceding half as many revolutions.

The above is an exceedingly well-marked, and in this vicinity abundant species, and I am surprised that it has not before been described. It is most frequently attached either to stones or wood in the New Barge and Lea rivers, but it is occasionally found mixed up with other floating species in still water. The filaments nearly equal in diameter those of *Zygnema decimum*, from which however it is readily distinguished by the greater length of its cells, and the presence of three closely coiled spiral tubes: sometimes however there are but two spirals, and then the resemblance to *Zygnema decimum* is much greater.

*Zygnema Grevilleanum*. Filaments about equal in diameter to those of *Zygnema rivulare*, round the interior of the cells, which are generally about eight times as long as broad, but frequently much longer; two lax spiral tubes are disposed so as to cross each other and describe in each cell three or four oval spaces.

To this species, probably the most elegant of the genus, I have taken the liberty of assigning the name of Dr. Greville, author of the excellent '*Algæ Britannicæ*,' as a slight mark of personal respect, as well as an acknowledgement of the eminent services rendered by that gentleman to natural history.

*Zygnema subventricosum*. Diameter of the filaments about equal to that of *Z. commune*; cells at the period of conjugation about six times as long as broad, but prior to that time frequently much longer: within the interior of each cell a single spiral tube performs five or six revolutions, and at the situation of the joints two short semicircular lines are to be noticed: spores large, occasioning the cells in which they are placed to assume a ventricose form.



This species is to be distinguished from *Zygnema commune* by its longer and ventricose cells, and by the presence of the curved lines at the joints, which are however met with in other species besides this.

In a small lake belonging to Mr. Bridgman near Cheshunt, and at other places.

*Zygnema æquale.* Filaments of less diameter than those of *Zygnema subventricosum*; cells usually eight times as long as broad, containing about six turns of a single spiral tube; spores oval, contained within the cells, the inflation of which they never occasion.

I have given this species, which cannot be confounded with any of the others described in this paper, the specific denomination of *æquale*, on account of the evenness of the filaments, which when they contain the spores never exhibit the smallest trace of inflation, and the uniform length of the connecting tubes.

Neighbourhood of Cheshunt.

*Zygnema commune.* Cells about three times as long as broad, in the interior of each of which a single spiral tube performs about two and a half revolutions; spores not producing any inflation of the cells in which they are placed.

This species has occurred to me in the neighbourhood of Cheshunt, and in ponds at the back of the Norland estate, Notting Hill.

*Zygnema catenæforme.* Cells rather more than twice as long as broad, each containing about two revolutions of a single spiral tube; spores largely inflating the cells in which they are contained.

It is scarcely possible to distinguish the filaments of this species from those of *Z. commune* before conjugation: after this has occurred, the difference in the length of the cells and the form of these is so obvious as to leave but little doubt of its being distinct from that species. If a condition of any, however, it is of *Z. commune*.

Mr. Bridgman's pond, Cheshunt.

*Zygnema malformatum.* Cells about twice as long, in each of which a single spiral tube performs usually two revolutions: spores lying obliquely in the cells, which are a good deal distorted for their accommodation.

I should hesitate to regard this as distinct from *Z. commune*, but that it has occurred to me in considerable abundance, unmixed with any filaments which I could decidedly refer to that species.

Cheshunt.



*Zygnema brevissimum.* Cells scarcely so long as broad : a single spiral tube performs one turn and a half within each cell ; spores usually oval, but occasionally almost circular, their long diameter being placed transversely in the cells.

This species comes very near to the *Conjugata condensata* of Vaucher, who however represents the spores as being in that species always of a perfectly circular form. Those cells, which have not conjugated from some cause or other, frequently swell up and assume a beaded form.

Vicinity of Cheshunt.

*Zygnema polymorphum.* Filaments of less diameter than in any of the preceding species ; cells at the period of conjugation about three times as long as broad : a single spiral tube performs three or three and a half turns within each cell ; spores not occasioning any inflation of the cells.

The above is the description of the species in its regular form, from which, however, some of the filaments differ considerably. Thus, in some, many of the cells which have not conjugated are observed to have become inflated, and to present a very characteristic appearance ; in others, in which the cells are six times as long as broad, and which have not conjugated, spores completely formed, but of a very elongated shape, are placed one within each cell, the inflation of which these spores have not as yet occasioned : in a third set, which likewise have not conjugated, the spores have become perfectly formed, are much shorter, and now have produced considerable enlargement of that part of the cells in which they lie ; and lastly, in other filaments there is a regular alternate disposition of spores and empty cells.

This species comes very near to the *Conjugata inflata* of Vaucher, in which, however, the spores are represented as lying in inflated cells, which they do not in the species just described.

Vicinity of Cheshunt.

*Zygnema elongatum.* Diameter of the filaments rather less than in the preceding species ; cells very many times as long as broad, down the interior of which a single tube passes in a waved manner : at the situation of the joints, the apparatus for the division of the threads, appearing like two curved knife-blades, is situated.

This is one of Vaucher's species, and a very abundant one it is. It is mentioned by Mr. Dillwyn in his 'Synopsis,' but has been excluded from Harvey's 'Manual : ' the grounds of this exclusion I am not acquainted with. It is to be distinguished from *Z. tenuissimum*, on the one hand, by its longer joints, laxness of the spiral tube, and greater diameter of the



filaments; and from *Z. subventricosum*, on the other, by the less considerable diameter of its filaments, as well as by other characters.

New River Reservoir, Cheshunt.

*Zygnema parvum*. Filaments very slender; cells rather more than four times as long as broad, each containing about two turns of a single spiral tube; spores generally producing a slight inflation of the cells.

The filaments of this species are nearly as slender as those of *Z. tenuissimum*, from which it may be distinguished by its much shorter joints.

Vicinity of Cheshunt.

*Zygnema tenuissimum*. Filaments extremely slender; cells about nine times as long as broad, each containing five or six revolutions of a single spiral tube; spores producing a slight inflation of the cells.

This species is to be distinguished from all others of the genus which I have met with by the minuteness of its filaments.

Vicinity of Cheshunt.

\*\* Seeds produced without conjugation.

*Zygnema quadratum*. Filaments at first cylindrical; cells about nine times as long as broad, each containing from six to seven revolutions of a single spiral tube; spores oval, large, and much elongated, contained within quadrangular enlargements of the cells; tube of communication arising from the point of junction of two cells.

I find this remarkable species very abundantly in ponds on Cheshunt Common.

*Zygnema intermedium*. Filaments nearly equal in diameter to those of *Zygnema quadratum*; cells about five times as long as broad, round the interior of which a single spiral tube performs about four revolutions; spores oval, smaller than those of the preceding species, and not contained in quadrangular enlargements of the cells, but still producing a slight inflation of them: tube of communication placed at the junction of two cells in the same filament.

I have no doubt of this being specifically distinct from the preceding. It occurred abundantly to me at High Beech, Epping Forest, and I have since met with it in other localities.

*Zygnema angulatum*. Filaments at first straight, but at the period of reproduction becoming angulated, the angles being situated at the passage of communication set up by means



of a hollow process between almost every pair of cells in the same filaments ; spores oval.

I met with sufficient of this species in the vicinity of High Beech to enable me to preserve several specimens of it.

#### GENUS TYNDARIDEA.

It has been surmised of the two little bodies into which the sporular mass in each of the cells of the species of this genus is invariably divided, that the one consists of fertilizable matter, and the other of that which is to be fertilized ; and this supposition is in a measure supported by the circumstance of a channel of communication frequently existing between them, but it is opposed by the fact that these little masses are continually undergoing division and separation according to the growth of the filaments ; so that each furnishes the material for two others from time to time, which themselves again undergo division. These sporular masses present a different form in each species, and are thereby doubtless designed to assist man in his endeavours to discover the differences between these minute productions ; they are, in fact, to be regarded as so many seals placed upon them by their Divine Creator, by means of which they may be frequently distinguished from each other.

*Tyndaridea gracilis* of Vaucher ? Filaments nearly equal in diameter to those of *Tyndaridea stagnicola* ; cells four times as long as broad, sometimes five times, at first filled with sporaceous matter as in the species of the genus *Mougeotia*, which subsequently contracts into two rarely perfectly divided roundish masses.

It is most probable that the above species is the *Conjugata gracilis* of Vaucher, but this cannot be ascertained with certainty without seeing it in a state of reproduction. The filaments may however be readily recognised by the above description.

*Tyndaridea stagnicola*. Filaments slender ; cells about two and a half times as long as broad ; sporular masses somewhat cruciform ; spores circular, contained within the cells, the diameter of which they entirely fill, as well as a portion of the connecting tube.

I cannot identify the above species with any described by Vaucher or Agardh. The filaments are more slender than those of *Tyndaridea bicornis*, but the species is to be distinguished from all others with which I am acquainted by the circumstance of the seeds passing a little way into the connecting tubes.

Abundant on Hertford Heath.



*Tyndaridea quadriformis.* Filaments more slender than those of *T. interposita*; cells rather better than four times as long as broad; endochrome divided into two quadriform masses.

The cells are longer than those of *T. interposita*.  
In ponds near Notting Hill.

*Tyndaridea interposita.* Filaments of less diameter than those of *Tyndaridea bicornis*; cells usually three or three and a half times as long as broad; spores circular, lodged within the cells; endochrome somewhat quadriform.

*Tyndaridea interposita* is to be distinguished on the one side from *Tyndaridea quadriformis* by the greater diameter of its filaments, but somewhat shorter cells; and from *Tyndaridea bicornis* on the other, in having longer cells, but somewhat finer filaments.

*Tyndaridea bicornis.* Filaments of more considerable diameter than those of *T. quadriformis*; cells usually better than twice as long as broad, but sometimes longer and sometimes shorter than this; endochrome consisting of two distinct masses united to each other by a lengthened tube of communication, and emitting a kind of ray or prolongation from each angle of their distal extremities: spores circular contained within the cells.

I have a suspicion that this is the species which is usually taken for the *Tyndaridea cruciata* of Vaucher, which has however filaments of more considerable diameter and rather shorter joints. It is by no means an uncommon species, but I have only met with it in a state of conjugation in the Diana pond, Bushey Park.

*Tyndaridea abbreviata.* Filaments of rather greater diameter than those of *Tyndaridea stagnicola*; cells usually a little longer than broad, but sometimes not so long; endochrome divided into two little masses, which, when magnified, resemble trees in miniature; these are connected by means of a transverse process, which may be compared to the trunks of the trees: spores circular, contained within the cells.

This species approaches somewhat near to *Tyndaridea stagnicola*, from which, however, I am satisfied that it is distinct, having had the opportunity of comparing the two species in specimens in which the spores were perfect in both. From *T. stagnicola* it is to be distinguished by the somewhat greater diameter of the filaments, and by the shortness of the cells, the spores appearing frequently to be in contact, so close are



they in this, while in *T. stagnicola* there is a distinct interval between them equalling that of the diameter of the spores themselves.

#### Genus MOUGEOTIA.

*Filaments* articulated, simple, at length generally united in pairs, either with or without the intervention of transverse tubes, and either angularly or parallelly. *Endochrome* at first filling the cells, but subsequently contracting into longitudinal or slightly spiral lines. *Spores* round, situated either in the cells or in the transverse tubes.

The genus *Mougeotia*, as above defined, appears to be a very natural one. The angular conjugation of the filaments is usually regarded as the most important characteristic of the genus. It is not so, however; for we have angular union of the filaments in an undoubted species of *Zygnema*, *Z. curvatum*. The character of most importance to notice is the circumstance of the cells being at first filled with granular matter, which subsequently generally contracts into longitudinal or slightly spiral lines.

*Mougeotia major*. Filaments of more considerable diameter than those of *Mougeotia genuflexa*; cells usually five or six times as long as broad; conjugation angular, and without the intervention of tubes.

This species approaches very closely to *Mougeotia genuflexa*, but differs from that species in the much greater diameter of the filaments and shortness of the cells.

In ponds in brick-fields near Notting Hill.

*Mougeotia glutinosa*. Filaments of rather less diameter than those of *M. genuflexa*, conjugating angularly; cells six or seven times as long as broad, those being the longest which have conjugated, at first filled with sporaceous matter, which frequently contracts into longitudinal lines: sporidium quadrangular, lodged between the filaments, which do not enter into its formation; spores when perfect somewhat oval.

This is a very distinct and fine species, occurring abundantly in boggy ponds on Hertford Heath. Not unfrequently a number of contiguous parts of cells unite, forming arched loops or links, separated from each other by the square ovium, which is the chief characteristic of the species.

*Mougeotia transversalis*. Filaments more slender than those of the preceding species, conjugating angularly; cells about six times as long as broad, united by transverse tubes.

This is by no means an uncommon species, although it is



rarely met with in a state of conjugation: there is no other species of the genus with which it can be confounded.

Pond in the parish of Enfield.

*Mougeotia reticulata*. Filaments nearly as slender as those of *Vesiculifera bombycina*, conjugating angularly; cells about six times as long as broad, united by transverse tubes of remarkable length.

Frequently a number of pairs of cells will unite in the same filament, as in *Mougeotia glutinosa* and *M. cærulescens*; these however are not as in them contiguous pairs, but alternate, so that four or five filaments are sometimes united with each other by means of those alternate cells, which have not conjugated in the pair of filaments which were the first to become united.

*Mougeotia alpina*. On a careful examination of a specimen of this interesting Conferva, kindly forwarded to me by Dr. Greville, I came to the conclusion that it ought to be regarded as a member of the family of *Conjugatæ*, and that the conjugation was most probably angular. On informing Dr. Greville of my opinion, that gentleman wrote me word, that Mr. Shuttleworth, who had examined some of his specimens, had arrived at the same conclusion, and considered it to be identical with the *Seda capucina* of Bory, *Mougeotia capucina* of Agardh. This led me to compare specimens of both species, which I was enabled to do through the kindness and liberality of Dr. Greville, who has placed in my hands the whole of his valuable collection of *Confervæ*; and the result of this comparison is, that I feel assured of the distinctness of the two species, the cells being in *Mougeotia capucina* many times longer than those of *M. alpina*. Outwardly the resemblance between the two species is very striking—the texture and colour being nearly the same in both, although the purple is somewhat richer in *Mougeotia capucina*\*.

*Mougeotia scalaris*. Filaments about equal in diameter to those of *Mougeotia genuflexa*, conjugating parallelly; cells about four times as long as broad; spores oval, lodged in the transverse tubes by which each pair of cells is united.

That this species is really to be regarded as a *Mougeotia*, notwithstanding its parallel conjugation, there cannot be the slightest doubt, from the circumstance of the sporular matter at first filling the entire cavity of the cells, and subsequently sometimes contracting into longitudinal lines, as in the other

\* Sir William Hooker has likewise with great liberality permitted me to make use of his collection of *Confervæ*, so rich in authentic species.



species of the genus *Mougeotia*. In no case is there ever any trace of division in the contents of the cells, nor are the spores ever circular : to both these points I particularly attended.

Pond in the parish of Enfield, also near Notting Hill.

*Mougeotia distans*. Diameter of the filaments about equal to that of *Mougeotia genuflexa*, extremities pointed ; cells four times as long as broad, conjugation parallel, connecting processes very long ; spores oval, contained within the cell.

I have only met with one specimen of this very distinct species.

Cheshunt.

*Mougeotia ovalis*. Filaments about two inches long, of rather less diameter than those of the preceding species, and conjugating parallelly ; cells nearly twice as long as broad, those becoming inflated and oval which receive the spores, which are oval, and nearly fill the cavity of the cells.

Of this distinct little species I lately received two specimens from the Rev. David Landsborough, collected by that gentleman in the parish of Stevenston, Ayrshire : one of these happening fortunately to be in seed, I was enabled to ascertain its distinctness, which I otherwise could not have done with the same certainty. In young filaments the cells are so full that the joints are invisible.

*Mougeotia notabilis*. Filaments rather slender, not conjugating, at first cylindrical, but subsequently becoming angulated, the angle of flexion being situated in the centre of each cell ; cells usually about eight or ten times as long as broad, but frequently longer ; spores non-symmetrical, a single one being placed in the angle formed *in each of the cells*.

When I first noticed this singular species I was under the impression that it was to be regarded either as *Mougeotia glutinosa* in an incomplete state, with the filaments just about to unite to form the quadrangular sporangium, or as a distinct species that had not as yet arrived at the perfect stage of its formation ; reflection, however, soon convinced me that neither of these ideas could be correct, but that it ought to be considered as a distinct and perfectly formed production, a view which I was at first most unwilling to adopt, for it presents in the circumstance of the formation of a spore *in each of the cells of all the filaments*, an anomaly which I am not able to account for physiologically ; in all other cases the spores being the result of the union of the contents of two distinct cells, placed either in the same or different filaments. That



it is not *Mougeotia glutinosa* in an imperfect condition, is proved first by the smaller diameter of its filaments, but more especially by the position of the angles of flexion, these being placed indifferently on either side of the filaments, and not on one side, as would be the case were the filaments intended to unite with each other, so that this arrangement of the angles of the cells forms a positive obstacle to their union; for even were the cells all of the same length, which they are not, it would still be impossible for the angles of one filament to correspond so as to unite to form the sporangium with those of another filament: and that the species is in itself perfect and distinct in the condition indicated in the definition above, is established by the invariable presence of spores in all the filaments and the non-union of these.

Found in great abundance in ponds in some of the brick fields near Notting Hill.

The genera *Zygnema*, *Mougeotia*, and *Tyndaridea* merge through certain species into each other. Thus the genus *Zygnema* passes into the genus *Mougeotia* through *Zygnema curvatum*, this having relation with the one by its spiral tubes, and with the other by its angular mode of conjugation; and the genus *Mougeotia* into the genus *Tyndaridea* through the species regarded with doubt as the *Conjugata gracilis* of Vaucher, in which the cells are at first filled with endochrome, as in *Mougeotia*, which subsequently becomes divided into two roundish masses, as in the species of the genus *Tyndaridea*. This transition of one genus into the other does not, I think, affect the validity of either.

Accurate figures of all the above species have been preserved, as well as of those already described in British works, and all drawn to the same scale.

X.—*Excerpta Zoologica, or abridged Extracts from Foreign Journals.* By Dr. FELIX VON BÆRENSPRUNG.

To Richard Taylor, Esq.

DEAR SIR,  
ANXIOUS on quitting Germany to possess myself as soon as possible of all information connected with physiology and natural history, and aware from experience of the difficulty of procuring many of the journals, and more especially the dissertations published in that country, some of which are of great value, I requested my friend Dr. F. von Bærensprung to forward to me short notices of what appeared from time to time. I have no doubt that these may be of as much interest





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