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About the Institute

The Hunt Institute for Botanical Documentation, a research division of Carnegie Mellon University, specializes in the history of botany and all aspects of plant science and serves the international scientific community through research and documentation. To this end, the Institute acquires and maintains authoritative collections of books, plant images, manuscripts, portraits and data files, and provides publications and other modes of information service. The Institute meets the reference needs of botanists, biologists, historians, conservationists, librarians, bibliographers and the public at large, especially those concerned with any aspect of the North American flora.

Hunt Institute was dedicated in 1961 as the Rachel McMasters Miller Hunt Botanical Library, an international center for bibliographical research and service in the interests of botany and horticulture, as well as a center for the study of all aspects of the history of the plant sciences. By 1971 the Library's activities had so diversified that the name was changed to Hunt Institute for Botanical Documentation. Growth in collections and research projects led to the establishment of four programmatic departments: Archives, Art, Bibliography and the Library.

^{in Sweden}
Elias Tillandz was born
1640 and died 1693. He was
a professor at The University of
Åbo (=Turku) and he was our
first surgeon and med. dr. He
was the first man who opened
a corpse in order to study its
anatomy. He was interested in
natural science, especially in
botany.

Thank you very much for Tillandzia
usneoides. Very interesting! It is now
in the School Museum in Karis.

Jan. 1st 1956.

ROLF GRÖNBLAD
DR. PHIL.
KARIS, FINLAND

Dear Arthur,

I owe you many thanks for all those most generous gifts which you with great kindness have sent me. The book "The World was my Garden" which I just have begun to read seems to be quite a book for me, and the "Geographical Magazine" is a periodical which certainly will bring me much pleasure. I feel very grateful and thank you most heartily! You shall not think of sending me anything more if you don't wish me feel ashamed.

In a few days I am sending you a first parcel of your drawings and the descriptions I have been trying to write to them. If there are any opinions with which you don't agree, you may make any changes you wish. As far as I can judge from our meeting here I think there are no very important disagreements as to the systematical arrangements in general. In order to save time I send the parcel by air mail. Quite recently I had a card from Prof. Luther who told me the President of the Soc.Sci.Fenn. had communicated that the Society this year has a rather good economical situation, so it would be advisable to have our paper ready for printing as soon as possible. This is, indeed, good news. The rest of Staurastrum and the filamentous Desmids I shall try to work up very diligently. I have not sent Arthrodesmus, because I wish to have another look at them. (You need not be afraid of any essential changes there!).

What shall the title of your paper be? "New ^{and interesting} Desmids from the Southern United States" (?) by Arthur M. Scott and Rolf Grönblad. I insist of having your name first, because the head part of the work is yours, and you are the older of us two. Then, I think it would be useful if you would write a short introduction describing something on the geography the ecology and the character of the habitats which may be of interest to the reader. I think we should have a list of all those habitats to which the numbers refer (because I believe it would take too much space to have the exact locality mentioned in connection with every description.

Then the plates. I am not sure of your method. You make pencil copies of your drawings on transparent paper and then these are inked? You said we could have Miss Tikkanen to ink them. If you think so, I shall write to her and ask if she is willing and if she has time. Do you wish always the drawings with double outlines? It looks finer, but it will take much more time. That is for you to decide. We will do quite as you wish. The general arrangement of the text must be the same as is used in my Desm. Lappl. and Desm. Brazil. In this respect the Society has its own praxis which cannot be changed.

I should be glad to send you any copies you want!

I have not answered the questions in your two last letters.

- 1) I am agreed that we should call "*Cosm. coesugatum*" by the name of *Cosm. costatum* (Wolle) Scott & Gbl. It is corrected in my typescript.
- 2) I should like to have the whole group of the polymorphic *Arthrodesmi* described and illustrated in our paper. Also some of those which are not new. Because I think the reader will get a clearer idea of the whole cluster. If the name of our paper will be as I proposed it will be OK.
- 3) Of course I did mean Sioli's Brazil. desm. - Yes, they may rest for a while.
- 4) I too believe here are numerous pyrenoids in *X. wewahitchkense*.
- 5) Could you not write and publish a critical review of *Micr. moebii* - *Eu. turgidum*? You are quite able to do it, and it would be useful.
- 6) To your critic of Hannah's drawings I wish to say a few words in justification. As far as I have seen, in arctic and alpine habitats *Desmids* very often have a somewhat irregular-asymmetrical shape. It seems to me as if the *Desmids* do not thrive very well under such conditions. If so, it would not be recommendable, it would not give a true illustration of the natural conditions, if you among hundreds of more or less irregular cells would choose just the one which looks most beautiful and regular. So I think it may not be Hannah's fault if some of her *Eu. tetralobum* look somewhat irregular or oblique. This I can say especially about *Eu. tetralobum* which I have seen in material from N. Norwegen and Greenland. The fig. 18 on pl. XIII most probably is no *desmid* at all (? I suspect so). This is, of course, only what I believe - said without any offence.

The size of *Acta Soc. Sci. Fenn.* is to be a little changed, so, that the margin will be narrower and the printing area - also the area for figures on the plates - will be somewhat enlarged. As soon as I know the exact size I shall tell you.

I believe you have your drawings reduced by the printing to $\frac{1}{2}$ the size of your original drawings. Isn't it so? Do you think it possible to have the smaller species (*Cosmar.* & *Stauratr.*) printed to a less reduced scale? Of course you would have to make a special plate for those drawings. (perhaps to $\frac{2}{3}$ instead of $\frac{1}{2}$???)

In conclusion I wish you a Very Happy New Year, and many new and fine *Desmids*!

Yours
P. Ralf.

The Latin text Hannah

promised to correct. So you will have to

correct it after your own corrections.

The magnification of each drawing in the reduced size must be given!

Remarks:

The Latin and English diagnoses are not always identical but the English description is made to compensate and explain the Latin.

W. & W. use "breadth" /when you use W = width/ ,so I have written "cells longer than broad" /as do W&W./.

The magnification of all drawings should be given. This is important.

In the "Introduction" which I hope you will write, it should be mentioned that ~~as~~ these, as we suppose, new species and varieties are selected out from the vast number of -- collections and more than 3000 (?) drawings. There has been a serious attempt to identify our material (which both of us had to his disposition) with earlier described desmids, but in those numerous cases, when there has been no reasonable possibility to such an identification, we have been forced to "make" new species and varieties (although we are well aware of the fact that a big-scale manufacture is not useful and not desirable to the systematy). In some cases we have thought it better to create a new species than to increase the number of varieties in such "overcrowded" species as e.g. Xanth. antilopaeum and Staur. gracile, S. polymorphum &c.

I hope earnestly you are not very discontented with my work. But do not hesitate to make such changes which you think valuable.

This is the size of your drawing sheets and also of my sheets used for the descriptions.

I sent this in a separate letter in order to avoid any difficulties with the postmasters and the customs. The parcel will be sent tomorrow Jan. 10th by air mail. (simultaneously to this letter).

Today I got a certificate of membership in the Geograph. Soc. I do not quite know what this means: shall I write to the Society with a grateful acknowledgement? or shall I only tell you my sincere and most hearty expressions of gratitude?

I hope to heaven there will be no accident with the air mail because I have (very unwisely) no copies!

Best wishes,

Jan 9/56

New species and varieties (and formae).
collected by A.M. Scott.

- Penium multicostatum*
Cosmarium costatum n. comb.
 speciosum v. *nyackense*
 cucurbitinum v. *longum*
 spinuliferum v. *irregularare*
 pachydermum v. *complanatum*
 latipyramidatum
 pachydermum v. *incrassatum*
 pseudotriplicatum
 clepsydra v. *nanum*
 pseudotaxichondrum
 v. *rotundatum*
monomazum v. *americanum*
excrescens
amoenum v. *constrictum*
dimaziforme n. comb.
 v. *floridum*
entochondrum v. *subquinarium*
biyrtii v. *floridense*
indentatum v. *ellipticum*
rectimarginatum
rotundum v. *americanum*
variolatum v. *elongatum*
 - v. *incrassatum*
bimemillatum v. *americanum*
 - v. *evolutum*
fastigiatum
ordinatum v. *borgei*
zonatum v. *subcirculare*
 - v. *subcirculare* f. *cylindricum*
 - v. *latum*
difficile v. *rotundum*
 - v. *depressum*
isthmochondrum v. *asymmetricum*
inaequalinotatum
exiguum f. *incrassatum*
 - f. *pygmaeum*
quadratum v. *tuberculatum*
hypochondrum
 - f. *retusum*
mamilliferum v. *basitotundum*
subnudiceps v. *angulare*
nymmannianum v. *fallax*
dentatum v. *ornatum*
 - f. *minus*
 - f. *spinosum*
ralsii v. *spinigerum*
strabo
Docidium undulatum v. *sinuundulatum*
Pleurotenium minutum v. *longissimum*
 - v. *excavatum*
 verrucosum v. *validum*
Triploceras verticillatum v. *taylorii*
 - v. *turgescens*
 gracile v. *bispinatum* f. *acutispinum*
Euastrum cornubiense v. *hypochondrum*
 quadrilobum
 luetkemulleri v. *sublaticolle*
 fissum v. *lineare*
Euastrum incavatum v. *floridense*
 - f. *pyramidatum*
 longicolle v. *capitatum*
 hypochondrum v. *acephalum*
 protuberans
 obesum v. *crassum* f. *nasatum*
 subornatum v. *aperum*
 ventricosum v. *mucronatum*
Xanthidium concinnum v. *americanum*
 - v. *floridense*
 apiculiferum f. *minus*
 cristatum v. *hipparquii* f. *floridense*
 - ff.
 - v. *scrobiculatum*
 - - f. *papillatum*
 - v. *pustulatum*
 antilopaeum f. *breviaculeatum*
 - v. *eurycerum*
 - v. *subeurycerum*
 - v. *mississippiense*
 - v. *floridense*
 - - f. *scrobiculatum*
 wewahitchkense
Staurostrum minnesotense v. *majusculum*
 n. comb. ~~new~~
 subpygmaeum v. *minus*
 - v. *spiniferum*
 - - f. *evolutum*
 laeve v. *latidivergens*
 dilatatum f. *productum*
 bicoronatum f. *asymmetricum*
 - v. *compressum*
 - f. *depauperatum*
 glaphyrum v. *denticulatum*
 talischeekense
 margaritaceum v. *gracilius*
 pseudomonticulosum
 trifidum v. *pygmaeum*
 pseudoneglectum
 logium v. *spiniferum*
 leptopus v. *americanum*
 diacanthum v. *evolutum*
 floriferum v. *elevatum*
 - v. *floridense*
 cyclacanthum v. *depressum*
 tryssos
 elegantissimum v. *evolutum*
 curviceps
 cyclurcatum
 subracillimum v. *tortum*
 magnifurcatum
 forficulatum v. *eximium*
 furcatum v. *taylorii*
 - v. *scaevum*
 novae-terrae v. *biradiatum*
 comptum f. *majus*
 pinnatum v. *elongatum*
 acerides . *dyscritum*

(Staurastrum)

sebaldi v. multispinosum
- v. corpulentum
leptacanthum v. brachycerum
hystrix v. floridense
octodontum v. tetrodontum
(hemisphaericum)
oxyacantha v. majus
pseudosebaldi v. compactum
cerastes v. pulchrum
brachiatum f. robustum
longispinum v. praelongum
magnottae n.comb.
- fac. biradiatum
ornithopodum fac. triradiatum
radians v. divergens
humerosum
depressiceps
- v. gracilius
- v. planiceps
iversenii v. americanum
lati~~v~~enter
.....

Jan 13 1956

Dear Roif,

Thanks for your letter of Jan 1st. The package of drawings and descriptions has not arrived, but no doubt it will come in a few days. Hannah has written me that she would like to get the Latin diagnoses for checking as quickly as possible, because her Latin professor is going away about the middle of February, and she wants him to look over them before he leaves. So I shall send them to her, or at least part of them, just as soon as I can get the descriptions checked.

Since Hannah had invited criticisms of her paper, I wrote her concerning the slight irregularities in her drawings, pretty much as I wrote you, and with the sole intention of trying to be helpful, not in any way to give offence. I said that I thought most of the irregularities were caused by the impossibility of making the pencil follow exactly the image seen in the camera lucida; that nearly all of my own first sketches came out the same way, and that if the specimen was symmetrical (as I believe that nearly all normal desmids are) I corrected the first sketch to make it symmetrical. I have not often encountered the condition you mention as occurring especially among arctic and alpine desmids, of numerous individuals exhibiting irregularities. In such a case I think it would be advisable to illustrate a perfect specimen as the type, with a few irregular ones to show the variation, and with special mention in the text of the irregularities. Hannah replied (without having taken offence) that she was aware of the asymmetry of her drawings, and that in future she will try to correct them where necessary.

As to the 'numerous' pyrenoids in *X. wewahitchkense*, I had occasion the other day to go over this collection (Florida 27) once more, while searching for another desmid that you think is *Cosm. lobatum*, but which in my opinion is not identical with Boergesen's plant. I noticed that also in this *Cosmarium*, and other large desmids, the chloroplasts were deteriorated and disorganized in such a way as to give the impression of numerous pyrenoids, but I am by no means sure that this impression is correct. Therefore I believe that it would not be safe to describe *X. wewahitchkense* of *C. lobatum* as having numerous pyrenoids; I would simply say that their number was not determinable due to deterioration of the chloroplast.

It is very generous of you to insist that my name appear as the senior author of our paper, and I accept with pleasure. Prescott made the same generous offer some years ago, saying that his reputation was already established, as yours is to an even greater degree. The title "New and interesting Desmids" is OK and will permit us to include forms that are already known in order to show their relationship with the new forms. I would suggest that the term "Southeastern United States" be used instead of "Southern", because there are several States not included in the region that I have investigated, which also are considered 'southern', for instance Virginia, the Carolinas, Tennessee, Georgia and Texas. I will write a short introduction as you suggest, though it will be largely a repetition of what I have written before in my previous papers. When I sent you my samples and drawings a few years ago, I also sent a complete list of the habitats, from which you can pick out those referred to, or I will gladly do it.

My plates, as you surmised, are drawn in pencil on transparent tracing paper which takes ink very well, and then the pencil lines are inked over. I prefer to use double outlines for all except the very small desmids; Taylor recommended this to me a good many years ago, after seeing some of my first crude attempts. It will be easy to make special plates for the smaller species, so that they will be reduced to 2/3 instead of 1/2, and you will find such smaller plates among those that I sent you

illustrating the North Australian paper by Scott & Prescott, which, by the way, has just gone to the printer. When you tell me the exact size of the plate area, I will prepare the plates for a reduction to exactly 1/2 or 2/3, and will give the ~~xxxx~~ magnification for each of the figures.

I am sure there will be no serious differences of opinion between us; if there should be something that I think is not quite right I will tell you about it; but I am quite content to leave the final decision up to you.

Perhaps one of these days I may undertake a critical study of *M. moebii* and *E. turgidum* and see if I can reduce them to some kind of order. But for these next few years I have too much other work to do. My friend in Indonesia is getting anxious to see his desmids published, and this will have to be my next job after I finish with our paper on new USA desmids.

About three weeks ago I sent you a package of drawings by ordinary mail, as it was rather heavy for airmail. You ought to be getting it about the same time you received this letter. Enclosed are some more of the formerly incomplete drawings; in some cases I have been able to get the other views and/or the chloroplast information; in other cases I have not been able to find any more specimens and the drawings will have to be held until such time as the plants turn up again. There still remain some other drawings to be investigated, but it is a slow job. I have sometimes worked for the better part of two days in getting the information on one desmid, but in going over these old collections I have run across a few other things of interest that did not show up in my previous examinations.

Enclosed is a list of Iyengar's papers that I possess. There is only one of them, in addition to *Triplastrum*, that contains desmids, namely the one from Kodakinal. If you do not succeed in getting it from Iyengar, let me know and I will send it for your inspection. It is not very important paper.

I have exchanged a couple of letters with Prof. R. Kufferath of Brussels, Belgium, who sent me some of his papers, and also asked for your address. Please send him some of your reprints. He is going to have one of his friends send me some samples of algae from Africa (Congo or French West Africa?), and in return I am going to send him some of my material from USA and foreign countries. These will not be for publication, just for our respective enjoyment and edification. If he sends sufficient material I shall divide it with you.

Has your paper on *St. bibrachiatum* been published yet?

With my best regards,

Sincerely,

The enclosed photos of *Cosm. costatum* show the features fairly well, and are about as good as I can make, but I am afraid that they would not reproduce very well in print.

Would you kindly tell me the names of the papers (and of the periodicals) in which they are published) by M.O.P. Iyengar. I have none of them, only a photocopy of the *Triplastrum* paper (sent by Teiling).

There are two papers in the preliminary list of desmid literature made by Prescott and Brunel resp. Iyengar & Vimala (1940) and Iyengar & Ramnatha on *Triplastrum*. Then you have quoted Iyengar & Bai (1941) on your drawing of *Xanth. sexmamillatum* v. *puleyense* Iyengar & Bai.

I have sent my copies to Iyengar but I have got no thing from him except a acknowledgement of receipt. Now I have written to him a beggar letter!

Jan. 17th 1956.

Dear Arthur,

Again I must write a letter to you. I had a letter from Hannah which I enclose. I don't know how to arrange the matter. Perhaps you know, and you may do quite as you find it best./I am afraid this is Swedish with English words?/, The principal matter is that you correct my English and make the diagnoses suitable for your mind, and draw the plates &c. The Latin can then be corrected by Hannah (I think her professor is not necessarily needed?).

When shall I return your other drawings?

I had some days ago a letter from Mr Prowse from Singapore. (I give his address if you wish to write to him: Goodwood Park Hotel, Singapore 9, /Malaya./) "I have settled down here quite happily, and am enjoying it" he says. He is also collecting ~~the~~ Desmids, but so far he has recorded only quite trivial species. Anyway, he will send samples, and that is OK.

When you are going ~~on~~ your next collecting trip I should suggest that you should try to collect some aerophil desmids if possible. There is a rich growth of mosses and lichens on the trees, and I think it would be interesting to know if there are any desmids. The mosses should be squashed and washed in water and after some time there certainly will be some Algae on the bottom. I know there are not numerous species, but it would be interesting to know which. If there are only one or two species to be found, this would already be important. Also the trunks of old trees may ~~be yielding~~.

I have been reading "The world is my garden" and I find it the more interesting the more I read. The Swedish plant pathologist Björn Palm has written 3 books telling of his life in tropical countries, ~~X~~ books that I found most fascinating - but Mr Fairchild's book is by far the best one I have ever read. There are so very many interesting tales of new records, and it is most fascinating to read about all those new plants that were imported to USA. Besides, his style is very pleasant, and this friend of his, Mr Lathrop must have been quite an extraordinary fellow. Always in hurry!

I am still every evening writing descriptions to the USA Desmids, but I am not able to get ^{more than} one or two species per evening. Nevertheless, I hope I have the whole pile ready in a short time. And then I shall send them by air mail.

So long,

*Next in our newspapers that there has been an
re-union of cold in Karis and Gurenska (-5°C)
What about the Desmids? I may gather them in very small
in some places 2 meters diameter. But it's not very good (-5°C).*

Jan 19 1956

Dear Rolf,

Your note of Jan 9th with the list of new species and varieties arrived on Jan 16th, and the package of drawings and descriptions came two days later, yesterday Jan 18th. Immediately I sent about half of them by airmail to Hannah, so that she can be checking the Latin while I am working on the English. So far I have found only a few minor changes necessary in your wording or phraseology, and nothing whatever to criticize in your nomenclature.

I am returning two items, *St. subcornutum*, and *St. leptacanthum*-Wattzschii dichotypical, which I think you included by mistake, since they are not new and will go in a later paper.

One of the *Cosmaria* you had determined as *C. rotundum* Prescott & Scott 1952 var. *americanum* v. nov. Soon after publication of this South Australian paper Prescott wrote me that someone had informed him that the name *C. rotundum* had already been used by Turner 1893, p. 58, Pl. 8, Fig. 48. So this specific name must be changed, but I don't know how to handle it. What do you suggest?

As soon as you can ascertain the size of the printed plates for the "Acta" I can start laying out the pencil plates, but I should like to begin with the first genus which I suppose is *Glosterium*. I think there are no novelties in the preceding genera.

The certificate of membership in the National Geographic Society means nothing except that you are now one of the TWO MILLION-odd members, or in other words that I have ordered a subscription to the magazine for you. You do not need to acknowledge it. I am sure you will enjoy the magazine, which is one of the best that I know of, and four times a year they issue really excellent maps of various parts of the world.

In drawing the plates I propose to group together all species of similar shape, as was done by West & West and Krieger, instead of arranging them alphabetically as you did in your Brazilian paper. Is this OK? I believe this is much more convenient for finding the illustrations, and enables a comparison of similar forms. In the introduction that I shall write I will utilize your remarks about having made a serious attempt to identify the specimens with previously known species, also on the list of names for the plates I shall give the magnification of each item, making allowance for the reduction in printing.

That's all for the present. I am still working on the remainder of the incomplete drawings, and hope to heaven that this tedious searching will soon be finished.

Sincerely,

Jan. 22nd 1956.

Dear Arthur,

I have now with an interval of a couple of days got your two parcels containing drawings and letters. Thank you again very much. I shall write just a few lines in answer.

I shall have another look at *X.wewahitchkense* and try to find something about the pyrenoids. I am almost convinced there are several of them in each of the 4 chromatophores. How does it come that the chloroplasts are so disorganized? Have you kept the material living for a longer time in the sampling bottle? I think in such hot climate the formaline should be added almost immediately. Perhaps in the late summer all algal vegetation becomes somewhat deteriorated, especially in smaller water pots. I have seen such things happening in small pieces of water here in Finland when there is an overgrowth of algae.

If you don't think it necessary to have an introduction describing the nature of the habitats, we could refer to some of your previous papers. Anyway, just a few words to explain the great number of new taxa would be desirable. The plates we will have quite as you wish. I too think that Miss Toini Tikkanen will do well. I have some days ago written to her asking if she is willing to ink our plates.

I see that you have got a great deal of new information about the dubious species. There are only a few that need be left.

I have sent a letter to Prof. Kufferath and also reprints requested. I have many years ago been in exchange of reprints with him, but during the war our connections were broken. His papers have been mostly about Diatoms, I believe.

I think your photos from *Cosm. costatum* are quite good for print, they give a rather good idea of the nature of the "costae".

Thank you for the list of Iyengar's papers.

As to *Eu. everettense* I didn't quite like to have it attached to *Eu. obesum* which seems too much different. And then I thought as many as possible of Wolle's species should be taken into use. This because I am almost certain there will come later on someone who will try to identify Wolle's species, e.g. Irene-Maire (who seems to have a very high opinion of Wolle) or somebody like him. *Eu. ansatum* is already a "mixtum compositum" with too many varieties.

As to *Pleur. burmense* v. *extensum* it may be that you are right. But you see, it sometimes takes a lot of time to get out of one's ideas! Perhaps once I shall be convinced? I have, indeed, seen the real *P. burmense* in a

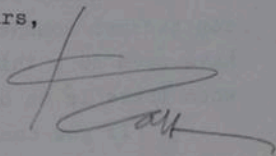
It is a rather long time since I read the last proof of the *S. bibrachiatum* paper, but so far I have not got the reprints. I am expecting them very soon.

I have finished reading Fairchild's book, and it is a good thing too, because it was so enthralling that I lay in my bed reading it late in the night, or better late in the morning! I have, indeed, enjoyed it very much. I wish I could have been something like him. His life has been a very happy one with many exciting experiences, and a life useful to the mankind too.

If you have a photo of your home and the house where you live, I should be glad to have one.

It is already getting late, so I shall finish now with kind regards.

Yours,



Jan. 26 1956.

Dear Arthur,

I got today your letter and another from Hannah.

I am glad to know that my package has safely arrived.

1) Yes I see there is a *Cosm. rotundum* Turn. What would you think of changing the name of your Australian species to *Cosm. ophelii* Presc. & Scott from the name of the collector of your samples?

2) The size of the printed plates is still unknown to me, but I hope to get it very soon from Dr Luther.

3) Of course the species are to be grouped together in the way you suggest. My alphabetical arrangement was not successful as far as I now can judge.

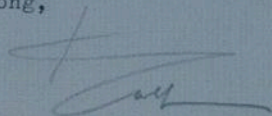
I am continuing with the diagnoses there are still about 20 species to describe + *Arthrodesmus*. It will not take a long time to finish the remaining pile.

I have really enjoyed the first number of the *Geogr. Magazine*. Not only fine pictures but an interesting text too. *Merci bien, cher ami.*

Last night the temperature in Kariş was -28°C . Horrible, isn't it?

I think the word "punctae" better should be avoided in desmid diagnoses because in the past it has been used for pores or pore organs and minute granules as well. (In Latin: *membrana porosa et granulata, sed non "punctata"*).

So long,



Feb 1 1956

Dear Rolf,

Now I have FOUR of your letters to answer, all written within a week. That's almost a cosmological phenomenon; no wonder Teiling says he hasn't heard from you for months. You are making excellent progress with the descriptions, and I am sure you will be relieved when they are finished. All that you sent me are in Hannah's hands, and I ought to get some of them back pretty soon. I shall have to keep your descriptions while I am drawing the plates, and then send all of them to you.

Now to answer your letters seriatim:

Jan 17. You may return the other drawings at any time that is convenient, if you think I can handle them by myself for our next paper. When you are packing them you might perhaps run through them quickly, and if you see anything on which you would like to comment, make some pencil notes on the sketches. If you send them by ordinary mail (not airmail) and registered, they may get a little better treatment. On the airmail package the outer wrapping paper was rather badly torn, though the contents was safe because you had tied them inside with string. I get heavy cardboard boxes from the grocer and cut them down to make smaller ones.

Glad to have Prowse's address, but I feel the least bit guilty towards him, so I think I shall not write him until we have something definite about his Sudan paper.

The idea of collecting aerophile desmids is quite new to me. I don't even know whether there is much moss or lichens available here; I should think much less than in cooler climates, but on my next trip I shall investigate.

There is another even more interesting book by Fairchild that I am trying to get for you. It is called "Garden Islands of the Far East", and describes a voyage on a Chinese junk owned by another American millionairess. They visited many out-of-the-way places in Indonesia and the Phillipines, but the voyage was brought to an abrupt end by the start of the war between Japan and the U.S. I hope to get it soon.

The February number of the Natl. Geographic Magazine is even better than the January. It came today and I have not yet read it, but there are some truly astonishing undersea photos in colour, with some of the most beautiful fishes that you ever saw, and some of the wierdest.

The weather since Christmas has been unpleasant; damp and chilly though not really cold; only once did the thermometer go down just to the freezing point, not enough to damage the vegetation except banana trees which will have to be cut down, but they grow again very quickly from underground suckers. I don't like even to think about your temperature of -28°C , but Hannah wouldn't mind it too much. If I remember correctly she told us that in Hanover it goes down to -30°F (-34°C) and even then she sleeps on an outside porch with only mosquito wire screens on two sides!!!

Jan 22. As far as I remember the collection Fba. 27 containing *X. wewahitchkense* must have been killed with formalin as the time it was collected, for the place is two days drive from New Orleans. However, I now believe that the floating masses that I collected perhaps were carried down a small stream from a swamp, for the water level was some 3 feet higher than normal, and I have failed to get good material in subsequent visits to the same identical spot. I don't know just where the swamp is, and it would be quite difficult to reach it. So perhaps the larger desmids were already in poor condition from being removed from their native habitat.

I do not have any interior pictures of my home, but am sending a not very good coloured slide (diapositif) of the exterior. Do you own, or could you borrow, a projector for such slides? If so I could send a lot of them that I am sure you would like to look at. I sent Hannah my slides from Sweden and Finland which she enjoyed very much, and I am getting duplicates of some of them for her.

Jan. 26, Ilmakirje. Now I see that there were only THREE letters, not four. The fourth was from Hannah, and it was mixed with yours. Cosm. Ophelii was used for another desmid in the same paper as C. rotundum, so you will have to try again. C. Prescottii is not safe; there may be one already, I don't know.

I agree that "punctae" is confusing, and I shall try to remember to use porose and the Latin porosa in future; I have sometimes done it in the past.

Now I am enclosing the rough draft of an introduction for our paper. It developed into something longer than I had expected. If you think it is too long, or goes into too much detail, or that the name Scott is mentioned too frequently, please make any changes that you think desirable. I am not ~~concerned~~ ^{concerned} about the kudos. Or if you think anything should be added let me know.

Seiling obtained Kossinskaj's address, sent her some papers, and got some from her in exchange. I am doing likewise. The address is: C. C. Kossinskaja, Prof. Popov-str. 2, Ap. 20, Leningrad, USSR.

Sincerely,

Febr.15.1956.

Dear Friend Arthur,

I have received your last letters with new drawings and other things that you kindly sent me. Thank you for them all most heartily.

Now I must begin telling you two not very pleasant news. It has been quite impossible to get any information concerning the size of the Acta Soc.Sci.Fenn. Our friend Hans Luther has tried his best, but in vain: he didn't get any definitive answer from the secretary prof. Wahl. I have written a letter to this man, but no answer! I don't know him, but I think he must be a very peculiar person since being the secretary it should be his duty to give concise answers to such questions. I shall telephone ~~one~~ once more to Luther and perhaps try to ask for information from the printer. This will be a cause for unnecessary waste of time.

The second unpleasant thing is that Miss Tikkanen has raised her taxes very considerably. When she last time inked plates for me she calculated with 200:- Fmk per hour, and now she told me her honorarium is 500:- fmk per hour. So each plate will be about 1000:- mk or more. I don't know how many plates there will be in our paper, perhaps 25 - 30? so it would make perhaps up to 30- 40.000:- mk. If we wish to have all drawings made with double contours, the prize will be still higher. The situation being such I would ask you whether you could consent to have ^{partly} simple outlines? In G.M.Smith's Wisconsin Plankton all small Cosmaria and Staurastra are drawn with simple outlines and they don't look so bad.

Febr.16th. I have just been talking with H.Luther about Acta. He told me he had not been able to get any new information. It is so that Prof.Wahl is very old (and senile) and he will retire next April, so it is hopeless to get anything from him. But I shall today write to the editor of Acta, prof.Lindberg, whom I know personally, perhaps with better success.

Then to your letter. I shall keep your drawings and have another look at them before I return them to you.

Concerning the aerophile desmids: I have seen in some of the periodicals you sent me pictures of trees with mosses or lichens growing abundantly on the branches. I think it was in some swamp and the moss was called "spanish moss" but I believe it was a lichen. During the rainy season I think such epiphytic vegetation would be good for desmids too.(?)

The February Geogr.Magazine was very fine, indeed!

Thank you for the beautiful photos. I have no projector but they look very fine in a lamp that I use for X-ray photos. Besides Mr Ridderstad has a projector. Next time I go to him I shall bring your photos with me.

= "pschogkermum"

For *Cosm. rotundum* Presc. & Scott I propose *C. callosum* or *callosissimum*.
Your "Introduction" is quite satisfying. To pag.2 I should add (after
"Herbarium of Harvard University") "and the samples sent to Gblad will be
deposited in the Botanical Museum of the University of Helsingfors". To
p.5: instead of your "L"; "W", "I" I have been using Long., Lat, Ist.

To the bibliography I think we must add all papers quoted in the
text. It has become a custom in Scandinavian scientific papers to give
a complete list of all quoted literature. If we shouldn't do so, there
most certainly would arise a howl from people who would accuse us of
behaving inappropriately. I do not return this Introduction because I
think you have a copy for yourself. /What does the word "kudos" mean?/

I have written to Kossinskaja and proposed exchange of copies. Now
I have got a copy of Part II of Kossinskaja's *Desm Flora* (*Penium* to
Tetmemorus). If you have not got it already I can send it to you be-
cause I have another copy for myself. I cannot remember if you had it?

I shall very soon write to Teiling, but he is asking so very many
difficult questions that the answer is not too easy to give!

In a few days I am sending another pile of diagnoses, not by air mail
and this time better packed.

I hope to be able to tell you the size of the plates very soon!

Best wishes, your

Today we have got elected a new president of Finland
and a very unsympathetic person too! Gosh!
Politics is a filthy affair.

ROLF GRÖNBLAD
DR. PHIL.
KARIS, FINLAND

Febr. 20th 1956.

Dear Arthur,

Now I can tell you the best of news: everything is settled concerning our paper and the best thing we can do is to hurry at our highest speed. A few minutes ago Hans Luther telephoned me and told me that the Soc. Sci. Fenn. had its meeting this evening. The secretary Prof. Wahl[†] said that the size of Acta will be quite the same as before. (So you can see it from my Lappland desm. or Brazil. desm.) This series of Acta in "quarto" size will be finished, because it is expensive to the Society. Our paper will be the last one to be printed in it. I am very glad and I think you will be so too. We must now try to have the paper ready for printing before the Society's last meeting, which will be ^{the} the third Saturday in May (better still if we have it finished to the beginning of May). Luther will have a talk with Miss Tikkanen, so that she is prepared to have a hurry with the inking. About the double contours I wrote in my last letter, so you have to decide: those figures which you think look better with double contours, you draw so, but when not needed, please, make only simple lines. Tomorrow a parcel will be sent to you by air mail.

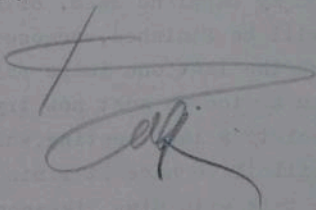
[†] Prof. Wahl had been abroad!

Arthrodesmus and the filamentous Desmids will come later. There are some difficult species and I shall have quite a struggle with them. I hope sincerely you will not be disappointed with my endeavours at cutting the Gordian knots.

My last letter must have been rather disappointing to you and I myself was sunken in black pessimism, but at present I am a bright optimist.

I shall be very very glad, indeed, when this work is finished.

Best wishes,

A handwritten signature in dark ink, appearing to be 'J. D. S.', written in a cursive style. The signature is positioned to the right of the typed text 'Best wishes,'.

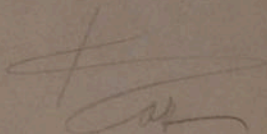
Febr 21. 1956

Dear Arthur,

I cannot restrain myself from sending you this new beauty from Lake Ambadi. One day I resolved upon taking a free night from the USA desmids, and thought it would be pleasant to have a look at the L. Ambadi sample again. You see it was a good catch!

By ordinary mail I am sending you photocopies from Nordstedt 1869 and 1877, all plates and textfigures. The size is 9 x 12 which I use myself (it is rather small, but if you wish to enlarge them more I could send you the film which is worthless to me). I should be glad to send you some more (e.g. Schmidle which perhaps would be useful to you. I should be glad to do something for you!)

Kind regards,

A handwritten signature in dark ink, appearing to be 'J. Schmidle', written in a cursive style.

Dear Rolf,

The word 'kudos' I suppose to be Greek and probably in its original form; it is not in my English dictionary. To obtain Kudos is to receive credit, or recognition, or admiration for a piece of work well done, to 'acquire merit', as opposed to a material reward.

Miss Tikkanen's jump in her price puts quite another colour on the picture; I wonder if she really wants to do the work. At 500 Fmk per hour, each plate is likely to cost much more than 1000 Fmk, for I doubt seriously if anyone can ink one of my plates in two hours; it is more likely to take twice that long, which would bring the cost up pretty close to what I have been paying here. In the next day or two I shall speak to the young lady who has done my plates before and see if she can undertake the job, and at what price. If she is willing to accept the same price as formerly I think I shall let her do them; she lives just around the corner from us, and can consult with me frequently, which would be quite convenient.

The delay in getting the size of the plates is regrettable, but no doubt you will receive the information either from the editor or printer very shortly, and then I can make a start on the plates. I have very nearly finished checking the incomplete drawings. There are only 3 or 4 more desmids to chase down, and then I will send the lot to you by airmail.

'Spanish moss' is neither a moss nor a lichen, but an epiphyte deriving its sustenance from the air, nor from the tree. Its botanical name is *Tillandsia usneoides*, and it belongs to the *Bromeliaceae*, a family which, strange to say, also includes the pineapple. In the country districts the 'moss' is gathered, hung on fences to dry, and the resulting fibrous material used for stuffing cheap mattresses and pillows. It is quite common here, and the next time I go out I will get some and send you a piece. Because of its long thin leaves I think it not likely that desmids could exist on it, since it would dry out quickly after a rain. In the collections from Cuba that I sent you, there are two containing water from the cup-like leaf bases of larger bromeliads. The water contains an assortment of aquatic life, but I do not remember if there were any desmids; if there were any they were extremely rare.

LATER. My friend, Mrs. Gotch, who inks my plates, came over for a cup of tea at lunch time, and I asked her about the new plates. She is willing to do them for the former price, so if it agreeable to you I will turn them over as I finish them, and let her work on them. I will pay the whole cost. She confirmed my guess that it requires not less than 4 hours to ink one plate.

As to *Cosm. rotundum* Presc. & Scott from South Australia. I now suspect that this may be related to *C. stenonotum* ~~(Nordstedt)~~ var. *spirale* (Nord.) Playfair, 1908, Some Sydney Desmids, page 618, Pl. XIII, Fig. 20, because from Tasmania I have a twisted form that corresponds more or less with Playfair's schematic and stylized sketch. But the funny part is that I cannot trace *C. stenonotum*, which is not in Nordstedt's Index nor Supplement, though I suppose that 'Nord.' means Nordst., and it must have been published prior to Nov. 1908 when Playfair's paper was issued. Have you any way of finding an illustration of the specific form?

You may make any changes that you wish in the introduction. If you will deposit the samples with the Univ. of Helsingfors, the vials should be filled up with water containing about 5% formalin and 10% glycerine, and then the tops of the vials should be immersed in melted paraffine wax until air bubbles have ceased escaping. If this is not done the water will slowly evaporate over a period of years, for the screw caps are not quite airtight. I made a short bibliography for the reason that editors in the USA object strongly to long ones because of the extra space and expense. It will, of course, be much better to have a complete list of all works cited in text.

By a curious coincidence I wrote only last week to Asher & Co., Booksellers, in Amsterdam, for a copy of Vol.II of Kossinskaja's Monograph. But I think it is doubtful if I shall get it, for these works are usually snatched up long before the catalogue reaches this country. So I shall be greatly obliged if you will send me your extra copy. Even if I also get the one from Holland I can send it to Prescott, who also has been unsuccessful in obtaining it.

Enclosed are some coloured prints of some of the photos I took in Finland, souvenirs of a very pleasant visit. Also there is a picture of yours truly collecting in the lily pond from which came the material that I sent to Kallio, including the *Micrasterias Torreyi* that seems to interest him so much.

I had a note from Mr. Ridderstad acknowledging the cigarillos that I sent him. Please remember me to him, and tell me if I may send him another box.

Best regards from your friend

Feb 29 1956

Dear Rolf,

I have your two letters of Feb 20 and 21, also the package of drawings and diagnoses came today, and I have immediately sent them on to Hannah because I have plenty on hand to keep me busy. It would save a little time if you would send the next batch direct to her, and ask her to forward them to me after she has checked the Latin.

It is good news about the size of the plates, and though the time is short to May 1st, I think we can manage it. Please let me know quickly what you think about having my pencilled plates inked here, so that if you approve I can turn them over to Mrs. Ferine as fast as I finish them. Also tell me in which genera, if any, I have all drawings; this is desirable for me to know in order to lay out the plates to the best advantage. Unfortunately there are a few left-overs in several genera, as you will see from the sketches that I sent yesterday by airmail.

Your drawing and photo of *M. tropica* from the Sudan show a very handsome plant that I have never seen before, but I wonder if it can be described as a new variety. The size scaled from your drawing is about 108:70, which just falls within the range quoted by Krieger for var. *elongata* Schum. Schumide's drawing (in Krieger) does not show the teeth at the isthmus nor the single tooth just below the apex, but these would hardly justify a new variety, I think, and all the other features are very similar to Schumide's specimen.

The reprint of your paper on *Desuids* collected by Hannah Crasdale and Dr. Moul arrived a few days; many thanks. I like it very much, though of course I have not had time to study it thoroughly. I hope you won't mind if I call your attention to a couple of misspellings that catch my eye at first glance: There are two 'accents aigus' in the first word of Irénée-Marie's name, not one; and *St. apcyroides* should be *ankyroides*.

On my sketch of the 5-angular form of *St. novae-caesarea* you have noted that the form of this plant with the central smooth area on the apical surface should probably be separated as a variety. For some years I have had the impression (perhaps wrong) that just the reverse was the case, and that Irénée-Marie's Canadian forms with verrucae all over the apical surface should be made a new variety. I base this opinion on my interpretation of Wollé's drawing, 1884/ XI.VII:4, as showing verrucae or granules only in 2 or 3 rows around the margins, and that the black scratchings in the center are meaningless as they are in many others of his drawings. It is true that he shows granules on the apical surfaces in Fig. 3 of the same plate, but both views are poor; the ornament is nothing like what he shows. I also remember seeing another illustration by Wollé, I think in his 1892 edition which I do not possess, a better indication of the ornament and which (as I remember it) clearly showed a smooth area in the center. I do not have the 1887 paper that you refer to, nor Cushman's 1904 paper. I think that I-M's plants must have verrucae all over the apical surface, for I believe him to be a careful observer, and I don't think he would insert them on his drawings unless he had actually seen them. An easy way to settle the matter would be for me to write him and send a sketch of the Florida plants, and ask him to check with his specimens; I shall gladly do so if you agree. But I must beg you to change the wording of your comment on his drawings of this plant, unless you want me to get into a fist-fight with him! He is some years older than I am, and I might be able to beat him, but I was not cut out for a pugilist!

Thanks for the photocopies of Wordstedt's paper that you are sending. Do you make these yourself, and if so on what size film? The 9x12 cm size is quite small, and not easy to file. If you use 35 mm film I can enlarge them myself to any size, but my enlarger will take nothing larger than 35 mm, and the photo-shops charge too much. There is a new method of photo-copying of which I first heard from Ruzicka. A special photographic paper is used, and is placed directly in contact with the page to be copied and then exposed to the light. If the page is printed on one side only the exposure is made through the page; if the page is printed on both sides the exposure is made through the photographic paper which results in a reversed copy, which must then be copied again to obtain an erect and unreversed copy. The process is called reflex copying. I have not yet tried it.

In the March issue of the Natl. Geographic magazine that you will receive shortly there is a good article on an expedition to Melville Island in North Australia, by C. E. Mountford, who also was leader of the expedition to Arnhem Land. I was supposed to get some algal material from Melville Island, but some damn fool packed the bottles in a box with pickaxes and shovels, and they were all smashed to smithereens!

Best regards from your friend

Mch 12 1956

Dear Rolf,

The reason I tried to telephone you yesterday was that I knew of the general strike in Finland, and that you could neither receive letters nor send them. The telephone company cancelled all the charges for the call when it developed that the connection was so poor that neither of us could understand what the other was saying. The operator told me that she had a good connection to Helsingfors and that the trouble seemed to be between Helsingfors and Karis.

I was anxious to know if you approved my plan for having the plates inked here, and I think I understood you to say that I should have them inked in America, but to make sure I sent you a cable. I have 10 plates finished and ready for inking.

Originally I intended to follow your system of numbering all the figures consecutively from 1 to say 300, but this proved to be impossible because I had to start with *Xanthidium* which seemed to be complete, and I do not know how many plates will precede this genus. So each plate is numbered from 1 to 10 or 20, as the case may be. I intend to send you a batch of the completed plates with their descriptions as quickly as they are finished, so that you can be working on them. Probably most of the descriptions will have to be retyped because of the numerous small corrections in the Latin and English. I do not think it necessary to return my original sketches to you, but will do so if you want them.

The number of plates will be considerably more than either of us thought. This is because you have selected an unusually large number of figures to be published. For instance, in *St. johnsonii* var. *evolutum* n. var., you have selected six figures illustrating three slightly different forms, and there are also a Janus-form with 2- and 3-radiate semicells, and another 3-radiate form. These 6 figures with top views of some of them occupy practically all of one plate. Personally I am very glad to see so many examples illustrated; it will make the paper much more complete and valuable. Perhaps the Society will not object too much to the larger number of plates, because this will be the last number of the Acta, and also because I am contributing a fairly large sum towards the cost of publication. However, if you think it advisable, I can try to reduce the number of plates by omitting some figures which may not be absolutely necessary. So far all of the illustrations I have drawn have been of very large desmids; when I come to the smaller species I can get many more on one plate, of course.

In my introduction you will have to change the name of Miss Toini Tikkanen as the inker to Mrs. Dorothy Perine (not Mrs. Gotch as I wrote by mistake in my letter of Feb. 22; Gotch was her maiden name). Also on page 1 of the introduction is the phrase "Texas is not included in the southern group of States". This should read southeastern group.

Hannah and her mother are going on an automobile trip for the Easter holidays, and will be away from Mch 24 to Apr 3, so during that time she will be unable to work on your Latin diagnoses. However, I do not think that will cause any delay, for it takes her only a few days to run through a batch and she returns them to me by airmail, and I have plenty to keep me busy on the drawings. Hannah had thought of visiting me in New Orleans on this trip, but apparently has given up the idea because of the great distance which would mean long and hard driving, and this is not agreeable to either Hannah or her mother.

In a letter to Prescott I mentioned having received your paper on *Besmidia* from the U.S., and in his reply he said he had not seen it, so please see that he gets a copy. Probably you have already sent it.

I think this is all for the present. Now I will go back to my drawing board and work on *St. leptocladum* and its varieties.

Hope the strike will be settled soon.

Sincerely,

CLASS OF SERVICE

fast message
deferred char-
acterized by the
code.

WESTERN UNION TELEGRAM

W. P. MARSHALL, PRESIDENT

SYMBOLS

DL = Day Letter
NL = Night Letter
LT = International
Letter Telegram

(58)

The hour time shown in the date line on domestic telegrams is STANDARD TIME at point of origin. Time of receipt is STANDARD TIME at point of destination

NSA009

NS CDU018 20 PD INTL=CD PARIS VIA RCA 12 1956 MAR 12 AM 8 30

LT ARTHUR SCOTT=

"MC" NEW ORLEANS

2824 DANTEST NRLNS=

INKING OKAY BUT EXPENSIVE TO YOU SENDING FURTHER
MANUSCRIPT IMMEDIATELY WHEN STRIKE FINISHED:

=GROENBLAD=

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

Feb 20 1956

Dear Rolf,

I was glad to read in the newspaper yesterday that the general strike in Finland has at last ended. Undoubtedly it has caused a lot of inconvenience and even hardship to some people. We did not get many details, but it was said that there had been some rioting in Helsingfors.

Your telegram reached me OK, and I am working full speed on the plates. Fifteen of them are finished in pencil, and my friend Mrs. Verine has inked eight or nine of them. It takes me a little more than a day to draw one plate if I get a straight run, but sometimes I have to stop and work with the microscope to get additional views of a specimen, or to use a pantograph to reduce or enlarge a sketch that may be undesirably large or small. So on the average I cannot do much better than one plate in two days. However, by May let I ought to be very nearly if not quite finished.

you

No doubt I shall hear from/in the next few days with another package of drawings. At present I am working on *Staurastrum*, and I think you have a few more of my sketches in this genus, so I hope you will send them as soon as you can.

Today I received the book that I told you I had ordered from Amsterdam, and which I believed to be the 2nd volume of Kossinskaja's monograph on desmids of the USSR. It turns out to be quite different. The title was given in the catalogue in German, "Bestimmungsbuch d. Süßwasser-Pflanzen a. USSR", Vol. 2., and I find that it deals solely with the Cyanophyceae, so it is of no use to me. Kossinskaja wrote part of it, with two other authors whose names I cannot read. The whole book is in Russian, except the botanical names, but the illustrations seem to be rather good, and it would be valuable for anyone interested in the blue-green algae.

From the same firm I got a reprint of a paper by A. A. El-Nayal, "Egyptian Freshwater Algae", 1935. It is not much good; the illustrations of desmids are wretched and mostly unidentifiable. He lists and figures 38 desmids, mostly *Cosmaria* of well-known species, but there is one item that might interest you, namely *St. bibrachiatum* "fa. brevior". He does not indicate ~~with~~ whether this form name is new or not. Enclosed is a tracing of his illustration, and also of what he calls *St. tetracerum*, a trigonal form.

This is all for the present. Just wanted to let you know that I heard about the end of the strike, and that everything is going along nicely.

Sincerely,

ROLF GRÖNBLAD
DR. PHIL.
KARIS, FINLAND

March 19th 1956.

Dear Arthur,

Today the parts in our general strike have arrived at an agreement and the strike will be stopped tomorrow at 06.00 o'clock. At last. The strike was quite absurd and has caused a great deal of damage to the whole country. Unfortunately we have a weak government and a very unpopular president, but we must hope that everything will be settled by and by.

It was very interesting to have a telephone talk with New Orleans, but unfortunately there was too much noise, so I could grasp only very few words. I hope you got my telegram.

Your letter and colour-photos I received Febr. 27 and I had begun an answer, but it could never be sent to you. Have you received Kossinskaja's paper? but perhaps it has not yet arrived?

You asked about "Cosmarium stenonotum Nordst." in Playfair 1908. He apparently refers to *C. pseudopyramidatum* subsp. *stenonotum* Nordst. (1876, XII:8)/also in W. & W., Mngr. II/. Playfair had a curious manner of changing very freely almost everything. On p. 618 in P.'s paper "(Nord.)" is put between brackets: this perhaps indicates that P. has made the change. But his fig. 20 is indeed very poor.

Now I have finished everything except the filamentous Desmids and I am sending a new parcel to you after a couple of days when the mail will be safer and the postoffices not so overloaded. There are of course again several arrangements of mine of which I don't know whether you can accept them or not. Again, you may make any changes you wish.

Perhaps it was to the best that the plates were inked in USA, but I feel really very sorry because you have to pay the costs. But when the African desmids are to be inked you shall certainly not pay anything. I wish also to pay your reprints of our paper.

The last parcel^{No 2} with descriptions of *Staurastrum* I hope you got?

I don't know what to do with Teiling's "Groenbladia"? I am not convinced it can with good reason be separated from *Hyalotheca*. What do you think yourself? *Gonatozydon* is known to have plate-shaped chromatophores, but already De Bary has recorded specimens with 3-radiate chloroplasts. I myself have recorded specimens with 4-6 longitudinal ridges (Gbl., 1948, I:1) but I think no one would say it is not a true *Gonatozygon*. I have very much pondered over this question, but really, I don't know??

I have photocopies of Nordstedt 1869 and 1877 made for you and am sending them in a few days. The text is, however, not complete, but all text-figures and plates. I hope you can use them. The size is 9x12 which I use for myself. Hoping no interruptions will cause further delay in our joint

I think there are perhaps some letters from you waiting in Stockholm where all mail has been deposited during the strike. In a few days I shall have them here.

ROLF GRÖNBLAD
DR. PHIL.
KARIS, FINLAND

1 Growth by you
1 Desmidium
2 Penium

March 24, 1956.

Dear Friend,

Today I got your letter of Feb. 29th ! I shall immediately write an answer and not keep you waiting any longer.

1) I shall send the next package of drawings and diagnoses to Hannah. *(perhaps not Monday)*

2) It is not quite necessary to have everything clear to May 1st, the Society's meeting is later, ~~about~~ sometime after 15th (I believe).

Which is
your opinion
?

3) Among the species not yet described are only very few: Hyalotheca ("Groenbladia", which I am inclined to accept on account of the very peculiar zygosporae, not only to make Teiling glad, and myself proud!)

4) At first sight I thought Micr. tropica from Ambadi to be var. elongata Schmidle, as I told you already when you were here. But it is not quite so elongated as Schmidle's fig., perhaps it should be a "forma"?

5) There are many things in the Grönblad-Croasdale paper which I do not approve of any more: e.g. Staur. majusculum I believe is certainly only a "forma valde depauperata" of S. minnesotense. - in any case the desmid I have seen. There are quite identical specimens in your material. I think all critic is useful, so tell me everything without being afraid!

6) Staur. novae-cesareae with smooth apex is to be considered the type. If I have written the reverse it is a mistake. It would be very kind if you would write to Ir. Ma. and put the question to him in a proper and polite form. I do not wish to make him angry! The text of this spec. I hope you will rewrite and make better. I beg you earnestly to make all alterations and corrections you find useful. My text is by no means something "noli me tangere"! - Staur. ankyroides was a bad mistake (with "c") - something like Desmid. Grewillii pro Greyillii!

7) I do not make my photocopies myself, but my friend Dr Gardberg takes the photos on 35mm film and then I have them enlarged in a photo shop. If you wish I can send you the film, because I do nothing with it. I have seen the contact method used and once I thought of buying a special machine for this purpose, but the costs were about 60.000:- fmk, so I thought it was not quite necessary for me. The method is very simple. Tell me if you want to have the film.

Today I got a copy of De Bary 1858 "Untersuchungen...." I had photocopies only for my use. These are now useless to me, so if you want to have them, tell me, and I shall send them to you. *(or the film?)*

Glad to see the clipping from "Time" with the vagabond face of Mr. Rekkonen, now our president. The worst type of a pushing politician.

Continued March 26th.

Got your letter of Mch 12th. (also package with sketches!)
The telephone trouble could not possibly have been between Helsingfors
and Karis, because it is almost the same as to telephone within Hfors.

It will take a lot of time if most of the descriptions have to be
retyped, I am rather slow in typing. But we shall see. Your original draw-
ings need not be returned to me.

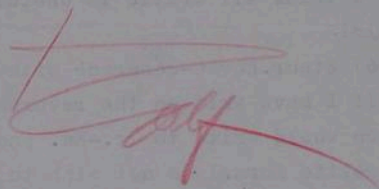
I too think our paper will be much more valuable if we have plenty
of illustrations. Of course, if you think some of those I have marked for
reproduction are not necessary, you can omit some of them.

If I send the next batch to Hannah tomorrow or so, then I think
she will have them when she has returned home.

Of course I shall send reprints to Prescott, but I have as yet
sent only very few copies, and you and Hannah were among the first to
have them.

The strike is finished but not quite settled, so no one can tell
what is coming.

So long,

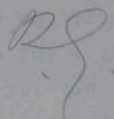


Mch 24

Just got a new letter from you date "Mch 20. 1956"

Today sending to Hannah a package, only very few remaining.

(+ your last sending). Hope you got my *Komarov's* ~~OK~~? Amsterdam
book sellers very shrewd Jews, take your last cent. Caution!



ROLF GRÖNBLAD
DR. PHIL.
HELSINKI, FINLAND

March 30 1956.

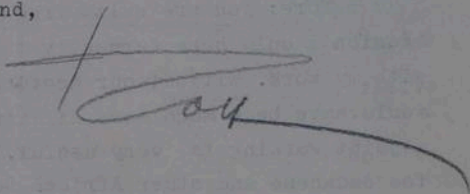
Dear Arthur,

Enclosed I send a list of the rest of the "new" Desmids described in the last batch sent to Hannah. I think she will get them when she has returned from her holidays trip. Some of them were very difficult to deal with. In some cases I had to examine the samples which always takes a lot of time. So I was really satisfied and lucky when the last diagnose was finished. A few Desmids which seemed to me too little known, when you had recorded only one or two specimens and I could find nothing at all in my samples, - I have omitted, which I think was the best I could do. As before, I don't know if you find my reasons acceptable or if you don't approve of them. I only repeat what I have said before: you are quite free to make any changes you wish! In conclusion I only hope earnestly that you will not get very disappointed with my work. Without our meeting and discussions last summer the work would have been much more difficult and troublesome. In my opinion such a joint working is very useful. I think it will be time for preparing the Sudanese and other African Desmids as my next work. I had a letter

from Dr. Rzoška who asked how far the work with the Sudanese Desmids had advanced. I had to tell him that I had done nothing since last summer but that I had intended to take them as my next job. However, there are many other works long ago begun which I have to do without very much delay, for example the Italian Desmids, and some collections from Sweden, Norway and Finland. Also about 600 samples from Greenland which I received two or three years ago. But I think the Africans are to come first.

Today it has been a fine spring day and I have been out fishing (angling) through holes made in the ice. It is very pleasant and exciting. There is still plenty of snow and ice, so I think the spring will be rather late this year.

Best regards,
your friend,

A handwritten signature in dark ink, appearing to be 'T. C. C.', written in a cursive style with a long horizontal stroke extending to the right.

Apl 16 1956

Dear Rolf,

I haven't written for the last two or three weeks because I have been so busy drawing the plates. Now I have more than half of them made and they are being inked. Today I received from Hannah the final package of drawings and descriptions, and I am glad to have it, for now I can see exactly what remains in the various genera.

Many thanks for the photocopies of Nordsteft 1869 and 1877 which came a week ago, and for Kossinskaja's second volume which arrived the day before yesterday. Probably both of them had been delayed by your strike. K's book would be a valuable one if anybody could read it; what a pity it is not written in one of the civilized languages. But anyway I can make out something from the pictures. I should be glad to have the photocopies of Debary 1858, and perhaps later on, when I have more time, I may ask you to send any of the 35mm films that you do not want, so that I can enlarge them to a bigger size. But I have quite a lot of work ahead, even after finishing the plates for our present paper.

As to *Groenbladia*: I think you have made the best decision in using the ~~same~~ name. I simply don't know enough about the principles of "higher" taxonomy (*sensu* Camp) to comprehend why it is necessary to place a desmid in a different or new genus just because it has a laminar chloroplast instead of a stelloid one. In fact I am only half-way convinced about the necessity of placing *Cosm. connatum* and *pseudocconnatum* in different species, especially as there are varieties of *pseudocconnatum* with elliptical end views. If *pseudocconnatum* can have 3, 4, 5 or 6 lobes in its chloroplast why can it not also have just 2? And if course the number of pyrenoids will vary with the number of lobes of the chloroplast.

My sketch of conjugation in *Phym. Nordstedtiana* fa. *minor* was made in 1942 when I did not know very much about desmids; as you suggest there should be dividing lines between the cells in the lower sketch. This is the only example I have ever seen of conjugation, though the plant is found in many different places in this region. In fact, there is one locality in St. Tammany Parish, La., where it is quite common. Some years ago Frohne had a paper in *Trans. Am. Micros. Soc. on Phymatodécis* with a sketch of conjugating cells, but I do not have a copy of it. Your interpretation of my sketch seems to be the only one that can be made, but it appears too strange to be trusted. Perhaps it will turn up again one of these days, and if I find it alive I shall certainly send it to Kallio and Starr for cultivation.

Also I received the package containing 11 additional sketches that you made of various desmids. Most of these are included in my own drawings, but I shall incorporate the chloroplasts where necessary. Your vertical view of *Micr. ringens* corresponds very closely with my illustration of *M. mahab.* var. *ringens* fa. *glabra* in Prescott & Scott 1952, except that in my plant the central tumour was more prominent. I think this plant should not have been transferred to *M. mahab.*, but I was obliged to agree with Prescott who preferred to follow Krieger.

Next week I shall send you the first lot of the plate drawings, with lists of names, and your own descriptions. If I see that I can spare the time, I will retype the descriptions embodying the corrections made by Hannah and myself. In a very few cases I have ventured to make slight changes in your comments, or have added some additional comment of my own.

Best regards, from your friend,

April 25th 1956.

Dear Arthur,

I am quite convinced that *Cosm. connatum* and *pseudocconnatum* are very well distinguishable species. I shall not try to convince you, if you are an "unbeliever". It would be a very difficult job, most probably exceeding my capabilities. But just one point of view I should like to emphasize. You say "If *C. pseudocconnatum* can have 3-4-5-6-7 lobes in its chloroplast, why can it not have just two?" Well, because there is a much greater difference when we proceed from 2 to 3, than if we proceed from 3 to 4, or 4-5, or 5-6 &c. The differences between the various radiations (= "facies") of multiradiate Desmids are generally of very small importance, - take e.g. *Staurastr. ophiura* or *S. margaritaceum* (or many others which you know). Among material of these species you can meet with a lot of dichotypical cells, which, I think, is to be understood as a mark of instability or faculty of variation in these species, which include formae with 3 or more radiations. On the other hand you have *Staur.* species with only 2 radiations (vertical view fusiform). As you know these latter species are much more constant (if compared with the multiradiate species), in fact this is the difference between *Arthrodesmus* and *Staurastrum* (of the *Staurodesmus* type). In the case "2 to 3" the difference or increase is 50%, continually diminishing as we arrive at higher radiations: we estimate the difference between a 8-radiate and a 9-radiate *Staur. ophiura* to be of very little value, (or importance). On the other hand, *Staur. natator*, *S. bicorne*, *S. grillatorium*, *S. saltans*, &c. biradiate *Staurastrum* are always biradiate and tri- or multiradiate forms have never been recorded. (The triradiate *S. johnsonii* ma. possibly be another species?). As in these cases, there is only little difference between the *Staurastrum* of the "*Staurodesmus*"-type with 3-4-5 or more angles - but when only 2-radiate then we have to do with an *Arthrodesmus*, which is much more constant. (although there are also 3-radiate facies). I don't know if I have succeeded in making my ideas clear - my clumsy English is a not quite harmless obstacle!

I am very glad to know that your plates are halfways finished. Indeed, if you can spare time, I think you would be able to retype the text much better and in a shorter time than I, having only a few hours of the nights to my disposal. I shall ask Luther when the May meeting of the Soc. Sci. Fenn. will take place, and then I shall tell you.

My additional drawings I sent to you merely to show what I have

seen, and if you find some chromatophores worth while copying I am quite happy.

Hannah has been very kind and very useful in correcting the Latin. There is no such person in Finland who would know both Latin and Desmids. (I myself have forgotten too much of my Latin notwithstanding Hannah's kind words. I am sure I couldn't avoid making rather bad mistakes.)

Now I am starting to do something with the Sudanese Desmids. But I have other works to finish too, so it will perhaps take a little more time. But I should like to have them finished sometime in the fall.

A few weeks ago I got the volume of Acta Soc. F. & F. Penn. containing our Staur. bibrachiatum paper. The whole volume is dedicated to Prof. Alvar Palmgren (to his 75th birthday). He asked your address, so he will certainly write to you. So far I have got no separate copies - it is one of the consequences of our general strike! But I hope they will be ready for distribution very soon.

Today (24.4) I received 3 copies from Kossinskaja (1953, -54, -55) on Desmids and one larger paper on Cyanophyceae. Have you got any answer from K? I include for your usage the Russian alphabet.

I am very curious to see the plates and the corrected resp. changed text of our US. Desmids.

I have written to Teiling a letter and told him ^{of} my difficulties and my doubts as to the acceptance of "Groenbladia". Of course he will be a little disappointed, perhaps angry (!) - he is always so with me, when I don't accept everything in his theoretical discussions - but nevertheless, we are good friends. I am ashamed I have kept him waiting for my answer a very long time (- and Ruzicka too!). But I had to put everything aside while working on the U.S. Desmids.

We have an exceptionally late spring. There is still plenty of snow and the ice is thick on our lakes. The days are rather warm - up to 10° C. and more, but every night is cold, -3 to -5° C. So we will have snow to the middle of May. As far as I remember this has never happened in my lifetime. All trees are still leafless and no flowers are to be seen in my little garden. The tulips and scillas and other early bulbs are just sticking up their tops from the soil.

There are many limnologists (and also desmidiologists) coming to the Congress in Helsingfors this summer. Why not you?

Best wishes and kind regards,

May 1 1956

Dear Rolf,

I have sent two airmail packages today, one containing 21 finished plates, and the other with the plate descriptions, diagnoses for all except Plate T, and a complete list of all habitats mentioned in the text. I am now retyping the diagnoses for Plate T, and will mail them tomorrow.

5 more plates are now being inked, and I guess that there are about 8 or 10 more to be drawn and inked, a grand total of about 34-36. On May 11th I shall mail all that are finished, - I hope all of them but cannot be certain.

You will see that I have assigned letters to the plates, for I was unable to draw them in the correct generic order, and I did not get them back after inking in the same order that I drew them. So after you have received all the plates it will be necessary for you to arrange them in the proper order, and then give them numbers instead of the letters. I have left spaces in the retyped diagnoses so that you may insert the proper numbers.

Just received from the Society a copy of the Acta with your paper on *St. bibrachiatum*. This journal is a beautiful piece of work, excellent paper and fine printing, extremely few typographical errors. I wonder what others will think of your defining the species as including three different forms!

Today came another installment of Hirano's Monograph on Japanese desmids. It seems that he has acquired Krieger's habit of making transfers and changing ranks without explanation. He has not accepted Teiling's genus *Actinotaenium*, but lists it in synonymy under one of his Sections in *Cosmarium*. I am afraid that not many persons will follow Teiling's rearrangement.

Cannot spare the time to write any more just now. So long!

Your friend,

May 7 1956

Dear Arthur,

Today I received your first sending: plates and descriptions. Of course I was very happy. The Society's meeting will be on May 14th, so it is scarcely possible that the whole manuscript will be here before that day. But I have discussed the situation with Hans Luther and his father, prof. Alex. Luther. The custom is that the manuscript is quite finished and ready for print when presented to the Society. But in this case, which is somewhat exceptional, it will be possible to present our paper without having been quite finished. I shall send to prof. Luther so much of the manuscr. and plates as I receive from you before the day mentioned. (I am not a member of the Soc. Scient. Fenn., so there must be two reporters who present the paper to the Society. These will be prof. Luther and Dr. Cedercreutz). Then I hope we will have good time for settling all questions which may appear.

As to the printing of new names in bold face type, I don't think it will be possible. Sorry! But the Society has its own traditions and it is very conservative and exclusive /founded 1838/ so we can have no hope of changing the rules of printing accepted long ago. (Societas pro Fauna et Flora fennica is the one still older scientific Society in Finland, founded 1821). I agree quite with your proposal, it would certainly be useful.

As to the term "Janus", it has not yet been accepted by any Botanical Congress, so we can use it or not use it, quite as we like. Personally I don't like it. I see in Teiling's paper (1950) that it is intended to mean something different from "dichotypical", referring only to the variation in radiation. At all events I shall consult dr. Kallio. I thought you didn't like Janus, so you said here in Karis?

You are quite right in correcting "graciliter" curvatis, it was a "lapsus calami" of mine!

Have you not got any reprints of the Staur. bibrachiatum paper? I shall order the secretary to have the printer to send them.

In the text you asked me to ink the chromatophores of Staur. scottii, but on the plate you ask me not to do so. Which do you want? I could have Miss Tikkanen to ink this after my instructions. She will do it nicely.

The two or three diagnoses that you ask me to rewrite I shall try to write and send to you for control.

May 12 1956

Dear Rolf,

Glad to see from your letter of May 7 that the first lot of drawings & arrived OK. Today I am sending another lot of 9 plates and a batch of descriptions. Three more plates are now being inked, and I have about three more to draw, including a few more *Staurastra* and all the filamentous genera. These will be finished next week and I shall be quite glad. Retyping the descriptions and diagnoses has been more of a job than I anticipated, but I can devote more time to it than you can. I have not been able to check this typing, so I wish you would read my sheets because there are probably some errors of spelling in them. In spite of a very careful check as I went along, I discovered last night that I had inadvertently given the same letter, "T", to two plates, and since the first one had already gone to you, it took me some little time to straighten the matter out. The second one I have changed from "T" to "JJ", as you will see.

My suggestion as to bold-face type was merely a suggestion, and if it cannot be done, why then it cannot. Every journal has its own mannerisms.

No, I am not exactly in love with the term "Janus", but I think some word is needed for the purpose of referring to desmids with different degrees of radiation. For that matter, "facies" has not been accepted officially, but if enough people use it, the Congress eventually will have to accept it.

I have not yet received any reprints of the *St. bibrachiatum* paper, only the one copy of the journal. Will you please thank Dr. Luther for send ~~ing~~ it to me?

The pencilled note on the plate regarding the chloroplast of *St. scottii* was intended for the young lady who inked the plates, and I forgot to erase it; so you will please either do it yourself or have Miss Tikkanen do it. The stippling of these chloroplasts requires a lot of time; one plate took nearly six hours to ink. I am sorry I started it, and wish I had merely indicated the chloroplasts with dashed outlines as Hannah did in her paper. For that matter, I should think that in the large majority of desmids it ought to be quite satisfactory if the chloroplast was described in the text as Teiling's Type F-2, or whatever it may be, and showing in the drawings only exceptional cases like your ~~pl~~irradiate chloroplasts of *C. pseudoconnatum* and similar ones.

Yesterday I received from Kossinskaja a copy of the first part of her desmid flora (but not the second), also three smaller papers. Her drawings are very good, and with the Latin diagnoses they will be of some help. I wish I could read some of her comments, and I have bought a small Russian dictionary which I shall try to use. But what a crazy alphabet!!! My name was spelled on the package A. M. Kkomny!!! Thanks for taking the trouble of giving the Russian alphabet both in print and script, but I hope I shall not have to try deciphering any handwriting in Russian, it would be much worse than the old German script that I learned at school.

Just received word that my paper on *St. wildemanni* has been printed in *Java*, and I suppose the reprints will arrive in another month or so. Also I have sent to *Java* my new paper on *Ichthyodontom sachlanii*, which is the name I have bestowed on the strange *Ichthyocercus*-like desmid.

In your letter you used two different kinds of parentheses, thus /founded 1838/ and (Soc. pro Fl. et F. Fennica). What is the difference between them? The former is not used in English, to my knowledge.

Must go out now to take your two new packages to the postoffice. So long.

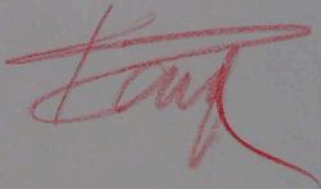
ROLF GRÖNBLAD
DR. PHIL.
KARIS, FINLAND

May 14 1956.

Dear Arthur,

Last Saturday (12.5.) I went to Helsingfors and brought with me as much of our typescript as you have sent me, it is :the first sending which is ,I think, about 2/3 of the whole and the 22 plates. I left them to professor Luther who promised to present our paper to the Societys meeting today. Although the paper was incompletethe thought it possible that the paper could be accepted for printing.We have to hope the best, but if they do not accept it in this condition we have to wait to the fall.

Your friend,

A red ink signature, likely of Rolf Grönblad, written in a cursive style. The signature is written in red ink and is positioned to the right of the typed text "Your friend,".

Karis, May 19. 1956.

Dear Arthur,

I can tell you that the second set of plates and text arrived in Karis a few days ago. The cardboard envelope covering the plates was very carelessly broken up (by the custom officials?) but the plates were OK. You have done a big job and done it carefully and well. I have not yet checked your typing, only a part of it (with help of Dr. Nordberg who can read both Latin and English and who is a teacher in biology here in Karis). It is very difficult to read proof-sheets alone.)

Here are some remarks: "Cosmar. callosissimum nov. nom." Syn. *C. rotundum* Presc. & Scott (1952) must not be called "*C. callosissimum* (Presc. & Scott) nob." because the author's name refers only to a plant's name, not to the plant itself, and Presc. & Scott have not given the name "callosissimum". Some authors e.g. Krieger use the manner proposed by you, but I have once called his attention to this matter. In order to be sure, I asked Dr. Luther (who is my living encyclopaedia in such things) and he told me my opinion was quite correct.

In a few cases you have altered the measurements. I think you have done it purposely, it is, I think, not a "printer's error"?

You use "cell wall" (or cellwall) but I think it should be dell-wall

You use cfr. - should be cf.

fa.

f. (forma)

I use in my letters two kinds of parentheses // and () if there are two parentheses needed. This is quite a private mannerism of myself and I have not seen it used in print!

There remains a great deal to do, but I shall try to be as quick as possible. The main point is that Prof. Luther and Dr. Cedercreutz have proposed our paper to the Society and now the "Board of officers" (I don't know what they are correctly called in English?) has to accept the paper for printing when it is completely finished.

So I think everything is going as we wish.

The few diagnoses which you asked me to rewrite I shall send to you for inspection.

Kind regards, yours

May 27 1956

Dear Rolf,

A few days ago I received the package of 75 reprints of the *St. bibrachiatum* paper. Many thanks for sending them.

The last of the plates was finished a few days ago, and they are now being inked. There are either 36 or 37 of them; I have lost count, and am somewhat confused because you said there were 22 in the first lot that I sent you, whereas I thought there were 21. Apparently my first guess of 35 to 40 plates was not far from the mark. It has been a big job, nearly twice as many plates as in the unpublished North Australian paper, but I have enjoyed doing it, and am happy that all these new desmids will appear in print soon. It is fortunate that the work was finished before the start of our really hot weather; though you would think it hot enough here right now. For the last couple of weeks the thermometer has varied from 28 to 32° C. and one day it reached 34.5°. Fortunately the nights are fairly cool, 18 to 22°, but about June 1st they will get much hotter and that will last until Oct. 1st.

I have finished retyping the descriptions, and they will go to you, together with the remaining plates in the next few days. I was not certain of the correct way of renaming *Cosm. rotundum*, so did the best I could. No doubt your way is in accordance with the Rules.

For a long time I have been under the impression that *fa.* was the correct abbreviation for *forma*; don't know where I got the idea. After checking several authors I find that all of them seem to use the abbreviation *f.* Also *Cf.* seems to be more generally used than *cfr.* Sorry to have caused you the trouble of changing them.

The measurements were changed purposely; in many cases you had not used all the measurements available, and in some other cases I found additional specimens which extended the range.

I have omitted about half-a-dozen desmids from the plates for various reasons. *St. furcatum* var. *taylorii*. Hannah told me that Bill Wade has this same form from Michigan and gave it the same name. He has rewritten his doctoral thesis and it may appear in print before our paper, so I thought it better to omit this item and let him have credit for it.

A. maximus var. *subcircularis*. You asked me to find out if this has one or two pyrenoids, and that if the latter it would have to be reassigned. There are two or three slightly varying forms occurring in different collections, and so far I have been able to see the pyrenoids in one sample (1 pyrenoid). I thought it better to omit the item until I get more time for searching.

C. binamillatum var. *americanum*. Under this name you have grouped four sketches that look to me like two or possibly three different species. It will require additional time for searching to get additional information, which I will send to you later.

Two small *Staurastr*a whose identification seems to me not quite consistent with other quite similar forms. These also I will send later.

Referring again to the typewritten descriptions. I have written the genus name in full on each sheet because you said the printer would probably work from these sheets, and the poor typesetter cannot be expected to know ~~what~~ whether *C.* stands for *Cosmarium*

or Cosmocladium, not whether S. means Staurostrum, Sphaerosozoma, or Spondylosium. For the same reason I prefer the abbreviation St. for Staurostrum, Sph., and Spond. for the others.

In writing previous manuscripts I have underlined the words to be printed in italics, but you had not done this. Who does it, the editor? He will have a rather tiresome job reading every word to see which should be underlined, and if he is not familiar with algae it is quite likely that he may miss some of them.

Some years ago when I offered to pay part of the cost of publishing our paper in the Acta, it was with the idea that all the desmids in my material would be published in one paper. Later it appeared preferable to publish a preliminary paper containing only the novelties, which we are doing, but this will leave several hundred known species for a later paper. Perhaps it may not be necessary to spend the entire amount on this paper, but save some for later. Of course I do not know what you have told the officers of the Society, and I certainly do not want to cause the slightest misunderstanding either with you or with them. It is simply a suggestion, and if you have promised the whole amount for the first paper, that is perfectly OK. However I shall not be able to pay any more.

When the paper is printed, perhaps you can ask the editor to have 6 or 8 extra sets of the plates run off, without the text, for distribution to those workers who have iconothèques. The only ones I know of are Teiling, Messikommer, Ruziske, Prescott and Hannah. Perhaps you know of others. I would like to have 125 reprints, and I wish to pay for them, notwithstanding your generous offer to pay the cost yourself.

For future papers I suggest the following points for your consideration: 'Wall' instead of 'cell-wall'. A desmid has only one wall so there can be no confusion. In Latin you write 'membrana', not 'membrana cellulis'.

Use one Latin word for 'pyrenoid' instead of 'nucleis amylicis', and for 'chromatophore' instead of 'massa chlorophyllacea'. In a few places you have used 'pyrenoidibus', and the Greek 'chromatophore' could be Latinized just as easily as the Greek 'chlorophyll'.

In your letter of Apl. 25th, writing about C. connatum and pseudconnatum, you make the point that the jump from a 2- to a 3- radiate form is much greater than from 3 to 4, etc. Agreed; but other desmids have taken the plunge, so why not C. connatum. It would be interesting if you could get Kallio to ~~not~~ raise pure cultures of the two species and then see if he can get them to conjugate. I understand Dr. Richard C. Starr is going to Finland this summer and will call on you. He is interested in sexuality in desmids, and might undertake the job.

Again, you write "St. natator, bicorne, grallatorum, saltans, etc., and always biradiate and tri- or multiradiate forms have never (yet) been recorded". I have added the little word 'yet'; don't you think it makes the sentence more correct? A year ago you would have added St. johnsonii to the list, but now we have not only a 3- radiate form, but dichotypical (or Janus) forms combining 2- and 3- radiate semicells. I don't think the 3- radiate form can be a separate species because of the exact correspondence of the highly elaborated ornament. And aren't you overlooking some others: St. magnottae, St. novae-terrae, and the specimens of St. brachyoprominens with 'supernumerary' processes making the semicells 3- or 4- radiate? If these four species occur in one small region of the USA, think how many more there may be in the rest of the world.

Teiling founded his genus Staurodesmus largely upon the numerous cases of dichotypy found in small species of Arthrodesmus and Staurostrum that he found in the plankton of his Swedish lakes. I think it quite strange that I have not recorded any such dichotypical specimens, though the individual species of Arth. and St. are represented in my collections. What queer influence can be at work in the Swedish lakes that is not present in the waters of Louisiana, Mississippi and Florida? I asked him this question, but he has not yet replied.

With my best regards, sincerely,

ROLF GRÖNDBLAD
DR. PHIL.
KARIS, FINLAND

June 5 1956.

Dear Arthur,

I am glad you have received the reprints of *St. bibrachiatum*. I can now tell you that both Kallio and Ruzicka have approved of ^{the} taxonomical arrangement proposed in this paper, describing the two different types of a *Staurostrum* (+ dichotypical cells) as one taxon. I think it was a lucky strike!

As to the plates for our US desmids I should be curious to know how much you have paid for the inking? I have got a grant from the Scientific Committee for various purposes, and if it can be possible to get US dollars from the Bank of Finland (which, indeed, may be difficult) I should be glad to pay at least (the half) price of the expences. But then you will have to write a bill showing how much you have paid. If it will appear quite impossible to get dollars, then you must allow me to pay your reprint^{ts}.

I have really promised the whole amount of your 500 dollars for our first paper. But if we are going to publish a second one, I am sure no further gifts from you are needed.

The underlinings of the text and other markings to the printer are usually made by the editor ("redacteur").

Have you any special wishes as to the order of the plates? I cannot do anything more before I have the whole typescript here, so I am eagerly waiting for the rest.

The extra plates-reprints will be ordered. I have always ordered a few for myself. But we must organize the sending of reprints so that our mutual correspondents may get only one reprint. (Could you send me a list of those phycologists to whom you are going to send reprints. Also of those to whom you have sent *Amscottia* reprints?)

I have never seen "wall" used for "cell-wall". Is it used in America? Why don't you like "cell-wall"? Isn't it the codified term? Corresponding term in Latin is "membrana" not "membrana cellulae". The words "nucleus amylaceus" and "massa chlorophyllacea" I have from such classical writers as Nordstedt and Lundell, who really knew how to write correct and fine Latin. Of course your proposal can be used, but why do you dislike these expressions? Because they are too long??

As to *Cosm. connatum* and *pseudocconnatum* the big forms from US are by no means identical to our European species and it would certainly be very interesting to cultivate them if you could send material to Kallio or Starr. (Starr has written to me that he is coming to the Congress, and he will perhaps come to Karis. - I hope so!)

"James" is not accented by a Britisher. We use "facies" which includes also the general meaning of James and what seems to me a better word!

Ruzicka told me that he was very much surprised and disappointed with my using the "facies" as a taxon in my Croasdale paper. Now I see he is quite right and it was most probably a mistake of mine to describe a "Staur. margaritaceum fac. variabile nov. fac." and *S. cuspidatum* "fac. ovale, n. f." You would not give taxonomical names to the 4-5-6-7-8-9-radiate forms of *S. ophiura*! nor to the 3-4-5-6-7-8-9-radiate forms of *S. meriani*! Nor can it be correct to give taxonomical names to the uni-, bi-, tri-, quadriradiate "facies" of *Micrasterias* which Kallio has created by means of his circus manipulations! Only as a short and concise "description" of these various radiations we may use the term "facies 3-4-5-6-7-8-9-angulata" (*angulata* following the gender of the word *facies*.) *St. paradoxum* and *S. gracile* are known as 3- or 4-angulate, but they need not be taxonomically named. These various facies are able to change into each another, they are not constant, permanent taxa but only more or less inconstant appearances of one taxon, and caused by diploidy - polyplidy and other nontaxonomical factors. Admitted some of these may be more constant - but they must not be described as a taxon with author's name and diagnoses.

Teiling in his first paper on radiation (the *Staurodesmus* paper) made subspecies of the different radiations. This was apparently false and Tg. himself has later changed his opinions. (I think T. has caused very much trouble in mixing the synonymy of a lot of species. No one will accept them. When such important taxonomical changes are made, they must be very severely founded. T's arrangements are not so. This is also Ruzicka's opinion. I cannot see any improvement in *Staurodesmus* nor in *Actinotaenium*.)

You call my attention upon the fact that dichotypical cells seem to be more common in Europe (Scandinavia) than in US. I think this is due to the fact that Tg. has studied almost only plankton samples where dichotypical individuals are frequently met with, whereas you have no or very few plankton samples. You should try to collect some plankton from good desmid lakes (not too small ponds that have dominant zooplankton). But there are really dichotypical cells in your samples, if not so frequently.

When I now look upon our new varieties and formae I cannot avoid feeling that many or at least some of them in the future, when more is known about them, will be reduced to variations within one taxon. However, until further research, especially by means of pure cultures, is made we think it inevitable to report the results of our investigations in this old manner.

Why do you call your new genus from Indonesia *Ichthyodontom*? "*Odontom*" (Gr.: *Odontoma*) is used by dentists for a tumour with a dental origin. I am afraid the name is not correctly constructed, but I know very

June 6 1956

Dear Rolf,

Today I hope you have received the last two packages of drawings and descriptions which I sent last Friday, June 1st. This completes my part of the work for the time being, until you send the proofs for correction. I know that you still have a great deal to do in checking the descriptions and notes, and arranging the species alphabetically. I did not quite understand the remark in your last letter that the Board of Officers of the Society "have to accept the paper for printing when it is completely finished". Do you mean that we have to wait for another meeting of the Society, or that you can send it to the Editor when you finish it?

I sent Irène-Marie an exact copy of our remarks on *St. novae-caesareae*, and have just received his reply which is enclosed. I think you do not read French very well, so I translate it as follows:

"I am anxious to see your descriptions of new plants, which will certainly be of much help to me in identifying the species that I hope to collect during my algological expedition this summer. Your remarks on the species *S. novae-caesareae* Wolle seem to me well justified. I have again examined my slides, and as far as I can tell, the centre of the apex of each semicell is granulate, as in Wolle's Plate XLIX:9, in Desmids of the U.S. 1892. I am not of Grönblad's opinion when he says that the centre is bare, in *S. novae-caesareae* Wolle. I believe it to be granulate as in my specimens. But I might be mistaken. I do not have the 1884 edition of Wolle's work, only the 1892 edition, and this might differ from the 1884 edition that you refer to. Just now I am preparing for my summer expedition and hope to bring back something new for Science, though I do not expect to find 160 new species or varieties".

So it seems that there really are two different forms, one with the smooth apex and the other granulate, and because of Wolle's imperfect drawings it becomes a matter of personal opinion which of the two should be regarded as the type. Hannah was kind enough to copy for me Wolle's figure of the plant from the 1892 edition, and it proves to be exactly the same as the one from the 1884 edition, as I proved by superposing Hannah's tracing on the plate; they match perfectly. But she says she copied it from Pl. 56, Figs. 3, 4., while in the 1884 edition it is Pl. 57, Figs. 3, 4, and both of these differ from I-M's citation of Pl. 49, Fig. 9. Anyway, there are arguments for both points of view as to the type species, and if you should wish to change your opinion and make our plants a variety, "*var. mediolaevae*", it would be OK with me.

In the current issue of the *Revue Algologique* there are two papers of interest, one by Kuno Thomasson on *St. brachioprominens* and allied species, and the other by Irène-Marie on *Euastrum* in certain regions of the Province of Quebec, with the usual lot of errors in spelling. One of these errors may cause some misunderstanding in the future. He has named a new variety of *E. verrucosum* in honour of Dr. Willie Laverdière, but he has written it *E. verrucosum var. Willei*, so that after the origin of the name has been forgotten it will be thought to have been named for N. Wille, the Swedish (or Norwegian?) algologist. No doubt you will receive reprints of these papers from the authors, and when you receive I-M's you will see that he lists both *E. everettense* and *E. obesum var. crassum* Pres. & Scott, which you believe to be identical.

Now I am drawing the plates for the paper on Peruvian desmids that Dr. Krieger worked up. Some of his drawings were too small and too sketchy for reproduction, so I have spent a week examining the material again and making new drawings, and in the process I have found several additional desmids that did not show up during the previous studies by either K. or myself.

Best regards from

June 11 1956

Dear Rolf,

There is no need to apologise for writing a 2-page letter; the longer they are the better I like them, and there is always a pleasant feeling when I look in the mail-box and see an envelope with the well-known Finnish or Swedish stamps.

I sent a copy of the *St. bibrachiatum* paper to Prescott, and asked what he thought of your idea of combining three different forms in one species, but he has not yet answered. Recently he took over the editorship of the *Trans. Am. Micros. Soc.*, which will take up a great deal of his 'spare' time and leave even less available for correspondence. Honestly, I don't see how he manages to keep up with all the projects that he undertakes.

Mrs. Perine charged me for inking the plates at the rate of \$1.50 per hour (= FM435.00). The average time for the 37 plates was 3 hrs. 10 min. each, so she asked for \$4.75 per plate. I increased this to the round figure of \$5.00 and paid her a total of \$185.00. This was considerable less than I had guessed in advance; I thought it would run to \$250.00 or more. If you are sure that your grant will stand it I should have no objection to your paying half of this, but I think it would not be possible for you to send dollars. There is another way in which it would be worked. You could withdraw \$407.50 from my deposit, pay \$92.50 from your grant, and ask your bank to instruct the Chase Bank in New York to return the balance of \$92.50 to me. If you should do this I should expect to pay for the reprints, and if you can give an estimate of what they will cost apiece I should like to know it. How much, for instance, did the reprints of your Brazilian and Lapland papers cost you?

I have no special desires as to the order in which the plates are arranged; they should follow, as nearly as possible, the usual sequence of genera. Unfortunately the genera are somewhat mixed up, because from the lack of time I had to work on the drawings as they arrived.

Shortly I will send you a list of my correspondents to whom I usually send papers, and will mark those names who received the *Amscottia* paper. There have been so many changes of addresses that the list needs to be rewritten. I will send the list in duplicate so that you may mark off those with whom you exchange reprints.

Some time ago I promised Dr. Starr to get some collections for him, but have had no opportunity to do so. My wife and I have not even been outside of New Orleans since we returned from Europe. But after Starr returns from Europe I intend to get some material for him, and shall also send some more to Kallio, and perhaps one or both of them can manage to put *G. connatum* and *pseudconnatum* into cultivation.

It is curious what different opinions can be formed by different persons about the same questions. That of course is one of the things that makes life interesting, and makes lawyers rich. I understand that Ruzicka claims that the term 'facies' is not a taxonomical unit (better 'category') and that therefore it is incorrect to couple it with an author's name, and that you agree with him. By reference to the 1935 edition of the International Rules (the only one that I possess) I think I can show that this position is wrong. Article 12 gives a list of categories and adds "If this list of categories is insufficient it may be augmented by the intercalation of supplementary categories". I interpret this to mean that as soon as one or more authors, for good reasons, adopt and publish a new term, such as 'facies', it automatically becomes a taxonomical category, without the necessity for formal approval by a Botanical Congress, or even for submission to one of the Committees on Nomenclature. Since you were (and perhaps still are) on one of these Committees, perhaps you can give a more authoritative opinion on this point.

Article 46 says "For the indication of the name (unitary, binary, or ternary) of a group to be accurate and complete.....it is necessary to cite the author who first published the name in question".

If you consider that my interpretation of an automatic creation of a new category is wrong, I submit the following. Committees and Congresses do not create new terms; they are devised and published by workers in the various fields; and if a sufficient number of other authors approve and start to use the new terms, then it seems to me that the Committees on Nomenclature would be obliged to recommend them for acceptance by the next Congress. Therefore, Telling and you and I, and I hope many others, are now in the process of creating the new taxonomical category 'facies', which ultimately will have to be accepted by a Congress, if that procedure is really required. And in the meantime we must follow Article 28, which says "Epithets of subspecies and varieties.....(and) similarly for subvarieties, forms, and slight or transient modifications..... agree in gender with the generic name". I think the new term 'facies' clearly comes under this rule, just as much as 'forma', and this is what I wrote to Hannah when she questioned your use of such ~~xxxxx~~ names as 'fac. trigonum'.

Here are some more observations that bear on the question. In the old days some desmid facies-variants were named as varieties, e.g. *Desm. aptogonum* v. *Ehrenbergii* Kütz., and incidentally we have an exact parallel to this in my biradiate version of *Desm. Baileji*. Later it became the custom to name such variants as formae, and your friend and mentor Nordstedt created the name *Desm. Baileyi forma tetragona*. I think you will admit that under the customary system we would have a perfect right to name our biradiate versions as formae, in which it would be mandatory to add the author's name. We think that 'facies' is a more accurate term than 'forma', but in changing from one to the other I can see no reason for departing from the rule.

You have cited *St. ophiura* and *St. mariani*, and I can add some others, *St. radians* (7,8,9) and *St. sagittarium* (7,8,9,10,11). No, I would not give taxonomical names to all of these, but as you yourself have pointed out, there is a much greater difference between 2- and 3-radiate forms than between 3, 4, 5, 6 etc. I have discovered some biradiate forms that I think are quite remarkable, such as *St. magnottae* and *St. novae-terrae*. The latter in particular shows so much variation within its own 2-radiate frame that I believe it to be much more than a mere facies; and I would not like to be deprived of the small honour of having my name, and yours, attached to them.

The name of the new Indonesian genus is *Ichthyodontum*, not *Ichthyodontom*, and is made from 'ichthys' and 'odont' plus the Latin termination '-um', to comply with Article 7 of the Rules. Since the Greek word for tooth is involved, it is not surprising that you have a similar word in dentistry, but I don't think that will bother anyone, for as far as I know you are the only dichotomous dentist-desmidiologist. The name is not what I would have liked, but my friends found some objection to every name that I suggested. Telling objected vehemently to *Sachlania* which was my first ~~xxxxx~~ choice; then you did not like a name made from the Greek 'polos'; then Hannah found another name was wrongly constructed, and Prescott objected to a fourth. Finally I got tired of the mess, and settled for *Ichthyodontum* suggested by Prescott. Everyone who knows desmids will also know that the name alludes to the similarity with *Ichthyocercus*, though this similarity is more apparent than real, since when they are analysed it is to be seen that nearly all the characteristics can be found in various species of *Euastrum*.

While on the subject of names, have you noticed in the Rules, under Orthography of names, XL (a), they give the example *Glazioui* from *Glaziou*? This *Glazovii* apparently is wrong, as is also *Glaziovii* as Krieger spelled it.

terms

My dislike for the ~~xxxxx~~ 'cell-wall', 'massa chlorophyllacea' and 'nucleus amyloceus' is simply that they are cumbersome and unnecessarily long. Why use two words when one will suffice. Probably I am influenced by the great American liking for speed and shortcuts, while Europeans are more under the strangle-hold of tradition. You cite Nordstedt, and I have the greatest respect for everything that he wrote. But he wrote

with a pen undoubtedly, perhaps even a quill pen; to be consistent you should abandon your typewriter. Language changes like other things; a century ago Ralfs used 'frond' for cell and 'endochrome' for chloroplast, as did Turner even as late as 1892; both are quite obsolete now, and I think that Nordstedt's and Lundell's Latin terms might be abandoned in favor of simpler words like 'chloroplastus', or 'chromatophorus'; and 'pyrenoideus', or whatever the correct Latin ~~terminations~~ terminations may be. Again, the Latin 'massa', meaning 'mass or lump' seems to me quite incongruous when applied to the delicate and complicated structure of the real chloroplast, and a pyrenoid is something more than a starchy nucleus, the starch being an inert accumulation of food reserves.

This morning I wasted a couple of hours looking through various papers to find what other authors had used for these terms, in several languages. From the enclosed tabulation you will see that there is little uniformity. It seems to me that the hyphenated 'cell-wall' is used much more on the other side of the Atlantic than on this side, and I should imagine that the German and Scandinavian authors who have written in English, or who have had their papers translated into English, have been largely influenced by West and West, who used 'cell-wall' throughout their works. It is not so easy to find the Latin words, for many writers who gave Latin diagnoses did not mention the pyrenoids and chloroplasts, and vice versa. But your friend and mentor Borge used 'pyrenoidibus singulis' and 'nucleis amylaceis' in the same paper (Brazil 1903).

You ask if cell-wall is not the codified term. I have never heard of any codification and would not know where to look for such a code. I should think that West & West were largely responsible for the popularization of the hyphenated form, but their use of it does not necessarily mean that it is correct nowadays. Perhaps you may not have noticed it, but I can tell when reading their works that they were written a long time ago, from certain small peculiarities of expression that are not used today. This is even more noticeable in Ralfs book written in 1848.

The suggestions that I made were nothing more than suggestions. If you don't approve of them, as probably will be the case, just forget them.

Hannah has returned your last two Latin diagnoses without change. I have only one change to make in the English. The word 'resp.' is not English, but a German abbreviation for 'respektive', meaning both 'respectively' and 'or'. In the sense that you have used it 'respectively' would not be correct, the right word is 'or'.

Telling has written a paper on Asymmetry in Desmids, and sent it to Hannah for correction of the English and for her to ink some drawings. He asked her to send it to me for examination because I had supplied him with a number of drawings showing various forms of asymmetry, and I have just returned it to him with my comments on certain species with which I am familiar. You will get some surprises when you read it!!!

This letter has become as long as some of Ruzicka's, but you don't need to answer it at such length.

Best regards from your friend,

	Latin.	English.	German.	French
Nordstedt	Membrana	Membrane		
Borge	Membrana		Membran	
Telling	Membrana	Cell wall	Zellhaut	
Skuja	Membrana		Membran	
Nygaard		Cell-wall	Sticksaakt	
Krieger			Zellwand, Membran.	
West & West		Cell-wall		
Fritsch		Cell-wall, Wall.		
G.M.Smith		Cell wall		
Taylor		Wall		
Taft		Cell wall		
Prescott		Cell wall, Wall		
Whelden		Cell-wall		
Irénée-Marie	Membrana			La membrane
Van Oye				Membrane
Bourrelly				La membrane

It thus appears that in Latin, German, and French, and also Spanish and Portuguese (the latter 2 not listed), a single word suffices. Then why continue to use two words in English just because someone started the fashion 75 or 100 years ago????

Nordstedt	Nucleis amyloaceis
Borge	Nucleis amyloaceis, pyrenoidibus singulis.
Telling	Nucleis amyloaceis, massa chlorophyllacea.
Turner	" " " "
Nygaard	Pyrenoidibus
Taylor	Somate pyrenoideo

ROLF GRÖNBLAD
DR. PHIL.
HELSINKI, FINLAND

10, June, 1956.

Dear Arthur,

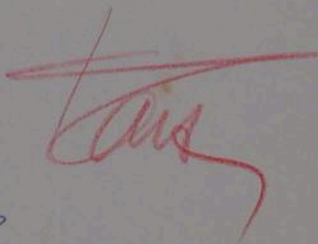
I wish to acknowledge the arrival of you last sending. I have got 37 plates + descriptions of plates + text. (There is no plate signed O nor OO). Is this all? Today I have finished the control of your typewriting. But there is a lot of work for me to do.

I am going to Helsingfors to the Sibelius festival where the British BEC orchestra will be playing. So I have no time to write more.

We have also got a very hot season quite suddenly - with a bang! as you say. Over 30°C.

Best wishes,

*Just before I leave for the
railway station I got J-M's
letter!*



July 20, 1956.

Dear Arthur,

Since a rather long time I have prepared a letter for you, but there are certain difficulties which I didn't know how to explain and how to put to you. Thus my rather long silence. Furthermore I have got into a unpleasant dilemma. This is all concerning the usage of the term "facies". Ruzicka has criticized my using the "facies" as a taxonomical category in my "Desmids from US. coll. by H. Croasdale and E. Moul. 1956." It is the opinion R.'s - (and presently also mine) - that facies is not at all to be considered a taxonomical category because the differences of the various facies don't depend on hereditary factors. By means of special manipulations (cf. Kallio!) you can artificially create a 1-2-3-4-facies of Micras-terias. This depends on the structure of the cell contents and especially of the nucleus. The haploid, diploid or polyploid individuals of a species are not to be considered taxa as far as I can see. There are lots of different "-ploids" among higher plants, artificial and natural, with remarkably different characters - but they are not taxonomically "named". We only say "a haploid" or "a diploid" individual of this species. I have also promised to Ruzicka not to use "facies" taxonomically, i.e. with a diagnosis and author's name. Well, you see, here is my dilemma: if you don't agree, what shall I do? Therefore I should be very glad, indeed, if you could agree to use "facies" as a special non-taxonomical term for describing the radiation of Desmids.

I am fairly willing to admit that my opinion as to this point is not absolutely certain without the slightest doubt. We don't know if all the different facies are of such ephemeral constitution or if, maybe, there are hereditary characters too. If by cell-division one semicell becomes 2-radiate, the other one 3-radiate, this phenomenon has nothing to do with different taxonomical categories. In fact, that is what happens: in pure cultures a Cosmarium is able to produce 3-radiate (semi)cells which are by no means unlike a Staurostrum. This I have seen in cultures from Praha, the 3-radiate cells being very numerous in certain cultures. Such cells cannot be taxonomically named. The same case may also happen in the nature and we call the results 2-3-4-5-....radiate "facies" because they are not varieties nor formae (as the older taxonomists thought) nor any taxonomical categories at all. This is how I now look upon the question. The term "facies" is OK but it signifies quite a special character in unicellular symmetrical Algae: in the Desmids.

There has been much confusion as to the naming of these facies in the past. As you write they have been called "var." and "formae" and by

Teiling (in his first Staurodesmus paper) they were made "subspecies". All these are to be replaced by "facies" - which we may accept as a non-taxonomical category or term.

If we think the biradiate Desmid. aptogonum var. Ehrenbergii or f. Ehrenbergii and Desm. Baileyi f. tetragonum taxonomically different, then we may call them var. or fa., but if we believe the only difference to be in radiation, then we must call them facies, without author's names. If we take the biradiate forms of Staur. magnottae and S. novae-terrae the situation is different: they include a series ^{or a group} of variable formae, evidently different from typical species. These we may call varieties (as we had done in our manuscript).

I cannot believe that you were so fond of seeing your name in print that you on that account would not consent to omit the author's names after a facies?

"Glaziiovii" I know is not correct, but I believe it must be spelled according to the author's spelling because this spelling has been used for a rather long time. There is a "recommendation" for such cases in the Internat. Rules. (Clost. baillyanum Breb. was altered by Eichl. & Racib. 1893 into "baileyianum", but this has not been accepted. Fleurot. tridentulum Wolle is ^{of} wrong and bad name because the plant has not 3 but 4 apical teeth - but we are not allowed to alter the name.)

To my ears "nucleus amylaceus" is much better Latin than pyrenoid-(us?) or (-eus?) or pyrenoides? this is formed from two Greek words: pyren = nucleus and eidos = like, the Greek ending being -eides, -eideios. I don't know how this is correctly latinized. This is why I use the "nucleus amylaceus" which is pure and correct Latin. As far as we know the pyrenoid is "a starchy nucleus" (cf. West & Fritsch, A Treatise..., and G.M. Smith, A Manual...) Perhaps Hannah and her professor could give a solution to the question about "pyrenoid" nominativ form? Howsoever, this is not a question of very great importance? "De gustibus non est disputandum".

I have for a time been very tired, perhaps because I have been working too late in the nights. Moreover my stomach was severely disturbed. So I have not been able to finish our manuscript so far. But now I have my holidays and I have been recovering quite well. So I hope I shall be able to work better and you can be sure I shall do my best!

We need not wait for another meeting of the Soc. Sci. I can send the manuscript to the editor who will have to consult the other members of the Board and ~~the~~ accept (or reject) the paper.

As to the financial problem I cannot do anything just at this moment because everyone is out somewhere on his holidays. But later I shall

ROLF GRÖNBLAD
DR. PHIL.
MARIE, FINLAND

clear up the matter in one way or another.

I should like to have your photo of *Cosm. costatum* (=Pen.Scottii) re-produced ^{on our paper} because it gives a rather good idea of the cell-wall.

||) Dont you think our *Cosm. ralfsii* v. *spinigerum* n.var. (Pl.EE f.1-3) is identical with *C.obsoletum* v. *maximum* Børges., 1890 = *C.maximum* (Børges.) W.& W., 1897.? 1196-1302

X) In a short time I shall send you the descriptions of *Staur. novae-caesareae* Wolle var. *pulcherrimum* (Cushm.) nov. comb. I think our specimens with a smooth apical area must be identified with Cushman's species, which most certainly is but a var. of Wolle's *C.nov.-caes.* I should very much like to have a look at Ir.-Mar.'s specimens! I am not quite convinced!

Simultaneously you will get *Staur. quadrispinatum* v. *spicatum* (W.& W.) nov. comb. rewritten.

In conclusion I wish to thank you most heartily for the second book by Fairchild which I received two days ago. You are very kind to me. I am sure this book will be as interesting and pleasant to read as the first book. The illustrations are excellent and numerous. I send you my very best thanks!

Staur. novae caesareae Wolle, in *Desm U.S.*, 1884 pl. XLVII f.3,4 is not the same as *St.nov.caes.* in 1892 edition pl. XLIX fig.8,9 (which is = *Frw.alg US.1867* pl.LX fig.8,9,). I enclose rough sketches.

I beg you, dear friend, try to forgive my slowness in finishing our paper. Believe me, I have been earnestly tired and also ill. But now I am OK.

Best regards from

X) I have not Cushman's text, only a copy of the plates. Could you get the text? (*Desm N. Hampshire, Rhodora 1913*)

Frahne's paper 1942 I should like to see, but how?

July 23rd. Today I got *Botanische Notizen* with Feilberg's paper on *Mic. mabeulensis*

I do not quite see what he is attempting at.
— Thank you for the "P.M."

What is the name of Miss Perrine? (whom we wish to
thank for interest) - in your list she is Miss Tolleson!

Do you think it necessary to mark the
figures which you have drawn and the few
ones which I have made? I am not particular
about this matter but perhaps it would be
correct? I don't know.

Here are Stam. quadr. minute var. - and
Stam. nov. caesus. - var. rewritten for your inspection
and also the "Literature quoted".

July 24th.

Just got your list of correspondents and a copy
of your lost paper on St. Willenani. Thanks! R.G.

А а	А а	= a	in <u>father</u>
Б б	Б б	= b	" <u>boy</u>
В в	В в	= v	<u>voice</u>
Г г	Г г	= g	<u>great</u>
Д д	Д д	= d	<u>down</u>
Е е	Е е	= je	<u>yellow</u> e.g. Elisabeth = Elisabeth
Ж ж	Ж ж	= sh	<u>sheet</u> read: "Yalysabeta"
З з	З з	= z	<u>measure</u>
И и	И и	= i	<u>pink</u>
Й й	Й й	= j	<u>buy</u>
К к	К к	= k	<u>blond</u> <u>dyke</u>
Л л	Л л	= l	<u>old</u>
М м	М м	= m	<u>man</u>
Н н	Н н	= n	<u>not</u>
О о	О о	= o	<u>not</u>
П п	П п	= p	<u>put</u>
Р р	Р р	= r	<u>red</u>
С с	С с	= s	<u>sick</u>
Т т	Т т	= t	<u>tell</u>
У у	У у	= u	<u>who</u> or <u>book</u>

from the last column
you can see the
pronunciation expressed!

Ф	ф	ф	ф	= f	<u>feel</u>
X	x	X	x	= h	like German <u>h</u> achen, <u>h</u> och
Ц	ц	Ц	ц	= ts	<u>ts</u> etse
Ч	ч	Ч	ч	= tsh	<u>Ch</u> arlie
Ш	ш	Ш	ш	= sh	<u>sh</u> ark
Щ	щ	Щ	щ	= shtsh	
	ь				yerk > no sound, not pronounced
	ы	ы		= y	yeryi (pyramidalum but off)
	е	е		= (z)	yery (may) (but very off)
Э	э	Э	э	= e	<u>cent</u> re
Ю	ю	Ю	ю	= ju	<u>you</u>
Я	я	Я	я	= ja	<u>ya</u> va

Before 1917 the following symbols were used too:

И	и	(ische)	= i
Ѣ	ѣ	(yaty)	= ie
Ѳ	ѳ	(fita)	= f

Ориг. рис. = original drawing.

А. М. Скотт = A. M. Scott

Ролф Гренблад = Rolf Grönblad (e is nearest to our ö)

Узухицкэсэ = Uzuitchikese

July 31st 1956.

Dear Arthur,

At last I have good news for you: our paper is finished and ~~see~~ ready for print with exception of the few questions I asked you in my last letter. Then there are a few more:

- 1) Can you get a photocopy or borrow a copy of Frohne 1942 with fig. 6 of the zygospores of *Phymatodocis*?
- 2) When "facies" is treated as a non-taxonomical category, then I believe it would be correct to write: *Desmid. sp. facies ovalis* and not *facies ovale*?
- 3) I have have used "cell wall", not "cell-wall" which you don't like. In the Botany Book which Hannah has illustrated "cell wall" is used. But in the Dictionary of Biology (1954) they use "cell-wall". But the authors are British. Well, you shall have it as you like best!
- 4) *Staurostr. pinnatum* v. *floridense* has no measurements. Long.? lat.? isthm.? Please send them.
- 5) I wrote already about *Cosm. ralfsii* v. *spinigerum*, which I think is identical with, or very little different from *C. maximum* (Börger). W.&W. / = *C. obsoletum* v. *maximum* Börger. /. What do you think?
- 6) *Cosm. subnudiceps* (Pl.U, fig. 7) has no habitat. Please send me! ^{Fla 109.182}

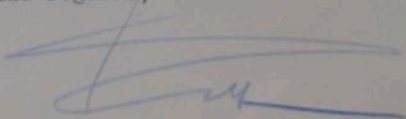
Then there is no more. I have gone several times through the text in order to have everything in order. As soon as I get your answer I shall put in the text the small additions. And then send everything (254 sheets + 37 plates) to prof. Luther.

Last week I went to the Limnol. Congress. I met those persons whom I wished to see and I attended to a few lecturers, among them Teiling. Almost all of the lecturers talked about different limnological topics which didn't be of any special interest to me. So I returned to Karis after having been only two days in Helsingfors. But why waste time?

Tomorrow Teiling, prof. Starr from U.S. and Mr. Alan Brook from Scotland will come to Karis, so I hope we can talk on some *Desmid* questions too.

I hope earnestly you will be satisfied with my work, I should feel very happy indeed.

Kind regards,



Aug 4 1956

Dear Rolf,

I was glad to get your letters of July 20th and 26th, for I suspected that you must be ill. It is good to know that you have recovered, and I hope the trouble will not occur again for a long time. From personal experience I know that it probably will recur; that is what happens to me when I get reckless and eat such things as pork chops with thick brown gravy highly seasoned. You and Teiling would have a hard time getting meals if you came to New Orleans; everyone here eats very rich food.

Sometime ago I asked Prescott what he thought of your ^{specific} ~~taxonomic~~ diagnosis (emended) of *St. bibrachiatum*, including three different forms in the one species. Here is his reply:

"as the title suggests, this species (and study) serves as a reminder of what we all know (and fear) that many, many species may characteristically possess equal ability to vary. At the same time, I am confirmed to the idea that, as you state, we shall have to go on 'pigeon-holing' species and variations among the desmids, taking them out and resorting as extensive field and laboratory observations dictate for reshuffling. A variation to me is worthy of a variety name when it can be demonstrated, or where there is only reasonable inference, that the variation 'breeds' true and maintains itself throughout several generations (at least one new generation). When one finds all manner of forms within a single collection one may suspect incidental and common 'variability' in the species. But even then, who can tell whether some of the variants are not true and will breed true in nature. If a variant of a species constantly appears in a particular region of the world and maintains that variation, one can only consider the desirability of attaching a variety name to the form. Personally, I think taxonomy is, in one way at least, simplified by attaching varietal names to definite expressions of a species for the sake of writing and talking about them in language and in references that all can understand. One may or may not, in this case, be talking and writing about variations, or about true varieties, but at least one's correspondent knows exactly what form is in mind. In other words, it does not bother me to continue making reference to var. *trilobum*, even though such a variety may be only a non-breeding variation of the typical. As soon as there is evidence that the 'variety' is not a true-breeder, then the species description and concept can be emended and we can go on our way, dropping the var. *trilobum* name altogether".

This is his usual circumlocutory way of saying that while he thinks your method is OK, he prefers to continue in the old way. But he brings out one point which I agree with, and I think you do also; that if a variant 'breeds true' and maintains itself in the same form (in nature), then it must be considered as a true variety and have a varietal name assigned to it.

Now, where do we draw the line between a 'variety' and a 'facies'? I certainly think that the biradiate forms of *St. magnottae* and *St. novae-terrae* are entitled to varietal rank, because they are so well established that they are now developing variations within the 2-radiate form; and there may be others among our new taxa.

The 4-radiate *Desm. baileyi* f. *tetragonum* is very common in Indonesia and N. Australia, while the 3-radiate form is quite rare. Therefore f. *tetragonum* must breed true. Typically *St. radians* is 8-radiate, but in one of my collections all the specimens are 7-radiate. Again, *St. sagittarium* is quite variable in the number of processes, but in one collection from N. Australia there are only 11-radiate forms. No doubt you could supply other instances, so there is evidently something hereditary

even in the facies character. The whole situation is a very puzzling one, and I really do not know what to suggest.

Yes, you really did get yourself into a dilemma by making the rather unusual promise to Ruzicka not to use 'facies' as a taxonomical category, and not to apply authors' names. Ruzicka is, of course, entitled to his opinion, and I have a high regard for him, both personally for his courageous struggle against extremely difficult circumstances, and for his ability as a desmidiologist. His drawings are splendid, and he has shown very remarkable diligence, patience, and perspicuity in finding out the relationships and differences between those obscurely marked *Cosmaria*, which are quite unattractive to me. A few years ago he was an amateur like me; since he obtained his present position he has been studying assiduously. Only recently he wrote that he had passed several examinations, with still more to come, and that he had had to learn a new language. (I cannot help wondering which language, for he already knows English, French, German, Czech and Russian). But with all that I do not think I would consider him as an authority on the Rules of Nomenclature.

Seeing my name in print is not important, except in the few cases that I have mentioned, and in order to get you off the horns of the dilemma I agree to the use of 'facies' as a non-taxonomical term without authors' names. If you do this I think that you and Hannah are correct that the name of the facies should be in the feminine form, and should not agree in gender with the genus. But if I write any more papers myself or in collaboration with Prescott, I shall not use the term 'facies' at all.

As you say, there is not much sense in arguing about matters of taste, and since you prefer 'nucleus amylaceus' and 'massa chlorophyllacea' there are quite allright with me. Here is what Hannah wrote in making some recent Latin diagnoses for me, "Chromatophorus parietalis, pyrenoideo uno centrali praeditus". Here's another, "Chloroplastus laminaformis taeniaformis (?) ordinem 5 vel 6 pyrenoideorum prominentium continens". She wrote these in her own way, I did not ask her to write them thus.

If you think my photo of *Cosm. costatum* will reproduce well enough, by all means publish it as a text figure. Also I think it should be stated which of the drawings were made by you; sorry that I forgot this. It can be done in the lists of names for the plates, and I think you can recognize which drawings you made.

Yes, our *Cosm. ralfsii* v. *spinigerum* does look very much like *C. obsoletum* v. *maximum* Børges., and I should think it is the same plant. I do not have W. & W.'s 1897 paper (Welwitsch) so do not know what their *C. maximum* looks like, but I believe that Børgesen's assignment to *C. obsoletum* was incorrect. But my drawings 1196-1202 show spineless forms along with the spined ones, and I am pretty sure we assigned the spineless ones to *C. ralfsii* v. *montanum*. Also there are transitional forms with one semicell with smooth basal angles, the other semicell with small mucrones at the angles. It seems to me that all these USA forms are related; you will have to decide whether to assign them to *C. maximum* or to *C. ralfsii*.

Thanks for copying Wolle's illustrations of *St. novae-caesarea*. The smaller of the two drawings seems to prove that his original specimens had granules all over the apical surface. Your assignment of our specimens to the new variety, v. *pulcherrimum* (Cushman) is a good solution of the problem.

I have ordered photocopies of the papers by Cushman and Frohne from the Farlow Library at Harvard University, but it may take a little while to get them. I do not know if the library is open during the summer holidays.

While I was writing this letter the postman brought yours of July 31st, with the excellent news that our paper is finished. You need have not the slightest fear about my satisfaction. I am extremely grateful for the large amount of time and work that you have expended on it, and the very great care with which the determinations have been made and the descriptions written. I think there is nobody else in the whole world who could have done it as well as you have.

Here are the answers to your questions that I have not already covered above:

The name of the inker of my drawings is Mrs. Dorothy Perine, as you will see it printed in the last several of my papers.

Coem. subnudiceps, Pl. U, Fig. 7. Habitats, Fla. 109, 182.

St. pinnatum v. *floridense*. Measurements are given on your diagnosis enclosed.

The postman also brought me the reprints of your memorial paper on Dr. Krieger, and on brackish water algae from Woods Hole. Many thanks for them. It is really remarkable that you should have found so many desmids in water with a salinity of 0.4 to 0.6%. As for sample No. 8, with a salinity of 2.6%, I should have said that it is quite impossible for desmids to live in water containing very nearly as much salt as real sea-water. In my own experience I have found a very few desmids in a sample from a pond on one of the Florida Keys, on the road to Key West. I strongly suspect that the water must have been brackish, though I had no way of testing it, for the pond was only about 50 feet from the Gulf of Mexico and only 4 or 5 feet above sea level, so that even if it was not flooded with seawater during very high tides, it would certainly receive a lot of salt spray during storms. Perhaps you could catch some desmids out in the middle of the Gulf of Finland, for the salinity does not exceed 0.6%, I believe. The more we study desmids, the more we find out that we don't know about them.

Glad that Telling was able to attend the Limnological Congress, and that he has visited you in Karis, with Prof. Starr and Mr. Alan Brook. I have never heard of Brook before; is he a desmidiologist? Perhaps you have had an opportunity to ask Telling whether he intended his term 'facies' to be used as a taxonomical category; I should be interested in hearing his opinion.

I have not yet received Telling's paper on *M. mahabuleshwarensis*, though he told me he was writing one. In a later paper (the one that Hannah and I corrected), he lists most of the known varieties of *M. mahab*— and gives the position of the auxiliary (smaller) processes of the apical lobe, as depicted by many authors, and shows that there are right-hand and left-hand forms of the plant, if we accept the drawings as correct. Perhaps I have seen more different varieties of *M. mahab*— than anyone else, including two new varieties as yet undescribed, but I have never seen the auxiliary processes in anything except what may be called the 'left-hand' position; that is, on the upper surface of the upper semicell, the small processé is to the left of the vertical centerline. Consequently I am suspicious of drawings that show them in a reversed position, though admitting the possibility that they may be correct. Several of Krieger's illustrations of *M. mahab*— and varieties have been reversed in his copying process, so that the smaller arms are shown in the wrong position. There are many desmid species that exhibit asymmetry, but I think that there are extremely few of them that exist in both dextro- and laevæ forms. The only one I can think of offhand is *St. subgracillimum*.

With my best regards,

Sincerely,

Aug. 16. -56.

Dear Arthur,

Yesterday my holidays were ended and my dentistry-slavery has begun. This summer has been exceptionally cold and rainy, almost every day showers of rain. It is a pity with the many foreigners who have come to Finland for the Limnological Congress. I was only a couple of days in Helsinki. But the lecturers were talking only limnology, of very little interest to me. Teiling spoke ^{about} ~~of~~ plankton Staurastrum, how *S. manfeldtii* by degrees is developing into *S. planctonicum* and further into *S. luetkenmuelleri*. Those are inventions without the slightest reality as a base. K.M. Ström asked if there had been any experimental control. Of course there had not been. So the discussion was ended. Tg. asked me "what did the man mean with his questions?" He is apparently quite under the spell of his own ideas and believes in them as in axioms. And whosoever dare put a question as to the exactitude of those ideas has no understanding for evolution!

I met some other people interested in desmids. Mr. Thomasson, a young man who escaped from Estonia to Sweden. I think you have got his papers? He was a very agreeable person. One day he came to Karis and we had a pleasant time together. Prof. Starr did not come, though he had promised and I was waiting him together with Teiling. Alan Brook is a quite young nice man who is studying Scottish plankton, even desmids, but I had no chance of talking many words with him. Starr is also rather young, or looks so, and I should have liked to have a quiet talk with him in Karis. Bourrelly I just saw, but when I said I cannot speak French he fled. He cannot or does not wish to speak German or English, although he has been as a prisoner of war in Germany and was allowed to work on Algae at Plön. Tg. told me that Bourrelly has got desmid samples from French Sudan, so I think we have to make our Sudanese paper ready for print as soon as possible. A Hindu by name of Singh from Benares promised to send samples. These were the news from the congress.

(Continued 27.VIII.) I agree with yourself and Prescott as to the sense of "variety": if a variant breeds true and maintains itself in the same form it must be considered a true variety. However, the distinctive line between variety and facies must remain more or less subjective. If anything Desmid taxonomy is a subjective science. It is to a very high degree depending on the author's personal ideas. As you say, *Staur. magnetatae* and *St. novae-terrae* have biradiate forms which have developed several variations within the biradiate shape. In accordance with these facts

we (you and myself) agreed to call them varieties and not facies. What you have said about the other examples is true. Another good example is *St. brasiliense*, type 4-radiate (common - main form in Brazil) and var. *lundellii*: 5-radiate (the only one found in Europe & N. Amer.). These are very constant and cannot be treated as merely facies - as far as I can see. The situation is puzzling, indeed. On the other hand we have such species as *St. meriani* 3-4-5-6-7-8-9-10-11-radiate. I don't know what to do with them. I don't know how they breed, perhaps they are constant. But it seems to me somewhat monstrous to give a taxonomical name to each of them: *f. triangulare* Scott, *f. quadrangulare* Grönbl., *f. quinquangulare* Teil., *f. sexangulare* Ruz. and so on.....! It seems better to make only a note in the text that Scott has recorded a triangular radiation (or facies, or forma, as the old authors did - but facies seems to me acceptable), Gblad a quadrangular and Teiling a 5-angular cell. Perhaps these numerous facies are hereditary, perhaps not. We don't know so far. I asked Teiling what he thinks of this last species and its facies. When I put the question to him, he admitted, but not without hesitation, that these numerous variations should not be taxonomically named. Perhaps, if he has time to think more over the question he will give a different answer. - Of course I don't consider Ruzicka an authority on Nomenclature Rules. But I like some of his ideas. He is an amateur, but so are you and so am I. Teiling has every now and then told me that only an educated botanist has a true sense of the great idea of evolution! I don't think so. - The question as to the sense of species, variety, forma, facies and morpha in Desmids is by no means altogether clear. And I think much more must be known about the Desmids before we can say: this is correct, that is wrong.

✓ There should perhaps be some remarks upon these questions in our introduction? I shall put all facies names in the feminine form, which I think is correct.

Cosm. ralfsii v. *spinigerum* nob. I have kept as a variety and added remarks on its likeness with *C. obsoletum* v. *maximum* Börg. - West's species *C. maximum* is not quite identical, the cells being considerably longer. (I enclose a copy of West, *Welw. Afr. Alg.* pl. 367, fig. 21.).

I too was very much surprised by the high salinity in Hannah's sample 8. And so was Hans Luther. So I asked Hannah if everything was OK, and she answered the method used for determining the salinity was quite reliable. I think it would be worth while to study this pond during a longer time. Perhaps the Desmids periodically die when ocean water is flooded into the pond and then there is a new growth of them when the water becomes less brackish.

I had a look at my original drawings of *Micr. mahabulesw.* + *var. wallichii*. To my surprize there were drawings showing the apical processes in a reversed position, though I had never paid any attention to this peculiar detail. I don't believe my drawings are incorrect because I always draw such details by means of my drawing apparatus, never by free hand. - (Here I can tell you something very curious. One day during the Congress a young Swede, Mr. Thomasson visiting Karis told me that Skuja's drawings are made without any drawing apparatus and then they are inked by himself directly by free hand on a thick plate, without copying them on a transparent paper!!! What do you think of it? How can such be possible. Is this the explanation why his drawing are looking "too fine"?)

Thank you very much for a copy of your *S. wildemani* paper. It seems to me very clever and altogether a sensible one.

Dr. Johnson from Singapore should bring with him some material collected by Prowse in Malaya. But I didn't see such a man at all.

~~Mr. Singh from Benares promised to send material from his part of the world. I shall send him some copies.~~

Mr Fairchild's book was very interesting, though I liked his first book ^{still} more.

Professor Luther told me that the Society has to decide about the printing of our paper. Next meeting will be held in September. It seems that there are difficulties for printing the explanations of the plates on the opposite side, as you proposed. It will raise the printing costs. However, I shall try to persuade Prof. Palmgren who is the man who has to decide the details of printing botanical papers.

With my best regards,

I had a letter from Mrs Krieger (I had sent her a copy of my small "In memoriam"). She told me that a Dr. Gerloff who is working at the Botan. Instit. Dahlem, is going to finish Krieger's *Desm. Flora.*, or he is trying to do so. I think he has published nothing on *Desmids*. But he has got all Krieger's notes and drawings and samples. I cannot believe this will be anything like K.'s *Flora* but nevertheless it will be better than nothing. Perhaps something like Migula's monstrous "*Kryptogamenflora*"

What is our Harmer's doing? It is a very long time since I had a letter from her. The II part of Hook. Icon seems rather good; (but numerous printer's errors!)

Sept 1 1956

Dear Rolf,

Thanks for your letter of Aug 16/27, with news of the Limnological Congress, which is just about as I should have expected. I have attended two large Congresses of the Am. Ass. for Adv. of Sci. (AAAS), at both of which the Phycological Soc. and the Am. Microsc. Soc. held sessions. But for me the trips were nothing but a waste of time and money. The only good that I got from them was the chance of meeting other algologists, and even then it was surprising how few are interested in desmids or know much about them.

Yes, Kuno Thomasson sends me his papers, which seem to be very carefully prepared. But his last one, on *St. brachioprominens*, seems to me rather peculiar, though I am hardly in a position to judge it since the only form of this desmid with which I am acquainted is the greatly different variety that occurs in southern USA, and of which several forms are illustrated in our paper.

I have exchanged a few letters with Bourrelly, and hoped to see him in Paris last year, but he was away at their Biological Station on the English Channel. Probably his English is like my French; I can read it well enough, but when I try to speak it I have great trouble in making the Frenchmen understand! Two or three years ago I asked ~~me~~ him to send me some of his Madagascar material merely for examination and not for publication, to which he replied that he could not do so because the material belonged to the Institution, not to him. I was disappointed, and mentioned the matter to Teiling who knows him quite well. T. wrote me that I could hardly conceive of the red tape and bureaucracy that prevails in France in such scientific institutions, and that Bourrelly would not dare to do such a thing. But as far as I can see all he would have had to do was to ask the Director for permission, and indeed I cannot conceive that permission would have been refused.

I hope that you get the material from Malaya that Prowse was supposed to have sent, and also that promised by Mr. Singh from Benares. There ought to be a lot of interesting desmids in India, and perhaps it would be possible to determine what some of Turner's unsatisfactory drawings really represent.

It would be quite appropriate to place in our introduction some remarks on the subject of 'facies', and our reasons for not considering the word as a taxonomical category.

If the printing of the plate explanations on the reverse side of the plates would increase the printing cost too much, please drop the matter. In several papers that have appeared in quarto size, like your Brazilian one, I have pasted typewritten lists of the names between the plates, for easier reference.

It is good to know that something is being done towards the completion of Krieger's monograph, though it seems quite strange that this enormous task should be entrusted to a non-specialist. Apparently Kurt Krieger has succeeded in getting his father's material out of East Germany, which he thought would be quite difficult. A few months before his death K. wrote me that he had almost completed the section on *Cosmarium*, but I do not know what he had done on the remaining genera, if anything. Kurt wrote me that the *Cosmarium* section was not in manuscript form, merely the notes and drawings arranged in card-index form. So if Dr. Gerloff follows Krieger's notes exactly (if that be possible) things may not be too bad, and one of these days we may have at least the most difficult genus straightened out. I am not acquainted with Migula's *Kryptogamenflora*; the only one of his desmid papers that I have is "*Die Desmidiaceen*", 1924, a small book intended for beginners.

Hannah went to Woods Hole for a couple of weeks during the summer vacation period, and then returned to Hanover; I don't know what she has been doing, but she wrote that she had not heard from you for a long time. Perhaps you owe her a letter.

For the last couple of months I have been working steadily on Indonesian material, but it got rather tiresome looking day after day at the same desmids, even though there are many strange and beautiful ones. So for a change I picked up one of Sioli's Brazilian collections, No. 32, and have recorded some more unusual and new species. One of the rarities is *Spondylosium desmidiiforme* (G.S. West) Borge, or probably a variety of it. In general it agrees very well with Borge's description and illustration, 1903, Pl. 5, Fig. 23, and 1918, Pl. 5, Figs. 36, 37. My specimens agree in size with Borge's "forma tenuior" in the 1918 paper, though I cannot say whether they are his form with the obtuse-angled or the acute-angled sinus. In the 1918 paper he does not give the end or side views, as he did in the 1903 paper; these however are of the larger plant which may not be identical with the smaller one. Some time ago you sent me one of your sketches of the plant from Brazil 32, but I think I must have returned it to you, and I do not remember what details you showed. From the enclosed sketches you will see that in a slightly oblique view of an empty cell or semicell, the margin is decidedly crenulate, caused by two parallel rows of pores which sometimes can be seen quite distinctly, in others only with great trouble. Further, the top view of an isolated cell shows that it is asymmetric, with a protuberance at only one end of the longer axis of the ellipse, and that the protuberances are deflected respectively to right and left of the long axis in the two semicells; this deflection corresponds with that seen in several species of *Desmidium*. But even more curiously, I believe that I have seen an isolated cell in which the protuberances were at opposite ends of the long axis in the two semicells. This requires confirmation, and I have been searching for more isolated cells with this peculiarity, so far without success. The plant is fairly common in the collection, in the form of long twisted filaments containing as many as 227 cells; also isolated semicells can be found without much trouble, and isolated whole cells are more rare. Not much information can be obtained from the filaments because of their strong twist, 90° in the length of 10-12 cells, so that an exact front view can be had of only one cell, the adjacent ones being tilted by about 8 or 9 degrees, and this is sufficient to conceal the small difference in appearance caused by the deflected protuberances.

When you get a chance you might see what you can learn about this funny little desmid, also try to find the pyrenoids if there are any; I have not been able to see the pyrenoids but you may be able to bring them out by your staining method. Note that in the end view the four lobes of the chloroplast seem to be arranged in a curious quadrantal fashion which I have tried to indicate.

I have a long letter from Teiling telling of the Congress and his visit with you, and with a lot more arguments about his theories. I must read it two or three times more in order to digest it, but as I have told him several times, I am simply not competent to understand the principles involved in his theories of desmid evolution. I am quite content to continue as I have been doing, finding desmids, drawing them, and identifying them with the invaluable assistance of yourself and Prescott. The division of the species into genera I must leave to wiser heads than mine.

Teiling told me some years ago about Skuja's drawings; that they are made without any mechanical or optical help. It seems almost incredible, and it probably accounts for the peculiar appearance of his drawings, which seem to me not to give a true impression of the plant, though the details generally are correct. However, Skuja has admitted to Teiling that one of his views is incorrect, the vertical view of *X. burkillii* v. *alternans*, in his Burma paper, Pl. 33, Fig. 16. I have seen what I take to be the same plant, and the vertical view is decidedly different.

With my best regards, sincerely,

1)

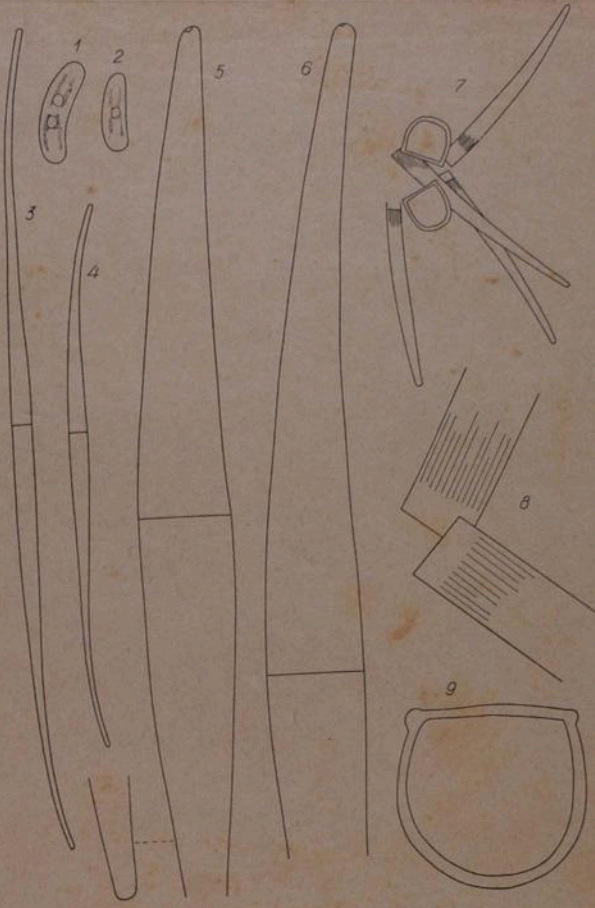


Plate I

II

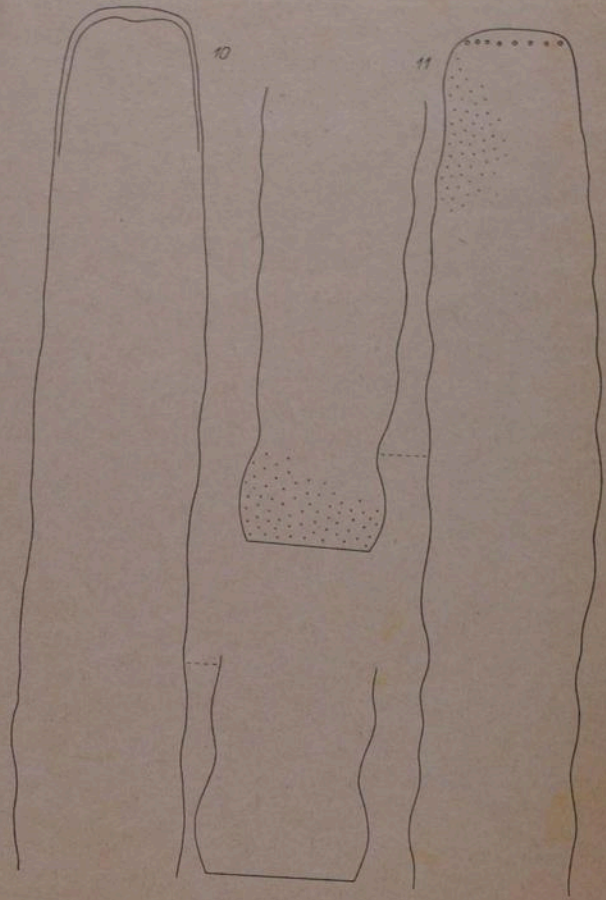


Plate II

11

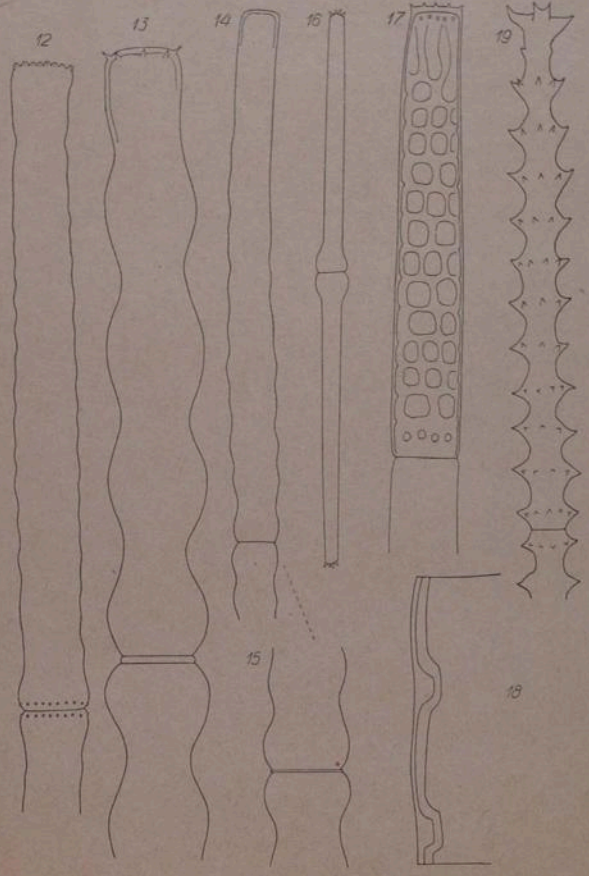


Plate III

IV

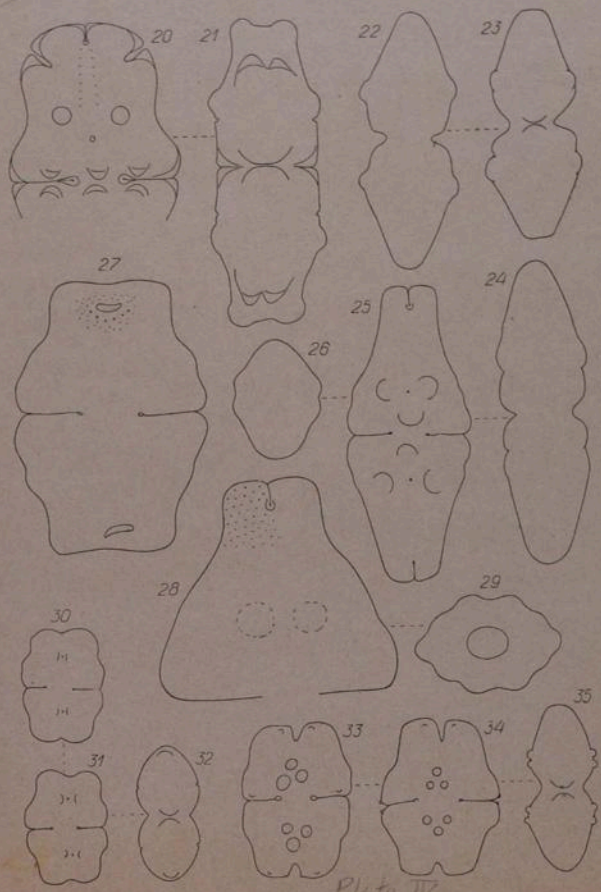


Plate IV

V

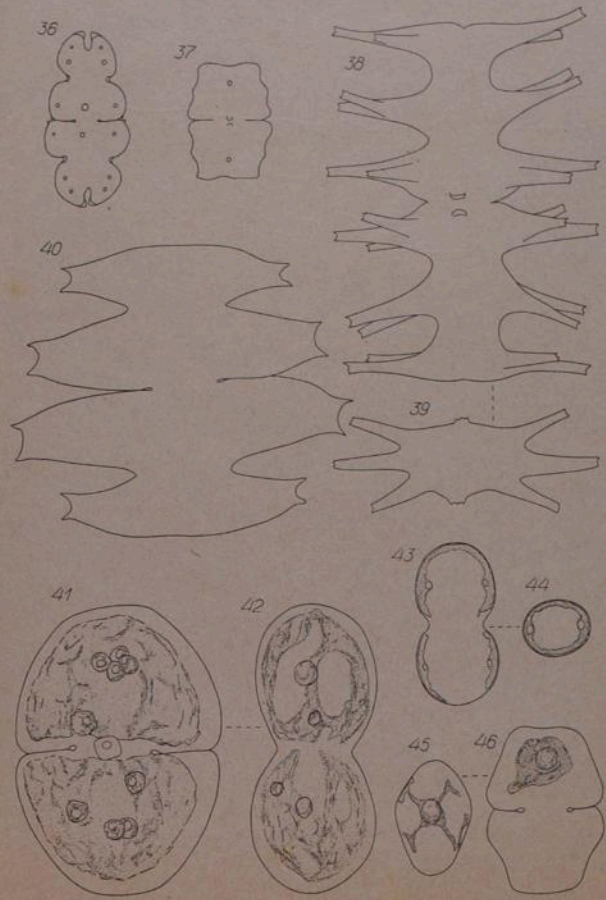


Plate V

VI

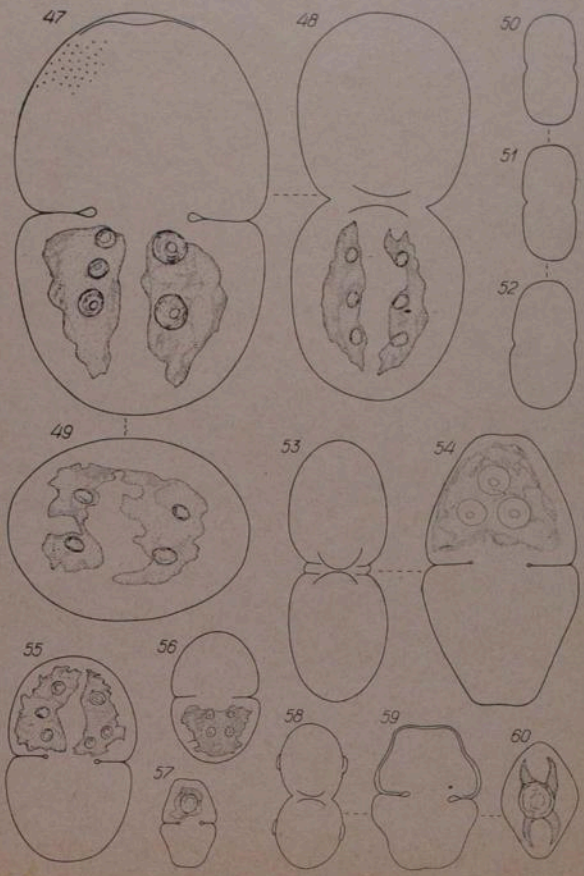


Plate VI

VII

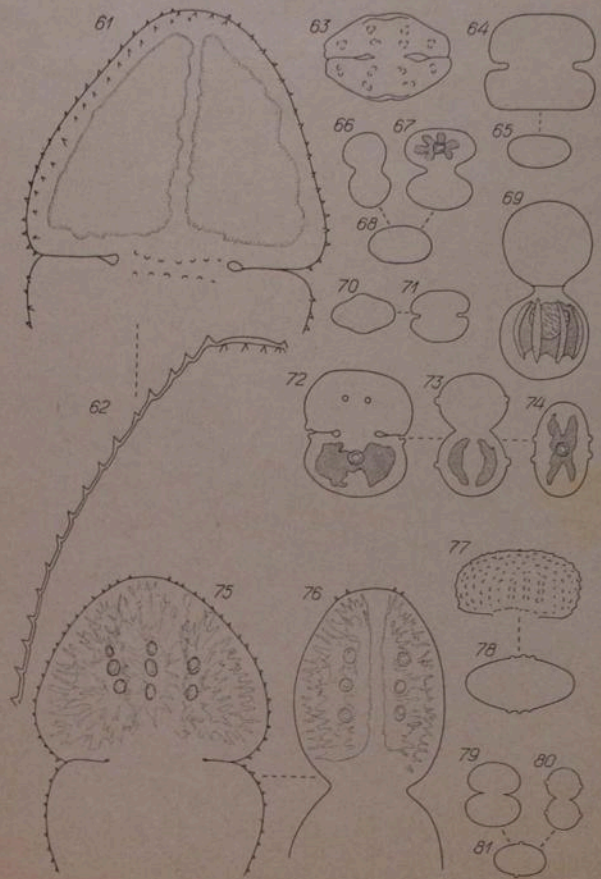


Plate VII

VII

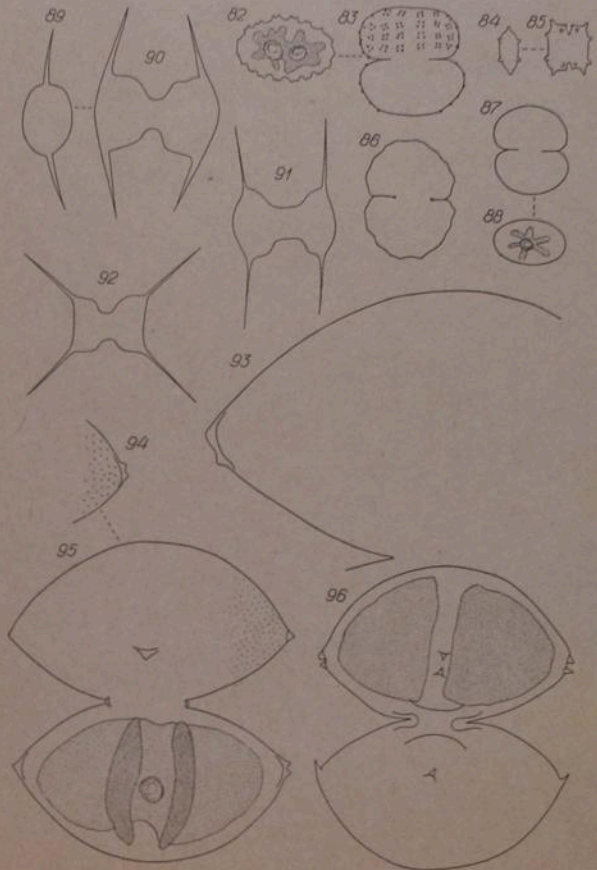
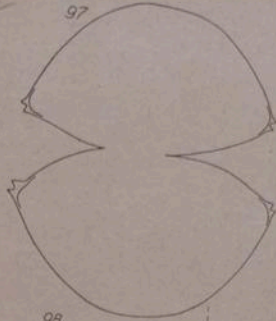


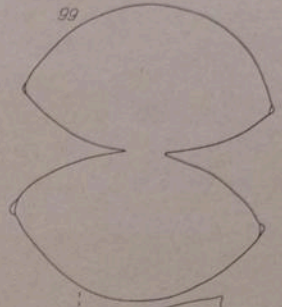
Plate VIII

IX

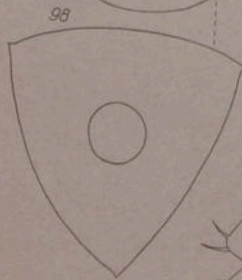
97



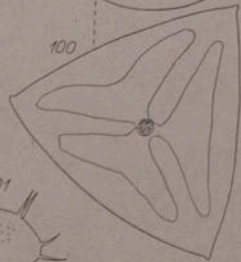
99



98



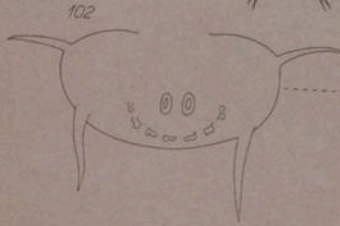
100



101



102



103

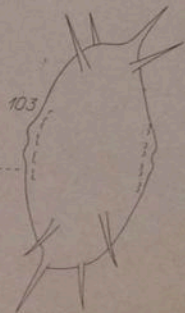


Plate IX

X

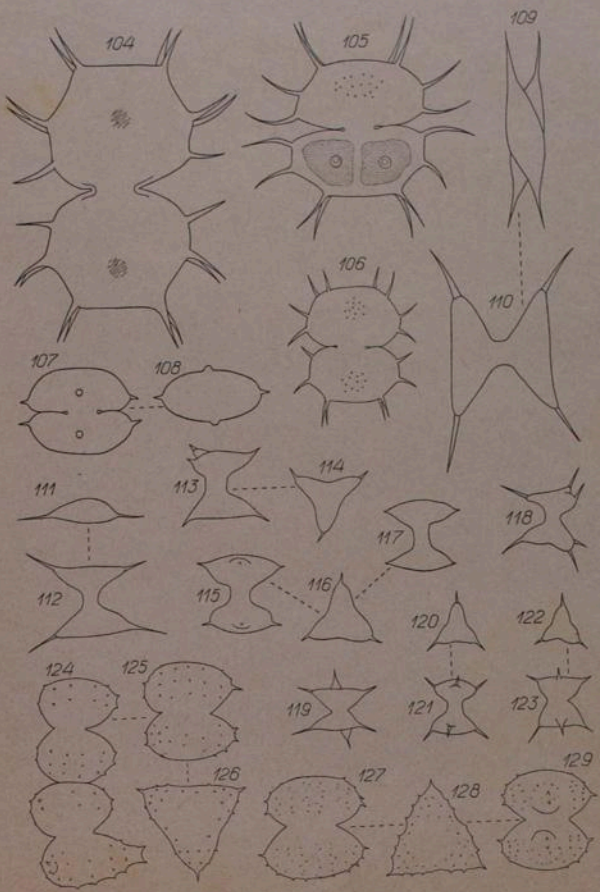


Plate X

XI

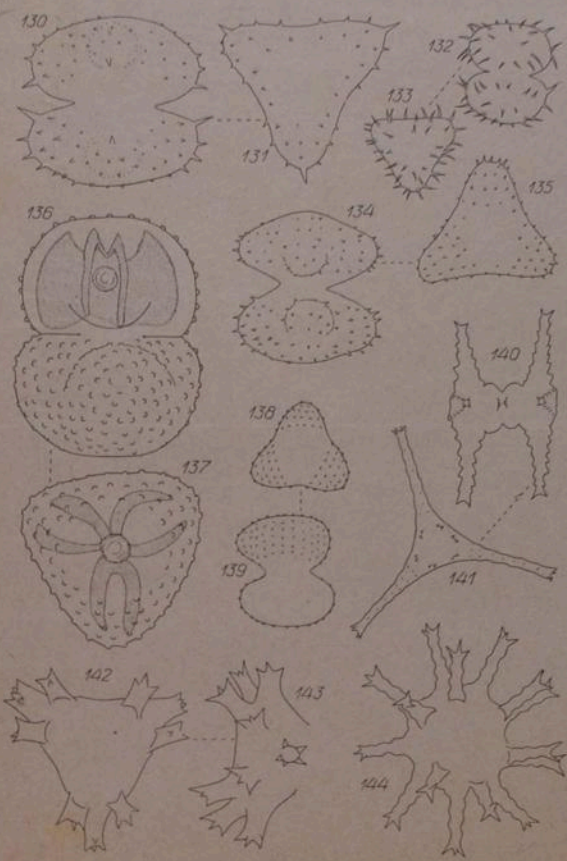


Plate XI

XII

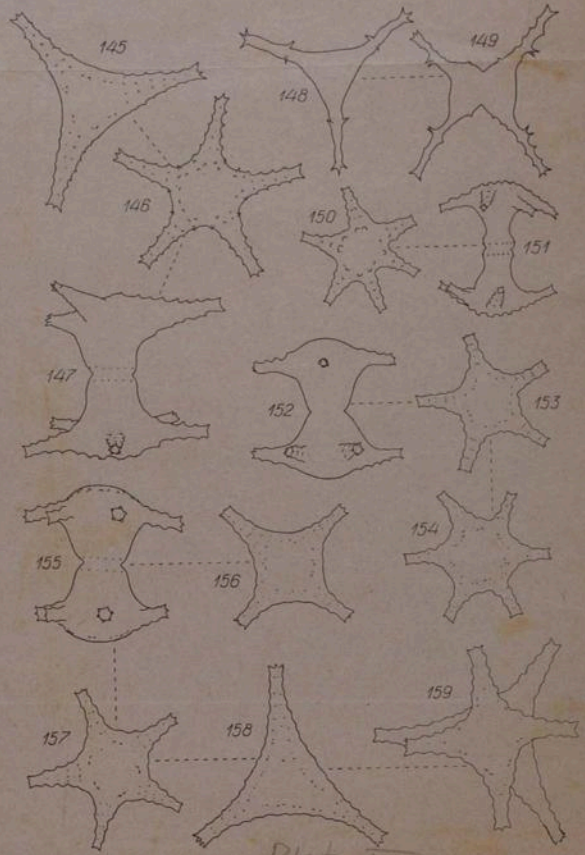


Plate XII

Söndag 20 maj

*Finska vetenskaps-
societytets majmöte*

Prof. G. Elfving behandlar i en uppsats ett problem ur den matematisk-statistiska teorin för planering av försök så att resultaten blir så riktiga som möjligt. — Vår kända algforskarare, dr Rolf Grönblad i Karls, har tillsammans med en amerikansk algforskarare, mr. Arthur M. Scott, bearbetat en mycket stor samling prov på mikroskopiska alger från USA:s sydliga stater. Mr. Scott har en längre tid arbetat hos sin kollega i Karls för att jämföra sin uppfattning om arternas kännetecken med hans.

Not to be returned!

Description of plates.

(The plates were inked from the author's enlarged drawings by Miss TOINI TIEKANEN and then again reduced by the printer to the original size. Thus it, unfortunately, has happened that the magnifications given in the following are not exactly correct being mostly a little too low.)

Plate I.

- Fig. 1-2. *Closterium pusillum*, 1 x2460/1, 2 x1460/1.
- 3-4. " *subulatum* x530.
- 5-6. " *ralfsii* var. *hybridum* f. *laeve* x530.
- 7-9. " *delpontii*, 7 x152, 8-9 x530.

Plate II.

- Fig. 10-11. *Pseudotaenium crenulatum* f. x530.

Plate III.

- Fig. 12. *Pseudotaenium subcircularatum* var. *detum* f. x530.
- 13. " *burmense* var. *extensum* x530.
- 14-15. " *ropandum* var. *floridense* f., 14 x530, 15 x890.
- 16. " *tridentulum* x530.
- 17-18. " *verrucosum*, 17 x530, 18 x2460
- 19. *Triploceras gracile* f. x530.

Plate IV.

- Fig. 20-21. *Euastrum crassum* var. *bigemmiferum* x530.
- 22-23. " *everettense* x530.
- 24-26. " *ansatum* var. *longum* x530.
- 27. " *luetkenmuelleri* var. *carolinicum* x1460.
- 28-29. " *everettense*, 28 x890, 29 x530.
- 30-32. " *crossdaleae*, nova spec., x1350.
- 33-35. " *elegans* var. *obtusum*, nova var., x1460.

Plate V.

- Fig. 36. *Euastrum informe* x890.
- 37. " *bipapillatum* x890.
- 38-39. *Micrasterias muricata* (var. *tumida*), x530.
- 40. " *pinnatifida* var. *inflata* f. x890.
- 41-42. *Cosmarium subcucumis* x890.
- 43-44. " *crossdaleae*, nova spec., x890.
- 45-46. " *hammeri* var. *protuberans* x890.

Plate VI.

- Fig. 47-49. *Cosmarium subcucumis* f. x890.
- 50-52. " *cucurbita* x890.
- 53-54. " *pyramidatum* (ad var. *angustum*), x530.
- 55. " *subcucumis* x530.
- 56. " (f. *minus*) x530.
- 57-60. " *hammeri* var. *protuberans*, 57 x530, 58-60 x890.

Plate VII.

- Fig. 61-62. *Cosmarium ovale*, 61 x530, 62 x890.
- 63. " *longii* x890.

- 64-65. * minimum, 64 x2460, 65 x1460.
 66-68. * contractum var. minutissimum, nova var. x1460.
 69. * menilliforme x890.
 70-71. * succisum var. hians x1460.
 72-74. * mamilliferum f., x890.
 75-76. * ovale f. x530.
 77-78. * arnellii var. notatum, nova var. x890.
 79-81. * biforme f. x890.

Plate VIII.

Fig. 82-83. *Cosmarium orthostichum* f. *schulzii* x890.

84-85. * *regnesi* f. x1460.

86. * *impersulum* f. x890.

87-88. * *tenue* x890.

89-91. *Arthrodesmus triangularis* v. *subtriangularis* f. x890.

92. * *incus* var. *longispinus* f. x890.

H 2 L 99-96 x530

93-96. *Staurastrum majusculum* f. x530, 93 x890.

Plate IX.

Fig. 97-100. *Staurastrum majusculum* f. x530.

101. *Xanthidium antilopaeum* var. *crameri* x530.

102-103. * * var. *polymazum* f. x890.

Plate X.

Fig. 104. *Xanthidium cristatum* var. *uncinatum* f. *laeve*, n. f. x890.

105. * *antilopaeum* var. *americanum*, Scott & Grönbl.,
 nov. var. x530.

106. * * var. *crameri* x530.

107-108. * *concinnum* var. *boldtianum* x1460.

109-112. *Staurastrum cuspidatum* facies *ovale*, x890, x530.

113-114. * * x530.

115-117. * * *mucronatum* x530.

118. * *dejectum* x890.

119. * *omearii* x890.

120-121. * *dejectum* x890.

122-123. * *omearii* x890.

124-129. * *subgatniense*, nova sp., x890.

Plate XI.

Fig. 130-131. *Staurastrum subbrebissonii* f. x890.

132-133. * *villosum* var. *simplicius*, nova var. x890.

134-135. * *erasum* x890.

136-137. * *circulare* var. *americanum*, nova var. x890.

138-139. * *rugulosum* var. *angulare*, nova var. x890.

140-141. * *manfeldtii* var. *parvum* x890.

142-143. * *renardii* x890.

144. * *arcticoen* var. *glabrum* x530.

Plate XII.

Fig. 145-147, 152-159. *Staurastrum margaritaceum*, facies *variabile*, x890.

148-149. *Staur.* *diacanthum* x890.

150-151. * *comptum* x890.

Cylindrocystis (crassa?)
Nectrium digitus v. naegelii 6460
"- v. lamellosum? 6527
Closterium aciculare v. subpronum
(=Lake Victoria plankt.)

incurvum 6485
infractum f.
kuetzingii (S. III)
parvulum v. angustum
porrectum v. angustatum
tumidum (L 190, W 18)
Pleurotaenium baculoideum
caldense
cylindricum?
eugeneum?
maximum
minutum
v. elongatum
v. (with retuse apex 6498
but not = Scott, USA) "Connellly" ?
trabecula f.
6452
6456

Docidium baculum
Triplaceras gracile var -
verticillatum f.

Euastrum
ampullaceum? var. ? ("E. corpulentum")
attenuatum var. 6470
biceps
capitatum 6468
"disphaericum", n.sp.
elegans f. 6482
"- v. prorum
evolutum f. 6453
insulare v. silesiacum? 6479
luetkemulleri (=Gbl. Brazil)
praemorsum f.
platycerum var.
pulchellum var.-
solum (=cuneatum v. solum Mdt. (=Gbl. Brazil)
= conicum var. presc. & Sc.)
sinuosum var.
spinulosum v. burmense? f.
nova sp. 6471
6416
6443
6350
6455 / 6503 "nasiform"

subcrasum var.-?
Micrasterias alata
ceylanica?
depauperata var. nov. 6414
divisa var. nov.?
foliacea v. ornata
"incredibilis" nov. sp. 6352
pinnatifida f.
radians v. aequalis
(=adians f. 1 in Krieger)
radiata f.

"sudanensis" nov. sp. 6353
tropica "var. surculifera" nov. var.
Cosmarium
binerve
bioculatum
capense v. nyassae f. 6525
connatum
contractum 6460

" v. ellipsoideum
cucurbita v. attenuatum?
cucurbitinum var.?
decachondrum v. ornatum
(=Uganda 6274)
diplosporium v. majus
elongatum f.
exiguum v. subrectangulum
floridanum (=Cyl. angulata S&W)
geminatum (Skuja, Burma)
glyptodermum (=Uganda)? =striolatum?
hammeri var. minor (Schmidle)
hammeri / "homelodermum var."/

gonioides f.
meneghinii 6466
moniliforme
monomazum 6484
" var. 6447
norimbergense f.?
" f. depressum 6518 obtusatum 6465
pachydermum 6463
" var. ?-

pardalis (? = favum v. africanum?)
protuberans ? f.
portianum (long. 27)
pseudocognatum f.
pseudoxiguum 6481
pseudonitidulum ? var.-
pseudopyramidatum
pyriforme ? var.-
regnesi
stephensii?

strigilatum f. 6462 (glyptodermum ?)
subretusiforme? 6458
tumidum
zonatum v. compressum
" var. - 6449
6421
6425
6450
6454

engleri? (=? pseudosulcatum Rich)
monomazum var. 6387
" " 6449
pseudomoenum
salisburyi Fr. & R. (=? C. bewsii F. & R)
taxichondrum var.-
6374 n.sp.?
6389

Xanthidium antilopaeum var. ??
calcarato-aculeatum Schm.
cristatum v. delponti f. africana
=X. subtrilobum v

Sudan

- Arthrodesmus "stellifer", n.sp.
- bulnheimii v. subincus?
- " var.? 6380
- " " 6406
- incus v. validus
- subulatus? fac. triquetrus??
- (or Staurostr.sp.)
- triangularis
- Staurostrum
- brachiatum (4-angular)
- corniculatum var.?
- cuspidatum
- dejectum
- fuellendornei var. -
- furcatum v. minus Fr. & R. ("minor")
- " var. - 6445
- hypocephalophorum 6459 (= ? Uganda 6287)
- leptocladum v. simplex Fr. & R.
- omearii
- orbiculare v. bidentulum Ndt
- (= S. bidentulum Gbl., Brazil) but must not be separate sp.)
- rotula
- sagittarium
- setigerum (typical or nearly so)
- sebaldi v. ornatum
- tetracerum (typical)
- tripes?? 6510 or perhaps S. mossambicum Schm. (sample III)
- unicorne
- wildemani
- wildeman/subtrifurcatum
- 6370
- 6408
- Sphaerosozma granulatum
- Onychonema filiforme f. 6514
- laeve var. 6473
- var. micranthum
- Hyalotheca mugosa v. minor 6451
- Desmidium nova sp. (ad asymmetricum acced.?)
- Phymatodocis irregularis
- ("irregularis" Schmidle!)
- Gonatozyon
- montaenium
- "- v. pilosellum(?) 6499

(Many of these names are only provisional and may perhaps be altered)

24/1-55

Co. 140 sp.

154

Sept. 12th, 1956.

Dear Arthur,

Here you have the additional sentences which I have put at the end of our "Introduction". Perhaps you wish to alter something, perhaps my English is not correct. The text can still be altered.

"As to the taxonomy of the Desmids we wish to point out the following principles. The Genus Actinotaenium Teiling has not been used in this paper because the authors wished to get thoroughly acquainted with the idea and its consequences, especially the synonyms, before ^{using} the new system is to be used. There are only two of our Cosmaria which belong to this group, viz. Cosmarium costatum (Wolle) nob. and Cosmarium longum n.sp.

The term "facies", recently created by Teiling is used in a non-taxonomical sense, indicating variation in radiation. The nontaxonomical sense of this term has been pointed out by Ruzicka (in litt.) and at a personal meeting between Teiling and Grönblad in Karis 1956 it was agreed that facies should not be used taxonomically. It would certainly look rather curious if the different radiations of Staurostrum meriani, which can be 3-4-5-6-7-8-9-10-11 radiate would be treated as taxa with separate names and author's names.

So far we know very little about the life history of the Desmid and of such radiations especially. In many cases they seem to be very inconstant, but in other cases they seem to be quite constant, e.g. the well known Staurostrum brasiliense Nordst. ^{always 4 radiate} and its var. lundellii W. & W., always 5 radiate. ¹⁹⁵⁶ These two variations in one species are quite constant each of them having their own geographical distribution. There is no doubt whatever that in this and in other similar cases we have different taxa and not merely occasional radiations.

The Genus Staurodesmus Teiling needs revision by the author himself before it can be decided whether this genus with its very complicated structure and innumerable synonyms is to be taken into use."

I guess my English is not quite satisfactory.?

During the last week I have been busy studying 6 samples sent by Prowse from Malacca. There was a Dr. Johnson who attended the congress and who brought them with him from Singapore to Helsingfors, but only a week ago I received the samples. Unfortunately two of them were quite dry and of very little use. The remaining 4 were not rich in species but very interesting, with a lot of species I have never seen. ~~Also~~ I think there are ^{also} some new varieties. (I enclose a list of the species I have found so far). There is very little of the material in each of the vials but if

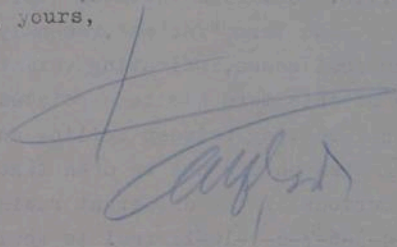
Can you put this in a shape that Teiling will not see offhand?

are especially interested in the material I can send you something. (if Frowse has not sent to you vials too?) I hope he will get more and better samples and send to both of us. I have written to him so!

Today I have spoken with the secretary of the Soc. sci. fenn., prof. Palmgren, and I am going next Saturday to Helsinki bringing our mscr. with me. Prof. Palmgren told me he hoped the printing of our paper ^{could} ~~will~~ begin very soon. He was of the opinion that the plates and the text to them should be best arranged as you proposed. That would be OK.

I have not yet had time to have a look at *Spondylosium desmii* in Sioli's Brazilian sample. But I shall do it soon and then write to you again.

Best wishes, yours,



Could you send me a new copy of your photomicrograph of *Cosmar. costatum* (Wolle) nob.

Bessids from Malacca collected by Mr. Frowse.

A.) *Gonatozygon monotaenium*, typical & var. *gracile* Krieg. (?), *Clost. ralfsii*, *Cl. parvulum*, *Cl. cerosum* f., *Cl. libellula* v. *intermedium*, *Pleurotaenium maculatum*, *P. ovatum*, *P. rectum*, f., *P. ehrenbergii* f., *P. annulatum* or n. spec. (not *P. verrucosum*!), *Micrasterias lux* var. nov., *M. alata*, *M. foliacea* v. *ornata*, *M. crux melitensis*, *Cosmar. askenasyi*, *C. decoratum* (= *C. aslinvarianum* v. *badenense*?), *C. pardalis*, *C. obsoletum* v. *sitvense*, *C. moniliforme*, *Staur. zabitruckneri*, *S. megacanthus* f., *S. sexangulare* v. *bidentatum*, *S. sp.* -, *Xanthid. trilobatum*, *X. burkillii*, *X. cristatum*, *X. acanthoporum*, *X. horridum* (= *X. ranceogunense* ?), *Onychonema laeve*, *Kyathotheca mucosa*, *M. turnensis*. - *Spirogyra rhizotrachialis* (?)

Sample B.) *Gonatozyg. aculeatum*, *Closter. acutus*, *Cl. gracile*, *Cl. archerianum*, *Pleurotaenium* -, *Micr. mahabaleshwariensis* var. -, *Staur. tohopekaligense* var. *S. sexangulare* f., *S. raciborskii*,

Sample C.) *Staurastr.* (ad *saalfeldtii* or *subsaalfeldtii*?), *Cosmar.* (ad *onychonema*?).

Sample D.) *Closter. baileyianum*, *Cl. ralfsii*, *Pleurot. keyei*, *Pl. trabecula*, *Pl. verrucosum* (v. *bulbosum*?), *Pl. annulatum*?, *Cosmar. askenasyi*, *C. decoratum*, *C. axilliferum* (or *lugerholsianum*?), *Staur. wildemani* v. *major*, *Xanthidium bifurcatum*. (This sample was quite dry!)

Sample E.) *Clost. cornu*, *C. Cynthia*, *C. libellula* v. *intermedium*, *C. jenneri*, *C. abruptum*, *C. subjuncidiforme*?, *C. lagoense* v. *crassius*, *Pleurot. keyei*, *P. nodosum*, *V. gutwinskii*, *Cosm. moniliforme*, *Staur. gnathoporum*, *S. indicum* v. *compactum*,

Micraster. foliacea v. ornata, M. thomasiana v. evoluta, Hyalotheca burmensis.

Sept 19 1956

Dear Rolf,

The additions that you have made to our introduction are OK, with only one small change in the English, and a few more words. I suggest the following:

"As to the taxonomy of the desmids we wish to point out the following principles which we have followed. The genus *Actinotaenium* Teiling has not been used in this paper because the authors wished to become thoroughly acquainted with the idea and its consequences, especially the synonyms, before using the new system. There are only two of our *Cosmaria* which belong to this group, viz. *Cosmarium costatum* (Wolle) nob. and *Cosmarium longum* n. sp.

The paragraph regarding "facies" is OK, and also the next one about radiation and *St. brasiliense* and var. *lundellii* (except as noted below).

"The genus *Staurodesmus* Teiling needs revision by the author himself before it can be decided whether this genus with its very complicated structure and innumerable synonyms is to be taken into use. We understand that he will undertake such a revision and a delimitation of the new genus". (Provided this statement is correct).

I do not think I could re-word this so as to be sure of not giving offense; in fact I think there is no way of being sure. When a man's brain-child is criticized there is always the danger that he may be offended, no matter how carefully the criticism is expressed, and especially when his opinions are so firmly fixed as Teiling's appear to be. I had a long letter from him a few weeks ago, partly on this subject, and he seems to feel keenly the fact that his new ideas have not met with acceptance from some of his close friends. Did you know that he wants to abandon the genus *Arthrodesmus* entirely?

It is not quite correct to say that *St. brasiliense* v. *lundellii* is always 5-radiate. In 1942 I recorded a 6-radiate specimen from Mississippi, my drawing 1906. It is true I found only one specimen; nevertheless it shows that the plant is capable of at least one different radiation. It appears to me unsafe to say that any desmid occurs in only one radiation; better to say that at present it is known only in one radiation.

Glad to hear that you took our paper to Helsinki for last Saturday for final presentation to the Society, and I hope that everything went well. If it can be printed by the end of this year it will be very welcome news. It has been a long piece of work for you, and an even longer wait for me, 15 or 16 years since I recorded some of these novelties.

Enclosed are the only two prints that I have left of the photo of *C. costatum*. They are not very good, so I am sending the negatives, from which your local photographer can make enlargements. I do not attempt any developing or enlarging in the hot weather, it is too troublesome. The tap-water has a temperature of 85 to 90° F., and ice must be used to reduce it to the standard temperature of 68° F.

Last week I had a letter from Dr. Prowse, telling about his Fish Culture Research Station, and saying that he will send me some samples later. So it is not necessary for you to send any of the small quantity that you received. I seem to foresee complications arising from the fact that the Malayan material will undoubtedly contain many of the new and rare species that I have recorded in Sachlan's material from Sumatra, Java and Borneo. In fact I think I have seen every one of the desmids that you listed. On some of them I can offer comments that may interest you.

Mic. lus. The 4 subapical spines may be lacking either in part or entirely. I have two new varieties; one has 10 lateral lobules on each side of the semicells instead of the typical eight; the other had facial spines, one spine on each of the lobules of the 2nd order (sensu Krieger).

Cosm. decoratum. You query if this is identical with *C. malinvernianum* v. *badense*, but W. & W. relegated the latter plant to synonymy with *C. margaritifera*, (Mon. III, pp. 201-202). If it resembles *C. margaritifera* it cannot be mistaken for *C. decoratum*, which has large triangular pits in the center of the face, not extending to the margin as W. & W. show unless theirs is different from mine. Further, *C. decoratum* is a much larger plant than *C. margaritifera*.

X. trilobum is a Brazilian plant. *X. subtrilobum* (not *trilobatum*) is common in Indonesia, and I also have Skuja's var. ~~inermis~~ *incarnatum*

X. horridum may perhaps be the same as *X. raneebungense* as you suggest, since it corresponds in size, shape and length of spines, also in the 2 pyrenoids per semicell. But I think it is not possible to be certain, because of Turner's poor drawing, which shows no spines in the center or lower part of the semicell. Curious that Skuja's text calls attention to *St. spinosissimum* but overlooks or neglects *X. raneebungense* immediately below the *Staurostrum* on the same plate. I have a plant quite similar to *X. horridum* ~~st~~ but with a hexagonal pattern of triangular pits in the center of the face, which I have tentatively considered as a new variety.

X. bifurcatum. I have seen only one specimen of this from Indonesia, nearly twice as large as Borge's Australian plant. Also I have from North Australia another form differing somewhat from Borge's.

St. zahbruckneri occurs in two slightly differing forms in Indonesia, but as I do not have the original description I am not quite sure what they are.

Cosm. lagerheimianum occurs in a good many Indonesian collections. I have not seen *C. paxillosum* (not *paxilliferum*), but from Turner's figures the only difference I can see is that the former is circular in topview and the latter is elliptical, which does not seem enough difference to make a new species. Maybe Teiling would say that one is omniradiate and the other biradiate!

Pl. annulatum. I have seen only one example of a *Pleurotaenium* resembling this in size and shape, but was quite unable to see if the elliptical markings were present because of the deteriorated chloroplast.

Haustorium gnathophorum is fairly common, but differs from Krieger's illustration. In his side view the margins are parallel and there is a sudden attenuation below the apex. In my specimens, in side view, the margins are not parallel, but the thickest part of the semicell is somewhat above the center, and the apex is broadly rounded with no attenuation. In front view the apical incision continues downwards to about the center of the semicell as a distinct groove that gradually dies out.

M. thomasiensis v. *evoluta*. This is the only one of your list that I have not seen, and I should like very much to see this very elaborately ornamented desmid. No doubt it will be in the samples that Prowse is going to send me.

I should be glad to send you sketches of any of the above.

Sincerely yours friend,

ROLF GRÖNBLAD
DR. PHIL.
KARIS, FINLAND

24 / (I forgot to send this letter!)
Sept. 19, -56.

Dear Arthur,

As I told you beforehand, I was last Sunday in Helsingfors where I met Prof. Palmgren. I delivered our typescript to him. He was very kind and promised to stand by our wishes as to the printing. He thought it will be printed rather soon, but the Society has to decide. Howsoever, I am happy to have the manuscript out of my hands.

I also talked about the sending of dollars to you. It seems to be possible, but I must send an application to the Bank of Finland, and then we will see. I wish to send the whole amount that you paid to Mrs Ferine, -if possible.

There are some more species I have recorded in the samples from Malacca, but unfortunately in a very poor condition: *Cosm. regnesi* var. *productum*, *C. portianum* (?) f., *C. connatum*, *C. tinctum*, *C. novae-semillae*, *C. medioscrobiculatum* v. *egranulatum*, sp. -, *Staur. pinnatum* v. *hydra*, *S.* sp. -, *Micrast. moebii* var. -, *M. moebii* var. *javanica*, *Clost. malinvernianum*, *Cl. subulatum*, *Sphaerozosma granulatum*, *Euastr. luetkemuelleri* f., *E. serratum* W&W., *E. substellatum*, *E. spinulosum* v. *burmense*, *E. coralloides* v. *subintegrum* W&W. (all in sample "A").

In sample C.: *Staur. javanicum* v. *apiculiferum*, *S. tetrace-rum* f., *Cosm. polygonum* f.

The find of *Micr. moebii* in two different forms was very interesting to me, because I have not seen that species earlier. I am yet the more convinced this species should be much better called *Euastrum* because no *Micrasterias* has such decorations in the centre of the semicells and, moreover, the wall is coarsely scrobiculate, quite as it is in certain *Euastra*. A species closely allied is *E. turgidum* is *Micr. moebii*, especially v. *burmense* which seems to me scarcely specifically distinguishable from *E. turgidum* ????

A few fétomicrographs are enclosed which you may keep. In *Micr. lux* var. - there are small spines at the sinus, the deepest incision in in the lateral lobe and at the polar lobe, the number of spines very much variable. A very beautiful desmid! Much finer than Krieger's fig.

Best wishes, yours

So your and mine with 4 legs

To-day I had a look at sheet 1 sample No. 32 and quite dry! (see over also 2, 7, 18, 26, 27, 29, 32, 51, 54)
If you want me to sign your list I must say yes to that - I don't mind. I have a drawing made from No. 32. I should also draw the other specimens. I think the drawing is something like this - (see over)

Continued 26.ix.-56.

The list of desmids from Malacca needs the following additions:

- Euastr. ansatum v. javanicum
- Cosmarium turgidum (?)
- Closter. acerosum
didymotocum (Not C. baillyanum)
- Netr. digitus
- Streptonema trilobatum
- Xanthidium fragile f.
- Staur. bifidum
wildemani v. majus
dejectum
pinnatum v. subpinnatum
- Clost. venus
costatum f. *C. longicauda Prowse*
nematodes
- Actinotaenium cucurbitinum v. subpolymorphum
- Tetmemorus granulatus (f. ad var. attenuatus)
- Pleurot. minutum
- Euastr. luetkemulleri
- Micraet. thomasiana v. notata
- Cosm. obsoletum v. sitvense.

sub sacculis
Thank you for letter of Sept. 19. and the book on Hieroglyphs, which was very interesting. I believe hieroglyphs are rather more difficult to identify than desmids!

I am going to send you a photocopy of Lütkemüller's paper on desmids from Central China where Staur. zahlbruckneri is described.

Our manuscript is in Helsingfors and I am waiting for further information.

Why should there arise complications from the material sent by Mr Prowse? Of course your Indonesian and Australian studies are earlier and you have priority. There is no doubt whatever about that.

Kind regards,

*This I forgot to
put into the envelope!*

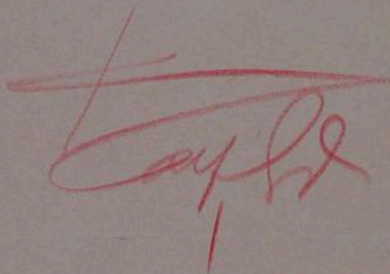
J. Lütkemüller

Karis 3.X.-56.

Dear Arthur,

In order to get dollars for you from the Bank of Finland I should need an account or a bill from which it can be seen that you have paid dollars 184.- for the inking of the plates in ~~our~~ paper. So I must trouble you to send me ^{two} such ~~a~~ ^{bills} ~~one~~, perhaps with Mrs Perine's acquittance. I wish to send you the whole amount that you have paid because I have got money from the Government for this purpose and I cannot use it for other purposes. I think the matter is quite clear and OK.

Best wishes,



ROLF GRÖNBLAD
DR. PHIL.
KABIV, FINLAND

Oktober 6th 1956

Dear Arthur,

One day when I had studied the material from Malacca it happened that I got into my hands a photomicrograph sent by you and called "Micr. anomala var. nov." This is exactly the same that I found in the Malacca material and which I had called Xanthid. bifurcatum f. (fig. 6857) Another desmid which occurred together with 6857 and not very much different is my fig. 6823 (and 6824) which are not much different from Borge's fig. 24 (Austral. Süsw. chlor. pl. II) and another slightly different form is your X. bifurcat. var. in your N. Austral. plate 10, fig. 2-3. On the other hand Micr. anomala in Turn. E.-Ind., XXII:1 and Krieger, D. Fl., pl. CXXI:9-10 which are perhaps more different. But where goes the difference between Micr. anomala and Xanthid. bifurcatum??? Perhaps there is no X. bifurcatum but only Micr. anomala with a lot of variable formae and varieties? Have you noticed this very puzzling coincidence? And what do you think of it? It would be very desirable to get much more material from Frowse.

Again, kind regards, yours

Oct 17 1956

Dear Rolf,

Of course I shall be very glad to get the money if you are able to send it to me, and accordingly I am enclosing a receipt from Mrs. Ferine for \$185.00 (not \$184 as you wrote). If necessary I can also send my cancelled cheque showing that I paid her this amount. Naturally if you send the money I shall expect to pay for the reprints when they are made. Please inform me when you have paid to the Society the money that I deposited with the Chase National Bank of New York.

Here are some more comments on the Malayan desmids:

St. zahlbruckneri. Your photo of the vertical view seems to be identical with a form that I have found from Sumatra, and which I have tentatively identified as var. macillatum W&W. I have a total of about 95 Staurostra from Indonesia, and am still finding more.

Micr. thomasi. Var. notata occurs in my material, and I have also seen just one example of the very beautiful var. evoluta, probably the most elaborately decorated Micrasterias in the world. I spent 6 hours on 2 successive days working on this specimen, and was able to get all three views of it; sketch enclosed.

M. lux. As you say, the actual specimens are much more graceful than is apparent from Krieger's illustration. It is fairly common in Indonesia and N. Australia, and seems to be quite variable in its spination. I have a total of about 25 Micrasterias from Indonesia, only two or three of which occur in Europe or N. America.

X. burkillii. Glad you found this. Recently I have had an argument with Telling, still unsettled, about my sketches showing two desmids that I have identified as X. burkillii v. alternans Skuja and X. sexmammillatum v. pulneyense Iyengar & Bai, which he is going to use in his new paper on Asymmetry in Desmids. (Perhaps I sent copies of these sketches to you also). He contends that my var. pulneyense does not differ appreciably from my var. alternans, which appears incredible to me, for anyone with half an eye can see that they must belong to different species. The last time I wrote him I sent a long and detailed tabulation of the similarities and differences in six different versions of these plants, namely, X. burkillii genuinum (the same as yours), var. alternans apud Skuja, var. alternans sensu Scott; X. sexmammillatum v. pulneyense apud Iyeng. & Bai, v. pulneyense sensu Scott; also X. burkillii sp. form apud W. & W. I suggested that if he is still unconvinced he might send the sketches and tabulation to you and ask your opinion. So if he does, you will know what the argument is about..

Have just received Telling's paper on M. mahabuleshwariensis var. wallichii which he wishes to call a forma, but since it exists by itself and reproduces itself in many parts of the world it seems to me that var. is the correct term. He has a remarkable collection of monstrosities, indicating abnormal conditions in the lake (perhaps zinc-poisoning?), but as far as I can see all that he has succeeded in proving is that the European specific form may change into var. wallichii and vice versa. This is not too surprising, for other Micrasterias species show a similar proclivity, especially M. radiata, several varieties of which show a tendency to 'revert to type'. Did you notice that he includes M. alata in the mahabuleshwariensis group? He did the same thing in the Ms. of his new paper, and I pointed out to him that alata has an entirely different structure and does not belong there. Krieger made a separate group containing only alata, but I think it could just as well have been assigned to the crux-melitensis-radiata group.

Will have more interesting news for you soon!

ROLF GRÖNBLAD
KARIS
FINLAND

Oct. 12. 1956.

Dear Arthur,

Two days ago, Oct. 10, I have sent to you the whole set of your drawings from USA desmids. I hope earnestly that they will arrive safely. I must beg your ^{not} pardon for not having sent them long ago. I think not and I hope that we ^{not} are or that we will get into the zone of danger. It would be too bad. But no one can tell what is to come in this world of lunatics.

The name Fleurot. "spinosississimum" (is certainly) impossible. It would be the same as to say in English "the spiniestiest"! Mr. Brunel has in his paper described a var. madagascariense recorded by Bourrelly and in the text is mentioned a form with "the spines rather localized on bulging parts whereas the concave parts did not bear any". (no figure of this form given). This may be (?) the same as Prowse's form. So it may be possible to call it a variety of *P. spinulosum* (Wolle) Brunel or a forma of var. madagascariense. But very probably it may be a distinct species? I should like to see some specimens, because it is dangerous to decide from a drawing only. *Mr Prowse's drawings are better than the Sudan ones.*

Also Ruzicka told me that he was very sorry and very painfully impressed because of Teilings letter to him. So I resolutely wrote to my old friend since many many years that he has no right to think that he alone has the correct ideas, that he alone is "the man of science" and all others only "stampcollectors" or "pigeonholers". This I ^{did} without hesitation because Waris, Kallio and Luther, and some of the younger Swedish phycologists, as well, are convinced that Teilings theories are wrong. So he must not go on telling offending words to everyone.

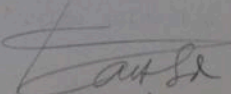
I had not quite forgotten that I asked you about Iyengar & Bai but I have got no answer to my "beggárs letter" to Iyengar!

Very soon I am sending a photocopy of Cohn's text.

I am still working with our Sudanese desmids. But as you know, it is a rather slow job. I am just about finishing Micrasterias and beginning with Cosmarium.

I pity the poor Hungarians who are suffering from the inhuman treatment of the barbarous Russians. The time will certainly come when ~~they~~ the Devil will take them to tha Hell. I should like to live so long as to see that happen.

Best wishes, yours sincerely,



Your idea as to the exsiccate "Desm. Bongocenses" in Wittr. & Nordst. No 552 is very interesting, and, I think, useful too. If you wish, certainly I am willing to collaborate.

There is another exsiccate, which I think you should see, viz. Habenhorst's exsicc. No 1727. collected by Grunow from the island Banka in Indonesia. I have examined it (in order to see original specimens of *Fleur. indicum* (Grun.) Lund.) long ago, in 1930, and I made a few drawings of some species: *Micrast. moebii* (or *Eu. turgidum*?!), *Eu. spinulosum* var. *inermius* f., *Cosm. bengalense*, *Pleurot. Ehrenbergii* f.1) and f.2), *Pl. indicum*, *Pl. repandum* (?), *Pl. eugeneum* (?), *Micr. mahabul. v. wallichii*. - I have seen but made no drawings of: *Triploceras gracile*, *Cosm. quadrum* (?), *Staurostr. sp.*, *Desmidium sp.* I think there are more desmids! Couldn't you get this exsiccate too from the Farlow Herbarium for examination?

The Bongo desmids are from "einem Wassertümpel bei Gir im Bongo-lande..... keine nähere Angabe..... nur lässt sich vermuthen, dass derselbe etwa unter dem 5° n.B. im Herzen von Afrika belegen...". That's all.

Oct 13 1956

Dear Rolf,

For the last week I have wanted to write you in reply to your three letters, and particularly to tell you about the remarkable resemblance between M. anomala and X. bifurcatum. And now you have taken the words right out of my mouth!!!

I delayed writing because I was bisily engaged in examining a new sample just received from Borneo, and making drawings of this Micrasterias-Xanthidium; when your letter arrived yesterday I was at my drafting table copying some of these sketches to send you. Also I made some colour photos that I sent away to be developed, and also was able to capture some of these and other remarkable desmids on slides that I am sending you. (They will follow in a couple of days).

Your photo of X. bifurcatum from Malacca, and also your sketches, show this plant to be practically with my "M. anomala var. nov." of which I sent you a photo. I called it this because it occurred in the same collection (Sachlan No. 270 from Lake Empangau in West Borneo) with the true M. anomala. The resemblance was so striking that it did not occur to me that any other identification was possible. It was not until a couple of years later, when I found a single specimen of a considerably larger form from Sumatra, that I realized it could also be considered as belonging to X. bifurcatum. The new specimens from Borneo, as you will see, have even wider polar lobes, with longer and more slender polar processes.

There is, therefore, considerable variation in the specimens from Malaya and Indonesia, and all of them differ considerably from Borge's Australian plants in the shape of the body. From another Australian sample I have a single example that more closely resembles Borge's illustration, though the processes and terminal spines are more slender. I am sending a sketch of this. I have this specimen preserved on a slide and I will refer to it again below. If you will look at the manuscript of the paper by Scott & Prescott on Arnhem Land, you will see that I have suggested that X. bifurcatum be compared with M. anomala and its varieties, and that its size and structure suggest that it may be more closely related to Micrasterias than to Xanthidium.

I think there is no doubt that Borge's plant must be transferred to Micrasterias as M. anomala v. bifurcatum. One of the strongest arguments for this is the chloroplast structure, which is distinctly of the Micrasterias type, and not like that of any Xanthidium as far as I know. The nearest Xanthidium is X. armatum, but this has a parietal chloroplast, "sector-parietal" according to Teiling's illustration, and "taenio-parietal" according to Krieger's figure (Mon., p.29). In the new Borneo sample I found a specimen with a very well-preserved chloroplast, and was even able to stain it with iodine to bring out the pyrenoids. From my sketch you will see that the chloroplast consists of a flat plate in the median plane, with right-angle ridges extending to the lateral and polar lobes, "discoid" in Teiling's terminology. The pyrenoids seem to be confined to the ridges, as nearly as I could make out, and they are seen in edge view in a frontal view of the whole cell; in side view of the cell they are more or less circular. My sketch shows 20 pyrenoids per semicell, but I got the impression (from a side view) that there may be more than this. Unfortunately, after staining I was unable to balance the cell long enough to draw the chloroplast in side view, or even to count the pyrenoids, and eventually I lost the specimen by too much pressure on the corner of the cover-glass, which allowed air to enter under the glass and washed it away..

In the Arnhem Land paper I gave a figure of a crushed and distorted semicell that I referred to M. anomala, but now I think it is just another form of Borge's plant. My remaining information about Australian forms is very scanty; I have never seen more than the two in the Arnhem Land paper, and the one example preserved on a slide and

mentioned above. This preserved specimen has the same type of chloroplast as the Borneo ones, and since it is almost identical in shape with Borge's illustration, I believe we must assume that Borge's plant also has the same kind of chloroplast.

In the next few days I will send you a sample of Borneo 270 containing both the typical M. anomala and the new variety; also a sample of the new collection Borneo 404. These are not for you to work on, simply for your information and enjoyment. In No. 404 the "M. bifurcatum" is rather rare and you may have to search some time before finding it. M. Torreii v. Doveri is even rarer, but I caught one of them on a slide for you; it is a very large and beautiful Micosterias. Also there are C. magnificum fairly common, and some nice examples of a large and highly ornate new variety of E. turgidum which I think is one of the most elaborately decorated desmids I have ever seen. In this sample I have seen three specimens of M. Moebii var., rather like your photo but proportionately much wider. Both yours and mine resemble var. tetrachastri-formis W. & W., which is much narrower.

I will write you again next week commenting on some of the other desmids from Malacca. It appears that the Malayan desmid-flora is almost identical with the Indonesian, for with two or three possible exceptions, all of the desmids that you have listed from Prowse's samples also appear in material from Sumatra, Java and Borneo. This is rather disappointing to me, for I had hoped that he would find a lot of new species and varieties. However, perhaps it is not so strange, for there is only about 40 miles of water between Malacca and the coast of Sumatra. From another viewpoint, the Indonesian islands are supposed to have been separated from the mainland of SE Asia for some hundreds of thousands, possibly millions, of years, so that it would be quite possible for them to have developed a desmid-flora of their own.

Sorry to hear that some of the Brazilian samples have dried out, but all of my samples contain 5% glycerine, added for the specific purpose of preventing complete desiccation if the water should evaporate. During the last couple of years I have increased the glycerine to 10%. So I think that if you add water containing 5% glycerine and 5% formalin, the material will be restored nearly to its original condition. At any rate it is worth trying, and I should be glad to know what result you get. I will send you some more of Brazil No. 32 so that you can examine the Sp. desmidiforme.

A bientot!

Your friend

Oct. 26. 1956.

Dear Arthur,

Many thanks for your letters, the beautiful photomicrographes and the two copies of Scientific American which were of great interest to me. One of them I have already perused, especially the astronomical article, but also the chemical one about the 33 components of water. Modern chemistry is going to become very complicated indeed. But very exciting.

Last week I was again to Helsingfors seeing Prof. Lindberg who promised to do everything in order to get our paper printed as soon as possible. The photo of *Cosm. costatum* will be printed in the text. The explanations of the plates will be printed at the end of the text, before the plates, - not on the opposite side as you proposed - I am sorry! But it would have increased the costs considerably. So I was told.

My application as to the 185.- dollars is forwarded to the Bank of Finland together with Mrs Perine's certificate. I hope I shall succeed.

The 3 small samples I got. So far I have studied only one of them apparently from Indonesia (?) with *Pleur. verrucosum* f., *Staur. sexangulare* var., *Cosm. paxilliforme* - *lagerheimianum* (which is the difference?), a very thick *Glost. ralfsii*, *Cosm. maculatum*, *Pleur. indicum?* &c., *Micr. foliacea*.

Mr. Prowse sent me some copies of his drawings. They are better than the Sudanese ones. He promised to send material too. It is not easy to identify drawings if they are not very good, such as yours. To get a clear idea of a desmid I think it is safest to have the specimens at hand. I hope Mr P. will be sending material to you, because you are more skilled with tropical material, especially from that part of the world.

Yesterday I sent a film with copies of Lütkenmüller's *Desm. Central China*, (S. Zahlbruckneri) and two papers by Schmidle (*Cosm. malinverianum*, *C. insigne* &c.) It seems to me that there is very slight differences between typical *S. zahlbruckneri* and West's var. *mamillatum* from Koh-Chang.

Your drawings from *Micr. anomala* - *Xant. bifurcatum* are very interesting. I think the chromatophores are pointing towards *Micrasterias* not *Xanthidium*. As far as I see Borgès *X. bifurcatum* is to be replaced in *Micr. anomala*??? What's your opinion? / I see in your letter that you suggest the same/. -

I have just sent a long letter to Telling in answer to his last questions and suggestions. But it is very hard to argue with him, sometime I feel it quite useless, because he is looking on everyone who dares oppose to him as an ignorant, as having no understanding for

Today I
have got
a check
for you!
So you will
have it
immediately!

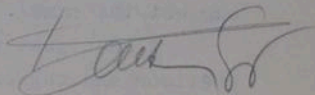
evolution - which is his cockhorse. I do not believe I am quite blind and unfamiliar to evolutionⁱⁿ desmids. But I do not believe in arguments without proofs, evident facts. Tg has produced no such facts, he is merely making constructions and hypotheses. Playfair is his great model. But the theories of Playf. are quite absurd. He has quite a wrong idea of how the desmids are growing. His "series" are impossible. Species do not change during their growth in this way. - Sometimes I feel quite unhappy with my old friend Tg. because he takes everything as a personal offence. But I am quite sure he is wrong, and so I can but say as old Martin Lutherus: "Here I am standing, cannot do otherwise, God help me!" - Fortunately Kallio was visiting Karis one day and we were talking of these questions. Both he and prof. Waris who have been cultivating desmids, and who really know a great deal of the life history of the desmids and have seen them growing and dividing, both these who are skilled professional botanists, are rejecting the hypotheses of Playfair and Teiling. I was very glad indeed to be supported by such men of profession. Hans Luther is an unbeliever too, and some others too. Ruzicka does not quite believe but he is so shy that he does not wish to hurt anyones feelings. (I too do not wish to hurt anyones feelings, but I cannot shut my mouth when I think something is going wrong). However, I wrote a long letter to Tg. trying to make clear everything. I am very curious to see his answer.

Teiling has principally been studying plankton organisms, so he has very little experience of other desmids (I believe so). As far as I know, the plankton specialists have very little eye for taxonomical differences. Almost all of them in the past have been very poor taxonomists. To have a good taxonomical eye is a special quality or character which is valuable and necessary - although taxonomists are very little estimated by some highbrow scientists. "Stamp collectors" we are called by those superior people.

You are quoting a paper by Iyengar & Bay which I don't know. Please tell me the complete title. Are there many desmids?

I don't think *Micr. mahabulesh. v. wallichii* should be reduced to the rank of a forma (neither does Kallio!). *M. alata* has nothing to do in the group of *M. mahabul.*, but nearest to *M. radiata*. OK.

Best regards,



J. B. S. Haldane: *M. mahabulesh. v. wallichii* & *M. radiata* J. B. S.

Oct 27 1956

Dear Rolf,

About a week ago, and rather to my surprise, I received from the Farlow Herbarium of Harvard University the three volumes of Wittrock & Nordstedt's *Exsiccatae* that I had requested for the purpose of trying to find the original specimens of *Spond. desmidiiforme*. The numbers, as cited by Borge (1918) are 539, 554 and 1270. After several days of preparation and search my results were these: In No. 555 I was unable to find any specimens. In No. 539 I found one short filament of 5 cells, but it was attached to a mass of debris from which I could not dislodge it, and therefore could not obtain the end view. In No. 1270 I found a number of short filaments, most of them collapsed and distorted, but there was a pair of attached cells in good condition of which I got the end view, and it proved to be identical with the specimens from Sioli's collection Brazil No. 32, having a unilateral asymmetry, with the projection at opposite ends of the long axis of the ellipse in the two semicells of one cell, and also showing the faint crenulation of the margins though the pores were not visible.

The specimens on which the species is based (Borge 1903) were considerably wider (39-40 μ) than those described in his 1918 paper (25-29 μ). The latter width agrees with all those that I have seen (26-30 μ). So it is still unknown whether the specific form was asymmetric or not, though I suspect it was from the unequal 'lobes' shown in Borge's Tab. 5, Fig. ~~xxx~~ 23-a'. I do not have the paper by G.S. West (1904a) West Indian FW Algae, in which he transferred Borge's plant from *Sphaerosozoma* to *Spondylosium*.

While browsing through the *Exsiccatae* I noted one of particular interest, No. 559, *Desmidiaceae* Bongoenses. Ever since you sent me a photocopy of Cohn's plate I have been curious about *Cosmarium Pardalis*, because he shows two quite different shapes of semicell, one ellipsoidal and the other decidedly rectangular. So I made two slides from the material and have sent you one of them. *C. Pardalis* is abundant, and though many specimens are distorted, there are enough in good condition so that you can easily see the characteristics. I think you will be surprised, as I was, to find that the plant is quite different from what subsequent authors have called *C. Pardalis*, e.g., W. & W. (Ceylon), Joshua (Burma), Gutwinski (Java), Bourrelly (Madagascar), which seem to be all the illustrations that I can find; I do not have the others listed in Nordstedt's Index. On the slide, as you will see, there is a remarkable variation in size and shape of the semicells. A few of them, if they are not distorted, seem to approach somewhat to the rectangular shape shown by Cohn; other small ones are almost circular; but the large majority are ellipsoidal or with a rather flat apex, so I think this must be taken as the typical form. And there is another remarkable difference from the forms shown by other authors; the granules are arranged in alternating horizontal rows which sometimes are slightly convex upwards in the upper semicell. Because of the quincunx arrangement they also form oblique rows at a steep angle, but these rows are much less noticeable than the horizontal rows, and quite different from the arrangement shown in W. & W. (Ceylon), which most of the other authors seem to have taken as the model. The granules also are smaller and much more numerous; Cohn shows about 12 in a horizontal row, but in the largest specimens there are 18-20, and each is surrounded by a group of very small pores, difficult to see in the glycerine in which they are mounted.

In examining this collection I found nearly all the desmids figured by Cohn. There was one specimen of a *Micrasterias*, probably *M. Schwanfurthii*, but it was too badly crumpled and distorted to be certain. I did not find *M. Crux-Africana*, though I should have liked very much to see it. Cohn's drawings are fairly good, but incorrect and incomplete in some respects. For instance, in *Euastrum trifolium* there is a large

pit just at the base of the polar lobe, as shown in Schmidle's figure, and there are also two smaller scrobiculae just below the apex, not shown by either Cohn or Schmidle. Cohn's side view shows small sharp granules in denticulations on the protuberances; all that I could see was some very obscure rounded markings resembling low granules on the protuberances.

I took some photos of *C. Pardalis* but they were unsuccessful; I shall try again. I believe I can make good drawings of nearly all of Cohn's plants, and I think it would be worth while writing a short paper accompanied by drawings, and photos if I can make good ones, so as to give a better idea of what the desmids really look like. What do you say? Will you collaborate?

Enclosed is a cutting from the Scientific American relating to gibberellic acid. Send it to Kallio and tell him that by using it he might be able to grow some *Microsterias* 2000 μ diameter!!!

With best regards,

Your friend,

Nov 2 1956

Dear Rolf,

The check for \$185.00 arrived safely and I am very much obliged for it, also I am rather surprised that you were able to transfer the money to this country with so little trouble. Don't forget that I insist upon paying for the reprints, so ask the printer to send them directly to me together with his invoice.

I am sure that I put labels on the three small tubes that I sent you recently, for I had to cut my regular labels in half. The sample with the abundance of *Pl. verrucosum* f. is Borneo 404; this also contains *X. bifurcatum* var., rather rare, also I found just one example of *M. thomasi* v. *evoluta*. The only differences that I can see between *C. paxillosum* and *C. lagerheimianum* are that the former is relatively wider and according to Turner the wall is smooth, without punctae, while *Lagerheimianum* is 'sparse sed graviter punctata'. He describes both as being widely oval in vertical view. All the specimens that I have seen, from several places in Borneo, Java and Sumatra, are exactly circular in vertical view, and all have a group of small pits (6 I think) around each of the spines or teeth. The specimens in Borneo 404, have teeth that are longer than usual, and with a somewhat inflated base. I believe there is not sufficient difference in Turner's two forms to make them different species, hardly enough for varieties. The small pits are difficult to see in specimens retaining the chloroplast, so it is possible that he may not have observed them.

Another sample is Borneo 270. This contains typical *M. anomala*, together with another form that I tentatively identified as a new variety of *M. anomala*; this is the one of which you have a photo. The variety is quite similar to the *X. bifurcatum* that occurs in Borneo 404, and to those that you found in Malayan samples sent by Prowse.

The third sample is Brazil 32, containing *Spond. desmidiiforme* and many other small desmids. You asked for this because my original sample had dried up.

Prowse has sent me prints from some of the tracings that he sent you. His drawings are a considerable improvement over his first lot from the Sudan, but they could still stand some refinement, which no doubt will develop as he goes along. His spiny *Pleurotaenium* is quite a curiosity, undoubtedly a new species, for which I suggest the name *Pl. spinosissimum*, if you can make such a Latin word. It is quite different from any of the forms of *Pl. spinulosum* (Wolle) Brunel. Each semicell has 10 undulations, against 4 or 5 in *spinulosum*; shows very little attenuation; the spines are shorter and stouter, and are bunched on the inflations, while in *spinulosum* they are uniformly distributed.

Prowse says he is unable to identify his drawings B, G, I, N, R and S, so let me see what I can do. B is *M. ceratophora* f. *maxima* Scott & Presc. (Arnhem Land in press). G is unknown to me, but cf. "*C. connatum* forms" in Arnhem Land XIII/6. I is probably a new species, though its structure shows a resemblance to *C. otus* Krieg., and to *X. quadridentatum*, *lepidum* and *ceylanicum* W. & W. There is nothing in my Indonesian material like it; I think there are probably some punctae or pits between the large granules that Prowse shows. N perhaps is a form of *St. contactum* or *St. trifidum*, but note the very small size. R looks like a stout form of *St. sublaevespinum*, though the vertical view is somewhat different. Drawing S is incomplete, ~~but~~ because his vertical view does not show the bifid verrucae shown in the rear view; also I think there is probably a circle of small teeth surrounding the produced angles.

I get the impression that Frowse wants to draw the illustrations himself when writing about the Malayan desmids, and it may be necessary to let him do so. I shall write him in the next few days, and shall offer some hints on improvements that could be made in his drawings, referring to specific figures on the sheets he has sent me. Of course, I shall try to put it in such a way that he cannot take offense.

IM Teiling's writings there is much that is true, but I think he goes too far in the conclusions that he draws from the limited number of facts that he can adduce. Playfair's theory of desmid development, as you say, is entirely incorrect; even I can see that, without any knowledge of biology, but just from my experience with desmids. In Teiling's new paper on Asymmetry in Desmids, which he has just sent to press, he has invented a new and complicated geometrical framework for the purpose of systematically describing the various forms of asymmetry, and in translating the Swedish into English the wording became so confused that Hannah simply could not understand it, and asked me to help. I read and reread it a dozen times before I could get into my head what he was trying to do, and even then had to ask him for explanation of some parts. I told him that I thought all this complication was unnecessary, and that the X, Y, and Z-axes of ordinary geometry ought to be quite sufficient to describe any known form of asymmetry. In his reply he adopted the professorial attitude, and told me that I must accept his dictum that his system is quite necessary. When you see this paper, I think you will agree with me, and I am sure that nobody else will ever use his system.

Sampaio's theory about the influence of the desmid cellwall on division and sexual reproduction is ridiculous, of course, but I expect that he is just as firmly convinced of its correctness as Teiling is of his own theories.

I believe your memory must be getting as bad as mine! Sometime ago I wrote you about Iyengar & Bai's paper, and you said you would write Iyengar and beg him to send it to you. Under separate cover I am sending you two of his papers, the only ones containing desmids that I know of, and you may copy them if you think it worth while, and then please return them.

Thanks for sending me the microfilm of Lütkenmüller's paper on Central China and the two by Schmidle. I have just bought some special enlarging paper, specially made for this purpose, and shall enlarge them to pretty near the original size. Would you make a similar negative of the remainder of Cohn's paper, Desm. Bongoenses, of which you sent me prints of only the plate and plate descriptions?

In view of the startling developments in Europe and Egypt during the last couple of weeks, I think it would be advisable for you to return to me, as quickly as possible, the remainder of my drawings. Don't you agree?

With my best regards,

Your friend,

Nov 9 1956

Dear Rolf,

I have just noticed that there is already a *Cosmarium costatum* Nordst. (1875), so *Calocylindrus costatus* Wolle will have to be given a different name. There is a *Cosm. Wollei*, so I suppose the best name would be *Cosm. corrugatum* Scott & Grünbl. nom. nov. (Syn. *Cal. costatus* Wolle).

Hope it is not too late to make the change.

Sincerely,

Desm. Bongomensis in Wittm., N. B. Africa
I have found the following Desm. ^{57.}:

Desm. elephantinum
ovatum f.
sp. - ("nodulosum - latior lobis")

Clusia melmeri (?) [with "girdle bark"]
Raltzi = hybridum (?)

Eucalyptus triflorum

Croton thalictroides
pendulus
f.

Decasidium (aphogonum?).
(= "D. walteri" in Coker's?)

Miconia dent. velata f. (?)
(= ? Miconia schovii f. dentata Coker)
Coker's fig. very poor!

ROLF GRÖNBLAD
KARIS
FINLAND

Nov. 25. 1956.

Dear Arthur,

Today I received the two papers by Iyengar. I shall copy and return them. Thank you.

I have also received the first proof sheet of our paper, and I have asked Prof. Lindberg to send you a copy so that you can make your own remarks and corrections and I can then transfer them on my copy. Of course you know that every not quite necessary change in the text should be avoided because they will become very expensive. I have only just had a look at the proof and I believe there are not very many mistakes. So

I am sorry:

there are

many printers

errors.

I hope you are content with the prompt progress. I have found a few of your original drawings which I am sending as soon as possible.

The controversy between Teiling and on the other side Ruzicka and myself seems to become very complicated and extensive....and unpleasant because Tg. is quite furious. I am very sorry because T. takes such a position against us. What I think wrong and what I believe to be right

ROLF GRÖNBLAD
KARIS
FINLAND

Do you wish 100 or 150 copies of our
USA. paper?

Nov. 30, 1956.

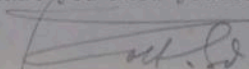
Dear Arthur,

I have received the photocopies of Frohne, Cushman and Cholnoky. Thank you again very much for them. Now I can quote Frohne without "non vidi" in our USA paper. Unfortunately there was not much of information, nothing new on the zygospores. But I am glad to have this paper. Cushman I had, but no text, so that is useful too. Cholnoky is only a "curiosity": how can such a paper be published (Can you give me the name of the Journal? and year of publishing?) Everything is "new" to this peculiar "phycologist"!!!

Thank you also for Iyengar. "Triplastrum" I had got from Sweden but not the other paper. I have taken a photocopy but I wish to see the copies before I return these papers to you.

Now I have the first proof sheet of our USA paper complete. But Prof. Lindberg thought it would be better to send the 2nd proof to you. So you will have to wait a short time. It is a tedious and rather slow job to read the first proof sheet, but that you know yourself.

Kind regards, yours

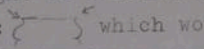


ROLF GRÖNBLAD
DR. PHIL.
KARIS, FINLAND

Dec. 13th 1956.

Dear Arthur,

Thank you again very much for the most interesting copy of Amer. Scientific. It was quite exciting to read about these new astronomical researches by means of the 200 inch telescope and the radio telescopes. The cosmological theories are to me always exceedingly interesting. Of course they are only theories, and I don't believe in everything but one can just get a glimpse of the greatness of the universe.

I have tried to look at your *Spondylosium desmidiiforme*, but so far with little success. I have seen that your drawings are correct: the crenulate margins and the asymmetrically unlike lateral lobules. The arrangement of the pores I was not able to see, but I shall try again. (There are very few cells which easily disappear by staining manipulations). I suspect that there are perhaps very flattened apical connecting processes and that the species might be a *Desmidium* (?). In front view the apex looks in this way:  which would suggest connecting processes. *Desmidium pseudostreptonema* fac. *biradiata* as found in Scandinavia has also very inconspicuous connecting processes, sometimes almost or quite invisible. I sometimes suspect that *Spondylosium lundellii* is the same plant. But perhaps it is not so?

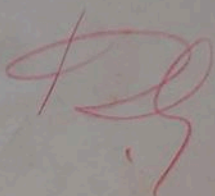
The exsiccate in Rabenhorst's Exsicc. with desmids from Banka by Grunow was a disappointment. I could find only diatoms, not one desmid. But Rabenh. exs. are usually not good (whereas Wittr. & Nordst. are mostly excellent).

Next week I shall send the text copy of Cohn's paper. I have taken some micrographs of the species in *Desm. Pongoense*. *Pleur. elephantinum* seems to me a good species.

I believe the second proof sheet of our USA paper will be printed before Christmas, and one copy will be sent to you.

Best wishes,
Yours,

- o -
+ with you will have
a Merry Christmas!!



Dec 15 1956

Dear Rolf,

The two large parcels of drawings have arrived in good condition; many thanks for sending them so promptly. In your letter of Nov. 25 you said that you were sending a few more; no doubt they will get here soon, and then I suppose the set will be complete. Have you given any thought as to where and when these should be published? Many of them are not certainly identified because of insufficient information. When the time comes I will endeavour to find more specimens and get the additional views, or information on the chloroplasts. But there is much to be done before this time arrives, - the Sudanese, Brazilian, and Indonesian collections will have to come first, I think.

It is good news that the Society has acted so quickly in getting our paper into proof. I had hoped to see it by this time, but perhaps it is best, as Prof. Lindberg says, to send me the second proof. On previous papers that I have written or checked, I have never seen a second proof, isn't this a little unusual?

Of course I was only joking about Pl. 'spinosississimum'; I know very well that such a name is impossible. But the plant is certainly deserving of some distinctive name. I had noticed Brunel's statement about the Madagascar form with spines "rather localized on the bulging portions", but Prowse's plant differs too much in other respects to be placed with Pl. spinulosum, and must be made a new species I think. I wrote to Prowse, giving him some hints on how his drawings can be improved, and have had a reply saying that he will try to put some of my suggestions into practice. He sent a sketch of another curious *Pleurotaenium*, looking somewhat like a very short Pl. burmense; it seems to be very close to the North Australian plant shown in Pl. 2, Figs. 3, 10 of the still unpublished paper, and which I called Pl. burmense var. curtum, n. nov.

Yes, I have noticed that in Pl. ovatum the chloroplast consists of longitudinal parietal bands which seem to be continuous instead of being broken up into many small pieces as shown in Krieger's illustration of var. tumidum, which, however, was copied from Bernard, whose drawings are not particularly good. I assume that this was an error. Borge shows a form of Pl. ovatum from Brazil in his 1903 and 1925 papers that differs considerably from Nordstedt's original illustration, and from the Indonesian forms. It is much less constricted in the middle, and perhaps should be made a variety. The African form in Cohn's *Desm. Bongoenses* is quite like the Asiatic one. Very early in my collecting days I found in Louisiana a Pl. that seems to be Pl. ovatum. I made sketches of it but did not know that it is the only record from North America (?), and the collection was discarded for some reason that I do not remember; I have never seen it since then from USA.

The Indonesian forms of *M. foliacea* are sometimes, but not always, curved sinusoidally ~~amongst~~ in side view, frequently in a very pronounced manner. I have tried to draw this, but the sketch got so complicated that I had to abandon it. The curvature of the filament is caused by the opposite curvatures of the right and left lateral lobes of the semicell, which can be seen very clearly in the end view; it is also present in the American plants, but to a much smaller extent. The end view in Krieger's plate 121, fig. 2, copied from Smith, does not show the curvature, but the side view by Okada, pl. 120, fig. 8, indicates it rather indefinitely.

I am not at all clear as to just what *Cosm. pardalis* is, after seeing the many different forms in *Desm. Bongoenses*. (Did you get the slide of this that I sent?). But I have sometimes seen, in *Cosmaria* of the margaritatum type, what appears to be a pore at the top of each granule, though I rather suspect that it may be an optical illusion caused by the refractive effect of the thickened cell wall. If the 'pore' becomes

lighter or darker or disappears when the focus is raised or lowered by 1 or 2 microns, it is due to the ~~fr~~ refraction of light, and is not a pore, I believe.

Cholnoky's paper appeared in Oesterr. Bot. Zeitschr. 101(1/2): 118-139, presumably in 1954. It was noticed in Bull. 27 of the Phycological Soc., which probably you have. The also is mentioned a paper by Gonzalves & ~~Saxathi~~ Bharati, "Eusastriella, a new genus in the family Desmidiaceae", (Abstract). Proc. Indian Sc. Congr. 40(3): 66. (nomen nudum). So far I have not been able to get a copy of this paper.

Please order for me 150 reprints of our paper, which the printer may send to me direct together with the invoice. Sometime ago I sent you two copies of my list of correspondents. Will you please mark on these the names of those to whom you will send reprints, and return one copy to me, so that we need not unnecessarily duplicate the sendings, which I expect will be rather expensive.

Telling is very much upset over the controversy concerning his rearrangements, and also about the Ruzicka matter, whatever that may be. He offered to send me Ruzicka's paper, but I replied that it would do no good, because I cannot read German sufficiently well to be able to follow a long and closely reasoned argument. I wrote him a few days ago, returning a short paper that he had sent to me for correction of his English, and I told him that whatever you had written him was done in a purely friendly and sincere spirit, and that a difference of opinion about desmid genera was certainly not sufficient cause for a rift in such an old friendship. I hope that this may help to calm him and induce him to take a more reasonable view.

A couple of months ago I had a letter from Ruzicka, mentioning that he had sent you a paper in which he hoped you might contribute, but he gave no details. I have not replied to this letter, because shortly after its receipt the uprising in Hungary took place, and our newspapers reported that this had caused increased activity by the Russian watchdogs in neighbouring countries like Czechoslovakia and Rumania, and I thought that receiving letters from America might possibly cause trouble. So if you have occasion to write him please ask him to write to me again, if it is OK for him to receive letters from USA. I have sent you a couple of magazines dealing with the Hungarian situation, from which you will obtain a clearer view of the American views. It is certainly deplorable that there is no practicable way for even the USA, supposedly the most powerful nation in the world, to get any effective aid to these poor people. But the same thing happened in Poland and Finland, as you know only too well.

Telling's wife is in the hospital for diagnosis and treatment of a tumour on her neck, which has been operated twice before, and which she thinks may be cancer. So it will not be a Merry Christmas for them. Hannah's mother, also, is ill again, and has been operated on without apparent improvement, so T. wrote. She must be having a hard time attending to her work at the College, running her house, and looking after her mother. Fortunately she has a car and lives only a few minutes drive from the College.

With best wishes for the holiday season,

Your friend,