

Cabbage-tree Swamp, Auckland.

This fresh-water deposit has also been put into my hands, and samples have found their way to England, but, as before, I take my list of species from Professor Hutton's MSS. notes:—

Achnanthidium inflata.
Eunotia (*Amphicampa*) *eruca*.
 „ (*Himantidium*) *bidens*.
 „ „ *arcus*.
 „ *diodon*.
Pinnularia major.
 „ *interrupta*.
 „ *radiosa*.
Epithemia turgida.

ART. XLIII.—*On the Lichenographia of New Zealand.*

By CHARLES KNIGHT, F.R.C.S.

[Read before the Wellington Philosophical Society, 28th February, 1883.]

Plates XXXV.—XXXVIII.

In continuing my papers on the Lichenographia of New Zealand, I wish to make the following remarks:—

In respect of the *Arthonia*. The leading characters of this genus, as given by Leighton in 3rd. ed. of Lichen Flora, are:—“*Asci pyriform in excavations of the sub-gelatinous hymenium; paraphyses none.*” The term “excavations” is not a happy one, but let that pass. Nylander seems to avoid committing himself to an unqualified statement of character, and instead of “paraphyses none,” limits himself merely to the terms “*paraphysibus discretis nullis.*” In reference to the above, I have already, in a paper on the lichens of New South Wales, called attention to the remark of Professor J. Müller, of Geneva (Flora, 11th April, 1879), where he states that paraphyses are always present in the *Arthonia*. This assertion of Müller needs qualification. In those *Arthonia* where the lamina sporigera is said to be grumose or homogeno-grumose, there exists in most cases no trace whatever of paraphyses or of stratification,—the structure is confused, cellular, or even granular. In others, where the lamina sporigera is said to be floccose, the structure is really clathrato-ramose, and is mostly condensed and rendered columnar in appearance by the pressure of the growing asci, as is seen in *A. globulosaformis*, Hepp, *A. lurida*, Ach., *A. kempelhuberi*, Mass., etc. Again in others distinct filaments can be traced, knit together in a more or less open network, as in *A. gregaria*, Ach., *A. swartziana*, Ach., *A. oleandri*, etc., and also as in most of the species of

Arthonia described in the present paper, with the exception of *A. aspera* (n. sp.), in which the lamina sporigera is more or less carbonized and degraded.

In respect of the *Pertusariæ* importance is always attached to the extraordinary thickness of the sporal envelope, which often consists of three or more laminæ; and this characteristic, when the paraphyses are implexo-ramose, is of the highest importance. Indeed, the presence of implexo-ramose paraphyses has induced Professor Müller to transfer several *Lecanoræ* to *Pertusaria*. In a paper on the lichens of New South Wales (Linn. Trans. Botany, second series, vol. 2) I called attention to Professor Müller's remarks (Flora, 1879, No. 39, p. 484) in which he advocates these transfers, and I noticed that, in my opinion, besides *L. parella* and *L. pallescens*, there are other species liable to similar removal; for instance, *L. verrucosa*, and *L. calcarea*. Hepp, together with Nylander and Th. Fries, has placed *Lecanora bryontha*, Ach., with the *Pertusariæ*, an arrangement amply supported by the great thickness of the parietes of the solitary spores and the implexo-ramose paraphyses. It may be added that the presence of intricate ramose paraphyses with thick double sporal envelopes renders it necessary that *Lecanora gemmifera*, Th. Fries, should also be transferred to *Pertusaria*. *P. fumosa* (n. sp.) of the present paper has a thin sporal envelope.

I have read with some interest in the Flora (1882, p. 458) Dr. Nylander's objections to break up a large genus of closely-allied species and dispose of them in several genera. We all agree with Ray,—“Methodum intelligo naturæ convenientem quæ nec alienas species conjungit, nec cognitias separat.” But it seems to be contended by Dr. Nylander that cognate species, however numerous they may be, ought not to be separated into genera and that no limiting number of species can be assigned to a genus. Certainly there is no reason why we should fix upon an arbitrary limiting number, which it would be improper to exceed; although, on the other hand, it may be desirable that genera should not be overburdened with species. One of the objects of classification is, that the generic name, like an algebraic formula, should be the symbol of certain characteristics of all the species included in the genus and these are stored in our memory.

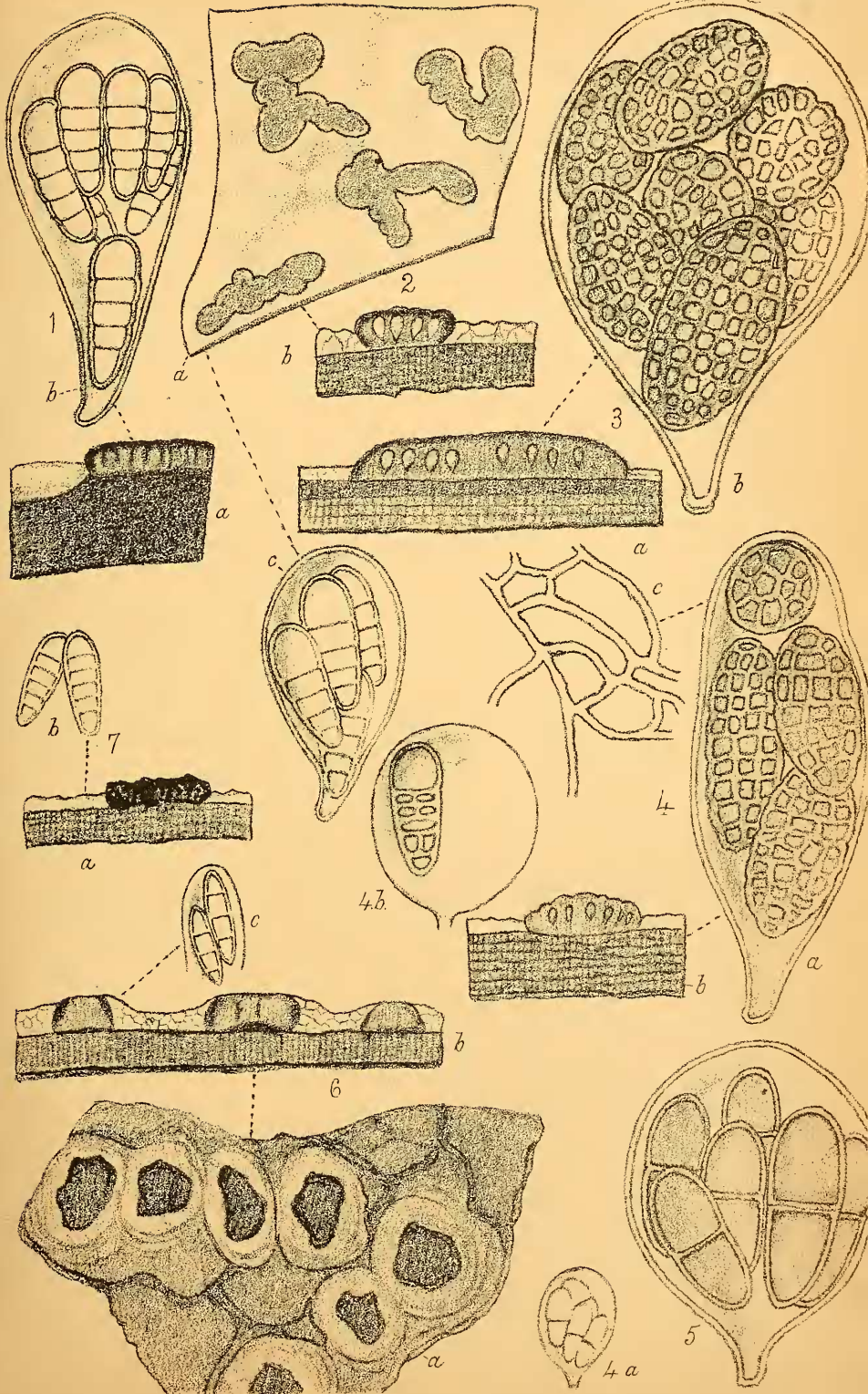
To take an instance. There are not much less than 500 species at present arranged under *Lecidea*, a genus which is limited by a small number of characters. Is it not a real disadvantage to the progress of a science that the generic name in this instance conveys to the mind so little of the nature and organization of any one of the 500 species. On the other hand, if we break up the *Lecidea* into several genera and group the new genera in

natural sequence under one tribe or subtribe, the few characters which at present define the genus would be sufficient for the higher group, in accordance with the law enforced by Jussieu, that the larger the group the fewer the characters by which it is limited. What reasonable objection can be urged to the proposal. We should outrage no natural alliance of the species. While the advantage would consist in this, that the name of each lichen would carry with it not only the tribal characters but also its distinguishing generic characteristics, and would thus secure to the student one of the leading objects of a natural classification.

It is urged that to scatter cognate species amongst a number of genera would be an offence against the harmony that exists in nature; but if so, and we are to be governed by mere prudery, no division of species could be admitted, seeing that, as Ray asserted and Linnæus copied, "*Natura non facit saltus.*" Indeed, there is no scheme of classification which is not liable to the objection that between two closely-allied genera there will always be one or more species which can be placed in either of the two; and, as Lindley observes in "*The Vegetable Kingdom,*"—"it cannot be of any possible consequence whether an intermediate or frontier plant be assigned to one group or another and convenience alone should be considered in such a matter. * * * All the groups into which plants are thrown are, in one sense, artificial, inasmuch as Nature recognizes no such groups. Nevertheless, consisting in all cases of species very closely-allied in nature, they are in another sense natural. But as the classes, subclasses, alliances, natural orders and genera of botanists have no real existence in nature, it follows they have no fixed limit and consequently it is impossible to define them." That differences exist among the *Lecidææ* as now constituted sufficient for the purpose of arranging the species under several genera is certain from the success which appears to have attended the labours of Massolonga and others. Nylander himself has arranged them in sections. As to the questionable value of Massolonga's scheme, I do not at present wish to make any remarks, or to criticize Nylander's sectional arrangement.

1. *Bæomyces novæ-zealandiæ*, n. sp.

Thallus crustaceus tenuissimus sordide luteolus, madefactus albivirescens, effusus pulverulens (microscopi area granula gonima obsita). Apothecia discoidea peltata, in centro peranguste adnata (diam. circa 2 mm.) madefacta albo-incarnata et convexa, margine obsolete, excipulo proprio incolorato arachnoideo-filamentoso (filis diam. 0.001 mm.), paraphysibus tenuissimis densatis paucis apice laxis nonnihil ramosis. Sporæ in ascis cylindræis angustissimis confertissimis uniseriales oblongo-subfusiformes incolores simplices, guttam unam magnam (evanescentem glycerinâ) centralem continentes, longit. 0.017 mm., crassit. 0.006 mm.



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LICHENES.



Obs.—*B. roseus* (Sch. No. 31) thallo granuloso, sporis fusiformibus leviter curvatis (long. 0·015, crass. 0·0025 mm.) luteolis. *B. byssoides* (Schær. No. 32) hymenio fusco, sporis ellipsoideis long. 0·01 mm., crass. 0·004 mm.

2. *Thelotrema circumscriptum*, n. sp.

Thallus ex ochraceo pallido-fuscus lævis subnitiuseculus tenuis continuus linea fusca determinatus, verrucis apotheciorum hemisphæricis (diam. 0·5 ad 1 mm.) prominulis, ostiolo simplici. Apothecia immersa excipulo proprio laterali dilute fusco instructa, matrice enata, madefacto epithecio in sectione multo dilato, paraphysibus distinctis apice dilute coloratis. Sporæ subclaviformes interdum oblongæ hyalinæ 6–12-septatæ, long. 0·02 ad 0·035 mm., crassit. 0·005 mm.

Ad cortices arborum.

3. *Thelotrema farinaceum*, n. sp.

Thallus albus cartilagineus nitidus continuus, verrucis apotheciorum globosis confertis. Apothecia primum clausa tandem late aperta, disco dilute colorato albo-pruinose, margine albo elevato farinaceo, paraphysibus subtilissimis subramosis. Sporæ in ascis crebris monosporis oblongo-clavatæ circiter 14-septatæ, longit. 0·14 mm., crassit. 0·04 mm.

Ad arborum cortices.

4. *Pertusaria leucodes*, n. sp.

Thallus albus passim rimosus, verrucis apotheciorum convexis v. hemisphæricis concoloribus, ostiolo primitus minuto mox in pseudo-discum nunc planum nunc urceolatum (interdum cavatum) confluentibus. Apothecia 1–3 in quavis verruca, excipulo proprio nullo, hymenio thallo enato, paraphysibus adglutinatis clathratim-ramosis. Sporæ 2, 4, 8næ, in iisdem apotheciis, ellipsoideæ simplices, pluries limbatae, longit. 0·05 mm., crassit. 0·02 mm.

Ad arborum cortices.

5. *Pertusaria fumosa*, n. sp.

Thallus fumoso-nigricans intus albus tuberculosis, tuberculis apotheciorum parvis globosis albescentibus mox hiantibus, epithecium urceolatum nigrescens denudantibus, margine elevato nonnihil subtumido irregulari, excipulo proprio nullo, hymenio strato gonimico oriundo, paraphysibus adglutinatis obscure ramosis. Sporæ in ascis clavatis ovoideæ simplices angustè limbatae luteolæ, longit. 0·025 mm., crassit. 0·012.

Ad arborum cortices.

6. *Phlyctis stromaphora*, n. sp.

Thallus crassus albidus granulosis areolatus, areolis nonnihil conglobatis. Apothecia in stromatibus thallinis creberrimis rotundato-diformibus v. convexo-prominentibus v. planis inæqualibus immersa, plura in singulis

stromatibus, punctis minutis indicata inde plerumque pyreno-carpoidea, passim epitheciis tandem evolutis fuscis concavis sæpe confluentibus et tum varie oblongis, margine thallino elevato cinctis, madefactis thallum æquantibus; hymenium thalli strato crasso impositum, paraphysibus capillaribus non discretis apice fuscis non dilatis. Sporæ ellipsoideæ v. fusiformes nonnunquam cuneiformes 7-8-septatæ tandem flavescens, longit. 0.057 mm., crassit. 0.013 mm.

Ad arborum cortices.

7. *Phlyctis cyrtospora*, n. sp.

Thallus cinereo-albidus tenuis lævis continuus, arefactus minutissime areolatus. Apothecia innata rotundato-diformia parva sparsa (solitaria v. aggregata), margine thallino crasso plano elevato, excipulo proprio nullo, paraphysibus bene discretis. Sporæ oblongo-fusiformes nonnunquam cuneiformes 7-septatæ luteolæ demum fuscentes curvatæ, longit. 0.085 mm., crassit. 0.018 mm.

Ad arborum cortices.

Obs.—*Phlyctis oleosa*, Stirt., “thallus areolato-diffractus, areolis concavis, sporæ incolores in thecis incrassatis una cum guttulis flavidis oleosis inclusæ” (*Stirton*).

8. *Bacidia minutissima*, n. sp.

Thallus tenuis ex olivaceo fuscus continuus indeterminatus. Apothecia minutissima (diam. 0.2 mm.) innata convexa nigro-fusca nonnihil e thallo velata immarginata, hymenio (in sectione subtilissima) dilute fusco, strato subhymeniale fusco, excipulo proprio dilute fusco—texturâ radiatim dispositâ—paraphysibus adglutinatis gracilibus apice dilutis fuscis. Sporæ in ascis clavatis bacillares spiraliter curvatæ nonnihil rectæ circiter 9-septatæ incolores, longit. 0.043 mm., crassit. 0.003 mm.

Ad arborum cortices.

9. *Lecidea (Catillaria) clathrata*, n. sp.

Thallus cinereus v. dilute cinereo-viridescens subgranulosus continuus linea atra limitatus. Apothecia atro-fusca superficialia (diam. circ. 3 mm.) nonnullo margine thalode in parte instructa, disco pruinoso, margine proprio atro-fusco prominente nonnihil nitido, hypothecio incolori excipuli linea atra imposito, excipulo dilute ochraceo-fusco in summo atro et linea atra omnino circumscripto, paraphysibus adglutinatis subtilissimis (crassit. 0.001 mm.) clathrato-ramosis. Sporæ in ascis oblongis magnæ ovatæ plerumque incurviusculæ uniseptatæ (epispora crass. 0.005 mm.) incolores, longit. 0.06 mm., crassit. 0.03 mm.

Ad arborum cortices.

Obs.—Inter *L. marginiflexam* atque *L. clathratam* præcipua differentia in sporis illius oblongis et ascis monosporis, hujus sporis ovatis et 8nis est

posita. *L. grossa*, excipulo omnino carbonizato. *L. versicolor*, v. *tuberculosa*, et *L. taitensis* excipuli structura radiante. *L. grossa*, *versicolor*, *taitensis*, sporis multo minoribus quam in *L. clathrata*.

10. *Lecidea cinnabaroides*, n. sp.

Thallus sordide testaceus effusus nonnihil leprosus tenuissimus. Apothecia rubra sparsa, margine concolore crassiusculo prominente, excipulo e guttis oleaceis hyalinis alius minutis alius sat grandibus formato, textura non radiatim disposita, a lateribus et basi per lineam tenuem aurantiacam contento, paraphysibus distinctis apice coloratis ovato-dilatatis. Sporæ in ascis clavatis simplices luteolæ v. incolores ellipsoideæ, longit. 0·015 mm., crassit. 0·007 mm.

Ad arborum cortices.

Obs.—*L. cinnabaroides*, Nyl., in litt.

11. *Arthonia (Coniangium) stictaria*, Nyl.

Thallus nullus. Apothecia atra innata rotundata ambitu applanata in centro convexa, hymenio tenui (crass. 0·035 mm.) pseudo-excipulo e matrice vitata constante, lamina sporigera laxissime clathrata, hypothecio tenui grumoso in marginem se explicato. Sporæ in ascis pyriformibus minutæ obovatæ incolores 1-septatæ, cellula superiore ampliore, long. 0·009 mm., crass. 0·0035 mm.

Ad Stictam auratam parasitica.

12. *Arthonia (Coniangium) conspicua*, Nyl.

Thallus sordide albus tenuissimus (v. nullus) continuus. Apothecia hypoplæodes sparsa rubricoso-fusca nuda rotundata v. difformia aspera, madefacta convexa (diam. circiter 1 mm.), intus luteo-fusca, lamina sporigera perfecto clathrato-ramosa. Sporæ in ascis globosis oblongo-ovoideæ 1-septatæ (cellula superiore vix ampliore) dilute luteo-fuscæ tandem fuscæ, emortuæ atro-fuscæ, longit. 0·025 ad 0·032 mm., crassit. 0·01 ad 0·012 mm.

Ad arborum cortices.

Obs.—Ab *A. lurida*, Ach., et *A. vinosa*, Leight., differt sporis duplo majoribus. *Syn. Myriangium inconspicuum*, Bab. ("Flora New Zealand," p. 310.)

13. *Arthonia aspera*, n. sp.

Thallus albidus v. albedo-cinerascens, plagulas parvas formans, tenuissimus lævis continuus. Apothecia hypoplæodes adnata aspera atra rotundato-difformia parva (latit. circiter 0·5 mm.) intus fusca excipulo destituta hymenio nullo, lamina sporigera floccosa plus minus carbonizata. Sporæ in ascis pyriformibus cuneato-oblongæ 6-loculares, loculo supremo vix ampliore, fuscæ emortuæ atro-fuscæ, long. 0·017, crassit. 0·006 mm.

Ad cortices.

14. *Arthonia lecideoides* n. sp.

Thallus uniformis lævis v. pulverulento-furfuraceus (passim byssoideo-furfuraceus) olivaceus, gonidiis crebris. Apothecia pseudo-lecidina hypoplæodes rotundato-diformia plana non-nihil subconvexa atra adnata immarginata (diam. circiter 1 mm.), hymenio fusco, lamina sporigera floccosa (vere subtilissime clathratim ramosa), basi laminæ sporigeræ et matricæ plus minus carbonizatis, crassis. Asci pyriformes inter laminas sporigeras condensatas oriundi. Sporæ nymphæformes ex hyalino fusciculæ, emortuæ fuscæ, 5-cellulæ, cellula extrema ampliore, longit. $\cdot 023$, crassit. $\cdot 008$ mm.

Ad cortices.

15. *Arthonia lirellæformis*, n. sp.

Thallus e lilacino cinerascens tenuis lævis continuus per lineam fuscam limitatus. Apothecia hypoplæodes (matricæ immutata) fusca lirellæformia oblonga v. elongata simplicia v. ramosa plerumque flexuosa undique attenuata innata ambitu cinereo-pulverulenta, hymenii lateri carbonizato, lamina sporigera clathrata et tanquam ab ascis compressa epithecio atrofusco. Sporæ in ascis pyriformibus obtuse cuneato-oblongæ tandem fusciculæ 4-septatæ, cellula suprema ampliore, longit. $0\cdot 02$ mm., crassit. $0\cdot 008$ mm.

Ad cortices arborum.

16. *Arthonia pellucida*, n. sp.

Thallus e cinereo albus tenuissimus lævis continuus. Apothecia hypoplæodes (matricæ immutata) atrofusca depressiuscula lobato-diformia sæpe inter se juncta, ambitu a thallo plus minus velata intus pellucida, pseudo-excipulo omnino destituta, lamina sporigera laxissime clathrata. Sporæ in ascis globosis cuneato-oblongæ hyalinæ tandem fusciculæ 5-septatæ, cellula superiore ampliore ceteris plerumque longitudinalibus divisis, longit. $0\cdot 02$ mm., crassit. $0\cdot 008$ mm.

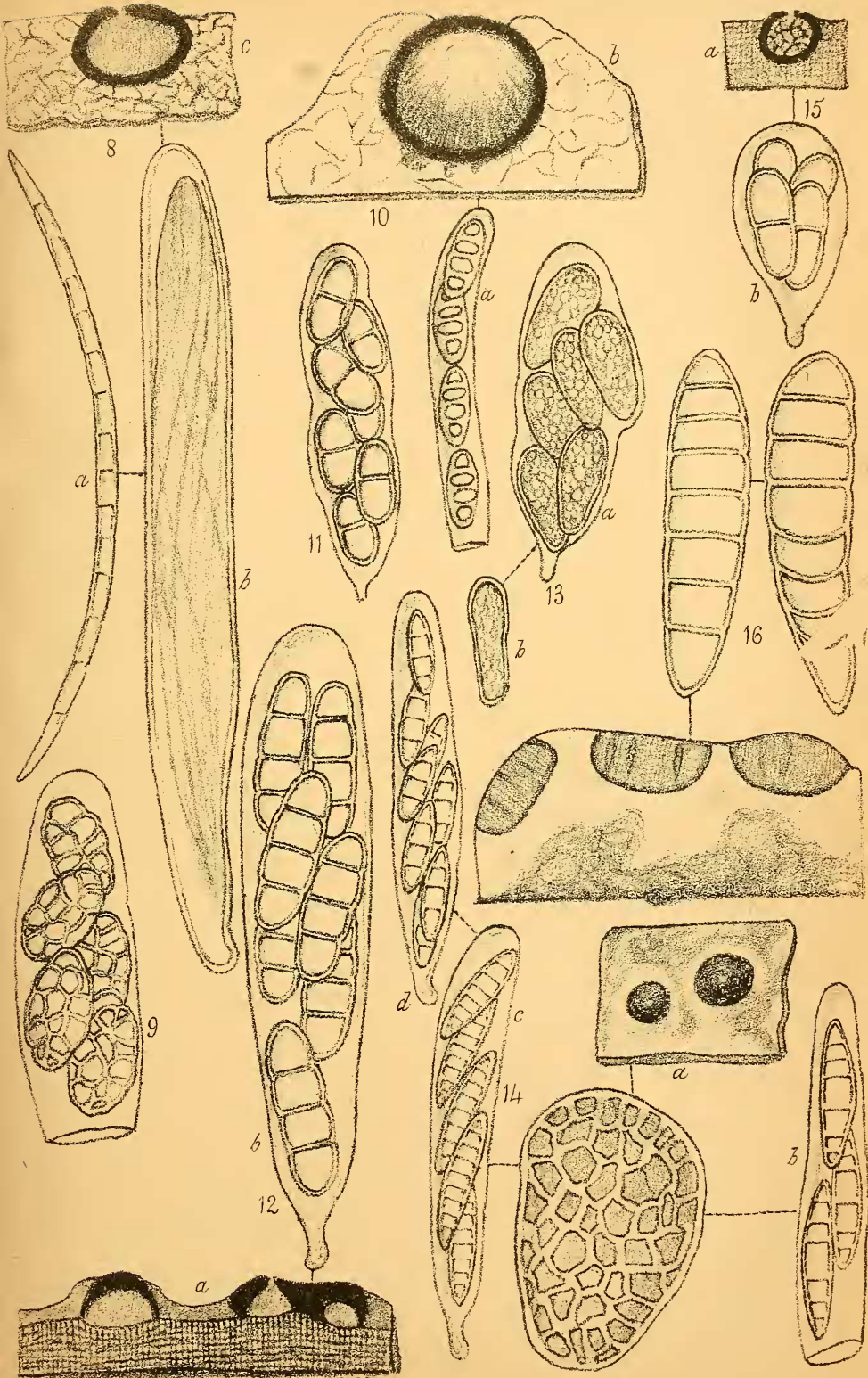
Ad arborum cortices.

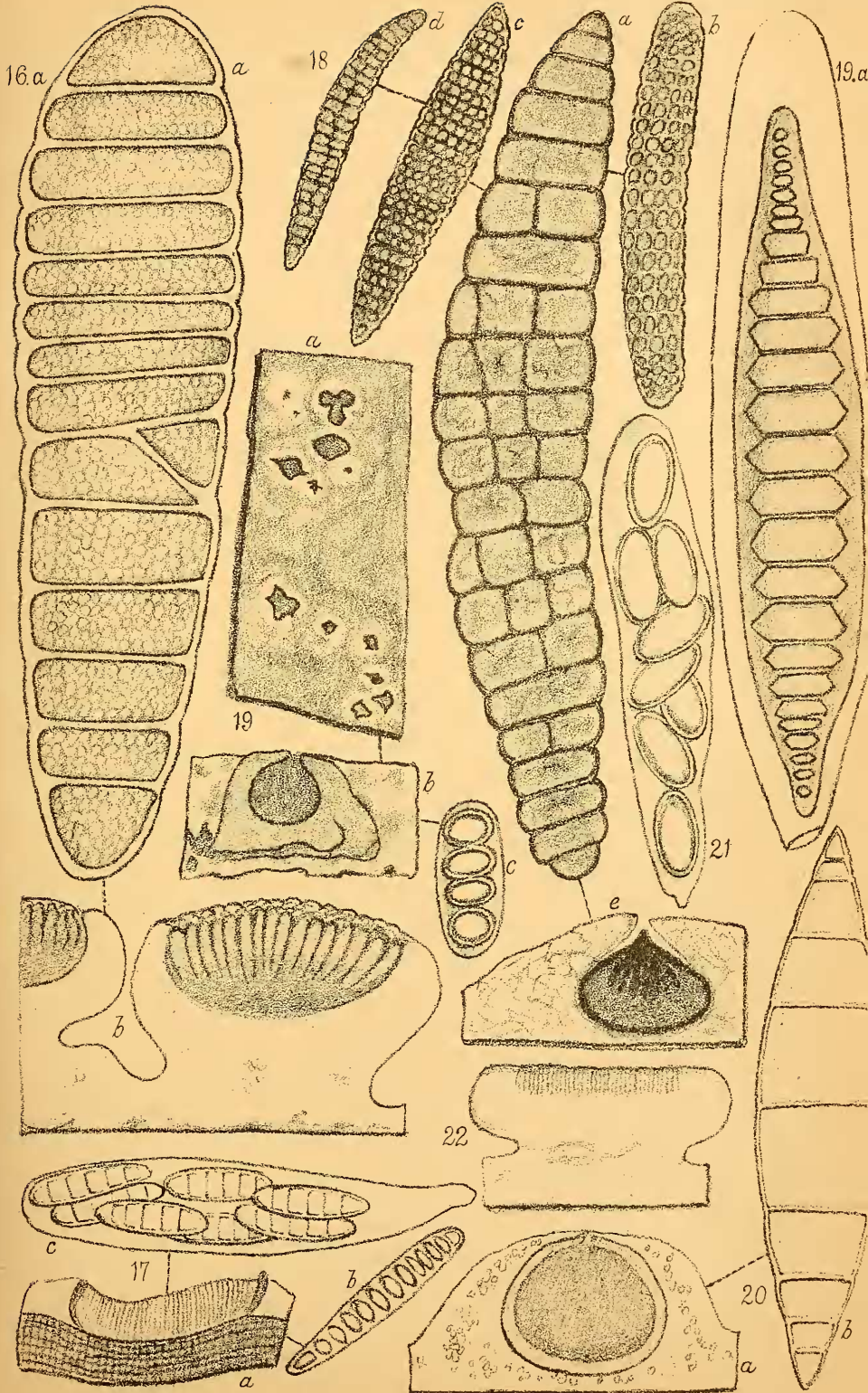
Obs.—Affinis est *A. lirellæformi* et vix differt nisi pseudo-excipulo omnino egente et sporæ cellulis longitudinalibus divisis; fortasse tamen haud species est distincta.

17. *Arthonia (Lecanactis) tenuissima*.

Thallus nullus v. macula minuta albida indicatus. Apothecia hypoplæodes (matricæ immutata) atra maculæformia intus mox fusca v. atra, hymenio tenui (crass. $0\cdot 06$ mm.), ambitu evanescente, lamina sporigera laxissime clathrata. Asci fusiformi-ellipsoidei creberrimi (long. $0\cdot 046$ mm.) Sporæ naviculares hyalinæ mox fuscæ emortuæ atrofuscæ 5-septatæ, cellulis mediis paulo amplioribus, longit. $0\cdot 014$ mm., crassit. $0\cdot 005$ mm.

Ad arborum cortices.





C. Knight, del.

LICHENES.

