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# HYDROBIOLOGIA

ACTA HYDROBIOLOGICA, LIMNOLOGICA ET PROTISTOLOGICA

EDITORES:

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Honorary Secretary: PROF. P. van OYE  
University Ghent  
St. Lievenslaan 30, Ghent, Belgium

Publishers: Uitgeverij Dr. W. JUNK  
van Stolkweg 13, Den Haag

Ghent, Aug. 5, 1952

Mr. A. M. Scott  
2824 Dante Street  
New Orleans 18, Louisiana

Dear Mr. Scott:

Your letter of Aug. 2 to hand, I beg to enclose herewith a not corrected first proofsheet of your paper so as to enable you to include the latter in the bibliography in your forthcoming paper.

Another copy of the proofsheet has been corrected by professor Prescott and is now at the printer's. Following your request, your name is now placed first.

As for the date of publication, I only can say that your paper shall appear in the near future.

In this connection I must draw your attention to the fact that your paper has not been postponed in order to allow the printing in one paper of Irénée Marie's work. In fact, the latter has been received at an earlier date than your paper, and it bears in my entry-book number 105 as against number 116 for your aforesaid paper.

Regarding the Euastrum-form described both by you and by Irénée Marie, I shall make the necessary correction on the last editorial proof.

Hoping you will be pleased to learn that your paper will appear soon, I am,

Very sincerely yours,

*P. van Oye*  
Prof. Dr. P. van Oye,  
Honorary Secretary.

*not enclosed*

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Publishers: Uitgeverij Dr. W. JUNK  
van Stolkweg 13, Den Haag

Ghent, June 16 Juni 1951

Mr. A. M. Scott  
2824 Dante Street  
New Orleans 18, Louisiana

Dear Mr. Scott:-

Dr. Junk of the Hague sends me the paper on Desmidiaceae by yourself and Professor Prescott, that you have sent him. ~~For publication in HYDROBIOLOGIA~~

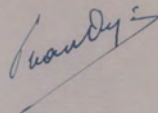
I am quite willing to publish the paper referred to above, and the latter will probably appear by the beginning of 1952.

Please send me as soon as possible the original drawings.

I should like to ask you to kindly note that any paper or correspondence in connexion with your papers should be addressed directly to me, so as to avoid delay, since papers received by the publishers have to be sent to me.

In the meantime, I am,

Very sincerely yours,



Prof. Dr. P. van Oye

1948 Desmidiées, in Expl. du Parc National Albert.

Sept 22 1952

Prof. P. van Oye,  
Ghent, Belgium.

Dear Prof. van Oye,

I have been laid up in bed for a week, with an intestinal disturbance, and have been thinking about the order for reprints that I sent you. I want to make it clear that the 275 reprints are the total required for both Prof. Prescott and myself; i.e., 75 for me and 200 for him.

Since Prescott is now at Point Barrow in Alaska, where he will remain until near Christmas, I think it best that you send all of them to me, and I will pay for them, and Prescott can reimburse me later. I shall write him by airmail and ascertain where he wants his 200 copies sent.

Sincerely,

Digitized by Hunt Institute for Botanical Documentation

Sept 12 1956

Prof. dr. P. van Oye,  
Universite de Ghent,  
Ghent, Belgium.

Dear Prof. van Oye,

Almost two months ago I sent you the Ms. of a paper by Krieger & Scott, "Einige Desmidiaceen aus Peru", and in a separate tube five plates of drawings.

Will you please send me a few lines by airmail, saying whether you have received them, and if you can publish the paper.

Sincerely yours,

July 20 1956

Prof. dr. P. van Oye,  
Universite de Ghent,  
Ghent, Belgium.

Dear Prof. van Oye,

Herewith is the Ms. of a paper on desmids by the late Dr. W. Krieger and myself, which I hope you will be able to accept for publication in *Hydrobiologia*. Under separate cover I have sent you the original drawings for the plates of illustrations.

As you will see, the paper is written in a mixture of English and German. The reason for this is stated in the text, and I think it is a valid one. Also I believe that all persons seriously interested in desmids must have at least a reading knowledge of both languages, so there should be no objection on this score.

Will the mixture of languages, plus Latin for the diagnoses of new taxa, cause any trouble with the printer and typesetters? I hope not.

A year ago my wife and I visited Europe, and spent an afternoon and night in Bruxelles. I hoped to make a quick visit to Ghent to see you, but when the concierge at the hotel telephoned to Ghent he was unable to reach you; probably you were away on a holiday.

I spent a few days in Sweden with Lektor Einar Teiling, and stayed for three weeks with my friend Dr. Rolf Grönblad in Finland, where we worked up several thousands of my desmid drawings from southern U.S.A., and others from the Sudan and Brazil. A paper on the U.S.A. desmids is now nearing completion and I hope it may be published by the end of this year by the Soc. Sci. Fennica.

With my best regards,

Sincerely yours,

KINIGE DESMIDIACEEN AUS PERU.

W. KRIEGER AND ARTHUR M. SCOTT.

Final

In 1953 the late Dr. W. Krieger, whose lamented and untimely death is such a severe blow to desmidiology, told me in one of his letters that he was working up the desmids in a small lot of algal material from Chile. At that time I had four samples from Peru, only one of which contained a fairly good assortment of desmids, and I suggested that I might send him some of the material so that he could publish the Chilean and Peruvian desmids together. He agreed, and I sent him the material together with 16 of my drawings showing some of the more notable desmids that I had seen during a rather cursory examination. In the spring of 1954 he wrote me that he had completed his study and hoped to publish the results shortly. After his sudden death on July 15 1954 I enquired about the matter, and his son, Dr. Kurt Krieger, very kindly sent me his father's notes and drawings, which required only a small amount of work to put in shape for publication. I am glad to be able to present herewith the Peruvian desmids, which proved to be more numerous than either of us had thought at first sight. At the present time I have no information about the Chilean material, and do not know from what source Dr. Krieger received it.

The drawings that I received from Germany consisted of my own 16 with Krieger's check, or sometimes change, of my identifications, and additional notes, with his original camera lucida drawings in pencil. These were made to a considerably smaller scale than mine, and some of them were rather too 'sketchy' to be suitable for use as illustrations, so I undertook another search of the material and made new drawings of all the forms that he had marked to be illustrated. During my last examination I found a few more species that had not shown up in either his or my previous searches, and the various lists have been corrected to include these additional species.

There were a couple of small problems in nomenclature and synonymy that I was unable to solve, and Krieger's script was rather difficult to read, a few words here and there being quite undecipherable to me. I asked my friend Dr. Rolf Grönblad for assistance on these points, which he has very kindly given. Also I wish to thank Dr. Hannah Croasdale for preparing the Latin diagnoses, and Mrs. Dorothy Perine for

inking my pencil drawings for the plates.

To make clear my part in the preparation of this paper my remarks are in English, while Krieger's are in his original German.

Von Herrn A. M. Scott (New Orleans) erhielt ich 4 Algenproben aus Peru, und zwar:

P-1, P-2. From the pool in the Botanical Garden at Lima. Nymphaea,  
Ceratophyllum, Sagittaria, Juncus, Eichhornia, etc.

P-3. From Laguna Villa, 15 km. south of Lima. Abundant Eichhornia,  
Sagittaria, Typha (domingensis?), Utricularia, etc.

P-4. From a roadside ditch at Pampa del Sacramento, on the road to  
Pucallpa on the Ucayali River, Department of Loreto. Tropical  
jungle. About 800 km. from Lima; 150 m. above sea level. The  
tepid water in the roadside ditches was full of reeds, rushes, and <sup>/s</sup>  
Ceratophyllum. Cattails (Typha) were cut low and the cottony  
growth of algae there was squeezed into the jar.

These brief descriptions of the habitats are from the collector's original notes.

In southern U.S.A. it is quite unusual to find Eichhornia and Nymphaea growing  
together, because they prefer different kinds of water, but the pool in the Botanical  
Garden may be an artificial one, and it is likely that the aquatic plants, especially  
Nymphaea, were planted intentionally. Also because of the dry climate and very low ~~rainfall~~  
rainfall it is possible that the pool may receive water from the municipal supply, and  
such supplies are frequently quite hard, either naturally or from the chemical treatment  
that they undergo.

Meteorologische Daten von Lima:

	Marz	Aug.	Feb.	Max.	Min.
Temperatur	19.0	15.9	23.0	31	11° C.
jährlich Regen 5 cm.		1	0		

Die Proben sind von Herrn dr. Felix Woytkowski gesammelt, und mir von Herrn  
Scott freundlichst zum Bearbeitung überlassen worden. Aus Peru sind bisher keine  
Desmidiaceen beschrieben worden, und es schien mir daher möglich die verhältnismässig  
kleine Sammlung zu bearbeiten. Zahlreichere Desmidiaceen enthielt nur die Probe P-3  
(Laguna Villa). Leider ~~hier~~ liegen keine chemischen und physikalischen Angaben vor, /e



um die Wassertypen festzulegen. Aus den Artenlisten ist jedoch zu schliessen, dass es sich um ein schwach saures Gewässer handelt. Auffallend ist der Reichtum an Vertretern der Gattung Closterium. Es handelt sich dabei um Arten die auch in der nordgemässigten Zone vorkommen. Überhaupt ist die Anzahl mitteleuropäischer Arten in der Desmidiaceen-Assoziation recht gross. Zunächst soll eine Übersicht über die Verteilung der gefundenen Arten auf die Gattungen gegeben:

Krieger gave two lists, which I have combined into one, showing a comparison of the number of species and percentages of the total found in the Peruvian material, with those from Brazil found by Grönblad, and also with those from Chile found by Krieger.

	Gronblad Brasilien.		Peru.		Chile.
	Arten.	%	Arten.	%	%
Gonatozygon	6	1.1	1	1.2	1
Spirotaenia	2	0.4			2
Netrium	5	0.9	2	2.5	1
Cylindrocystis					2
Roya	1	0.2			
Penium	6	1.1	1	1.2	4
Glosterium	57	10.7	21	26.0	18
Docidium	1	0.2			
Pleurotaenium	25	4.7	4	5.0	
Triploceras	3	0.6			
Tetmemorus	2	0.4			2
Euastrum	36	6.7	12	14.8	7
Micrasterias	27	5.1	8	9.9	1
Cosmarium	113	21.2	19	23.5	36
Xanthidium	18	3.4			1
Arthrodesmus	21	3.9			3
Staurastrum	157	29.4	9	11.1	19
Sphaerosozma	4	0.8			
Onychonema	7	1.3			
Spondylosium	9	1.7			
Hyalotheca	9	1.7			2
Desmidium	17	3.2	3	3.7	
Bambusina	5	0.9	1	1.2	1
Phymatodocis	3	0.6			
	534	100.0	81	100.0	100

Krieger also gives another listing showing the percentages of the principal genera found in various countries:

	Peru.	Chile.	Brasil.	Arktis.	Nord- Amerika.	Kanada.	Gross- Britannien.	Portugal.
Closterium	26	18	11	6	7	14	9	17
Pleurotaenium	5	-	5	1	9	4	3	4
Euastrum	15	7	7	8	10	10	6	6
Micrasterias	10	1	5	-	8	7	5	2
Cosmarium	24	36	21	47	20	24	36	39
Staurastrum	11	19	29	24	27	25	24	15

A further list gives the complete enumeration of all the desmids found in collection P-3, the best of the lot:

Gonatozygon monotaenium	rr	Micrasterias abrupta	rrr
Netrium digitus v. naegelii	rr	" borgei	rr
" " v. parvum	rr	" " v. multidentata	rrr
Penium spirostriolatum	rrr	" laticeps	rrr
Closterium abruptum	rrr	" " f. depressa	rrr
" acutum v. tenuius	rr	" " v. acuminata	rrr
" archerianum	rr	" radians	rr
" cynthia v. jeneri	c	" thomasiana v. notata	rrr
" diana	rr		
" " v. arcuatum	rr	Cosmarium binum	rrr
" didymotocum	r	" commissurale v. crassum	rrr
" ehrenbergii	rrr	" cucurbita	c
" gracile v. elongatum	rr	" crassiusculum v. pulchrum	r
" kuetzingii	rrr	" denticulatum v. ovale	c
" libellula	r	" " v. perspinosum	r
" malmei	rrr	" elegantissimum v. simplicius	rrr
" moniliferum v. acutum	rr	" exiguum v. dilatatum	r
" navicula	rrr	" obliquum v. minimum	rr
" parvulum v. angustum	c	" orthostichum v. compactum	rrr
" ralfsii v. hybridum	rr	" pseudocognatum	c
" striolatum	r	" pyramidatum	r
" tumidum	rrr	" raciborski	c
" turgidum	rr	" retusifforme v. abscissum	rrr
" " v. borgei	rrr	" subcostatum	r
		" subtumidum	c
Pleurotaenium ehrenbergii	r	" variolatum v. <del>rotundatum</del> <sup>rotundatum</sup>	r
" eugeneum v. undulatum	r	" vexatum	r
" nodosum v. gurdwinski	c	" wollei	c
" trabecula v. maximum	rr		
		Staurostrum alternans	rr
Euastrum abruptum v. lagoense	rrr	" bieneanum v. brasiliense	rr
" ansatum	rr	" octangulare	c
" " v. dideltiforme	rrr	" orbiculare v. depressum	rrr

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/t

Gonatozygon monotaenium De Bary. (rr).

Ca. 16 mal so lang wie breit. Membranporen sehr zart. L. 158-204; Br. 10-11; Enden 12-13. Brasilien, Kolumbien.

Netrium digitus (Ehrbg.) Itzigs. var. naegeli (Bréb.) Krieg. (rr).

Relativ kleine Form. L. 120; Br. 30.

Netrium digitus (Ehrbg.) Itzigs. var. parvum Borge. (rr).

Ein wenig schlanker als die von Borge aus Brasilien (Matto Grosso) beschriebene Varietät, ca. 3 mal so lang wie breit. L. 70; Br. 22.

Penium spirostriolatum Barker. (rrr).

Only once reported from South America, by Grönblad (1945). L. 216; Br. 17; Ap. 12.

Closterium abruptum W. West. (rrr).

Previously known from Brazil and Colombia. L. 120; Br. 15.

Closterium acutum Bréb. var. tenuius Nordst. (rr).

In Südamerika neuerdings (Grönblad 1945) aus dem Amazonas-Gebiet festgestellt.

L. 60-82; Br. 3. (Krieger-Rabenhorst, T. 13, Fig. 16).

Closterium archerianum ~~W. West.~~ Cleve. (r). T. 1, Fig. 1.

Etwas kürzer als der Typus, (8-10 mal so lang wie breit). Enden leicht winklig abgesetzt. Vorher aus Venezuela und Brasilien gemeldet. L. 163-202; Br. 18-19.

Closterium cynthia De. Not. var. jenneri (Ralfs) Krieg. (c).

Eine Streifung der Membran konnte nicht festgestellt werden. Auch in Brasilien und Patagonien (Kol). (Krieger-Rabenhorst, T. 36, Fig. 2). L. 92; Br. 13.

Closterium dianae Ehrbg. (rr).

Nur 8-9 mal so lang wie breit. Von Venezuela bis Feuerland gemeldet. (Krieger-Rabenhorst, T. 19, Fig. 10).

Closterium dianae Ehrbg. var. arcuatum (Bréb.) Raben. (rr).

Ca. 13 mal so lang wie breit. Von Grönblad (1945) aus Brasilien gemeldet. (Krieger-Rabenhorst, T. 19, Fig. 12). L. 240; Br. 19.

Closterium didymotocum Ralfs. (r). T. 1, Fig. 2.

Ca. 8-9 mal so lang wie breit. Steht zwischen dem Typus und der var. minus. Aus Kolumbien bekannt. L. 315-350; Br. 40.

Closterium ehrenbergii Menegh. (rrr).

About 6 times as long as wide. Previously known from Brazil, Uruguay, Argentine, Patagonia. L. 285; Br. 45.

Closterium gracile Bréb. var. elongatum W. & W. (rr).

60 mal so lang wie breit. Aus Brasilien (Grünblad 1945) bekannt. (Krieger-Rabenhorst, T. 30, Fig. 10). L. 540; Br. 9.

Closterium kuetsingii Bréb. (rrr).

About 30 times as long as wide. Known from Brazil to Patagonia. L. 528; Br. 18.

Closterium libellula Focke. (r).

Ca. 5-6 mal so lang wie breit. Vorher aus Brasilien und Feuerland gemeldet.

L. 175-195; Br. 35.

Closterium malmei Borge. (rrr). T. 1, Fig. 3.

6 mal so lang wie breit, mit ca. 3 Rippen auf 10  $\mu$ . Aus Brasilien, Venezuela und Paraguay gemeldet. L. 310; Br. 55.

Closterium moniliferum (Bory) Ehrbg. var. ACUTUM var. nov. (rr). T. 1, Fig. 4.

Cellulae circa 7 plo longiores quam latae, differentes a cellulis speciei possessione extremitatum acutiorum.

Ca. 7 mal so lang wie breit. Unterscheidet sich vom Typus durch stärker zugespitzte Enden. L. 276-385; Br. 40-56.

Closterium navicula (Bréb.) Lütken. (rr). T. 1, Fig. 5.

Auch in der vorliegenden Probe sind die Umrisslinien etwas variabel; es wechseln schlanke mit mehr gedrungenen Formen. Venezuela, Brasilien, Kolumbien, Paraguay, Feuerland. L. 34-67; Br. 10-15.

Closterium parvulum Næg. ad var. angustum W. & W. acc. (c).

Sehr schlanke Form, die sich der var. angustum nähert. Die Art ist von Venezuela bis Feuerland festgestellt. L. 65-69; Br. 7.

Closterium ralfsii Breb. var. hybridum Raben. (rr).

Sehr schlanke Form der var. hybridum; die var. gracilius ist wesentlich kleiner. Brasilien, Venezuela, Kolumbien. L. 564-635; Br. 25-35; 10 striae auf 10  $\mu$ .

Closterium SEMICIRCULARE sp. nov. (r). T. 1, Fig. 6.

Cellulae mediocres, 5-6 plo longiores quam latae, valde curvatae, margine ventrali non inflato, extremitatibus minus rotundatis quam in Cl. monilifero. Membrana levis atque sine colore. Chromatophorus 4 pyrenoidibus atque 4 latis rugis longitudinalibus <sup>/i</sup> praeditus. Crystalla gypsi circa sex.

Closterium von mittlerer Größe, 5-6 mal so lang wie breit; Zelle stark gebogen, Innenrand nicht angeschwollen. Enden weniger abgerundet als bei Cl. moniliferum. Membran glatt und farblos. Chromatophoren mit 4 Pyrenoiden und 4 weite Langsplatten.

Ca. 6 Gypskristalle. L. 285; Br. 50.

Closterium striolatum Ehrbg. (r).

8-10 mal so lang wie breit. Zart gestreift (10 striae auf 10  $\mu$ ). 9 Pyrenoiden in der Halbzelle. Gemeldet von Venezuela bis Feuerland. L. 365-370; Br. 36-45.

Closterium tumidum Johns. (rr).

Ca. 7-8 mal so lang wie breit. Innenrand der Zelle gerade oder leicht angeschwollen. Meist 1 Gypskristalle in der Endvakuole. Aus Kolumbien, Brasilien, Paraguay, Patagonien. L. 100-104; Br. 12-14.

Closterium turgidum Ehrbg. (r).

Sehr schlanke Form, die sich der var. borgei Defl. nähert. Bisher aus Brasilien, Paraguay, Argentinien und Venezuela gemeldet. L. 662-880; Br. 45-65; 8 striae auf 10  $\mu$ .

Closterium turgidum Ehrbg. var. borgei Defl. (rrr).

Two specimens seen by Scott measured 1140x76 and 1260x72. Previously known from Brazil.

Pleurotaenium ehrenbergii (Bréb.) De Bary, forma. (r).

16-17 mal so lang wie breit. Zahl und Grösse der Endwarzen variabel. Die als forma clavata beschriebene teratologische Form ebenfalls beobachtet. Sehr grosse Form, weiter und länger, meist wie der Typus. In Südamerika von Venezuela bis Patagonien. L. 702-950; Br. 46-58; I. 40-45.

/e Pleurotaenium eugeneum (Turn.) W. & W. var. undulatum (Borge) Krieg. (r).

Ca. 16 mal so lang wie breit. Stattliche Exemplare mit deutlicher Basalanschwellung; Enden erweitern sich nicht. Bisher aus Brasilien gemeldet. L. 1015-1150; Br. 60-75; Basis 65-70; I. 50-55.

Pleurotaenium nodosum (Bail.) Lund var. gutwinski Krieg. (c).

Stattliche Form. Die Zahl der kegelförmigen Endwarzen ist grösser, 7 sind sichtbar. Die Poren stehen auf den Häckerenden wesentlich dichter und nicht in Reihen. Gemeldet aus Brasilien und Paraguay. L. 550; Br. 90; I. 45.

Pleurotaenium trabecula (Ehrbg.) Mäg. var. maximum (Reinsch) Roll. (r).

Ca. 10 mal so lang wie breit. Die Unterschiede zwischen dem Typus und der var.

maximum bestehen in der Hauptsache in den grösseren Massen. Exemplare aus Probe

/I P-1 und P-2, L. 635-650; Br. 60; L. 40; Basis leicht angeschwollen. Exemplare aus Probe P-3, L. 505; Br. 55. Brasilien, Argentinien.

/h Euastrum abruptum Nordst. var. lagoense (Nordst.) Krieg. (rrr).

Vorger nur aus Brasilien bekannt. L. 22; Br. 17; I. 4.

Euastrum ansatum Ehrbg. (rr).

Aus Brasilien und Paraguay bekannt. L. 74; Br. 34; I. 12.

Euastrum ansatum Ehrbg. ad var. dideltiforme Ducell. acc. (rrr). T. 1, Fig. 7.

Only two examples were found, and in neither case were the surface features discernable. The large central pit that is usually present could not be seen in either, front, side, or oblique views. L. 111; Br. 47; I. 12; D. 30.



Euastrum bidentatum Næg. var. PERUVIANUM var. nov. (rrr). T. 4, Fig. 7.

Varietas a specie typica differens possessione duorum tantum granulorum in centro faciei utriusque semicellulae, differens necnon absentia paris lacunarum profundarum proxime super inflationem centralem.

Differs from the type in having only two granules in the center of the face of each semicell, and by the absence of the pair of deep pits immediately above the central swelling. L. 53-54; Br. 37-38; I. 9-10; D. 23-24.

Euastrum binale (Turp.) Ehrbg. var. hians W. West. (rrr).

Der nächste Fundort liegt in U.S.A. L. 11; Br. 9; I. 3.

Euastrum elobatum (Lund.) Roy & Biss. var. PERUVIANUM var. nov. (rrr). T.1, Fig.8.

Varietas satis differens a var. simplici Krieg. de Java; isthmus latior, margines laterales infra apicem constricti, angulis apicalibus minus rotundatis. Cellula a latere visa membranam super centrum semicellulae interne incrassatam <sup>e</sup>præbens.

Von den javanischen var. simplex Krieg. etwas verschieden. Isthmus breiter.

Unter dem Schitel eingezogen. Apikalecken weniger gerundet. Membran über der Mitte der Halbzelle verdickt (Seitenansicht). L. 21; Br. 15; I. 8.

Euastrum evolutum (Nordst.) W. & W. var. integrus W. & W. (rrr).

Die vorliegende Form stimmt in Grösse und Umrisslinien gut mit der bisher nur aus Afrika und U.S.A. beschriebenden var. integrus überein. Der Polarteil ist weniger stark abgesetzt. L. 52; Br. 35; I. 9.

Euastrum fissum W. & W. var. brasilense (Borge) Krieg. (rr). T. 4, Fig. 4.

In den Basal- und Apikallappen ist eine Gruppe kleiner Warzen vorhanden, die in der Abbildung bei Borge fehlen. L. 46-47; Br. 25-26; I. 8-9; D. 17.

Euastrum incavatum Josh. & Nordst. forma. (rrr). T. 4, Fig. 5.

Only one specimen of this plant was seen, and it proved impossible to get the exact side and top views, but an approximation of these is given, as seen during the manipulation. The front view bears an evident resemblance to E. cornubiense and ~~XXXXXXXXXX~~ E. crassicolle, but the side and top views are quite different, and

approach more closely to those of E. incavatum, to which species it is tentatively assigned. L. 41; Br. 23; I. 7; D. 16.

Euastrum LATUM sp. nov. (rrr). T. 4, Figs. 2, 3. 12

Cellulae parvae, paulo latiores quam longae, sinus profundus linearisque, in extremitate paululum apertus. Semicellulae trapeziformes, marginibus lateralibus convexis, 3-undulatis inter angulos basales apicalesque; apex 2-undulatus, incisione media non profunda praeditus. Membrana duos ordines marginales granulorum non altorum, necnon granulum in utroque angulo basali apicaliue praebens. Centrum semicellulae inflationem geminam non altam habens, visibilem solum in semicellula a latere (fere circulari) aut a vertice (elliptica) visa. Chromatophorus parietalis, pyrenoideo uno centrali praeditus.

Kleines Euastrum, etwas breiter als lang. Sinus tief, nur am Ende wenig geöffnet. Halbzelle trapezförmig. Seiten convex, zwischen Basal- und Apikalecken 3-wellig. Scheitel 2-wellig, mit flachem Mitteleinschnitt. Membran mit 2 randlichen Reihen flachen Warzen, und je einer weiteren in den Basal- und Apikalecken. Mittel der Halbzelle mit einer flachen 2-teiligen Anschwellung, die jedoch nur in der elliptischen Scheitelansicht und in der fast kreisförmigen Seitenansicht der Halbzelle zu erkennen sind. Chromatophore parietal, mit einem centralen Pyrenoid. L. 30-34; Br. 34-38; I. 7-8; D. 17-18. 12

Euastrum latum ist eine Art, die zwischen den Gattungen Cosmarium und Euastrum steht, hier wegen der apikalen Einschnitte zur Euastrum gestellt.

The illustration, T. 4, Fig. 3, shows a smaller and narrower plant, of which a single empty cell was found. The profile is evidently quite like that of E. latum, with the same number of lateral and apical undulations, but though the cell was quite empty, and the wall could be seen to be finely and delicately porose (punctate), there was no evidence of any granules or warts in any view.

Euastrum sinuosum Lenorm. (rrr).

Vorher aus Guiana, Brasilien und Uruguay gemeldet. L. 65; Br. 35; I. 11.

Micrasterias abrupta W. & W. (r). T. 2, Fig. 1, 2; T. 3, Fig. 6.

Meist in der Normal form mit 2-spitzigen Polarlappen, seltener in der durch Übergänge /a verbundenen Abänderung mit 1-spitzigen Lappen. L. 49-53; Br. 50-52; I. 11-12.  
Vorher aus Brasilien und Paraguay gemeldet.

Micrasterias borgei Krieg. (rr). T. 1, Fig. 3-5.

Wie schon Grönblad (1945) bemerkt, ist die Bestachelung variabel. Bei dem abgebildeten Exemplaren sind die kleinen Dörnchen ziemlich gleichmässig über die Oberfläche verteilt, wie bei der var. multidentata; doch ist die für den Typus charakteristische kegelförmige Mittelanschwellung vorhanden. L. 277-325; Br. 237-275; I. 45-50.

Micrasterias borgei Krieg. var. multidentata Krieg. (r). T. 1, Fig. 6.

Der Scheitel trägt auf den Höckern keine Stacheln. Bisher in Südamerika nur aus /r Brasilien bekannt. L. 306; Br. 250; L. 45.

Fig. 7 shows a dichotypical cell combining semicells of the species and var. multidentata.

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Micrasterias laticeps Nordst. (rrr). T. 3, Fig. 3.

Diese amerikanische Art, die vorher aus Venezuela, Brasilien und Paraguay gemeldet war, konnte in einigen stattlichen Exemplaren beobachtet werden. L. 200; Br. 250; I. 25.

Micrasterias laticeps Nordst. forma DEPRESSA f. nov. (rrr). T. 3, Fig. 4.

Forma a planta typica differens ratione multo ampliore latitudinis ad longitudinem (1.47 adversus 1.10 ad 1.33 in specie), aspectu cellula sic praeter <sup>insolitum</sup> selitum depressum.

Differs from the type in the much greater ratio of width to length (1.47 against 1.10 to 1.33 for the species), giving the cell a curious depressed appearance.  
L. 147, Br. 216; I. 25.

Micrasterias laticeps Nordst. var. acuminata Krieg. (rrr). T. 3, Fig. 5.

Isthmus etwas breiter. Bisher aus Brasilien und Paraguay gemeldet. L. 85-90; Br. 102-113; I. 20-22.

Micrasterias radians Turn. (rr). T. 1, Fig. 9.

Die Art steht M. radiata nahe, doch unterscheiden sich die typischen Formen so bedeutend dass schwer an eine Vereinigung zu denken ist. Vielleicht kann der geographische Faktor für Trennung der Arten beitragen. M. radians ist eine tropische Art, während M. radiata temperierte Gebiete bewohnt. L. 133; Br. 109; I. 21.

Micrasterias radians Turn. var. brasiliensis (Grönbl.) Krieg. comb. nov. (rr).

Syn. M. radiata var. brasiliensis Grönbl.

Wenn man die tropische M. radians bestehen lässt, gehört die var. brasiliensis hierher. Sie steht zwischen dem Typus (Krieg.-Rab., T. 115, Fig. 8) und der var. hogoriensis (Bern.) G.S.West. (Krieg.-Rab., T. 116, Fig. 2). L. 185; Br. 150; I. 25.

Micrasterias thomasiana Arch. var. notata (Nordst.) Grönbl. (rrr). T.3, Fig.1,2.

Hälften kleiner als die bisher gemeldeten Exemplare; in älteren Zelloberflächen mit Dornenreihen parallel mit den grösseren Einschnitten. (An jüngeren Zelloberflächen nicht wahrnehmbar). In Südamerika nur aus Brasilien bekannt. L. 150-153; Br. 132-133; I.24.

In the Peruvian specimens the spines were extremely small and difficult to see. The illustrations should be compared with var. torneensis Krieg. (Krieg.-Rab., T. 141, Fig. 3) which is much larger and has a different arrangement of the spines.

Cosmarium binum Nordst. (rrr).

The specimens seen had semicells of a more pyramidal shape than in any illustrations that I have seen, and in this respect they resemble the form that occurs in southeastern U.S.A. Previously known from Brazil. L. 84-88; Br. 62-69; I. 18-20; D. 41-43.

Cosmarium commissurale Bréb. var. crassum Nordst. (rrr). T. 5, Fig. 1.

Die Mittelanschwellung ist sehr stark entwickelt. L. 30; Br. 32; I. 13; D. 27.

Cosmarium cucurbita Bréb. (c).

Kleine Exemplare der weitverbreiteten Art. Vorher in Brasilien gefunden. L. 26; Br. 16; I. 13; D. 13.

Cosmarium crassiusculum (De Bary) Insam & Krieg. var. PULCHRUM var. nov. (r).

T. 4, Fig. 6.

Cellulae 2-3 plo longiores quam latae, extremitatibus late rotundatis aut complanatis. Membrana poris crebris ac manifestis praedita, in apicibus incrassata.

2-3 mal so lang wie breit. Scheitel gerundet bis abgestutzt. Membran mit sehr dichtstehenden deutlich sichtbaren Poren. Membran an den Enden verdickt.

L. 55-71; Br. 24-29; I. 20-23. The chloroplasts have 5, 6 or 7 radiating lamellae.

Cosmarium denticulatum Borge var. ovale Grönbl. (c). T. 3, Fig. 7.

Stattliche Exemplare der im Material nicht seltenen Art. Das Mittelfeld ist mit dichtstehenden deutlichen Poren bedeckt. Vorher aus Venezuela und Brasilien bekannt.

L. 148-175; Br. 106-115; I. 30-31.

Cosmarium denticulatum Borge var. perspinosum Grönbl. (r). T. 3, Fig. 8.

Seiten leicht konvex. Scott hat die Stacheln bei einem Exemplare gezählt; auf der einen Zellohlfte waren 287, auf der andern 296 sichtbar. Nur aus Brasilien gemeldet

(Grönblad 1945). L. 239-250; Br. 159-173; I. 46-62.

It may perhaps be thought that I have drawn the spines in too regular an arrangement, but that is really the way they appear; also the total number of spines is approximately correct.

Cosmarium elegantissimum Lund. var. simplicius W. & W. (rrr). T. 4, Fig. 7.

Only one example was seen, and the surface features were concealed by the dense chloroplast, but I think there is little doubt about the identification. Previously reported from Brazil. L. 48; Br. 20.

Cosmarium exiguum Arch. var. dilatatum (Schm.) Krieg. (r).

Die Form der Halbzelle schwankt bei C. exiguum. Die var. hexagonum leitet zu der vorliegenden forma dilatata Schm. L. 25; Br. 12; I. 5; D. 9.

Cosmarium obliquum Nordst. var. minimum W. West. (rr).

Bisher noch nicht aus Südamerika gemeldet. L. 11-13; Br. 9-10; I. 5.

Cosmarium orthostichum Lund. var. compactum W. & W. (rrr). T. 4, Fig. 10.

Eine Form mit quer verbreiteten und verdoppelten Warzen. L. 21; Br. 20; I. 6; D. 13.

This plant should be compared with C. ordinatum var. depressum W. & W. (1898) and with C. geminatum Lund. in Prescott & Scott (1942).

Kleiner als der Typus, ca. 1-1/3 mal so lang als breit. Chromatophor mit 6 radialen

Fort. Cosmarium pseudoconatum Nordst. (c).

In Südamerika aus Brasilien, Ecuador und Paraguay gemeldet. L. 46-47; Br. 34; I. 32.

Stauscheide abwärts ...

Cosmarium pyramidatum Bréb. (r).

Aus Venezuela, Brasilien, Kolumbien, Bolivien, Uruguay, Paraguay und Argentinien gemeldet. L. 64-74; Br. 37-44; I. 12-15.

Stauscheide abwärts ...

Cosmarium raciborskii Lagerh. (c). T. 4, Fig. 9.

Membranskulptur deutlich; sie besteht in dichtstehenden Poren die nicht in Reihen angeordnet sind. Zellrand sehr fein gewellt. Membran an Enden verdickt. 1 Pyrenoid in der Halbzelle. L. 33-37; Br. 31-39; I. 12-13; D. 18. Vorher aus Brasilien bekannt.

Stauscheide abwärts ...

Cosmarium retusiforme Gutw. var. abscissum (Schm.) Kriegl. comb. nov. (rrr).

Syn. C. hammeri fa. abscissa Schm. (1895, S. 302, T. 4, F. 8)

C. retusiforme forma Borge (1918, S. 34, T. 3, F. 4).

In Scheitelansicht mit etwas angeschwollener Mitte. Membran in der Mitte der Halbzelle verdickt. Brasilien, Kolumbien. L. 23, Br. 18, I. 6; D. 12.

Cosmarium subcostatum Nordst. (r).

Die Skulptur des Mittelfeldes weicht etwas ab. Es ist eine grossere Mittelwarze vorhanden, die von ca. 9 Graneln umgeben ist. L. 21; Br. 18; I. 5; D. 11.

Cosmarium subtumidum Nordst. (c).

Verhältnis vom Breite zu Länge etwas variabel, 1:1.35-1.47. Brasilien, Kolumbien. L. 25-33; Br. 18-20; I. 6-7.

Cosmarium variolatum Lund. var. rotundatum (Kriegl.) Messik. (r).

Aus Brasilien gemeldet. L. 27; Br. 15-16; I. 7; D. 11.

the lowest of the three spines at each angle arises from an inflated base with a

distinct shoulder. Borge assigned his forms toria to var. glabrum Lagerh., but

Cosmarium vexatum W. West. (r).

Etwas kleiner als der Typus. L. 30-31; Br. 25-26; I. 10.

Cosmarium wollei (W. & W.) Grönbl. (c). T. 4; Fig. 8.

Kleiner als der Typus, ca. 1-1/3 mal so lang wie breit. Chromatophor mit 6 radialen Fortsetzungen. L. 26; Br. 19; I. 17.

Staurastrum alternans Bréb. (rrr). T. <sup>5</sup>/<sub>4</sub>; Fig. <sup>2</sup>/<sub>β</sub>.

Die gefundenen Formen sind nicht ganz so stark gedreht und haben etwas gedrungeneren Arme. L. 33; Br. 30; I. 11.

Staurastrum asteroideum W. & W. var. brasiliense Grönbl. (rr).

Die Arme sind etwas stärker gerundet. L. 20; Br. 22; I. 4. Von Grönblad

aus Brasilien.

Staurastrum bieneanum Raben. var. patens Nordst. (rrr).

Aus Brasilien und Patagonien bekannt. L. 18; Br. 20 (23); I. 5.

Kleiner als die brasilienischen Exemplare. Basale Fortsetze zuweilen 3-spitzig,

apikale manchmal 1-spitzig. Die Länge der Stacheln schwankt etwas. L. 24-27 (30-33);

Br. diag. 22 (27); Br. Seiten 17 (23-28); I. 10-12.

Staurastrum orbiculare Ralfs var. depressum Roy & Biss. (rrr). T. 5, Fig. 7.

Reported from Brazil by Borge (1918) and Grönblad (1945). L. 34; Br. 33; I. 10.

Staurastrum setigerum Cleve var. pectinatum W. & W. (r). T. 5, Fig. 4.

Etwas kurzstacheliger als die von Grönblad aus Brasilien beschriebenen Exemplare.

L. 36 (50); Br. 32 (46).

Staurastrum teliferum Ralfs var. pecten (Perty) Grönbl. (r). T. 5, Fig. 5.

Die Länge der Stacheln ist Schwankungen unterworfen. In Südamerika nur aus Brasilien bekannt (Grönblad 1945). L. 33-34 (42); Br. 27 (32-33); I. 11-13.

Staurastrum trifidum Nordst. var. inflexum W. & W. forma tortum Børges. (rrr).

Only two specimens were seen. They agreed with Børgesen's illustration except that the lowest of the three spines at each angle arises from an inflated base with a distinct shoulder. Børgesen assigned his forma torta to var. glabrum Lagerh., but

Cosmarium vexatum W. West. (r).

Etwas kleiner als der Typus. L. 30-31; Br. 25-26; I. 10.

Cosmarium wollei (W. & W.) Grönbl. (c). T. 4; Fig. 8.

Kleiner als der Typus, ca. 1-1/3 mal so lang wie breit. Chromatophor mit 6 radialen Fortsetzungen. L. 26; Br. 19; I. 17.

Staurastrum alternans Bréb. (rrr). T.  $\frac{5}{2}$ , Fig.  $\frac{2}{8}$ .

Die gefundenen Formen sind nicht ganz so stark gedreht und haben etwas gedrungenerere Arme. L. 33; Br. 30; I. 11.

Staurastrum asteroideum W. & W. var. brasiliense Grönbl. (rr).

Die Enden der Arme sind etwas stärker gerundet. L. 20; Br. 22; I. 8. Von Grönblad (1945) gemeldet aus Brasilien.

Staurastrum octangulare Grönbl. (c). T. 5, Fig. 3.

Kleiner als die brasilienischen Exemplare. Basale Fortsetze zuweilen 3-spitzig, apikale manchmal 11-spitzig. Die Länge der Stacheln schwankt etwas. L. 24-27 (30-33); Br. diag. 22 (27); Br. Seiten 17 (23-28); I. 10-12.

Staurastrum orbiculare Ralfs var. depressum Roy & Biss. (rrr). T. 5, Fig. 7.

Reported from Brazil by Borge (1918) and Grönblad (1945). L. 34; Br. 33; I. 10.

Staurastrum setigerum Cleve var. pectinatum W. & W. (r). T. 5, Fig. 4.

Etwas kurzstacheliger als die von Grönblad aus Brasilien beschriebenen Exemplare. L. 36 (50); Br. 32 (46).

Staurastrum teliferum Ralfs var. pecten (Perty) Grönbl. (r). T. 5, Fig. 5.

Die Länge der Stacheln ist Schwankungen unterworfen. In Südamerika nur aus Brasilien bekannt (Grönblad 1945). L. 33-34 (42); Br. 27 (32-33); I. 11-13.

Staurastrum trifidum Nordst. var. inflexum W. & W. forma tortum Børges. (rrr).

Only two specimens were seen. They agreed with Børgesen's illustration except that the lowest of the three spines at each angle arises from an inflated base with a distinct shoulder. Børgesen assigned his forma torta to var. glabrum Lagerh., but



West & West (1896) transferred it to their var. inflexum because Lagerheim's variety is not described with the inflexed (downwardly curved) spines. I have found a very similar form in Louisiana and Mississippi, U.S.A., which sometimes shows the inflated base for the lowest spine. The Peruvian plants show a resemblance to certain forms of St. contectum Turn. L. 33; Br. 39; I. 10.

Staurastrum trihedrale Wolle. (rrr).

Only one specimen was found, quite typical, and exactly like the North American plants. L. 38; Br. 26; I. 10.

Staurastrum zonatum Børges. var. horizontale Borge. (?). (rrr). T. 5; Fig. 8.

Only one specimen was found, and because of the opaque cell-contents the exact number and arrangement of the granules on the apical surface could not be determined, so that my vertical view may not be quite correct in this respect. The plant possesses the characteristics of St. zonatum, and I have tentatively assigned it to var. horizontale although the granulation is more elaborate than shown in Borge's drawing.

L. 37; Br. 40; I. 11

Desmidiium coarctatum Nordst. (rrr).

Aus Brasilien und Guayana bekannt. L. 35; Br. 45; Apex 20.

Desmidiium grevillii (Kütz.) De Bary. (rrr).

In Südamerika aus Guayana, Kolumbien, Brasilien und Paraguay gemeldet. L. 28; Br. 50; Apex 28; I. 42.

Desmidiium laticeps Nordst. var. quadrangulare Nordst. (rrr). T. 5, Fig. 9.

In Südamerika nur aus Brasilien bekannt. Krieger's vertical view shows the chloroplast consisting of 9 radiating plates, each with one pyrenoid, as does one of Grünblad's /e illustrations (1945). L. 25, Br. 75.

Bambusina borreri (Ralfs) Cleve. (rrr).

In Südamerika aus Guayana, Kolumbien und Brasilien bekannt. L. 20-25; Br. 14; Apex 9.

## EXPLANATION OF THE PLATES.

## Plate 1.

- Fig. 1. *Closterium archerianum* Cleve x440  
 2. *Cl. didymotocum* Ralfs x315  
 3. *Cl. malmei* Borge x315  
 4. *Cl. moniliferum* (Bory) Ehrbg. var. *acutum* var. nov. x300  
 5. *Cl. navicula* (Bréb.) Lütkm. x610  
 6. *Cl. semicirculare* sp. nov. x300  
 7. *Euastrum ansatum* Ehrbg. ~~xxx~~ ad var. *dideltiforme* Ducell. acc. x600  
 8. *E. elobatum* (Lund.) Roy & Biss. var. *peruvianum* var. nov. x850  
 9. *Micrasterias radians* Turn. x475.

## Plate 2.

- Figs. 1, 2. *Micrasterias abrupta* W. & W. x540  
 3-5. *M. borgei* Krieg. x210  
 6. *M. borgei* Krieg. var. *multidentata* Krieg. x210  
 7. Dichotypical cell combining *M. borgei* with var. *multidentata*. x210

## Plate 3.

- Figs. 1, 2. *Micrasterias thomasiana* Arch. var. *notata* (Nordst.) Grönbl. x400  
 3. *M. laticeps* Nordst. x200  
 4. *M. laticeps* Nordst. forma *depressa* f. nov. x200  
 5. *M. laticeps* Nordst. var. *acuminata* Krieg. x320  
 6. *M. abrupta* W. & W. forma. x320  
 7. *Cosmarium denticulatum* Borge var. *ovale* Grönbl. x385  
 8. *C. denticulatum* Borge var. *perspinosum* Grönbl. x250

## Plate 4.

- |         |  |      |
|---------|--|------|
| Fig. 1. | <i>Euastrum bidentatum</i> Næg. var. <i>peruvianum</i> var. nov.                       | x870 |
| 2, 3.   | <i>E. latum</i> sp. nov.   | x800 |
| 4.      | <i>E. fissum</i> W. & W. var. <i>brasiliense</i> (Borge) Krieg.                        | x760 |
| 5.      | <i>E. incavatum</i> Josh. & Nordst. forma.   | x800 |
| 6.      | <i>Cosmarium crassiusculum</i> (de Bary) Insam & Krieg. var. <i>pulchrum</i> var. nov. | x800 |
| 7.      | <i>C. elegantissimum</i> Lund. var. <i>simplicius</i> W. & W.                          | x800 |
| 8.      | <i>C. wollei</i> (W. & W.) Grönbl.   | x850 |
| 9.      | <i>C. raciborskii</i> Lagerh.  | x800 |
| 10.     | <i>C. orthostichum</i> Lund. var. <i>compactum</i> W. & W.                             | x850 |

## Plate 5.

- |         |   |      |
|---------|---|------|
| Fig. 1. | <i>Cosmarium commissurale</i> Bréb. var. <i>crassum</i> Nordst.                   | x800 |
| 2.      | <i>Staurastrum alternans</i> Bréb.  | x800 |
| 3.      | <i>St. octangulare</i> Grönbl.  | x850 |
| 4.      | <i>St. setigerum</i> Cleve var. <i>pectinatum</i> W. & W.                         | x800 |
| 5.      | <i>St. teliferum</i> Ralfs var. <i>pecten</i> (Perty) Grönbl.                     | x850 |
| 6.      | <i>St. trifidum</i> Nordst. var. <i>inflexum</i> W. & W. f. <i>tortum</i> Børges. | x850 |
| 7.      | <i>St. orbiculare</i> Ralfs var. <i>depressum</i> Roy & Biss.                     | x800 |
| 8.      | <i>St. zonatum</i> Børges. var. <i>horizontale</i> Borge (?).                     | x850 |
| 9.      | <i>Desmidiium laticeps</i> Nordst. var. <i>quadrangulare</i> Nordst.              | x300 |

EINIGE DESMIDIACEEN AUS PERU.

W. KRIEGER† AND ARTHUR M. SCOTT.

In 195<sup>3</sup> the late Dr. W. Krieger, whose untimely and lamented death is such a severe blow to desmidiology, told me in one of his letters that he was working up the desmids in a small lot of algal material from Chile. At that time I had four samples from Peru, only one of which contained a fairly good assortment of desmids, and I suggested ~~to him~~ that I might send him some of the material so that he could publish the Chilean and Peruvian desmids together. He agreed, and I sent him the material, together with 16 of my drawings showing some of the more notable desmids that I had seen in a rather cursory examination. In the Spring of 1954 he wrote me that he had completed his study and hoped to publish the results shortly. After his death <sup>on July 15 1952</sup> I enquired about the matter, and his son, Dr. Kurt Krieger, very kindly sent me his father's notes and drawings, which required only a small amount of work to put in shape for publication. I am glad to be able to present here- with the Peruvian desmids, which proved to be more numerous than either of us had thought at first sight. At the present time I have no information about the Chilean material, and do not know from what source Dr. Krieger received it, <sup>nor if he worked it up.</sup>

The drawings that I received from Germany consisted of my own 16 with Dr. Krieger's check, or sometimes change, of my identifications, and additional notes, plus his original camera lucida sketches in pencil. These were drawn to a considerably smaller scale than mine, and I <sup>have</sup> thought it desirable to enlarge them to my scale so as to present a more uniform appearance. There were a couple of small problems in nomenclature and synonymy that I was unable to solve, and Dr. Krieger's script was rather difficult to read, a few words here and there being quite undecipherable to me. I asked my friend Dr. Rolf Grönblad for assistance on these points, which he has very kindly given.

*Crossdale & Dorothy, thanks*

Von Herrn A. M. Scott (New Orleans) erhielt ich 4 Algenproben aus Peru,  
und zwar:

- P-1, P-2. From the pool in the Botanical Garden at Lima. Nymphaea, Ceratophyllum, Sagittaria, Juncus, Eichhornia, etc.
- P-3. From Laguna Villa, 15 km south of Lima. Abundant Eichhornia, Sagittaria, Typha (domingensis ?), Utricularia, etc.
- P-4. From a roadside ditch at Pampa del Sacramento, on the road to Pucallpa on the Ucayali River, Department of Loreto. Tropical jungle. About 800 km from Lima; 150 metres above sea level. The tepid water in the roadside ditches was full of reeds, rushes and Ceratophyllum. Cattails were cut low and the ~~kanak~~ growth of algae there was squeezed into the jar. cottony

(Note by Scott: These ~~kanak~~ brief descriptions of the habitats are from the collector's original notes. In the U.S.A. it is quite unusual to find Nymphaea and Eichhornia growing together, but the pool in the Botanical Garden may be an artificial one, and it is likely that the aquatic plants were planted intentionally).

*(This is a very interesting & important note! Rg.)*

Meteorologisch Daten von Lima:

	Mar.	Aug.	Feb.	Max.	Min.
Temperatur	19.0	15.9	23.0	31	11° C.
Regen	5 <sup>cm.</sup> metres	1	0		

*laches*

Die Proben sind von Herrn Dr. Felix Woytkowski gesammelt, und mir von Herrn

Scott freundlichst zum Bearbeitung überlassen worden. Aus Peru sind bisher keine Desmidiaceen beschrieben worden, und es ~~erschien~~ mir daher möglich die verhältnismäßig kleine Sammlung zu bearbeiten. Zahlreicher <sup>e/</sup> Desmidiaceen enthielt nur die Probe P-3 (Laguna Villa). Leider liegen keiner chemischen und physicalischen Angaben vor, <sup>m</sup> nur die Gewässertypen fest <sup>e/</sup> zulagen. Aus der <sup>m</sup> Artenlisten ist jedoch zu schliessen, dass es sich um ein schwach saures Gewässer handelt. Auffallend ist der Reichtum an Vertretern der Gattung Closterium. Es handelt sich dabei um Arten die auch in der <sup>m/</sup> nörd-gemässigte <sup>il</sup> Zone vorkommen. Überhaupt ist die <sup>il</sup> Anzahl mitteleuropäischer <sup>il</sup> Arten in der Desmidiaceen-Assoziation sehr gross. Zunächst soll eine Übersicht <sup>die</sup> der gefundenen Arten <sup>(eitung)</sup> über den Vertretern auf die Gattungen gegeben:

(Krieger gives two lists, which I have combined into one, showing a comparison of the number of species and percentages of the total found in the Peruvian material, with those found by Grönblad from Brazil, and also with those from Chile found by Krieger).

	Grönblad, Brasil <sup>en.</sup>		Peru.		Chile.	
	Arten.	%	Arten.	%	%	
Gonatozygon	6	1.1	1	1.2	1.4	1
Spirotaenia	2	0.4				2
Netrium	5	0.9	2	2.5	2.8	1
Roya	1	0.2				
Penium	6	1.1	1	1.2	1.4	4
Closterium	57	10.7	21	17	16.0	24.0
Docidium	1	0.2				18
Pleurotaenium	25	4.7	4	5.0	5.6	
Triploceros	3	0.6				
Tetmemorus	2	0.4				2
Euastrum	36	6.7	12	8	11.8	7
Micrasterias	27	5.1		8	9	11.3
Cosmarium	113	21.2	19	23.5	26.7	36
Xanthidium	18	3.4				1
Arthrodesmus	21	3.9				3
Staurastrum	157	29.4	3	4	11.3	19
Sphaerosozma	4	0.8				
Onychonema	7	1.3				
Spondylosium	9	1.7				
Hyalotheca	9	1.7				2
Desmidium	17	3.2	3	3.7	4.2	
Bambusina	5	0.9	1	1.2	1.4	1
Phymatodocis	3	0.6				
	534	100.0	71	100.0		100

*Cylindrocystis* →  
1a  
revised

Krieger also gives another listing showing the percentages of the principal genera found in various countries:

	Peru.	Chile.	Brasil.	Arktis.	Nord- Amerika.	Kanada.	Gross- Britannien.	Portugal.
Closterium	24	18	11	6	7	14	9	17
Pleurotaenium	6	5	5	1	9	4	3	4
Euastrum	11	15	7	7	8	10	6	6
Micrasterias	11	10	1	5	-	8	7	5
Cosmarium	27	24	36	21	47	20	24	36
Staurastrum	11	11	19	29	24	27	25	24

A further listing gives a complete enumeration of all the desmids found in collection P-3, the best of the lot:

Gonatozygon monotaenium

Netrium digitus var. Naegelii

" " var. parvum

Closterium

A further list gives the complete enumeration of all of the desmids found in collection P-3, the best of the lot: *desmids*

Gonatozygon monotaenium	rr	Micrasterias abrupta	rr
		" Borgei	rr
Netrium digitus var. Naegelii	rr	" " var. multidentata	r
" " " parvum	rr	" laticeps	rrr
<i>Penium spirostratum</i> rrr		" " var. acuminata	rrr
<i>abruptum</i> rrr		" radians & V. brasiliensis	rr
Closterium acutum var. tenuius	rr	" Thomasiana var. notata	rrr
" Archerianum	rr		
" costatum	rrr	<i>binum</i>	rrr
+ " cynthia var. Jenneri	c	Cosmarium commissurale var. crassum	rrr
" diana	rr	" cucurbita	c
" " var. arcuatum	rr	" <i>crassivexillum</i> var. pulchrum ??	r
" didymotocum	r	" denticulatum var. ovale	c
" gracile var. elongatum	rr	" " var. perspinosum	r
" libellula	rr	" <i>elegantissima</i> var. <i>similicium</i>	rrr
" moniliferum var. acutum	rr	" <i>depressum</i> var. <i>elevatum</i>	rr
" navicula	rrr	" <i>obliquum</i> var. <i>minimum</i>	rr
" parvulum var. angustum	c	" orthostichum var. compactum	rrr
" Ralfsii var. hybridum	rr	" <u><i>polymorphum</i> var. <i>medioglabrum</i></u>	rrr
" striolatum	r	" ? <i>peruvianum</i>	rr
" tumidum	rrr	" pseudoconatum	rr
" turgidum	rr	" pyramidatum	c
" " var. <i>borgei</i>	rrr	" <i>subtumidum</i> <i>retusiforme</i> v. <i>abscessum</i>	rrr
Pleurotaenium Ehrenbergii	r	" <i>subrotundum</i>	rr
" eugeneum var. undulatum	r	" <i>variolatum</i> var. <i>rotundatum</i>	rr
" nodosum var. Borgei	c	" <i>Wollei</i>	c
" trabecula <i>Gutierrezii</i>	rr		
" " <i>v. maximum</i>	rr	Staurastrum alternans	rr
Euastrum abruptum var. lagoense	rrr	" Bieneanum var. brasiliense	rr
" ansatum	rr	" <i>costangulare</i>	rr
" bidentatum v. <i>peruvianum</i>	rrr	" <i>orbiculata</i> var. <i>depressum</i>	rr
" binale var. hians	rrr	" setigerum var. pectinatum	r
" elobatum var. <i>peruvianum</i>	rrr	" teliferum var. <u><i>lagoense</i></u>	rr
" <i>evolutum</i> v. <i>integrum</i>	rrr	" <i>trihedrale</i>	rrr
" fissum var. brasiliense	rr	" <i>triduum</i> <i>ta. tortum</i> rrr	rrr
" <i>incavatatum</i> forma	rr	Desmidiium coarctatum	rrr
" sinuosum	rrr	" Grevillii	rrr
		" laticeps	rrr
		Bambusina Borreri	rrr

+ if you use capitals in "Jenneri" and "Ralfsii" then "cynthia" and "diana" ought to be capitalised too. (I do not remember the Rules by heart)

"Woytkowskii" ?

I think Krieger intended to give the name of the collector (= Sauerbrey)!

Gonatozygon monotaenium De Bary.

Ca. 16 mal so lang wie breit. Membranporen sehr zart. L. 158; Br. 10; Enden 12. <sup>158-204 10-11 17-18</sup> rr.

Brasilien, Kolumbien.

Netrium digitus (Ehrbg.) Itzigs. var. Naegelii (Breb.) Krieg.

Relativ kleine Form. L. 120; Br. 30. rr.

Netrium digitus (Ehrbg.) Itzigs. var. parvum Borge.

Ein wenig schlanker als die von Borge aus Brasilien (Matto Grosso) beschriebene

Varietät, ca. 3 mal so lang wie breit. L. 70; Br. 22. rr.

Add Penium spirostriolatum Barker. Only once reported from South America (Groub 1945)  
~~Glostobroptum~~ W. West. Brazil, Columbia. rr. L. 120, Br. 15.  
 L. 216 Br. 17 Ap. 12

Closterium acutum Breb. var. tenuius Nordst.

In Südamerika neuerdings (Grönblad 1944) aus dem Amazonas-Gebiet festgestellt.

L. 60-82; Br. 3. rr. (Krieger-Rabenhorst, T. 13, Fig. 16).

Closterium Archerianum Cleve. T. 1, Fig. 1.

Etwas kürzer als der Typus (8 mal so lang wie breit). Enden leicht winklig abgesetzt. rr.  
 L. 153; Br. 17.

Vorher aus Venezuela und Brasilien gemeldet.

Closterium cynthia De Not. var. Jenneri (Ralfs) Krieg.

Eine Streifung der Membran konnte nicht festgestellt werden. L. 92; Br. 13; c.

Auch in Brasilien und Patagonien (Kol). (Krieger-Rabenhorst, T. 36, Fig. 2).

Closterium dianae Ehrbg.

Nur 8-9 mal so lang wie breit. L. 185-275; Br. 20-35. rr. Von Venezuela bis

Feuerland gemeldet. (Krieger-Rabenhorst, T. 19, Fig. 10).

Closterium dianae Ehrbg. var. arcuatum (Breb.) Rabenh.

Ca. 13 mal so lang wie breit. L. 240; Br. 19. rr. Von Grönblad (1944) aus Brasilien

gemeldet. (Krieger-Rabenhorst, T. 19, Fig. 12).

Closterium didymotocum Ralfs. T. 1, Fig. 2.

Ca. 8-9 mal so lang wie breit. L. 315-350; Br. 40. r. Steht zwischen dem Typus und der

var. minus. Aus Kolumbien bekannt.



*Cl. ehrenbergii* Menagh. rrr. L 285 Br 45  
Brasil, Uruguay, Argentinien, Patagonien ca 6 mal so lang wie breit 5.

*Closterium gracile* Bréb. var. *elongatum* W. & W.

60 mal so lang wie breit. L. 540; Br. 9. rrr. Aus Brasilien (Grönblad 1944) bekannt.  
(Krieger-Rabenhorst, T. 30, Fig. 10).

*Cl. Kuetzingii* Bréb. L 528 Br 18 rrr  
Ca 30 mal so lang wie breit. Brasil, Ecuador, Argentinien, Paraguay, Patagonien  
*Closterium libellula* Focke.

Ca. 5-6 mal so lang wie breit. L. 175-195; Br. 35. r. Vorher aus Brasilien und  
Feuerland gemeldet.

*Closterium Malmei* Borge. T. 1, Fig. 3.

6 mal so lang wie breit, mit ca. 3 Rippen auf 10 u. rrr. Aus Brasilien, Venezuela,  
und Paraguay gemeldet. L 310 Br 35

var. *AGUTUM* var. nov.

*Closterium moniliferum* (Bory) Ehrbg. ~~xxxxxxx~~ T. 1, Fig. 4.

Ca. 7 mal so lang wie breit. L. 276-385; Br. 40-56. rrr. Unterscheidet sich vom  
Typus durch stärker zugespitzte Enden.

Latin diagnosis.

*Closterium navicula* (Bréb.) Lüth. T. 1, Fig. 5.

L. 34-67; Br. 10-15. rrr. Auch in der vorliegenden Probe sind die Umrisslinien etwas  
variabel; es wechseln schlanke mit mehr gedrungenen Formen. Venezuela, Brasilien,  
Kolumbien, Paraguay, Feuerland.

*Closterium parvulum* Næg. ad var. *angustum* W. & W. acc. T. 1, Fig. 6.

Sehr schlanke Form, die sich der var. *angustum* nähert. L. 65-69; Br. 7. c.

Die Art ist von Venezuela bis Feuerland festgestellt.

*Closterium Ralfsii* Bréb. var. *hybridum* Rab. rrr.

Sehr schlanke Form der var. *hybridum*; die var. *gracilius* ist wesentlich kleiner.  
L. 635; Br. 35; 10 striae auf 10 u. Brasilien, Venezuela, Kolumbien.

*Closterium SEMICIRCULARE* sp. nov. T. 1, Fig. 6. r.

*Closterium* von mittlerer Größe, 5-6 mal so lang wie breit; Zelle stark gebogen.  
Innenrand nicht angeschwollen. Enden weniger abgerundet als bei *Cl. moniliferum*.

Membran glatt und farblos. Chromatophoren mit 4 Pyrenoiden und 4 weite Langsplatten.  
Ca. 6 Gypskristalle. L. 285; Br. 50.

Latin diagnosis

Why not to  
Cl. Ehrenbergii?

Closterium striolatum Ehrbg. r.

Zart gestreift (10 striae auf 10 u). 9 Pyrenoiden in der Halbzelle. <sup>8-10 mal so lang wie breit.</sup> L. 365-370; Br. 36-45. Gemeldet von Venezuela bis Feuerland.

Closterium tumidum Johns. rr.

Ca. 7-8 mal so lang wie breit. Innenrand der Zelle gerade oder leicht angeschwollen. Meist 1 Gypskristalle <sup>ell</sup> in der Endvakuole. L. 100-104; Br. 12-14. Aus Kolumbien, Brasilien, Paraguay, Patagonien.

Closterium turgidum Ehrbg. r.

Sehr schlanke Form, ~~xxx~~ die sich der var. Borgei Defl. nähert. <sup>cb2</sup> L. 690-880; Br. 45-65.

8 striae auf 10 u. Bisher aus Brasilien, Paraguay, Argentinien und Venezuela gemeldet.

*Two others seen by Scott measured 1140 x 76 and thus correspond with var Borgei 1260 x 72*

Pleurotaenium Ehrenbergii (Bréb.) De Bary, forma. r.

16-17 mal so lang wie breit. Zahl und Grösse der Endwarzen variabel. Die als

forma clavata beschriebene teratologische Form ebenfalls beobachtet. Sehr grosse

*7 don't think it's correct R.G.*

Form, weiter und länger, meist wie der Typus. L. 705-950; Br. 46-58; I. 40-45.

In Südamerika von Venezuela bis Patagonien.

Pleurotaenium eugeneum (Turn.) W. & W. var. undulatum (Borge) Krieg. r.

Ca. 16 mal so lang wie breit. Stattliche Exemplare mit deutlicher Basisanschwellung, <sup>al</sup> Enden nicht <sup>u- sich</sup> weiter werdend. L. 1015-1150; Br. 60-75; Basis 65-70; I. 50-55. <sup>al?</sup>

Bisher aus Brasilien gemeldet.

Pleurotaenium nodosum (Beil.) Lund. var. Gutwinskii Krieg. C.

Stattliche Form. Die Zahl der kegelförmigen Endwarzen ist grösser, 7 sind sichtbar.

Die Poren stehen auf den Höckerenden wesentlich dichter und nicht in Reihen.

L. 550; Br. 90; I. 45. Gemeldet aus Brasilien und Paraguay.

Pleurotaenium trabecula (Ehrbg.) Näg. var. maximum (Reinsch) Roll. r.

Ca. 10 mal so lang wie breit. Die Unterschiede zwischen dem Typus und der var.

maximum bestehen in der Hauptsache in den grosseren Massen. Exemplare aus Probe

P-1 und P-2, L. 635-650; Br. 60; I. 40, Basis leicht angeschwollen. Exemplare aus

Probe P-3, L. 505; Br. 55. Brasilien, Argentinien.

Euastrum abruptum Nordst. var. lagoense (Nordst.) Krieg. rrr.

Vorher nur aus Brasilien bekannt. L. 22; Br. 17; I. 4.

Euastrum ansatum Ehrbg. rr.

Aus Brasilien und Paraguay bekannt. L. 74; Br. 34; I. 12.

*E. ansatum* Ehrbg. var. *dideltiforme* Duceell. (?) *ren. I. 1 Fig. 7*

*E. bidentatum* Ndg. v. PERUVIANUM, var. nov. rrr. T-4 Fig 1.

Euastrum binale (Turp.) Ehrbg. var. hians W. West. rrr.

Der nächste Fundort liegt in U.S.A. L. 11; Br. 9; I. 3.

PERUVIANUM

Euastrum elobatum (Lund.) Roy & Biss. var. ~~peruvianum~~ var. nov. rrr. T. 1, Fig. 2

Von den javanischen var. simplex Krieg. etwas verschieden. Isthmus breiter. Unter dem Sch<sup>ci</sup>itel eingezogen. Apikale<sup>ci</sup>cken weniger gerundet. Membran über der Mitte der Halbzelle verdickt (Seitenansicht). L. 21; Br. 15; I. 8.

Latin diagnosis.

Euastrum evolutum (Nordst.) W. & W. var. integrius W. & W. rrr. T. 1, Fig. 1

Die vorliegende Form <sup>st/</sup>nimmt in Grösse und Umrisslinien gut mit der bisher nur aus Afrika und U.S.A. beschriebenen var. integrius überein. Der Polarteil ist weniger stark abgesetzt. L. 52; Br. 35; I. 9.

Euastrum fissum W. & W. var. brasiliense (Borge) Krieg. rr. T. 4, Fig. 4.

In den Basal- und Apikallappen ist eine Gruppe kleine<sup>n</sup> Warzen vorhanden<sup>n</sup>, die in der Abbildung bei Borge fehlen. L. 46-47; Br. 25-26; I. 8-9.

*E. incavatum* Jochs v. Nordst. forma. rr. T-4 Fig 5

I should prefer > Euastrum LATUM sp. nov. rrr. T. 4, Fig. 3, 3.

Cosmarium!

R. 9.

Kleines Euastrum, etwas breiter als lang. Sinus tief, nur am Ende wenig geöffnet.

Halbzelle trapezförmig. Seiten konvex, zwischen Basal- und Apikalecken 3-wellig.

Scheitel 2-wellig, mit flach<sup>m</sup>er Mitteleinschnitt. Membran mit 2 randlichen Reihen

flachen Warzen, und je einer weiteren in den Basal- und Apikalecken. Mitte der Halbzelle

mit einer flachen 2-teiligen Anschwellung, die jedoch nur in der elliptische<sup>m</sup> Scheitelansicht und in <sup>du</sup> fast kreisförmig<sup>my</sup> Seitenansicht der Halbzelle<sup>zu</sup> erkennen sind.

Chromatophor parietal, mit einem centrale<sup>m</sup>m Pyrenoid. L. 30-34; Br. 34-38; D. 17-18; I. 7-8.

Latin diagnosis.

Euastrum latum ist eine Art, die zwischen dex<sup>m</sup> Gattungen Cosmarium und

Euastrum steht, hier wegen der apikalen Einschnitte, zur Euastrum gestellt, wurde.

Euastrum sinuosum Lenorm. rrr.

Vorher aus Guiana, Brasilien und Uruguay gemeldet. L. 65; Br. 35; I. 11.

Micrasterias abrupta W. & W. r. T. 2, Figs 1, 2, 3, 4, 5, 6.

Meist in der Normalform mit 2-spitzigen Polarlappen, seltener in der durch Übergänge verbundenen Abänderung mit 1-spitzigen Lappen. L. 49-53; Br. 50-52; I. 11-12.

Micrasterias Borgei Krieg. rr. T. 1, Fig. 3-5.

Wie schon Grönblad (1945) bemerkt, ist die Bestachelung variabel. Bei dem abgebildeten Exemplar sind die kleinen Dörnchen ziemlich gleichmäßig über die Oberfläche verteilt, wie bei der var. multidentatum; doch ist die für den Typus charakteristische kegelförmige Mittelanschwellung vorhanden. L. <sup>277-321-237-275-45-50</sup> 325; Br. 275; I. 50.

Micrasterias Borgei Kriegg. var. multidentata Krieg. r. Fig. 1, Fig. 6.

Der Scheitel trägt auf den Höckern keine Stacheln. L. 306; Br/ 250; I. 45.

Bisher in Südamerika nur aus Brasilien bekannt.

Micrasterias laticeps Nordst. rrr. T. 3 Fig 3

Diese amerikanische Art, die vorher aus Venezuela, Brasilien und Paraguay gemeldet war, konnte in einigen städtischen Exemplaren beobachtet werden. L. 200; Br/ 250; I. 25.

*M. laticeps* Nordst. *formidpressa*, forma nov. rrr. T. 3, Fig 4

Micrasterias laticeps Nordst. var. acuminata Krieg. rrr. T. 3, Fig 5.

Isthmus etwas breiter. Bisher aus Venezuela und Brasilien gemeldet. L. <sup>85-90 102-113 20-22</sup> 85; Br. 102; I. 22.

Micrasterias radians Turn. rr. T. 1, Fig. 9.

Die Art sieht M. radiata nahe, doch unterscheiden sich die typischen Formen so bedeutend dass schwer ~~an~~ an eine Vereinigung <sup>zu</sup> zum denken ist. Vielleicht kann der geographische Faktor für Trennung der Arten beitragen. M. radians ist eine tropische Art, während M. radiata temperierte Gebiete bewohnt. L. 133; Br/ 109; I. 21.

Micrasterias radians Turn. var. brasiliensis (Grönbl.) Krieg. comb. nov. rr.

Syn. M. radiata var. brasiliensis Grönbl.

Wenn man die tropische M. radians bestehen lässt, gehört die var. brasiliensis hierher.

Sie steht zwischen dem Typus (Krieg.-Rab., T. 115, Fig. 8) und der var. bogoriensis (Bern.) G.S.West (Krieg.-Rab., T. 116, Fig. 2). L. 185; Br. 150; I. 25.

Micrasterias Thomasiana Arch. var. notata (Nordst.) Grönbl. rrr. T. 3, Fig. 1, 2.

hälften Kleiner als die bisher gemeldeten Exemplare. In älteren Zellhälften mit Dornenreihen parallel mit den grösseren Einschnitten. (An jüngeren Zellhälften nicht wahrnehmbar).

Die var. torneensis wäre zu streichen, wenn dieses Merkmal veränderlich ist.

L. 153; Br. 121; I. 24. In Südamerika nur aus Brasilien bekannt.

*C. binum* Nordst. rrr.

Brazil. L. 84-88. Br. 62-69. I. 18-20. D. 41-43

Cosmarium commissurale Breb. var. crassum Nordst. rrr. Tl. 5, Fig. 1.

Die Mittelschwellung ist sehr stark entwickelt. L. 30; Br. 32; D. 27; I. 13.

Cosmarium cucurbita Breb. c.

Kleine Exemplare der weitverbreiteten Art. Vorher in Brasilien gefunden. L. 26;

Br. 16; D. 13; I. 13.

Cosmarium crassiusculum (De Bary) Insam & Krieg. var. PULCHRUM var. nov. r.

T. 4, Fig. 1.

Mehr als 2-mal so lang wie breit. Scheitel gerundet bis abgestutzt. Membran mit sehr

dickstehende/deutlich sichtbaren Poren. Membran an den Enden verdickt. L. 55-58;

Br. 24-25; I. 20.

Latin diagnosis.

Cosmarium denticulatum Borge var. ovale Grönbl. c. T. 3, Fig. 7.

Stattliche Exemplare der im Material nicht seltenen Art. Das Mittelfeld ist mit

dickstehenden deutlichen Poren bedeckt. L. 148-175; Br. 106-115; I. 30-31.

Vorher aus Venezuela und Brasilien bekannt.

Cosmarium denticulatum Borge var. perspinosum Grönbl. r. T. 3, Fig. 8.

Seiten leicht konvex. Scott hat die Stacheln bei einem Exemplare gezählt. Auf der

einen Zellhälfte waren 287, auf der andern 296 sichtbar. L. 239-250; Br. 159-175;

L. 46-65. Nur aus Brasilien gemeldet (Grönblad 1945).

Cosmarium exiguum Arch. var. dilatatum (Schm.) Krieg. comb. nov.

*C. elegantissimum* Grönbl. var. simplicius W.W. rrr. T. 4, Fig. 7

Brazil L. 48 Br. 20.

<sup>syn</sup>  
Cosmarium exiguum Arch. var. dilatatum (Schm.) Krieg. comb. nov. r.

Syn. C. norimbergense Reinsch.

Note! C. norimbergense is much older and has the priority. C. Krieg must be deleted. cf

Die Form der Halbzelle schwankt bei C. exiguum. Die var. hexagonum leitet zu der vorliegende <sup>W</sup>fa. dilatata Schm. L. 25; Br. 13; D. 9; I. 5.

Cosmarium obliquum Nordst. var. minimum W. West. rr.

Bisher noch nicht aus Südamerika gemeldet. L. 11-13; Br. 9-10; I. 5.

Cosmarium orthostichum Lund. var. compactum W. & W. rrr. T. 4, Fig. 10.

Eine Form mit quer verbreiteten und verdoppelten Warzen. L. 21; Br. 20; D. 13; I. 6.

Cosmarium perlatum Krieg. nom. nov. rr. T.    , Figs.    .

Why new name?

Syn. C. polymorphum Nordst. subsp. Paulense Börger.

It should be replaced

Die Skulptur <sup>den</sup>des Mittelfeldes <sup>s</sup>ist variabel. Neben glatten Formen kommen solche, die noch eine Querreihe von kleinen Warzen <sup>ein</sup> ~~mit~~ <sup>WT</sup> ~~besitzt~~ <sup>und</sup> eine von Isthmuswarze <sup>ist</sup> vorhanden, die auf jeder Seite noch eine kleinere Warze besitzt. L. 35-36; Br. 29-30; D. 16; I. 10-11.

Cosmarium pseudoconnatum Nordst. c.

L. 46-47; Br. 34; L. 32. In Südamerika aus Brasilien, Ecuador und ~~xx~~ Paraguay gemeldet.

Cosmarium pyramidatum Breb. r.

L. 64-74; Br. 37-44; I. 12-15. Venezuela, Brasilien, Kolumbien, Bolivien, Uruguay, Paraguay, Argentinien.

C. raciborskii Lagerh. c. T. 4 Fig. 9

Cosmarium retusifforme Gutw. var. abscissum (Schm.) Krieg. comb. nov. rrr.

Syn. C. Hammeri fa. abscissa Schm. 1895, S. 302, T. 4, Fig. 8.

C. retusifforme forma Borge 1918, S. 34, T. 3, Fig. 4.

In Scheitelansicht mit etwas angeschwollener Mitte. Membran in der Mitte der Halbzelle <sup>b</sup>verdickt. L. 23; Br/ 18; D. 12; I. 6. Brasilien, Kolumbien.

> C. Raciborskii!?! C. depressum has not such cell-wall.

Cosmarium depressum (Näg.) Lund. var. elevatum Borge. c. T.    , Fig.    .

Membranskulptur deutlich, sie besteht in dichtstehenden Poren, die nicht in Reihen angeordnet sind. Zellrand sehr fein gewellt. Membran am Enden verdickt. 1 Pyrenoid in der Halbzelle. L. 33-37; Br. 31-39; D. 18; I. 12-13. (See note by Scott on next page).

(Note by A. M. Scott: Among the sheets on which Krieger had written the final descriptions of the various species, there was one bearing the name "Cosmarium Scottii" sp. nov., ~~xxx~~ with a complete description but no reference to any other species with which it might nor did any of the drawings nor his list of species show this name. show a similarity. After some search I found that "C. Scottii" was intended to apply to one of my drawings, which I had not identified, but I had noted that the same desmid occurs in some of my ~~xxx~~ collections from Florida, U.S.A. On my drawing Krieger had written the identification C. depressum (Näg.) Lund. var. elevatum Borge. ~~xxxxxxx~~ After comparing with Borge's original illustration ~~(Sao Paulo, 1918, P. 34, Pl. 3, Fig. 6)~~ <sup>Cf. my drawings 1535, 1536</sup> with the plants from Peru and Florida, I find that the size and shape correspond very well, the only appreciable differences being that in Borge's illustration the sinus is somewhat more open and the margin of the cell is ~~xxx~~ shown smooth and not minutely crenulate. However, he did not show the scrobiculations on the <sup>either,</sup> face of the cell, though his description reads "Membrana subtiliter scrobiculata". It is well known that scrobiculations extending over the whole cell-surface frequently cause the margin to appear minutely crenulate, though it is impossible to show this on a drawing without considerable exaggeration. After careful consideration I have come to the conclusion that the Peruvian plant does not differ enough from Borge's var. elevatum to warrant even a varietal distinction, and though I appreciate the honour that he intended to bestow upon me, I feel that his original determination was correct, and accordingly I have allowed it to stand).

Cosmarium subcostatum Nordst. r.

Die Skulptur des Mittelfeldes weicht etwas ab. Es ist eine grossere Mittelwarze vorhanden, die von ca. 9 Graneln <sup>u/</sup> umgeben ist. L. 21; Br. 18; D. 11; I. 5.

Cosmarium subtumidum Nordst. c.

Verhältnis von Breite zu Länge etwas variabel, 1:1.35-1.47. L. 25-33; Br. 18-20; I. 6-7. Brasilien, Kolumbien.

Cosmarium trapezicum (Grönbl.) Krieg. comb. nov. var. ~~PERUVIANUM~~ var. nov. rr.

T. \_\_, Fig. \_\_.

(Note to Grönblad). I am in trouble with this one, for there was no drawing bearing this name; I have, however, attached to K.'s description the sketch which I believe must be the one, from the correspondence in dimensions. I cannot trace the name

'trapezium' in your works, and I suppose it must be a variety which you established. If you can trace it, please give the synonymy. I shall have to try to find a specimen and make a good drawing of it, for K.'s sketch is not complete enough). If I cannot find a specimen I think I shall omit it.

Cosmarium variolatum Lund. var. rotundatum (Krieg.) Lessik. r.

L. 27; Br. 15-16; D. 11; I. 7. Aus Brasilien gemeldet.

Cosmarium vexatum W. West. r.

Etwas kleiner als der Typus. L. 30-31; Br. 25-26; I. 10.

Cosmarium Wollei (W. & W.) Grönbl. c. T. \_\_\_\_, Fig. \_\_\_\_.

Kleiner als der Typus, ca. 1-1/3 mal so lang wie breit. Chromatophor mit radialen Fortsetzungen. L. 26; Br. 19; I. 17.

Staurastrum alternans Breb. rr. T. 4, Fig. 8.

(Note to Grönblad). I cannot make out the intent of K.'s description, part of which is deleted. Will you please write it out for me?).

*Die gefundenen Formen besitzen sind nicht ganz so stark gedreht und haben etwas gedrungene Arme.*

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Staurastrum asteroideum W. & W. var. ornatum Grönbl. rrr.

Ein wenig grösser und breiter als die nordwestdeutschen Exemplare. Der Granelring am Isthmus fehlt. Auf dem Scheitel mit der doppelten Anzahl kleiner Dornen. Die Arme sind 3-zahlig. L. 22; Br/ 23; I. 8.

Staurastrum Bieneanum Rabenh. var. brasiliense Grönbl. rr.

Die Enden der Arme sind etwas stärker gerundet. L. 20; Br. 22; I. 8. Von Grönblad (1945) gemeldet aus Brasilien.

Staurastrum dejectum Breb. var. patens Nordst. rrr.

L. 18; Br. 20 (23); I. 5. Aus Brasilien und Patagonien bekannt.

Staurastrum octangulare Grönbl. c. T. 5, Figs. 3.

Kleiner als die brasilianischen Exemplare. Basale Fortsetze zuweilen 3-spitzig, apikale manchmal 1-spitzig. Die Länge der Stacheln schwankt etwas. L. 24-27 (30-33); Br. Diag. ~~XXXXX~~ 22 (27); Br. Seiten 17 (23-28); I. 10-12.



Staurastrum setigerum Cleve var. pectinatum W. & W. r. T. 5, Fig. 7:

Etwas kurzstacheliger als die von Grönblad aus Brasilien beschriebenen Exemplare.

L. 36 (50); Br. 32 (46).

Staurastrum teliferum Ralfs. var. pecten (Perty) Grönbl. r. T. 5, Fig. 5

Die Länge der Stacheln ist Schwankungen unterworfen. L. 33-34 (42); Br. 27 (32-33);

L. 11-13. In Südamerika nur aus Brasilien bekannt (Grönblad 1945).

Add *St. trihedrale* Wille rrr. <sup>St. trifidum Nordst. det. by Borge. rrr. T. 5, Fig. 6</sup> L. 38. Br. 26. L. 10.

Staurastrum "Sammler" sp. nov. rrr. T. \_\_, Fig. \_\_

Kleines Staurastrum, ca. 1-1/4 mal so lang wie breit. Sinus spitzwinklig, weit geöffnet. Seiten und Scheitel konvex. 3-strahlig. Obere Ecken mit einem kurzen Dorn, darunter 2 schräg nach unterstehende Stacheln, die auf ihrer oberen Seite einen Winkel haben. Seiten in Scheitelansicht mit leicht konkaven Seiten.

What is this?  
I think Krieger  
was interested  
to give the  
name of the  
collector to  
this species?

H 2

L. 28-30; Br. 22 (35); I. 11.

Latin diag. *St. zonatum* Borge var. *horizontale* Borge (?) rrr T. 5 Fig. 8.  
Desmidiium coarctatum Nordst. rrr.

L. 35; Br. 45; Apex 20. Aus Brasilien und Guiana bekannt.

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Desmidiium Grevillii (Kütz.) De Bary. rrr.

L. 28; Br. 50; Apex 28; I. 42. In Südamerika aus Guiana, Kolumbien, Brasilien und Paraguay gemeldet.

Desmidiium laticeps Nordst. rrr. <sup>var. quadrangulare</sup> T. 5, Fig. 9

L. 25; Br. 75. In Südamerika nur aus Brasilien bekannt.

Bambusina Borreri (Ralfs) Cleve.

L. 20-25; Br. 14; Apex 9. In Südamerika aus Guiana, Kolumbien und Brasilien bekannt.

Gonatozygon monotaenium De Bary (rr).

Ca. 16 mal so lang wie breit. Membranporen sehr zart. L. 158-204; Br. 10-11; Enden 12-13. Brasilien, Kolumbien.

Netrium digitus (Ehrbg.) Itzigs. var. Naegelii (Breb.) Krieg. (rr).

Relativ kleine Form. L. 120; Br. 30.

Netrium digitus (Ehrbg.) Itzigs. var. parvum Borge. (rr).

Ein wenig schlanker als die von Borge aus Brasilien (Matto Grosso) beschriebene Varietät, ca. 3 mal so lang wie breit. L. 70; Br. 22.

Penium spirostriolatum Barker. (rrr).

Only once reported from South America, by Grönblad (1945). L. 216; Br. 17; Ap. 12.

Closterium abruptum W. West. (rrr).

Previously known from Brazil and Columbia. L. 120; Br. 15.

Closterium acutum Breb. var. tenuius Nordst. (rr).

In Südamerika neuerdings (Grönblad 1945) aus dem Amazonas-Gebiet festgestellt.

L. 60-82; Br. 3. (Krieger-Rabenhorst, T. 13, Fig. 16).

Closterium archerianum Cleve. (r). T. 1, Fig. 1.

Etwas kürzer <sup>als</sup> ~~als~~ der Typus (<sup>8-10</sup> mal so lang wie breit). Enden leicht winklig abgesetzt.

Vorher aus Venezuela und Brasilien gemeldet. L. 153-202; Br. 18-19.

Closterium cynthia De Not. var. jenneri (Ralgs) Krieg. (c).

Eine Streifung der Membran konnte nicht festgestellt werden. Auch in Brasilien und Patagonien (Kol). (Krieger-Rabenhorst, T. 36, Fig. 2). L. 92; Br. 13.

Closterium dianae Ehrbg. (rr).

Nur 8-9 mal so lang wie breit. Von Venezuela bis Feuerland gemeldet. (Krieger-Rabenhorst, T. 19, Fig. 10).

Closterium dianae Ehrbg. var. arcuatum (Breb.) Rabenh. (rr).

Ca. 13 mal so lang wie breit. Von Grönblad (1945) aus Brasilien gemeldet. (Krieger-Rabenhorst, T. 19, Fig. 12). L. 240; Br. 19.

Closterium didymotocum Ralfs. (r). T. 1, Fig. 2.

Ca. 8-9 mal so lang wie breit. Steht zwischen dem Typus und der var. minus. Aus Kolumbien bekannt. L. 315-350; Br. 40.

Closterium ehrenbergii Menegh. (rrr).

About 6 times as long as wide. Previously known from Brazil, Uruguay, Argentine, Patagonia. L. 285; Br. 45.

Closterium gracile Breb. var. elongatum W. & W. (rr).

60 mal so lang wie breit. Aus Brasilien (Grönblad 1945) bekannt. (Krieger-Rabenhorst, T. 30, Fig. 10). L. 540; Br. 9.

Closterium kuetsingii Breb. (rrr).

About 30 times as long as wide. Known from Brazil to Patagonia. L. 528; Br. 18.

Closterium libellula Focke. (r).

Ca. 5-6 mal so lang wie breit. Vorher aus Brasilien und Feuerland gemeldet. L. 175-195; Br. 35.

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Closterium malmei Borge. (rrr). T. 1, Fig. 3.

6 mal so lang wie breit, mit ca. 3 Rippen auf 10 u. Aus Brasilien, Venezuela und Paraguay gemeldet. L. 310; Br. 55.

Closterium moniliferum (Bory) Ehrbg. var. ACUTUM var. nov. (rr). T. 1, Fig. 4.

Ca. 7 mal so lang wie breit. Unterscheidet sich vom Typus durch stärker zugespitzte Enden. L. 276-385; Br. 40-56.

### Latin diagnosis.

Closterium navicula (Breb.) Lütkem. (rr). T. 1, Fig. 5.

Auch in der vorliegenden Probe sind die Umrisslinien etwas variabel; es wechseln schlanke mit mehr gedrungenen Formen. Venezuela, Brasilien, Kolumbien, Paraguay, Feuerland. L. 34-67; Br. 10-15.

Closterium parvulum Næg. ad var. angustum W. & W. acc. (c).

Sehr schlanke Form, die sich der var. angustum nähert. Die Art ist von Venezuela bis Feuerland festgestellt. L. 65-69; Br. 7.

Closterium ralsii Breb. var. hybridum Rabenh. (rr).

Sehr schlanke Form der var. hybridum; die var. gracilius is wesentlich kleiner.  
Brasilien, Venezuela, Kolumbien. L. 564-635; Br. 25-35; 10 striae aus 10 u.

Closterium SEMICIRCULARE sp. nov.<sup>(r)</sup> T. 1, Fig. 6.

Closterium von mittlerer Grösse, 5-6 mal so lang wie breit; Zelle stark gebogen.  
Innenrand nicht angeschwollen. Enden weniger abgerundet als bei Cl. moniliferum.  
Membran glatt und farblos. Chromatophoren mit 4 Pyrenoiden und 4 weite Langsplatten.  
Ca. 6 Gypskristalle. L. 285; Br. 50.

Latin diagnosis

Closterium striolatum Ehrbg. (r).

8-10 mal so lang wie breit. Zart gestreift (10 striae auf 10 u). 9 Pyrenoiden in  
der Halbzelle. Gemeldet von Venezuela bis Feuerland. L. 365-370; Br. 36-45.

Closterium tumidum Johns. (rr).

Ca. 7-8 mal so lang wie breit. Innenrand der Zelle gerade oder leicht angeschwollen.  
Meist 1 Gypskristalle in der Endvakuole. Aus Kolumbien, Brasilien, Paraguay, Patagonien.  
L. 100-104; Br. 12-14.

Closterium turgidum Ehrbg. (r).

Sehr schlanke Form, die sich der var. borgei Defl. nähert. Bisher aus Brasilien,  
Paraguay, Argentinien und Venezuela gemeldet. L. 662-880; Br. 45-65; 8 striae auf 10 u.

Closterium turgidum Ehrbg. var. borgei Defl. (rrr).

Two specimens seen by Scott measured 1140x76 and 1260x72. Previously known from Brazil.

Pleurotaenium ehrenbergii (Breb.) De Bary, forma. (r).

16-17 mal so lang wie breit. Zahl und Grösse der Endwarzen variabel. Die als forma  
clavata beschriebene teratologische Form ebenfalls beobachtet. Sehr grosse Form,  
weiter und länger, meist wie der Typus. In Südamerika von Venezuela bis Patagonien.  
L. 705-950; Br. 46-58; I. 40-45.

Pleurotaenium eugeneum (Turn.) W. & W. var. undulatum (Borge) Krieg. (r).

Ca. 16 mal so lang wie breit. Stattliche Exemplare mit deutlicher Basalanschwellung;

Enden erweitern sich nicht. Bisher aus Brasilien gemeldet. L. 1015-1150; Br. 60-75; Basis 65-70; I. 50-55.

Pleurotaenium nodosum (Bail.) Lund. var. gutwinskii Krieg. (c).

Stattliche Form. Die Zahl der kegelförmigen Endwarzen ist grösser, 7 sind sichtbar. Die Poren stehen auf den Höckerenden wesentlich dichter und nicht in Reihen. Gemeldet aus Brasilien und Paraguay. L. 550; Br. 90; I. 45.

Pleurotaenium trabecula (Ehrbg.) Næg. var. maximum (Reinsch) Roll. (r).

Ca. 10 mal so lang wie breit. Die Unterschiede zwischen dem Typus und der var. maximum bestehen in der Hauptsache in den grösseren Massen. Exemplare aus Probe P-1 und P-2, L. 635-650, Br. 60; I. 40; Basis leicht angeschwollen. Exemplare aus Probe P-3, L. 505; Br. 55. Brasilien, Argentinien.

Euastrum abruptum Nordst. var. lagoense (Nordst.) Krieg. (rrr).

Vorher nur aus Brasilien bekannt. L. 22; Br. 17; I. 4.

Euastrum ansatum Ehrbg. (rr).

Aus Brasilien und Paraguay bekannt. L. 74; Br. 34; I. 12.

Euastrum ansatum Ehrbg. ad var. dideltiforme Duce. accedens. (rrr). T. 1, Fig. 7.

Only two examples were found, and in neither case were the surface features discernable. The large central pit that is usually present could not be seen in either front, side, or oblique views. L. 111; Br. 47; I. 12; D. 30.

Euastrum bidentatum Næg. var. PERUVIANUM var. nov. (rrr). T. 4, Fig. 7.

Differs from the type in having only two granules in the center of the face of each semicell, and by the absence of the pair of deep pits immediately above ~~the~~ the central swelling. L. 53-54; Br. 37-38; I. 9-10; D. 23-24.

#### Latin diagnosis

Euastrum binale (Turp.) Ehrbg. var. hians W. West. (rrr).

Der nächste Fundort liegt in U. S. A. L. 11, Br. 9; I. 3.

Euastrum eläbatum (Lund.) Roy & Biss. var. PERUVIANUM var. nov. (rrr). T. 1, Fig. 8.  
 Von den javanischen var. simplex Krieg. etwas verschieden. Isthmus breiter. Unter dem ~~XXXXXX~~ Scheitel eingezogen. Apikaleckenweniger gerundet. Membran über der Mitte der Halbzelle verdicht (Seitenansicht). L. 21; Br. 15; I. 8.

Latin diagnosis.

Euastrum evolutum (Nordst.) W. & W. var. integrius W. & W. (rrr).  
 Die vorliegende Form stimmt in Größe und Umrisslinien gut mit der bisher nur aus Afrika und U.S.A. beschriebenen var. integrius überein. Der Polarteil ist weniger stark abgesetzt. L. 52; Br. 35; I. 9.

Euastrum fissum W. & W. var. brasilense (Borge) Krieg. (rr). T. 4, Fig. 4.  
 In den Basal- und Apikallappen ist eine Gruppe kleiner Warzen vorhanden, die in der Abbildung bei Borge fehlen. L. 46-47; Br. 25-26; I. 8-9; D. 17.

Euastrum incavatum Josh. & Nordst. forma. (rrr). T. 4, Fig. 5.  
 Only one specimen of this plant was seen, and it proved impossible to get the exact side and top views, but an approximation of these is given, as seen during the manipulation. The front view bears an evident resemblance to E. cornubiense and E. crassicolle, but the side and top views are quite different, and approach more closely to those of E. incavatum, to which species it is tentatively assigned. L. 41; Br. 23; I. 7; D. 16.

Euastrum LATUM sp. nov. (rrr). T. 4, Figs 2, 3.  
 Kleines Euastrum, etwas breiter als lang. Sinus tief, nur am Ende wenig geöffnet. Halbzelle trapezförmig. Seiten convex, zwischen Basal- und Apikalecken 3-wellig. Scheitel 2-wellig, mit flachem Mitteneinschnitt. Membran mit 2 randlichen Reihen flachen Warzen, und je einer weiteren in den Basal- und Apikalecken. Mittel der Halbzelle mit einer flachen 2-telligen Anschwellung, die jedoch nur in der elliptischen Scheitelansicht und in der fast kreisförmigen Seitenansicht der Halbzelle zu erkennen sind. Chromatophore parietal, mit einem centralen Pyrenoid. L. 30-34; Br. 34-38; I. 7-8; D. 17-18.

Latin diagnosis

Euastrum latum ist eine Art, die zwischen den Gattungen Cosmarium und Euastrum

steht, hier wegen der apikalen Einschnitte zur Euastrum gestellt.

The illustration, T. 4, Fig. 3, shows a smaller and narrower plant, of which a single empty cell was found. The profile is evidently quite like that of E. latum, with the same number of lateral and apical undulations, but though the cell was quite empty, and the wall could be seen to be finely and delicately porose (punctate), there was no evidence of any granules or warts in any view.

Euastrum sinuosum Lenorm. (rrr).

Vorher aus Guiana, Brasilien und Uruguay gemeldet. L. 65; Br. 35; I. 11.

Micrasterias abrupta W. & W. (r). T. 2, Fig. 1, 2; T. 3, Fig. 6.

Meist in der Normalform mit 2-spitzigen Polarlappen, seltener in der durch Übergänge verbundenen Abänderung mit 1-spitzigen Lappen. L. 49-53; Br. 50-52, I. 11-12.

Micrasterias borgei Krieg. (rr). T. 1, Fig. 3-5.

Wie schon Grönblad (1945) bemerkt, ist die Bestachelung variabel. Bei dem abgebildeten Exemplar sind die kleinen Dörnchen ziemlich gleichmässig über die Oberfläche verteilt, wie bei der var. multidentata; doch ist die für den Typus charakteristische kegelförmige Mittelanschwellung vorhanden. L. 277-325; Br. 237-275; I. 45-50.

Micrasterias borgei Krieg. var. multidentata Krieg. (r). T. 1, Fig. 6.

Der Scheitel trägt auf den Höckern keine Stacheln. Bisher in Südamerika nur aus Brasilien bekannt. L. 306; Br. 250; I. 45.

Fig. shows a dichotypical cell combining semicells of the species and var. multidentata.

Micrasterias laticeps Nordst. (rrr). T. 3, Fig. 3.

Diese amerikanische Art, die vorher aus Venezuela, Brasilien und Paraguay gemeldet war, konnte in einigen stattlichen Exemplaren beobachtet werden. L. 200; Br. 250; I. 25.

Micrasterias laticeps Nordst. forma <sup>caps</sup> depressa f. nov. (rrr). T. 3, Fig. 4.

Differs from the type in the much greater ratio of width to length (1.47 against 1.10 to 1.33 for the species), giving the cell a curious depressed appearance.

Latin diagnosis.

Microsterias laticeps Nordst. var. acuminata Krieg. (rrr) T. 3, Fig. 5.  
Isthmus etwas breiter. Bisher aus Brasilien und Paraguay gemeldet. L. 85-90;  
Br. 102-113; I. 20-22.

Microsterias radians Turn. (rr). T. 1, Fig. 9.  
Die Art steht M. radiata nahe, doch unterscheiden sich die typischen Formen so  
bedeutend dass schwer an eine Vereinigung zu denken ist. Vielleicht kann der  
geographische Faktor für Trennung der Arten beitragen. M. radians ist eine tropische  
Art, während M. radiata temperierte Gebiete bewohnt. L. 133; Br. 109; I. 21.

Microsterias radians Turn. var. brasiliensis (Grönbl.) Krieg. comb. nov. (rr).  
Syn. M. radiata var. brasiliensis Grönbl.  
Wenn man die tropische M. radians bestehen lässt, gehört die var. brasiliensis hierher.  
Sie steht zwischen dem Typus (Krieg.-Rab., T. 115, Fig. 8) und der var. bogoriensis  
(Bern.) G.S.West (Krieg.-Rab. T. 116, Fig. 2). L. 185; Br. 150; I. 25.

Microsterias thomasiana Arch. var. notata (Nordst.) Grönbl. (rrr). T. 3, Fig. 1, 2.  
Hälften kleiner als die bisher gemeldeten Exemplare. In älteren Zellhälften mit  
Dornenreihen parallel mit den grösseren Einschnitten. (An jüngeren Zellhälften nicht  
wahrnehmbar). In Südamerika nur aus Brasilien bekannt. L. 150-153; Br. 132-133; I. 24.

In the Peruvian specimens the spines were extremely small and difficult to see.  
The illustrations should be compared with var. torneensis Krieg. (Krieg.-Rab. T. 1, Fig.3)  
which is much larger and has a different arrangement of the spines.

Cosmarium binum Nordst. (rrr).  
The specimens seen had semicells of a more pyramidal shape than in any illustrations  
that I have seen, and in this respect they resemble the form that occurs in southeastern  
U.S.A. Previously known from Brazil. L. 84-88; Br. 62-69; I. 18-20; D. 41-43.

Cosmarium commissurale Breb. var. crassum Nordst. (rrr). T. 5, Fig. 1.  
Die Mittelschwungung ist sehr stark entwickelt. L. 30; Br. 32; I. 13; D. 27.

Cosmarium cucurbita Breb. {c).  
Kleine Exemplare der weitverbreiteten Art. Vorher in Brasilien gefunden. L. 26, Br. 16,  
I. 13; D. 13.



Cosmarium crassiusculum (De Bary) Insam & Krieg. var. PULCHRUM, var. nov. (r).

T. 4, Fig. 6.

2-3 mal

~~Mehrere mal~~ so lang wie breit. Scheitel gerundet bis abgestutzt. Membran mit sehr dichtstehenden deutlich sichtbaren Poren. Membran an den Enden verdickt.

L. 55-71; Br. 24-29; I. 20-23. The chloroplasts have 5, 6 or 7 radiating lamellae.

Latin diagnosis.

Cosmarium denticulatum Borge var. ovale Grönbl. (c). T. 3, Fig. 7.

Stattliche Exemplare der im Material nicht seltenen Art. Das Mittelfeld ist mit dichtstehenden deutlichen Poren bedeckt. Vorher aus Venezuela und Brasilien bekannt. L. 148-175; Br. 106-115; L. 30-31.

Cosmarium denticulatum Borge var. perspinosum Grönbl. (r). T. 3, Fig. 8.

Seiten leicht konvex. Scott hat die Stacheln bei einem Exemplare gezählt. Auf der einen Zellhälfte waren 287, auf der andern 296 sichtbar. Nur aus Brasilien gemeldet (Grönblad 1945). L. 239-250; Br. 159-175; I. 46-65.

It may perhaps be thought that I have drawn the spines in too regular an arrangement, but that is really the way they appear; also the total number of spines is approximately correct.

Cosmarium elegantissimum Lund. var. simplicius W. & W. (rrr). T. 4, Fig. 7.

Only one example was seen, and the surface features were concealed by the dense chloroplast, but I think there is little doubt about the identification. Previously reported from Brazil. L. 48; Br. 20.

Cosmarium exiguum Arch. var. dilatatum (Schm.) Krieg. (r).

Die Form der Halbzelle schwankt bei C. exiguum. Die var. hexagonum leitet zu der vorliegenden forma dilatata Schm. L. 25; Br. 12; I. 5; D. 9.

Cosmarium obliquum Nordst. var. minimum W. West. (rr).

Bisher noch nicht aus Südamerika gemeldet. L. 11-13; Br. 9-10; I. 5.

Cosmarium orthostichum Lund. var. compactum W. & W. (rrr). T. 4, Fig. 10.

Eine Form mit quer verbreiteten und verdoppelten Warzen. L. 21; Br. 20; I. 6; D. 13.

This plant should be compared with C. ordinatum var. depressum W. & W. (1898), and

with "*C. geminatum* Lund." in Prescott & Scott 1942.

Cosmarium pseudoconnatum Nordst. (c).

In Südamerika aus Brasilien, Ecuador und Paraguay remeldet. L. 46-47; Br. 34; I. 32.

Cosmarium pyramidatum Breb. (r).

Aus Venezuela, Brasilien, Kolumbien, Bolivien, Uruguay, Paraguay und Argentinien gemeldet. L. 64-74; Br. 37-44; I. 12-15.

Cosmarium raciborskii Lagerh. (c). T. 4, Fig. 9.

Membranskulptur deutlich; sie besteht in dichtstehenden Poren die nicht in Reihen angeordnet sind. Zellrand sehr fein gewellt. Membran an Enden verdickt. 1 Pyrenoid in der Halbzelle. L. 33-37; Br. 31-39; I. 12-13; D. 18. Vorher aus Brasilien bekannt.

Cosmarium retusiforme Gutw. var. abscissum (Schm.) Krieg. comb. nov. (rrr).

Syn. *C. hammeri* fa. abscissa Schm. 1895, S. 302, T. 4, Fig. 8.

*C. retusiforme* forma Borge 1918, S. 34, T. 3, Fig. 4.

Im Scheitelansicht mit etwas angeschwollener Mitte. Membran in der Mitte der Halbzelle verdickt. Brasilien, Kolumbien. L. 23; Br. 18; I. 6; D. 12.

Cosmarium subcostatum Nordst. (r).

Die Skulptur des Mittelfeldes weicht etwas ab. Es ist eine grössere Mittelwarze vorhanden, die von ca. 9 Graneln umgeben ist, L. 21; Br. 18; I. 5; D. 11.

Cosmarium subtumidum Nordst. (c).

Verhältnis vom Breite zu Länge etwas variabel, 1:1.35-1.47. Brasilien, Kolumbien. L. 25-33; Br. 18-20; I. 6-7.

Cosmarium variolatum Lund. var. rotundatum (Krieg.) Messik. (r).

Aus Brasilien gemeldet. L. 27; Br. 15-16; I. 7; D. 11.

Cosmarium vexatum W. West. (r).

Etwas kleiner als der Typus. L. 30-31; Br. 25-26; I. 10.

Cosmarium Wollei (W. & W.) Grönbl. (c). T. 4, Fig. 8.

Kleiner als der Typus, ca. 1-1/3 mal so lang wie breit. Chromatophor mit radialen Fortsetzungen. L. 26; Br. 19; I. 17.

Staurastrum alternans Breb. (rr). T. 4, Fig. 8.

Die gefundenen Formen sind nicht ganz so stark gedreht und haben etwas gedrungener  
Arme. L. 33; Br. 30; I. 11.

Staurastrum asteroideum W. & W. var. brasiliense Grönbl. (rr).

Die Enden der Arme sind etwas stärker gerundet. L. 20; Br. 22; I. 8. Von Grönblad  
(1945) gemeldet aus Brasilien.

Staurastrum bieneanum Rabenh. var. patens Nordst. (rrr).

Aus Brasilien und Patagonien gemeldet. L. 18; Br. 20 (23); I. 5.

Staurastrum octangulare Grönbl. (c). T. 5, Fig. 3.

Kleiner als die brasilienischen Exemplare. Basale Fortsetze zuweilen 3-spitzig,  
apikale manchmal 1-spitzig. Die Länge der Stacheln schwankt etwas. L. 24-27 (30-33);  
Br. Diag. 22 (27); Br. Seiten 17 (23-28); I. 10-12.

Staurastrum orbiculare Ralfs var. depressum Roy & Biss. (rrr). T. 5, Fig. 7.

Reported from Brazil by Borge (1918) and Grönblad (1945). L. 34; Br. 33; I. 10.

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Staurastrum setigerum Cleve var. pectinatum W. & W. (r). T. 5, Fig. 4.

Etwas kurzstacheliger als die von Grönblad aus Brasilien beschriebenen Exemplare.  
L. 36 (50); Br. 32 (46).

Staurastrum teliferum Ralfs var. pecten (Perty) Grönbl. (r). T. 5, Fig. 5.

Die Länge der Stacheln ist Schwankungen unterworfen. In Südamerika nur aus Brasilien  
bekannt (Grönblad 1945). L. 33-34 (42); Br. 27 (32-33); I. 11-13.

Staurastrum trifidum Nordst. forma <sup>tortum</sup> ~~torata~~ Børgesen. (rrr). T. 5, Fig. 6

Staurastrum trifidum Nordst. var. inflexum W. & W. forma <sup>tortum</sup> ~~torata~~ Børgesen. (rrr).

T. 5, Fig. 6.

Only two specimens were seen. They agreed with Børgesen's illustration except that  
the lowest of the three spines at each angle arises from an inflated base with a  
distinct shoulder. I have found a very similar form in Louisiana and Mississippi which  
sometimes shows the inflated base. Børgesen assigned his forma torta to var. glabrum  
Lagerh., but West & West (1896) transferred it to their var. inflexum because Lagerheim's

L.

variety is not described with the inflexed (downwardly curved) spines. The Peruvian plants show a resemblance to certain forms of St. contectum Turn.

Staurastrum trihedrale Wolle. (rrr).

Only one specimen was found, quite typical, and exactly like ~~the~~ North American plants. L. 38; Br. 26; I. 10.

Staurastrum zonatum Børges. var. horizontale Borge (?): (rrr). T. 5, Fig. 8.

Only one specimen was found, and because of the opaque cell-contents the exact number and arrangement of the granules on the apical surface could not be determined, so that my vertical view may not be quite correct in this respect. The plant possesses the characteristics of St. zonatum and I have tentatively assigned it to var. horizontale although the granulation is more elaborate than shown in Borge's drawing.

Desmidium coarctatum Nordst. (rrr).

Aus Brasilien und Guiana bekannt. L. 35; Br. 45; Apex 20.

Desmidium grevillii (Kutz.) De Bary. (rrr).

In Südamerika aus Guiana, Kolumbien, Brasilien und Paraguay registert. L. 28; Br. 50;

Apex 28; I. 42.

Desmidium laticeps Nordst. var. quadrangulare Nordst. (rrr). T. 5, Fig. 9.

In Südamerika nur aus Brasilien bekannt. Krieger's vertical view shows the chloroplast consisting of 9 radiating plates, each with one pyrenoid, as does one of Gronblad's illustrations (1945). L. 25; Br. 75.

Bambusina borreri (Ralfs) (Cleve). (rrr).

In Südamerika aus Guiana, Kolumbien und Brasilien bekannt. L. 20-25; Br. 14, Apex 9.

Euastrum LATUM sp. nov.

Cells small, somewhat wider than long, sinus deep and linear, slightly open at the ends. Semicells trapeziform; lateral margins convex and 3-undulate between basal and apical angles; apex 2-undulate, with a shallow median incision. Wall with two marginal rows of low granules, and another granule in each of the basal and apical angles. Center of the semicell with a low double swelling, only visible in the ~~obverse~~ elliptical vertical view and the almost circular side view of the semicell. Chromatophore parietal, with one central pyrenoid.

Cellulae parvae, paulo latiores quam latae, sinus profundus linearisque, in extremitate paululum apertus. Semicellulae trapeziformes, marginibus lateralibus convexis, 3-undulatis inter angulos basales apicalesque; apex 2-undulatus, incisione media non profunda. Membrana duos ordines marginales granulorum non altorum, necnon granulum in utroque angulo basali apicalique praebens. Centrum semicellulae inflationem geminam non altam habens, visibilem solum in semicellula a latere (fere circulari) aut a vertice (elliptica) visa. Chromatophorus parietalis, pyrenoideo uno centrali praeditus.

Micrasterias laticeps Nordst. forma ~~DEPRESSA~~ f. nov. \*\*\*\*\*

Differs from the type in the much greater ratio of width to length (1.47 against 1.10 to 1.33 for the species), giving the cell a curious depressed appearance.

Forma a planta typica differens ratione multo ampliore latitudinis ad longitudinem (1.47 adversus 1.10 ad 1.33 in specie), aspectu cellula sic praeter solitum depressum.

\*\*\*\*\*

Gosmarium crassiusculum (De Bary) Insam & Krieg. var. PULCHRUM var. nov.

Cells 2-3 times longer than wide; ends broadly rounded or slightly flattened. Wall with closely spaced and clearly visible pores. Wall thickened at the apices.

Cellulae 2-3 plo longiores quam latae, extremitatibus late rotundatis aut complanatis. Membrana poris crebris ac manifestis praedita, in apicibus incrassata.

New taxa from paper by Krieger & Scott, "Einige Desmidiaceen aus Peru". June 18 1956

Closterium moniliferum (Bory) Ehrbg. var. ACUTUM var. nov.

Cells about 7 times longer than wide. Differs from the type in the more sharply pointed ends.

Cellulae circa 7 plo longiores quam latae, differentes a cellulis speciei possessione extremitatum acutiorum.

\*\*\*\*\*  
Closterium SEMICIRCULARE sp. nov.

Cells of medium size, 5-6 times longer than wide, strongly curved, ventral margin not inflated, ends less rounded than in Cl. moniliferum. Wall smooth and colorless. Chromatophore with 4 pyrenoids and 4 wide longitudinal ridges. About 6 gypsum crystals.

Cellulae mediocres, 5-6 plo longiores quam latae, valde curvatae, margine ventrali non inflato, extremitatibus minus rotundatis quam in Cl. monilifero. Membrana levis atque sine colore. Chromatophorus 4 pyrenoideis atque 4 latis rugis longitudinalibus praeditus. Crystalla <sup>circa 5 ex.</sup> gypsi ~~quatuor~~.

\*\*\*\*\*

Euastrum bidentatum Nög. var. PERUVIANUM var. nov.

Differs from the type in having only two granules in the center of the face of each semicell, and by the absence of the pair of deep pits immediately above the central swelling.

Varietas a specie typica differens possessione duorum tantum granulorum in centro faciei utriusque semicellulae, differens necnon absentia paris lacunarum profundarum proxime super inflationem centralem.

\*\*\*\*\*

Euastrum elobatum (Lund.) Roy & Biss. var. PERUVIANUM var. nov.

Somewhat different from var. simplex Krieg. from Java; isthmus wider; lateral margins contracted below the apex, and apical angles less rounded. In side view wall thickened <sup>internally</sup> above the center of the semicell.

Varietas satis differens a var. simplici Krieg. de Java; isthmus latior, margines laterales infra apicem constricti, angulis apicalibus minus rotundatis. Cellula a latere visa membranam super centrum semicellulae interne incrassatam praebens.

Nov 11 1959

Vaca Valley Orchards,  
Vacaville, Cal.

Gentlemen,

For several years I have been ordering your dried fruits as a Christmas present for my sister in England. They are highly appreciated because your quality is much better than anything they can buy in that country.

This year I have not received any announcement from you, so I am enclosing my check for \$10.00, to pay for a 10-lb. Jumble Pack, to be sent to:

Mrs. E. M. Nixon,  
Roundham Gardens,  
Paignton, Devon.  
England.

If the check is not enough, let me know and I will send the balance, or if there is any change you can send it to me in stamps.

Formerly I used to buy crystallized greengage plums at one of the New Orleans stores that handles fancy groceries, but I have not seen them for many years now, though they have the canned greengages in syrup. Can you tell me the name and address of any California firm that makes the crystallized ones? I don't want anything by greengages.

Very truly yours,

Nov 15 1959

Vaca Valley Orchards,  
17555 Ventura Blvd.,  
Encino, Cal.

Gentlemen,

On Nov 11, just three days before receipt of your Christmas brochure, I sent you an order for a 10-lb. Jumble Pack to be sent to my sister:

Mrs. E. M. Nixon,  
Roundham Gardens,  
Paignton, Devon,  
England.

I enclosed my check for \$10.00, but unfortunately, relying on my memory, I addressed the letter to you at Vacaville, Cal., where Mr. Hawkins was formerly located. Maybe the letter will be forwarded to you; if not, it will come back to me.

From your brochure I now see that what I should have ordered is the 3½-lb. Jumble Sampler at \$9.65, to be sent to Mrs. Nixon at the above address. To this you may add one Gift #3, Tropical Chest, at \$6.35, to be sent to:

Mrs. K. W. Billings,  
141 Dartmouth Road,  
Paignton, Devon,  
England.

If you get my \$10.00 check, apply it on the bill, and invoice me for the difference plus the extra postage to England. If not, send me a bill for the whole amount and I will remit immediately. I have been ordering these Christmas gifts from Mr. Hawkins or from you for 10 years or more.

My wife and I have just returned from an automobile trip to San Francisco, so I happen to have several California road maps on hand. I thought that Encino would be somewhere near Vacaville, but I could not find it at all on the first two maps, and it was only on the third one, which gives an enlarged map of the Los Angeles area, that I found Encino is on Highway 101, a few miles northwest of L.A. The closest we got to your place was "arineland of the Pacific, near Long Beach.

Very truly yours,



Oct 28 1957

Vaca Valley Orchards,  
Canoga Farm,  
Encino, Calif.

Gentlemen,

Please send one ~~4 1/2~~ Jumble Pack Fruit

Sampler to:

Mrs. K. M. Billings,  
141 Dartmouth Rd.,  
Paigton, S. Devon.  
England.

I will send you a check upon receipt of your invoice  
for the cost and extra postage.

Very truly yours,

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# ORDER FORM

FALL, 1957

ORCHARD-TO-YOU Gift-Quality  
SUN-DRIED FRUITS AND NUTS

VACA VALLEY ORCHARDS, at Canoga Farm, Encino, California  
Dear Mr. Hawkins: Please send me packs as marked below. I under-  
stand prices include shipping costs to anywhere in the U. S.

How Pack	Net Wt.	Pack	Price	Amount
<b>"JUMBLE-STYLE" PACKS</b> (Now 16% to 35% off)				
83	5 1/2 lb.	"Jumble" Jumbo Prunes	\$5.95	
84	10 lb.	"Jumble" Jumbo Prunes	8.90	
85	4 1/2 lb.	"Jumble" Fruit Sampler	5.95	
86	9 lb.	"Jumble" Fruit Sampler	8.95	
87	4 1/2 lb.	"Jumble" Apricots & Prunes	6.65	
88	10 lb.	"Jumble" Apricots & Prunes	11.35	
91	4 1/2 lb.	Ex. Fancy White Callimyrna Figs	4.95	

## DE LUXE GIFT PACKS

79	5 1/2 lb.	Jumbo Prunes	\$7.25
80	10 lb.	Jumbo Prunes	10.65
78	2 1/2 lb.	Jumbo Prunes	3.55
77	1 1/2 lb.	Fiesta Tray Pack	3.85
8	2 1/2 lb.	Fiesta Tray Pack	5.85
74	2 1/2 lb.	7-Fruit Sampler	3.95
75	4 1/2 lb.	7-Fruit Sampler	7.25
76	9 lb.	7-Fruit Sampler	10.95
90	4 1/2 lb.	Apricots and Prunes	10.20
89	2 1/2 lb.	Ex. Fancy White Callimyrna Figs	3.15
22	12 oz.	Nectar Fruit Cake	1.45
23N	1 lb.	Nectar Fruit Cake	1.90
24N	2 1/2 lb.	Nectar Fruit Cake	3.95
30	5-11 oz.	Special Preserves Gift Box	5.25
26	5-5 oz.	Special Preserves Gift Box	3.95

(for other Preserves, see Special Order Form)

## TENDERMOIST FRUITS in Colorful Gift Boxes

2 1/2 lb.	Jumbo California Dates	\$2.85
2 1/4 lb.	Jumbo Apricots	3.95
2 1/4 lb.	Jumbo Peaches	2.95
2 1/2 lb.	Walnut-topped Callimyrna Figs	3.60
2 1/2 lb.	Dates and Callimyrna Figs	3.05
2 1/2 lb.	Jumbo Mixed Fruit Variety	3.65

TOTAL AMOUNT ENCLOSED \$

I am enclosing check  Money Order  Currency  Send me bill  which I will pay within 7 days after receipt, or return box (I can bill you, but it would save office work and expense if you send your check with order.)

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY, STATE \_\_\_\_\_

100% SATISFACTION GUARANTEED  
Money Back if not Pleas'd!



Homemade with fresh fruits and berries

11 OZ. JARS

6 JARS  
\$5.35

These wonderful preserves are downright terrific, preserved at their very peak of goodness. Flavor's outstanding in these pure fruit preserves. Made the good old way in small batches, in open kettles, on top of the stove. No artificial acids, flavoring or pectin—just pure fruit and cane sugar! Takes more fruit to make such good preserves without jelly fillers. Richer and thicker with pure whole fruit. Nicely packed for shipping.

BOYSENBERRY SPECIAL  
12 JARS \$8.95  
8 jars Boysenberry Preserves plus 2 each Damson Plum, Sweet Spiced Figs.

Your Own Selection  
12 JARS  
\$9.45

## Old Fashioned California Fruit Preserves

Choose your own favorite assortment!

### SPECIAL ORDER FORM

Jars Wanted	ALL JARS 11 OZ. NET WT.
_____	Strawberry Preserves
_____	Boysenberry Preserves
_____	Red Raspberry Preserves
_____	Royal Apricot Preserves
_____	Damson Plum Preserves
_____	Kadota Fig Preserves
_____	Sweet Spiced Figs
_____	Orange Marmalade
_____	Golden Peach Preserves
_____	Orange Blossom Honey
_____	Red Sour Cherry
_____	3-Fruit Marmalade
_____	6 jars as marked above..... \$5.35
_____	Boysenberry Special..... 8.95
_____	12 jars as marked above..... 9.45

Attach above to separate sheet with your name and address (Gifts No. 26 and No. 30 see regular order form)



NEW!  
Mixed Fruit Basket Tray

3/4 lb. net... just \$1.35

Here's a grand little pack of plump, juicy-sweet orchard favorites! Sun-dried Tendermoist Jumbo California fruits in a handsome re-usable rattan basket tray. Dates, Figs, Prunes, Pears, Peaches and golden Apricots! Mmm!

### NECTAR FRUIT CAKE!

Different than any confection or cake you've ever tasted... truly delectable! No flour! No eggs! No shortening! Unbaked! No equal! Of rich, luscious fruits and nuts. Packed in a handsome white gift box.



12 oz. cake \$1.45  
1 lb. cake \$1.90  
2 1/2 lb. cake \$3.95

VACA VALLEY ORCHARDS  
at Canoga Farm Encino, California  
R. B. HAWKINS

## Treats from the Trees!

(How to Pamper Old Devil Sweet-Tooth with California Sunshine Fruits)

—"Juicy Sweet" Hawkins



A.M. SCOTT  
2824 DANTE ST.  
NEW ORLEANS 18, LA.

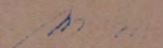


Bogor, 30 June 1953.-

Dear Sir,

I have pleasure in announcing that I will be on leave from 15 July 1953 until 15 January 1954. My address will be c/o Prof. J.C. van Oyen, 28 Cobetstraat, Leiden, Holland. During my absence Mr. Hassanuddin Saadin will be in charge at the Laboratory of Inland Fisheries at Bogor.

Please communicate with me for all private matters at my address in Leiden and for all official matters to the Laboratory at Bogor.

  
(Dr. K.F. Vuus).

Head of the Laboratory of Inland Fisheries  
Tjikomsuh 99  
Bogor - Djawa  
INDONESIA.-

June 20 1951

Prof. Dr. P. van Oye,  
Hon. Secy., HYDROBIOLOGIA,  
30 St. Lievenslaan,  
Ghent, Belgium.

Dear Prof. van Oye,

Many thanks for your very prompt acceptance of the paper on Euastrum. Under separate cover I have today sent you, by registered mail, the original drawings for the plates.

I have noted that correspondence is to be sent to you, and not to the publisher, Dr. Junk, and shall be guided accordingly. Today I borrowed a copy of Hydrobiologia from a friend in the Wildlife & Fisheries Dept., and am surprised to see that the symbols that are used in Europe to indicate the various kinds of type are quite different from those in general use in this country. But perhaps you have had experience with this before, since you have published a number of papers by American writers.

The only one of your works that I possess is your 1943 paper "Desmidiées" in Exploration du Parc National Albert. If you have available any reprints of your other papers dealing with desmids, particularly those from Congo, Indonesia, and other tropical countries, I should be most grateful if you would send me copies of them. I am now working on a paper by Prof. Prescott and myself on desmids from Arnhem Land in North Australia, collected on a Government Expedition to that almost unknown region in 1949. Last night I completed the fourteenth of a series of about twenty plates which will show something like 250 different species and varieties of desmids, some of them new, and others that are the first records since their original discovery 50 or 60 years ago. This paper will be published in the official account of the Expedition, to be issued by the Australian Government. The desmid-flora of this region, as might be expected, is very similar to that of the Indo-Malayan-Indonesian area.

Also I have recently received, through the courtesy of Dr. K. M. Vaas and Mr. M. Sachlan, a number of collections of freshwater algae from Sumatra, Bali, Java, and Borneo, which will eventually be written up by Prescott and myself. So far I have made only a preliminary examination of this material, which is highly interesting, and contains some of the most wonderfully ornamented and elaborated desmids that I have ever seen or heard of.

With my best regards,

Sincerely yours,

July 14 1951

Dr. K. F. Veas,  
Laboratory for Inland Fisheries,  
Tjikeumeh 99,  
BOGOR, Java, Indonesia.

Dear Dr. Veas,

Many thanks for sending me the reprint of your paper on *Eichhornia crassipes*. I enjoyed reading it, not from any love of the plant, but because it is such a nuisance.

I am sending you the reprint of a paper written a few years ago by Dr. James Nelson Gowenlock, describing some experiments with mechanical systems for the removal of water hyacinths. He has also written another and more recent paper, of which unfortunately no copies are available, on some experiments with 2-4-D. In general the results coincided closely with yours; a very large kill was obtained, about 99% if I remember correctly, but it was found that if even one plant was left alive, it would eventually repopulate the water.

After the experiments with mechanical conveyors for lifting the whole plants out of the water and depositing them on the bank, another mechanical device was tried. This consisted of a number of large circular saws mounted on a horizontal shaft, on a framework projecting from the bow of a barge. The saws were driven by chain from a gasoline engine mounted on the barge, and the framework could be raised or lowered so as to adjust the depth of the saws in the water. The saws were spaced closely on the shaft, with a space of perhaps 1" or 2" between them. When the saws were rotating rapidly they were pushed against the floating mass of vegetation, and the plants were chopped into small pieces which sank to the bottom because of the loss of buoyancy, and eventually they decayed. I don't know what was the effect upon the aquatic biota of this large mass of decaying plants. This experiment was partially successful, but obviously the device could not reach the plants in very shallow water close to the shore, and it proved too expensive to remove these plants by hand. Soon after this experiment, the 2-4-D became available, and it is, of course, by far the best method found up to date.

I have been observing the water hyacinth, rather casually I must admit, for the last fourteen years, since I started collecting desmids. With very few exceptions, water in which *Eichhornia* grows is unsuitable for desmids, so I no longer bother to take collections from such habitats, if any others can be found. One of the statements in your paper, that hyacinths can grow in water with a pH of 4 to 10, rather surprised me. It has been my impression that they grow abundantly only in hard, calcareous water, and this is partly borne out by the fact that in the few cases where I have obtained any considerable catches of desmids from hyacinth-infested waters, the desmids have invariably proved to be hard-water species, mostly cosmopolitan in range. On the other hand, the waters in which I get my very rich desmid collections, in Louisiana, Mississippi, and Florida, have a pH of 5.0 to 7.0, and it is extremely seldom that I see hyacinths in these habitats. In central Florida there are thousands of lakes, from small ones a couple of hundred feet in diameter, up to large ones 20 or miles long. Almost ~~at~~ the whole peninsula of Florida is underlaid by a stratum of limestone, and some of the larger and deeper lakes are fed by springs from this calcareous deposit. Consequently the water is hard and usually contains considerable quantities of hyacinths, and I get few desmids from these large lakes. On the other hand, the small and shallow lakes, which I presume do not penetrate into the limestone stratum, have no hyacinths, the water is soft and acid, and yield astonishingly rich desmid gatherings.

Eichhornia is not so sensitive to frost as you might think. In his paper Dr. Gowanloch refers to a cold winter a few years ago, but the winter of 1950-51 was even colder. In the city of New Orleans the temperature on February 1 and 2, 1951, was 20°F (minus 7°C), and it was below freezing for a whole week. Fifty miles from New Orleans, where hyacinths are quite abundant, the temperature was considerably lower, reaching 10°F (minus 12°C), and of course it stayed below freezing considerably longer than a week. Yet today, judging from casual observation, the hyacinths are as plentiful as ever. During a freeze, the emergent parts of the plant turn brown, wilt, and bend down into the water, where they decay. But new leaves grow from the base, and after a few months the whole bed of plants is ablaze with the blue and yellow flowers.

I have seen the plants in the neighbourhood of Savannah, Ga., and in northern Louisiana, both of which are a hundred miles or so north of the northern boundary of Florida. But the case which Dr. Gowanloch mentions, of plants which survived a winter in Washington, D.C., must have been in an artificial planting, because it does not grow naturally so far north. In Cuba I have seen another species, *Eichhornia azurea*, growing rather sparingly in association with *E. crassipes*.

Would you be kind enough to place Dr. Gowanloch's name on your mailing list to receive copies of your future papers, and any that may be published by the Dept. of Inland Fisheries. His title and address are given on the cover of his paper. He is an all-round biologist, and has an excellent knowledge of our flora and fauna, particularly of fresh and salt water fishes and shrimps, and of oysters which are an important item in local food and commerce.

The desmid collections that you made and which were sent to me by Mr. Bechlan, are extremely interesting, and contain some of the most highly ornate forms that I have ever seen or heard of. I am now nearing the completion of a series of about 20 plates of illustrations of desmids from Arnhem Land in north Australia. When these are finished I can go to work on your material.

If you have any opportunity to collect in the eastern part of the Indonesian archipelago, Celebes, Halmahera, Timor, Sunda Islands, or New Guinea, I should be delighted to get some desmids from there. Or if you know of any botanists in those parts who would be willing to make some collections for me, I am ready and willing to pay for them, either in cash, or by purchasing needed articles in this country and sending to them.

With my best regards and wishes,

Sincerely yours,

Oct 23 1951

Prof. Dr. P. van Oye,  
St. Lievenslean 30,  
GHEENT. Belgium.

Dear Prof. van Oye,

Instead of returning directly to you the corrected proof of our paper on *Euastrium*, Prof. Prescott sent it to me, presumably so that I might see the corrections that he has made. Most of these are typesetter's errors. In others I think he is being somewhat hypercritical. In the first paragraph I used the expression "State of Florida, the richness of whose desmid-flora", which he has changed to "the rich desmid-flora of which". Strictly speaking he is correct, since the pronouns who and whose are supposed to be used only in connection with human beings. But my expression is used so frequently both in speech and writing that I would be inclined to let it stand.

He wrote me recently regarding the spelling "supraisthmian" versus "supraisthman", and asking my opinion. On checking, I find that etymologically the latter is correct. But the former spelling has been used so many thousands of times in the literature that I think it is somewhat pedantic to insist upon changing it at this late date.

Enclosed is a photostat of the second page of Prescott's letter, from which you will note that he is willing to change the authorship of the paper from Prescott & Scott, to Scott and Prescott. If you can make this change without too much trouble I should like you to do so, since it would be a "feather in my cap". This change would necessitate two other changes, viz. "junior author's" to "senior author's" in the 2nd. and 3rd. paragraphs.

I am retaining my original ink drawings, since I suppose that you have no more need for them. The printed plates have turned out very nicely, and I am quite pleased with them.

With my best regards,

Sincerely yours,

July 22 1951

Dear Prof. van Oye,

Many thanks for the reprints which arrived a couple of days ago. Those that are written in French I can understand quite easily, but this is my first encounter with the Flemish language, and I find it rather tantalizing. Many of the words are almost pure English, and many others almost pure German, so it would appear that I ought to be able to read it, but there is too much Dutch mixed in. So though I can get the general drift of the papers, I cannot understand them thoroughly.

I have noted your several comments on the paucity of desmids in collections from the Belgian Congo. This is a pity, since it would seem that there ought to be rich gatherings from such a large tropical country. But there are other countries where similar conditions prevail. In the United States there are many large areas in which the predominant rock formations are limestones, and the aquatic habitats are in general unfavorable for desmids. Several years ago Prof. Prescott told me that Mexico is practically a "desmid desert". I don't know where he formed this opinion, but it is confirmed by my own experiences. In 1939 I drove from New Orleans to Mexico City, and made a few collections from the roadside ditches, but found almost no desmids. A couple of years ago a friend sent me some gatherings from the Zumpala Lakes near Mexico City, which also contained only a very few and uninteresting desmids. Dr. Amelia Somano Bishop has published several papers on freshwater algae from Mexico City, Oaxaca, and Vera Cruz. All of the habitats that she describes appear to be hard, alkaline water, with very few desmids.

In 1949 my wife and I visited Cuba, partly for pleasure, and partly for my collecting. Before the trip I studied carefully two excellent books, "Itinéraires botaniques dans l'île de Cuba", par Frère Marie-Victoria, of the University of Montreal. These volumes do not deal with algae, but they contain many extremely clear photographs of water habitats and descriptions of the larger aquatic plants, so that I was able to form a clear idea of what to expect. It appears that the greater part of the island of Cuba has underlying strata of limestone and magnesite, which are unfavorable for desmids, but that in the extreme western tip of the island, in the province of Pinar del Rio, there is a small region where the soil is sandy and siliceous, with many lagoons containing such plants as *Nymphaea*, *Nymphoides*, *Cabomba*, *Myriophyllum*, *Utricularia*, etc., which are excellent indicators that desmids may be expected. After making a few poor gatherings in the neighbourhood of Havana, my wife and I started for Pinar del Rio, expecting to spend a few days there. But on the road the automobile which I had engaged met with an accident, in which both of us were painfully injured, which put a sudden end to our holiday. Perhaps one of these days I may be able to go back to Cuba.

So you are not the only one who has met with disappointments in desmid collecting!

Sincerely yours,



KEMENTERIAN PERTANIAN

DJAWATAN  
PENJELIDIKAN PERTANIAN

BOGOR, 14 - 10 - 1951.  
TJIKUMEUH 99.

BALAI PENJELIDIKAN  
PERIKANAN DARAT

No. 423.

A. M. Scott  
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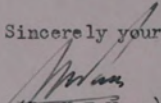
LAMPIRAN:

PERIHAL:

Dear Mr. Scott.

Many thanks for your letter of July 11<sup>th</sup> and the reprint of Mr. Gowanloch's paper. I took great troubles to secure a copy because I saw a reference to it, but I was unable to secure one. Of course destruction of Eichhornia and other noxious weeds is in a quite different phase now after the discovery of weedicides such as 2-4, D and others. Still the paper is important from the historical point of view. Your own observations are very interesting. I need not tell you how much Mr. Sachlan and I value your kind collaboration on the desmids. You can be sure that every important sample collected by us will be forwarded without delay. But for Celebes I have not yet worked in the "Australian" part of our country but we will keep your request in mind. With best regards and wishes.

Sincerely yours

  
(Dr. K. F. Vass).-

Head of the Laboratory of Inland Fisheries  
General Agricultural Research Station

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