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Original Articles.

ALABASTRA DIVERSA

AUCTORE S. LE M. MOORE.

Pars tertia.

(TAB. 206.)

NEPENTHES DYAK, *sp. nov.*

CAULE subtereti glabrato, foliis approximatis coriaceis elongatis oblongis utrinque angustatis deinde glabris pagina superiore eximie reticulato-nervosis petiolo late alato amplexicauli suffultis cirrho quam folium multoties breviore gracili, ascidiis parvis exalatis cylindraceo-ventricosis reticulato-nervosis rufo-tomentellis mox glabris ore rotundato peristomio aliquanto angusto crebre costato in collum gracilem producto ad operculi insertionem valide decurvo-bicalcarato operculo rotundato-cordato intus lævi, panicula elongata valida glabra laxiflora, floribus longe pedicellatis ad apicem ramulorum congestis, perianthii segmentis oblongo-ovatis, columna staminea brevi gracili, fl. fœm. haud visis.

Hab.—In Borneo legit Tejsmann (No. 10962).

Videtur ex affinitate *N. eustachyæ*, Miq. abs qua diversa foliis multo majoribus, ascidio dispari, floribus paniculatis.

Rami circiter 1·0 cm. lat. Folia (petiolo incluso) ad 33·0 cm. long. et 5·0 cm. lat., subtus ad costam rufo tomentella mox glabra; cirrhus circiter 7·0 cm. long., sub ascidio incrassatus. Ascidia 4·5–5·0 cm. long. vix 3·5 cm. lat. Perianthii segmenta 0·4 cm., columna staminea 0.15 c.m. long.

Ante oculos habui *Ranunculi extorris* Hance specimen a cl. Shearer ad Kiu Kiang Chinæ cent. lectum.

Cardamine bracteata, nob. (Journ. Bot., 1878, p. 130) monente cl. Maximowicz est *Eutrema Wasabi*, Max. Itaque *C. chelidonioidem* nob (*op. cit.*) prius descripserunt cll. Franchet et Savatier sub nom. *C. Tanakæ*.

ACRIDOCARPUS HIRUNDO, *sp. nov.*

Caule tereti rufo-tomentoso deinde probabiliter glabro et cinereo, foliis alternis brevipetiolatis obovato-oblongis brevissime cuspidulatis coriaceis supra fere glabris subtus pallidioribus et reticulatis

et precipue secus nervum medianum rufo-tomentellis, racemis elongatis foliis longioribus rufo-tomentosis dein glabris, bracteis firmis ovatis vel ovato-lanceolatis concavis, sepalis crassis ovatis vel ovato-lanceolatis uno glandulis parvis duabus notato, petalis late ovatis superne breviter erosis, samaris duobus longissimis late oblanceolatis coriaceis reticulato-nervosis rufo-tomentosis mox glabris.

Hab.—In Liberia Afr. Trop. Occ. ubi repperit Carder.

Folia ad 8·5 cm. long. et fere 4·0 cm. lat. fortasse juvenalia utrinque rufo-tomentosa. Racemi 16·0 cm. et bracteæ circiter 0·3 cm. long. Pedunculi 3·0 cm. long., mox glabri. Flores circiter 2·0 cm. diam. Samaræ 6·0–7·0 cm. long., sub apice 1·5–1·7 cm., basi 0·7 cm. lat.

Species insignis multis de characteribus a congeneribus abhorrens.

Dalhousiea africana, *sp. nov.*

Foliis petiolatis oblongo-lanceolatis apiculatis vel cuspidatis obscure cordatis glabris conspicue minuteque nervosis subcoriaceis, corymbis vel paniculis terminalibus aut axillaribus, pedicellis laxe fusco-tomentosis dein glabris, bracteis bracteolisque rotundatis obtusissimis fusco-ciliatis ætate omnino glabris ac (ut in *D. bracteata*) longitudinaliter nervosis.

Hab.—In Angola unde habuit Dr. Welwitsch a Golungo Alto, et a Quiballa mens. Apr. florens (Monteiro).

D. bracteata, Wall. a nostra planta distat præsertim ob folia valde diversa et bracteas bracteolasque paullo minores et partes juniores tomento fusco destitutæ.

"A large, spreading, trailing bush; very handsome. All the flowers and buds white. Leaves bright glossy green."—Monteiro. Mr. Baker has already recorded in manuscript his belief that Monteiro's plant is a new species. I cannot see that it differs in any way from Welwitsch's Golungo Alto specimen referred in 'Flora of Trop. Africa,' ii., 247, to *D. bracteata*.

Pithecolobium zanzibaricum nob. (Journ. Bot., 1877, p. 292) certe est *Acaciæ* sp. ex affinitate *A. Ehrenbergianæ*, Hayne.

Rubus paradoxus nob. (Journ. Bot., 1878, p. 132) est *R. leucanthi*, Hance ramulus incompleto evolutus foliis saltem supremis oppositis et quam in typo majus coriaceis.

"*Deutzia parviflora*, Bge." (Alabastra, pars II., Journ. Bot., 1878, p. 179) est *D. gracilis*, S. & Z., specimen parvum.

Cacoucia velutina, *sp. nov.*

Scandens caulibus teretibus sparsim villosis deinde glabris, foliis subsessilibus ovatis vel ovato-oblongis acute cuspidatis basi cordatis subcoriaceis nervis villoso-pilosis exclusis glabris, racemis erectis fusco-velutinis, bracteis acuminatissimis quam ovarium multo longiore, calycis fusco-velutini tubo elongato inferne angustato lobos triangulares acutos saltem duplo excedente, disco glabro pilorum annulo coronato, petalis oblanceolatis apiculatis puberulis, filamentis calycem fere duplo excedentibus, fructus nec

a me nec ut opinor a cl. Lawson visus—*C. coccinea*, Laws. Fl. Trop. Afr., II., p. 434 (non Aubl.).

Hab.—Ad fl. Bagroo Afr. Trop. Occ. legit Mann, No. 856.

C. coccinea, Aubl. differt foliis plerumque minoribus, bracteis acuminatis, sed precipue calyce omnino diverso.

In herb. Kew est *Potentillæ Dickinsii*, Fr. et Sav. specimen ex descriptione Franchetiana faciliter recognoscendum.

Medinilla halogeton, *sp. nov.*

Glaber caule valido subtereti passim breviter alato cinereo vel pallide brunneo, foliis oppositis brevipetiolatis oblongis leviter acuminatis 3–5-nerviis aliquanto carnosis, florum longipeduculatorum fasciculis paucifloris in axillis ramorum defoliatorum sessilibus pedunculis gracilibus apicem versus interdum carnosis, bracteis prope basin pedunculi minimis, calycis tubo turbinato limbo truncato obscure sinuato, petalis verisimiliter 4 ovato-oblongis obtusis, staminibus 8 æqualibus incurvis porosis postice appendice apicem versus incrassata et breviter lamellata ferentibus, bacca ovoidea glabra, seminibus triangularibus lævibus nitidis.

Hab.—In ins Admiralty dictis repperit H. N. Moseley supra arbores magnos mare impendentes vigentem.

Caulis usque ad 7·0 cm. crassus, nodosus. Folia ad 21·0 cm. long. et 6·5 cm. lat. petioli vix 1·0 cm. long. Pedunculi 2·0 cm. long. Flores splendide punicei ex Moseley 1·3 cm. long. Calyx et petala succulenta.

Inter affines primo intuitu distincta ob inflorescentiam cauliflorem.

Tococa (§ *Hypophysca*) coriacea, *sp. nov.*

Nodis caulis glabri paullo tumidis, foliis ovatis acuminatis basi truncatulis vel leviter cordatis coriaceis subtus valide nervosis puberulis supra hirto-pilosulis margine involuti obscure ciliatis, petiolis brevibus, vesicis parvis, paniculis terminalibus paucifloris floribus verisimiliter nudis, calycis apteri parcissime pilosi tubo inconspicue costato limbo truncatulo fere omnino obsoleto, petalis 5 ovatis inæqualiter emarginatis unilateraliter undulatis, staminibus 10 antheris demum recurvis connectivo inappendiculato.

Hab.—Crescit ad Belise Amer. Cent. unde misit prefectus Barlee.

Folia ad 15·0 cm. long. et 10·0 cm. lat.; petioli vix 1·5 cm. long. vesicas obscurissime papillosas duplo excedentes.

Ad *T. guianensem*, Aubl. mihi videtur proxime accedere, abs qua inter alias signas differt caule glabro, foliis coriaceis nervosis, vesicis nequaquam hirtis.

Astronia Samoensis, *sp. nov.*

Glabra foliis longe petiolatis ovato-lanceolatis ovatisve breviter acuminatis basi attenuatis pro genere sat obscure reticulatis supra læte subtus pallide viridibus tenuiter coriaceis paniculis laxis, floribus mediocribus, calycis campanulati limbo irregulariter plurilobulato, petalis 6 late oblongis crassiusculis, staminibus 12 antherarum loculis postice acute calcaratis, ovario 5-loculo vertice fere plano, seminibus ignotis.

S. H.

Hab.—In ins. Samoa ubi eam habuit Rev. S. J. Whitmee (No. 122 in hb. Kew).

Foliorum lamina 10·0–13·0 cm. long. et 4·0–4·5 cm. lat., petiolus 2·0–3·0 cm. long. Calyx 0·4 cm. long., sub flore vix 0·5 cm. diam. Petala 0·6 cm. long. Antherarum appendix 0·1 cm. long., debilis incurva.

Proxima videtur *A. tomentosæ*, Seem., et *A. Pickeringii*, Gray, sed floribus 6-meris ab ambabus facile notata. Ab *A. tomentosa* distat itaque inter alia foliis longioribus angustioribus et tomenti absentia, ab *A. Pickeringii* foliis angustioribus minus coriaceis et nervosis late viridibus, inflorescentia laxiore, pedunculis longioribus, antheris disparibus.

Ab *A. confertiflora*, Gray, et *A. ? subcordata* evidenter, ut ex descriptione patet, multis de notis abhorret.

Sphærosicyos Meyeri, Hook. f., crescit in ins. Comoro unde misit Hildebrandt (No. 1603).

PENTANISIA OURANOGYNE, *sp. nov.*

Caule erecto pilis albidis patenti-villoso, foliis elongatis linearibus acutis sparsim strigoso pubescentibus, stipulis longe setaceis villosis patulis, calycis villosi lobis 2 majoribus linearibus pubescentibus, corollæ profunde cæruleæ tubo gracillimo superne sensim ampliato extus crebre puberulo fauce villoso, staminibus florum omnium nobis obviorum longiuscule exsertis.

Hab.—In locis sterilibus in Ukamba Afr. Trop. Or. (Hildebrandt, No. 2754.)

P. variabili, Harv. proxima sed ob folia elongata linearia, stipulas longiores, floresque cæruleos vix ejus varietas.

Folia ad 8·0 cm. long., basi abbreviata; stipulæ 0·6 cm. long. Calycis lobi circiter 0·4 cm. long., basi ipsa connati. Corollæ tubus 1·3 cm. long.

OTOMERIA OCULATA, *sp. nov.*

Caule subtereti strigoso-pubescente demum vix glabro, foliis subsessilibus lineari-lanceolatis acutis basin versus sensim angustatis, stipulis 2–(3 ?-) fissis lobis linearibus, calycis puberuli tubo brevi laciniis linearibus, vel 2 vel 3 quam reliquæ multo longiores, corollæ tubo sub fauce ipso dilatato limbo magno, staminibus insertis, stylo longe exserto, stigmatis lobis linearibus.

Hab.—Ukamba Afr. Trop. Or. (Hildebrandt, No. 2756).

Suffrutex. Folia membranacea 3–5 cm. long., sparsim puberula. Calycis lacinia longiora 1–2 cm. long., laciniæ breviores 0·2–0·3 cm. long. Corollæ tubus vix 2·5 cm. longitudine, limbus circiter 1·2 cm. diam. pallide flavidus cæruleo-oculatus.

Congeneribus ab omnibus foliis lineari-lanceolatis, calycis tubo brevi floribusque magnis uno aspectu dignoscenda.

Sebæa oldenlandioides, nob. (Journ. Bot., xv., 68) = *Exacum quinquenervium*, Griseb.

Crawfurdiæ japonicæ, S. & Z. specimen coll. Prof. J. B. Steere ad Posia in ins. Formosa.

3673 NEPETA MANCHURIENSIS, *sp. nov.*

Erecta foliis petiolatis supremis fere sessilibus late lanceolatis obtusis dentato-serratis supra saturate subtus pallide viridibus et reticulato-nervosis, verticillastris densifloris pedunculatis, bracteis lineari-setaceis quam calycis tubus brevioribus, calycis tubulosi 15-nervii puberuli lobis lanceolatis tribus paullo altius connatis, corollæ tubo gradatim ac leviter amplificato calycem duplo excedente limbi labio postico 2-fido lobos laterales æquante labii antici lobo mediano magno emarginato, nuculis ignotis.

Hab.—Ad oras Manchurienses anno 1859 repperit Wilford (No. 1187 in hb. Kew).

N. subsessili, Max. arcte affinis sed foliis petiolatis minus argute dentatis, inflorescentia nec superne spicata nisi specimen unicum nobis obvium incompletum, calyce minore multo minus conspicue bilabiato et corollæ minoris tubo angustiore certe distincta.

Caulis robustus, obscure puberulus, purpureus. Foliorum inferiorum lamina ad 10·0 cm. long. et 4·0 cm. lat., basi truncata plerumque vero attenuata; petioli graciles obscure puberuli fol. inf. 2·0 cm. sup. 0·3–0·5 cm. long. Verticillastrorum 2 inf. pedunculus vix 1·5 cm. long., 2 sup. paullo brevior. Bracteæ ad 0·5 cm. calyx ad 0·9 cm. et corolla 1·3 cm. long.

9995 SIPHONOSTEGIA LÆTA, *sp. nov.*

Glanduloso-pubescens foliis parvis oblanceolatis vel anguste obovatis integris vel incisis vel paucilobatis et lobis plerumque incisis foliis floralibus quam calyx longioribus lanceolatis integris calycis tubo gracili conspicue angulato sub limbo ipso attenuato membranaceo limbi lobis lanceolatis foliaceis, corolla ut in *S. chinensi*, Bth., antherarum loculis basi inæqualibus, stigmate simplici.—*S. chinensis*, Bth., var. ? nob. (Journ. Bot. xiii., p. 229).

Hab.—Ad Kiu Kiang Chinæ cent. coll. Dr. Shearer.

Folia plerumque 1·0–1·5 cm. long. (majora et minora exstant) basi in petiolum attenuata sicca atra. Folia floralia circiter 2·0 cm. long. Bracteæ anguste spathulares circiter 0·4 cm. long. Calycis tubus 1·3 cm. long., lobi ejus 0·8 cm. long. et ad 0·3 cm. lat. Capsula ignota.

A *S. chinensi*, Bth. differt vestitu, foliis nequaquam pinnatisectis, foliis floralibus integris, calycis membranacei tubo tenuiore sub limbo attenuato limbi lobis magnis foliaceis, antherarum loculis basi inæqualibus, necnon stigmate simplici.

THUNBERGIA (§ *Eu-Thunbergia*) AFFINIS, *sp. nov.*

Scandens glabra foliis ovatis vel ovato-lanceolatis basin versus angustatis petiolis brevibus gracilibus, floribus in axillis solitariis pedunculatis, bracteis oblongo-lanceolatis obtusis vel acutis membranaceis, calycis lobis elongatis setaceis acuminatis puberulis, corolla antheris et stigmate *T. erectæ*, Bth., capsula longissime rostrata fere glabra.

Hab.—Mombassa Afr. Trop. Or. Hildebrandt (No. 2004 b), Angola, Monteiro.

Folia ad 9·0 cm. long. et 4·0 cm. lat., margine undulata vel

fere omnino integra, eleganter nervosa. Pedunculus 1·5–2·3 cm. long., glaber. Bracteæ ad 3·5 cm. long. eximie reticulatæ, decolores vel virescentes. Calycis lobi parum inæquales usque ad 1·8 cm. long, interdum vero minores. Corollæ violaceæ limbo ad 5·0 cm. diam. Capsula circiter 2·7 cm. long.

Var. *pulvinata*. Foliis et bracteis et floribus minoribus, nodis conspicue pulvinatis.

Hab.—Kitui in Ukamba (Hildebrandt, No. 2749).

Ob similitudinem *T. erectæ*, Bth. e sectione *Meyenia* cavendum ne has species confundas.

THUNBERGIA (§ *Meyenia*) SCHWEINFURTHII, *sp. nov.*

Erecta caule ramoso glabrato sicco longitudinaliter striato, foliis breviter petiolatis lanceolatis vel lineari-lanceolatis parum acuminatis basi hastatis pagina superiore mox pilis paucis strigosis adpressis obtectis pagina inferiore crebre crispeque pubescentibus, pedunculis axillaribus vel terminalibus quam folia brevioribus sparsim pilosulis, bracteis parvis ovato-lanceolatis obtusiusculis longe ac scabride glanduloso-pubescentibus viride reticulatis, calycis limbo sinuato, corollæ sat parvæ tubo basi attenuato superne gradatim ampliato, antherarum fere glabrarum loculo altero incurvo-calcarato altero casso, ovulis quoque in loculo 2.

Hab.—In agris Djurensium (Schweinfurth, No. 1510).

Foliorum lamina 4·0–6·5 cm. long., medio 0·7–1·4 cm. lat.; petioli 0·5 cm. long., pubescentes. Pedunculi ad 2·0 cm., erecti. Bracteæ ad 1·3 cm. long. et 0·5–0·7 cm. lat., intus glabræ. Corolla 3·0 cm. long., limbus ejus vix 1·0 cm. diam. Capsula ignota.

A *T. oblongifolia*, Oliv. differt imprimis foliis petiolatis hastatis angustioribus acuminatis, bracteis minoribus, corollæ majoris tubo basin versus angustato; a *T. Kirkiana*, T. And. cujus folia hastata vestitu, pedunculis brevioribus bractearum corollarumque forma, &c.

CARDANTHERA JUSTICIOIDES, *sp. nov.*

Foliosa spithamea vel minus, ramulis patulis ascendentibus, foliis sessilibus ovato-oblongis floralibus minoribns ovatis omnibus obtusis basin versus attenuatis sparsim hirsutulo-pubescentibus supra saturate subtus pallidiore viridibus, floribus in axillis solitariis vel perpaucis, bracteis lineari-lanceolatis hispide pilosis quam calyx paullo brevioribus, calycis laciniis subæqualibus longissime setaceis hispide pilosis, corollæ parvæ labio antico breviter rotundatilobato postico 2-fido vel oblique emarginato, staminibus 4 antherarum loculis æqualibus vel altero minore staminum 2 superiorum quam eos inferiorum majoribus, ovario pluriovulato puberulo, stylo crebre piloso, stigmatis lobo altero dentiformi, capsula parva oblonga obtuse cuspidulata circiter 12–14 sperma.

Hab.—Ad fl. Nilum. (Schweinfurth, No. 972).

Caulis tenuis, tetragonus, primo hirsutus ætate pubescens vel puberulus. Folia ad 1·7 cm. long., magno pro parte vero minora. Corolla fere 0·4 cm. long. Capsula 0·5 cm. long., obscure puberula.

Ex affinitate *C. uliginosæ*, Br. (*Adenosma*), abs qua calyce dispari, floribus multo minoribus, capsula breviore puberula aliisque notis discedit.

CARDANTHERA AFRICANA, *T. And.* (Adenosma.)

Var. *Schweinfurthii.* A typo divergens præsertim fasciculis plurifloris et bracteis latioribus.

Hab.—In ditione Bongoensi repperit Schweinfurth (Nos. 2708, 2764, 2799).

RUELLIA SCLEROCHITON, *sp. nov.*

Caule tenui tetragono glabrato, foliis longipetiolatis ovatis obtusis undulatis utrinque puberulis conspicue reticulato-nervosis membranaceis pagina inferiore pallidioribus, floribus mediocribus in axillis ramulorum lateralium brevium superiorum solitariis vel ad apicem ramorum positis, bracteis linearibus calyce brevioribus, calycis sparsim ciliatæ laciniis æqualibus linearibus longissime acuminatis 1-nerviis, corollæ tubo recto omnino uniformi limbi valde obliqui lobis oblongis æqualibus 2 posticis inter se majus liberis, filamentis basi dilatatis liberis, styli lobo altero fere omnino obsoleto altero attenuato lamellato recurvo, ovulis quoque in loculo 6.

Hab.—In terris Niamniamensium legit Schweinfurth (No. 3257).

Caulis in exemplario parvo meos ante oculos ad 0·2 cm., crassus siccus brunneo-ater. Foliorum pagina 5·0–7·0 cm. long., 3·0–4·0 cm. lat., petiolo puberulo 2·0– fere 4·0 cm. long., suffulta. Calycis laciniæ vix 1·0 cm. long. Corolla vix 1·5 cm. long., limbus ejus fere 1·0 cm. diam. Capsula ——.

A very remarkable species, aberrant from its congeners by reason of the very oblique limb of its corolla, a character which must place in one well-defined section all the future discoveries exhibiting it.

A plant collected by Mann in the Cameroons (No. 1259 in part in Herb. Kew), with the same curiously oblique corolla, may perhaps be a varietal form of this species.

RUELLIA AMABILIS, *sp. nov.*

Caule tenui quadrangulari geniculato villosulo-pubescente mox pubescente, foliis longe graciliterque petiolatis membranaceis late ovatis breviter cuspidatis basi leviter cordatis nonnunquam fere truncatis repandis supra saturate viridibus sparsim minute pubescentibus subtus pallidioribus et secus nervos prominenter villosulis, floribus magnis in axillis superioribus solitariis (an semper ?) pedunculatis, bracteis quam calyx multo brevioribus linearibus obtusis villosulis, calycis 5-partiti laciniis subæqualibus erectis elongatis lineari-lanceolatis obtusis piloso-villosulis margine debiliter ciliatis, corollæ tubo longissimo tenuissimo fere uniformi (basin versus leviter dilatato) obscure puberulo abrupte in faucem brevem campanulatam ampliato limbi lobis subæqualibus late ovatis, staminibus leviter exsertis, disco inconspicuo, ovario oblongo breviter stipitato pubescente, stylo crassiusculo, ovulis quove in loculo 6, capsula ——.

Hab.—Taita Afr. Trop. Orient (Hildebrandt, No. 2480).

Ab omnibus congeneribus africanis recedit foliis pro genere ac ordine longissime petiolatis, precipue vero calycis et corollæ forma atque magnitudine. Corolla eam *R. aruensis* aliquanto simulat. Folia (petiolo excluso) fere ad 8·0 cm. long. et 6·5 cm. lat.; petiolus ad 4·0 cm. long., siccus parum flexuosus, villosulus. Pedunculus 1·3 cm. long., villosulus. Bracteæ 0·8 cm., calycis laciniæ 1·5 cm., corollæ lacteæ tubus circiter 6·0 cm. longitudine; corollæ tubus medio 0·2 cm. lat., limbus circiter 2·5 cm. diam.

Calophanes thunbergiæflora, *sp. nov.*

Frutex (ex Hildebrandt) caule ramoso folioso angulato pubescente deinde glabro albido, foliis parvis membranaceis breviter tenuiterque petiolatis ovatis minutissime cuspidulatis basi oblique attenuatis puberulis læte viridibus, racemis axillaribus brevibus paucifloris, bracteis plerumque minimis setaceis, calyce longe tubuloso magnilobo crebre glanduloso-puberulo, corollæ maximæ tubo elongato levissime curvato superne in faucem longam campanulato-tubulosam amplificato limbi lobis rotundatis, staminibus 4 subinclusis filamentis crassiusculis glandulosis antherarum loculis longe calcaratis, stylo glanduloso, stigmatis lobo postico dentiformi, capsula ignota.

Hab.—Crescit ad Kitui in Ukamba Afr. Trop. Orient. unde habuit Hildebrandt (No. 2719).

Species eximia et corollis magnis eas *Thunbergiæ erectæ* mentientibus inter affines facile distinguenda.

Folia plerumque 1·5–2·0 cm. long.; petiolus 0·3–0·5 cm. long., obscure puberulus. Bracteæ plerumque circiter 0·3 cm. long. Calycis tubus 1·0 cm. et lobi ejus 0·7 cm. long. Corolla violacea, decora, circiter 4·5 cm. long., 3·0 cm. diam.

Calophanes Hildebrandtii, *sp. nov.*

Frutex ramosissima (ex Hildebrandt) partibus junioribus glanduloso-patenti-hirsutulis, caule tetragono mox glabro cortice albido obducto, foliis petiolatis anguste ovato-lanceolatis obtusiusculis basi brevissime attenuatis margine crispulis, racemis axillaribus breviter pedunculatis paucifloris, calycis laciniis quam tubus longioribus, corollæ majusculæ tubo gracili erecto sub fauce amplificato limbi lobis ovatis, staminibus 4 subinclusis alte insertis basi pubescentibus, antherarum loculis breviter aristatis, styli pubescentis lobo postico obsoleto, capsula anguste acuta 2-sperma.

Hab.—Ad Kitui in Ukamba Afr. Orient (Hildebrandt, No. 2718).

Folia ad 3·5 cm. long., plerumque vero minora. Calyx vix 1·5 cm. long. Corollæ lilacinæ profunde violaceo-notatæ tubus 2·8 cm. long., medio 0·1 cm. lat.; limbus circiter 1·0 cm. diam. Capsula 0·7 cm. long., nitida. Semina vix 0·2 cm. diam.

A *C. Heudelotiana*, Nees diversa ob foliorum formam magnitudem et vestitum, corollæ tubum elongatum, &c., a *C. setosa*, Nees habitu, foliis, corolla, &c.

ON SOME SOUTH-EAST DEVON PLANTS.

By the Rev. W. Moyle Rogers.

The following notes are merely supplemental to some of a like character written by me two years ago, after twelve months' residence at Trusham, near Chudleigh, and printed in this Journal for January, 1878. All the stations here named (with two or three obvious exceptions) are between Exeter on the north-east and a line drawn from Berry Head to Moreton-Hampstead on the south-west, the district chiefly explored being that lying between Exeter and Bovey-Tracey. Except in the cases of *Helianthemum polifolium*, *Sedum albescens*, and two or three other plants (where it will be found expressly mentioned), I know of no previous record of any of the stations given.

Ranunculus peltatus, Fries (aggregate).—Water meadows by River Teign, near Newton Abbot, and in the Bovey Stream, on Knighton Heath; abundant. In River Otter, near Ottery St. Mary (the form *R. pseudo-fluitans*, Syme).

R. Baudotii, Godr.—Paignton, in ditch near railway station; fairly abundant.

R. Lenormandi, F. Schultz.—Trusham, near the village. On eastern slope of Peak Hill, Sidmouth.

R. Flammula, L., b. *pseudo-reptans*.—Banks of River Teign, above Dunsford Bridge; frequent,

R. auricomus, L.—Hennock, and (as recorded in 'Fl. Dev.'), Chudleigh, at "the Rocks," and at one or two other stations. Apparently quite a local plant in S. Devon.

R. hirsutus, Curtis.—Brought to me, in September last, by Mr. T. R. Archer Briggs from near Newton Abbot.

Caltha palustris, b. *Guerangerii*.—In one place in the Teign Valley, Trusham.

Nymphæa alba, L.—Teign Valley, Trusham; in a pool at the bottom of Teign Lane, where it was planted, a good many years ago, by the Rev. H. Roberts, and now flowers profusely every year. It may be well to record here that the plants of *Aponogeton*, now also flowering every year in another pond about a mile higher in the Teign Valley (in Ashton parish), were in like manner placed there by Mr. Roberts.

Papaver Rhæas, L., b. *strigosum*.—Trusham and Ashton.

P. dubium, L., a. *Lamottei*.—Trusham, as a casual weed in my garden. Seaton is the only other station in S.E. Devon where I have seen this species. There (near the beach) it looked less like a casual.

Raphanus maritimus, Sm.—Berry Head; a plant or two. In Stewart's 'Flora of Torquay' it is said to grow in "various places around the Bay."

Diplotaxis muralis, DC.—Torquay, but only near some new buildings. In and about Paignton, and between Paignton and Goodrington Sands as one of the commonest weeds, and so looking

more like a colonist, and less like a casual, than elsewhere in the county where I have seen it.

Erysimum cheiranthoides, L.—In a potato field about a mile from King's-Teignton, on the Chudleigh road.

Cardamine impatiens, L.—In the Teign Valley, Ashton, on a bank of the new railway cutting; a few very luxuriant plants. Also, in considerable quantity, on banks by the roadside in the parish of Christow, about a mile farther down the river, on the opposite side.

Helianthemum polifolium, Pers.—So profusely abundant on the rocks all round Torbay as to constitute one of the most striking features in its flora.

Cerastium pumilum, Curt.—This (like the last) is nearly as abundant at Berry Head as about Torquay.

Hypericum linariifolium, Vahl.—I have, this year (1879), found two new stations near the Teign for this rare St. John's wort: one being the rocks above Canonteign Waterfall, where it seems in no great quantity; and the other a low hill in the parish of Trusham, about a quarter of a mile higher up the river than the rocky spot in the same parish on which I first found it in 1877. In this second Trusham station it extends for a considerable distance among furze and broom bushes, and even over turf, but still only in shallow rocky soil. In 1878 I visited the station recorded in Ravenshaw's 'List,'—rocks near Dunsford Bridge,—and found it still growing there abundantly.

H. montanum, L.—Anstis Cove, Torbay; as recorded in Stewart's 'Flora.'

Malva rotundifolia, L.—Sands at Teignmouth and Paignton.

Geranium rotundifolium, L.—The "Rock-walk," Torquay, and walls at Kingswear.

Erodium maritimum, Sm.—Dawlish Warren and Berry Head.

Medicago denticulata, Willd.—Brought to me by Mr. Briggs from near Newton Abbot, where he thinks it may be only casual.

Melilotus sulcata, Desf.—Teignmouth Sands, near the harbour; a casual.

Trigonella ornithopodioides, DC.—Cliffs south of Berry Head; local, but in one place almost wholly occupying the ground for several yards. Goodrington Marsh.

Trifolium medium, L.—Western slope of Haldon Hill, from about 400 feet above sea-level to near the top; frequent.

T. glomeratum, L.—Dawlish Warren; Berry Head.

T. suffocatum, L.—Top of Chapel Hill, near Torre; in great quantity.

T. fragiferum, L.—Between Starcross and Dawlish Warren.

Lotus tenuis, Kit.—Near King's-Teignton, by long-disused clay-pits; some of the plants with straw-coloured flowers.

Vicia gracilis, Lois.—Chudleigh Rocks. In Ravenshaw's 'List' reported from "Cliffs at Preston, near Paignton; rare," but disallowed for the vice-county in 'Topographical Botany.' I looked for it in vain during a walk along the cliffs from Paignton,

past Preston to Torquay, last summer; and a week or two later found it (in small quantity only), at the Chudleigh Rocks.

V. bithynica, L.—Near Dawlish. The type, without any of the variety *angustifolia* intermixed.

Lathyrus tuberosus, L., b. *tenuifolius*.—Ashton and Hennock, roadside-banks; a few plants occasionally with the type, which is frequent.

Potentilla argentea, L.—Christow; roadside, on rocky cutting; a few plants at intervals, about a mile and a half south-east of the village, and nearly a mile from the nearest station in Trusham, where it is frequent in rocky ground. The only Devon stations yet recorded.

Epilobium tetragonum, L.—The segregate. Trusham and neighbouring parishes; rather frequent. Paignton.

Bryonia dioica, L.—Teignmouth, on a garden wall in the outskirts; I suppose only as a casual. Queried for S. Devon in 'Topographical Botany.'

Sedum reflexum, L., b. *albescens*.—Chudleigh Rocks; and all round Torbay in great quantity. The extraordinary abundance of this stonecrop at Berry Head, and on all rocky places near Torquay, is so remarkable that I do not see how its claim to be considered a native plant can be reasonably questioned. It is of a pale glaucous green, much smaller than ordinary *S. reflexum*, and without reflexed leaves. The "*S. rupestre*" of 'Flora Devoniensis' ("Rocks at Babbicombe and Mary Church"), and the "*S. Forsterianum*, Sm.," of Ravenshaw's 'Supplement' ("Anstis Cove and Babbicombe, Mr. Lees, in 'Phyt.,' 1851"), must, I suppose, be referred to this. In Ravenshaw's 'Supplement' Babbicombe is credited with *S. rupestre*, *S. glaucum*, and *S. Forsterianum!*

Silaus pratensis, Bess.—Trusham and Ashton; rather frequent. Apparently a very local plant in Devon, and not yet reported at all from Cornwall.

Galium Cruciata, With.—General in this part of the county, though local farther west.

G. uliginosum, L.—Ashton, in one place. Haldon, at about 800 feet above sea-level, not far from the top. Lacks personal authority for S. Devon in 'Topographical Botany.' Mr. Briggs (who does not find this species near Plymouth), tells me that he saw a specimen labelled "Haldon" among Borrer's plants at Kew.

Valerianella carinata, Lois.—Near Torquay.

V. dentata, Koch., b. *mixta*.—Cliffs of Daddy Hole Plain, Torquay; locally abundant. Very small and slightly-branched plants. I could find no specimens of typical *dentata* intermixed.

Arctium majus, Schkuhr.—By the Teign, near Chudleigh Bridge. Seen in one place only.

Bidens cernua, L.—Brought to me, with the following, from near Teigngrace by Mr. Briggs. I have not seen it growing in Devon.

B. tripartita, L.—Teign Valley. Trusham; and Ashton. Local.

Leontodon hispidus, L.—Teign Valley, not far from Chudleigh Bridge; two or three plants. Near Sidmouth, and (as recorded in 'Fl. Dev.'), Exmouth. Very local.

Specularia hybrida, A. DC.—Fields, Trusham and Ashton; local.

Wahlenbergia hederacea, Reich.—Ashton (in same bog with *Galium uliginosum*); Teign Valley, near Dunsford Bridge; by Canonteign Waterfall. Locally abundant.

Erythræa pulchella, Fries.—Frequent in badly-drained fields and heathy places.

Verbascum nigrum, L.—Buckerell, near Honiton. The only Devon station where I have seen it.

V. virgatum, With.—Frequent in bushy places through the district. I think undoubtedly native.

Linaria spuria, Mill.—Fields at Trusham; and between Paignton and Goodrington Sands. Apparently local.

Veronica Anagallis, L.—Marshy waste place at Newton Abbot; and Paignton Green. In considerable quantity at both stations. A very local plant in Devon and Cornwall.

Bartsia viscosa, L.—In a badly-drained field at Ashton; a plant or two. I have seen it nowhere else in S.E. Devon, except in the station named in Ravenshaw's 'List,' between Dawlish Warren and Starcross, where it is very luxuriant and abundant.

Orobanche Hederæ, Duby.—Chudleigh Rocks; and (as recorded in Stewart's 'Flora of Torquay') cliffs of Daddy Hole Plain, Torquay.

Mentha hirsuta, L., b. *subglabra*.—Brought to me, with *M. sativa*, L., b. *paludosa*, by Mr. Briggs, from Teigngrace.

M. gentilis, L.—Teign Valley, Trusham, in long grass by the river; only a plant or two.

Stachys ambigua, Sm.—Trusham, bank of stream in the village; and (less well-marked plants, nearer *palustris*), by the Teign, near Crocombe Bridge.

Galeopsis Ladanum, L.—Trusham, Doddiscombe Leigh, and Clist St. Mary. Rather local.

Myosotis repens, Don.—Trusham, and most of the neighbouring parishes; frequent. Haldon. By the Dart at Totnes. *M. palustris*, With., I have not yet found in Devon.

Centunculus minimus, L.—Haldon; rather frequent from about 500 feet to near the top. Dawlish Warren, at sea-level. In both places associated with *Radiola Millegrana*, Sm.

Chenopodium olidum, Curt.—Paignton Sands, between the harbour and the pier.

Orchis Morio, L.—Trusham; locally abundant. Near Sidmouth; Berry Head.

Rhynchospora alba, Vahl.—Haldon.

Scirpus multicaulis, Sm.—Haldon.

S. Tabernæmontani, Gmel.—Ditches in water-meadows by the Dart at Totnes; near Newton Abbot; Paignton.

Carex pallescens, L.—Meadow at Trusham; bog at Ashton.

Festuca pseudo-myurus, Soyer.—Trusham; tops of walls, and stony places in Teign Valley. On walls at Chudleigh, Christow, Newton Abbot, and Totnes.

Sclerochloa Borreri, Bab.—Salt-marsh at Ottermouth; and (as recorded in Ravenshaw's 'Supplement'), Goodrington Marsh.

Nephrodium Filix-mas, Rich., b. *affine*.—Trusham lanes; frequent.

Chara fragilis, Desv.—In old clay-pit at Preston, near King's-Teignton.

The following have not been given in their natural order in the above list, because the stations named (the only ones in S.E. Devon where I have seen the plants in question) had been previously recorded in one or more of the following works:—'Flora Devoniensis,' Stewart's 'Flora of Torquay,' Ravenshaw's 'List' and 'Supplement.' But in the case of species so rare or local in the county a confirmatory record here for the year 1879 may not be altogether without value, especially as there seems reason to fear that such stations are becoming sadly reduced in number by the "improvements" already effected, or now in progress, at places like Paignton and the Goodrington Sands.

Thalictrum minus, L.—Berry Head, on north side, among rocks, but apparently in no great quantity.

Brassica oleracea, L.—Rocks below Dartmouth Castle.

Hippocrepis comosa, L.—Very abundant all round Torbay. Lacks personal authority for S. Devon in 'Topographical Botany.'

Vicia sylvatica, L.—Anstis Cove, in great quantity.

Spiræa Filipendula, L.—All round Torbay; frequent. Lacks personal authority for S. Devon in 'Topographical Botany.'

Sedum album, L.—On rocky ground at back of Torquay, with *Erodium moschatum*. Well established now, if not native.

Trinia vulgaris, DC.—Berry Head; in considerable quantity just at the Head, but not seen elsewhere.

Scabiosa Columbaria, L.—All round Torbay; freqnent. Lacks personal authority for S. Devon in 'Topographical Botany.'

Ruppia maritima, L. (aggregate).—Goodrington Marsh. I could find no specimens in fruit.

Scilla autumnalis, L.—Torbay, in several places, in great quantity.

Scirpus Savii, S. & M.—Between Starcross and Dawlish Warren; frequent in the salt-water ditches. Lacks personal authority for S. Devon in 'Topographical Botany.'

Avena pubescens, L.—Torbay; locally abundant.

A. pratensis, L.—Torbay; usually more abundant than *A. pubescens*, especially on Daddy Hole Plain. Queried for S. Devon in 'Topographical Botany.'

Kœleria cristata, Pers.—Torbay; common. Lacks personal authority for S. Devon in 'Topographical Botany.'

Hordeum pratense, Huds.—Meadows near Newton Abbot, and by canal, in great quantity.

Fresh specimens of *Linaria repens*, Mill. (which I have not seen growing in Devon), were brought to me, in October, 1877, from the station named in 'Flora Devoniensis,'—"Downs west of Christow, near a farm called Kennock."

NOTE ON SOME SPECIES OF MOSSES FROM LOCHLEE "CRANNOG."

By C. P. Hobkirk, F.L.S.

Prof. Bayley Balfour, of Glasgow, recently sent to me for determination a small tuft of a moss, which possesses very considerable interest to the botanist, the archæologist, and the geologist alike, and on which, with some others presently to be mentioned, I propose to offer a few notes.

Dr. Munro, of Kilmarnock, has been exploring one of the old "crannogs," or lake dwellings at Lochlee, near Kilmarnock, and in the course of his investigations has found in it a number of tree trunks of various species, such as oak, elm, birch, &c., and some relics of its human occupation. A full account of his discoveries will be published by Dr. Munro in the 'Proceedings of the Society of Antiquaries of Scotland.' Amongst the other relics found are a number of tufts of the moss just named. This is in a very brittle state, much pressed and matted together, broken and semi-carbonised, but still sufficiently well preserved for identification. On examination it proves to be *Hylocomium splendens*, Hedw. Some fringes and a girdle made of the stems of *Polytrichum commune*, plaited, were also among the relics. Through the kindness of Dr. Munro I have received specimens of this moss and another for examination. The *Polytrichum* is well preserved, and is quite a characteristic specimen, not so much broken as the *Hylocomium*, but, if anything, blacker and more carbonised. It shows, however, distinctly the white margin and teeth of the leaf, which are quite brown under the microscope, as is also the hyaline portion of the base; and the lamellæ of the centre of the leaf may be distinctly recognised. The third moss is almost denuded of leaves, and consequently it is difficult, if not impossible, to recognise it. So far as I have examined it under the microscope I can find only the leaf attachments and the torn bases attached to the stem, which is some five or six inches long, rather rigid, shows signs of having been more or less branched, and looks at first sight not unlike a number of stems of *Hypnum stramineum* or *aduncum*. Amongst these stems, in the form almost of "microscopic dust," is a quantity of *débris* of leaves, &c. On examining these, I am disposed to think that many fragments of tips and bases of leaves have belonged to *Eurynchium prælongum*, but whether they belong to the stems is doubtful: I scarcely think so. Another longer and narrow fragment looks very like a leaf of a *Campylopus*, whilst several fragments show distinctly the peculiar cell structure of *Sphagnum*, the spiral thread being distinctly visible. Another scrap shows plainly one leaf and part of another of *Lepidozia reptans*, whilst mixed up with the smaller dust are numerous diatoms, chiefly I think *Navicula*.

The chief interest of these specimens centres in the question of the antiquity of the Lochlee crannog, on which I am not in a position to decide; but, knowing generally the horizon of these

structures, we are safe in considering that they have been there buried a goodly number of centuries. They have evidently been so long buried as to have undergone the first stages, at any rate, of fossilization, and they are the most ancient specimens of mosses that have come under my cognisance. For many years I have been hankering after a fossil moss, but have as yet come no nearer than these. I have seen specimens so labelled from Burnt-island which are not mosses at all—with which conclusion, by the way, Prof. Williamson, F.R.S., entirely agrees, and there can be no better authority on those beds,—and I have seen specimens from the "Halifax hard bed," in the coal measures, but these are also more than doubtful. I have seen specimens from other localities as well, but to all such I must append the same verdict.

It would be interesting to be informed whether any undoubted specimens have been found in similar localities or in other formations, either in this or other countries; and if so, what they are. I have seen various lists drawn up by Prof. Heer of the cryptogamic plants from various localities, and from older deposits than the one above named, but in none of them have I seen any mention of mosses or their allies. Can any one supply information on this subject?

ON A NEW *ÆCHMEA* FROM TOBAGO.

By J. G. Baker, F.R.S.

In my recent synopsis of the genus *Æchmea* I described ('Journ. Bot.,' 1879, p. 133) a very curious new species under the name of *Æchmea dichlamydea* from a single incomplete specimen in the herbarium of the British Museum, gathered long ago in the island of Tobago. This present summer Mr. Louis C. Meyer, who had been occupied for some time previously working at the Kew Herbarium, took an engagement in that island, and I asked him to try and rediscover it. This he soon accomplished, and he has also found there two other species, one of them the widely-dispersed *Æ. odora*, and the other new to science.

The leaves of Mr. Meyer's specimen of *Æ. dichlamydea* were unfortunately destroyed by an accident, but he describes it as being similar in general habit to its allies, with a tuft of large lorate or lanceolate leaves in a sessile rosette, and a drooping inflorescence borne on a peduncle shorter than the leaves. In this specimen the panicle is a foot and a half long, and consists of about twenty oblong-deltoid dense heads borne on ascending peduncles varying from an inch and a half to four inches in length, which are subtended at the base by red-tinted lanceolate scariose primary bracts. The petals are bright violet-purple, but the lanceolate lamina, which protrudes beyond the bract and sepals, is not more than $\frac{1}{4}$–$\frac{1}{3}$ in. long, so that it would not be a species of much value from a horticultural point of view.

The new species falls into the section *Pironneava*, in the neighbourhood of *Æ. angusta*, Baker, which is excellently figured by

Gaudichaud in the Atlas of the plants gathered in the Bonite expedition at tab. 63, under the name of *Pironneava glomerata*.

15*. Æchmea (Pironneava) Meyeri, *Baker*.—Produced leaves about a dozen in a sessile rosette; dilated base oblong, 4–5 in. long by about 3 in. broad; lamina lanceolate, a foot and a half long, 1–1¼ in. broad at the middle, narrowed gradually to the point, not so rigid in texture as in its near ally, the commonly-cultivated *Æ. glomerata*, Hook., plain green on the face, pale and finely striated and thinly lepidote down the back; the basal prickles close, curved, lanceolate, brown-black, ½–⅛ in. long, the upper ones growing gradually smaller and more distant. Peduncle stiffly erect, above a foot long, with three or four large ascending clasping scariose red-tinted bract-leaves. Panicle dense, erect, oblong-deltoid, six or eight inches long by about half as broad, consisting of about ten globose multifarious heads on short stiff peduncles, the lowest peduncle not more than an inch long, subtended by reflexed red-tinted lanceolate scariose bracts, like those of the peduncle. Heads consisting of 6–12 flowers each, about an inch in diameter without the petals; flower bracts ovate-navicular, coriaceous, about an inch long, with a small brown cusp. Calyx, including the ovary, 1–1¼ in. long, not lepidote; ovary flattened on the side nearest the axis; sepals lanceolate, rather longer than the ovary, with only a small erect non-pungent cusp. Petals not seen. Tobago; growing on trees near the seashore, aud frequently in the woods, *L. C. Meyer*.

Mr. Meyer speaks of the plant as one of the characteristic features of the vegetation of the island, and hopes to be able to introduce it into cultivation.

ON *SPERGULA ARVENSIS*, Linn., AND ITS SEGREGATES.

By George Nicholson.

Spergula arvensis has been, by various continental botanists, somewhat split up as a species. The two most decidedly-marked forms I have found in the neighbourhood of Kew, and it was whilst looking up information respecting these varieties, and going over the large series of specimens in the Kew Herbarium, that I was struck with a peculiarity in their geographical distribution. As no full or definite data have, so far as I know, been published, nor could well be obtained away from large public herbaria like those at Kew and the British Museum, I think the following facts may interest some of the readers of the 'Journal of Botany.'

All the forms that have been regarded as varieties, and also those that have been accounted of specific rank, are very easily referable to two forms, viz., *S. sativa*, Boenn. (Reich. 'Plant. Critic.', cent. vi., t. 704), and *S. vulgaris*, Boenn. (Reich. 'Plant. Critic.', cent. vi., t. 705). These were first described as species by Boenninghausen in his 'Prodromus Floræ Monasteriensis Westphalorum' (1824), p. 136; and of the latter species (using that word in the author's sense) he gives a variety *sphærocarpa*, which, from the

description, seems to differ very slightly from the type, the principal character residing in the papillæ (seminum papillis fuscescentibus). This variety Reichenbach states he had not seen, but as I have noticed plants of *S. vulgaris* permanently exhibiting shades of colour (other then black, the normal colour) in the papillæ, I am inclined to reject such characters as worthless. Although when growing, as far as my experience goes, *S. sativa* and *S. vulgaris* are quite distinct, and can be easily recognised, their differences seem to disappear when dried, and the only reliable characters are in the mature seed. The number of stamens is very variable in all the forms. *S. sativa* has minutely punctulate, margined seeds, and in a living state can be distinguished by its decidedly viscous, dull grey-green leaves and branches; on the other hand, in *S. vulgaris* the seeds are obscurely margined, or totally devoid of wing, and beset with club-shaped papillæ, generally quite black in fully-matured seeds. When growing the latter is conspicuous on account of its light grass-green leaves, altogether brighter-looking and less viscid than the former plant.

In addition to the two plants just named, another form has been treated as a species—*S. maxima*, Weihe, and which, however, is nothing but very luxuriant *vulgaris*, only differing from that plaut in its taller stems and larger seeds. At any rate, that is the verdict pronounced by Neilreich ('Flora von Wien'), Brebisson ('Flore de la Normandie'), and Boreau ('Flore du Centre de la France'), and other critical botanists have either called attention to the slight characters separating it from *S. vulgaris*, or have united it with that plant. D. Douglas found *S. maxima* "common on the banks of the River Columbia at Fort Vancouver, and near the ocean in open places," and, believing it to be distinct from previously described species, accorded it specific rank under the name of *S. ramosissima*. It was Sir W. J. Hooker, in 'Flora Boreali-Americana,' vol. i., p. 93, who first identified Douglas's plant as Weihe's "maxima."

With regard to the distribution of *S. sativa* and *S. vulgaris* in Britain, the former is nearly everywhere common, whilst the latter seems to find its maximum of frequency in the south, although Syme, in 'English Botany,' says that he has only seen it from Lancashire. The 'Flora of Middlesex,' however, gives a number of localities, and I have specimens from various places in the neighbouring county, Surrey. At Kew both forms grow together, whilst at Petersham I could find no trace of *S. sativa*, and *S. vulgaris* was very abundant. A number of plants collected for me at Albury, near Guildford, by Mr. W. Kemp, of the Royal Gardens, Kew, all proved to be *S. vulgaris*, as also were specimens collected at Lyndhurst, in Hampshire, by Mr. J. G. Baker. Babington, in 'Primitiæ Floræ Sarnicæ' (1839), says, "*sativa* has not been observed in these islands"; and I have the evidence of Mr. W. Hillhouse that the same state of affairs still obtains, for during a ramble over all the Channel Islands during last summer he failed to find a single plant of *S. sativa*, although he kept a special look-out for it. Some months ago I was botanising in Yorkshire (North and West Ridings), in the vicinity of Edinburgh, in Perthshire and

Aberdeenshire, but although *S. sativa* was extremely abundant in most places, *S. vulgaris* seemed entirely absent; and I am informed by Prof. J. W. H. Trail that during his botanical excursions in Aberdeenshire and the surrounding counties he carefully examined the Spergulas he met with, but failed to find *S. vulgaris*. This negative evidence, coupled with the foregoing facts, goes to prove that although *S. vulgaris* may be common in some places, it is certainly (in Britain) much the rarer of the two forms.

To return, however, to the specimens in the Kew Herbarium and at the British Museum. By far the greater number are labelled with the aggregate name *arvensis*, but I have carefully examined them and determined to which of the two forms the different specimens belong. The results show that although *S. sativa* is by far the prevailing plant, as far as Britain is concerned, the very opposite holds good when the *total* distribution is considered. Why one of two apparently equally prolific seeders should so far outstrip the other I cannot explain. The following are the results of my examinations:—the countries, &c., from which *S. vulgaris* has been sent I give in alphabetical order, mentioning the name of collector, and herbarium number of specimen where it seems desirable to do so. There are no wild British specimens at Kew, unless an unlocalised specimen in the Borrerian Herbarium be one, but in the British Museum there are examples from Hampshire, Middlesex, and Buckingham—Bournemouth, Trimen; Staines, Trimen; Little Marlow, Elizabeth Chandler. A specimen of Forster's (unlocalised) belongs here, as well as *S. major* from Hampstead in Herb. John Hill.

Abyssinia, Schimper, 1166; Angola, Welwitsch; Azores, 'Plantæ Canarienses,' 334, Rev. R. T. Lowe, G. Mann, F. D. Godman, and others; Bas Rhin, Billot, 731; Ceylon, Thwaites; Corsica, Kralik, 503; France, many collectors; Geneva, Boissier, Ducommun; Heidelburg, Flückiger; Iceland, Babington; Java, Horsfield; Leipzig, several collectors; Natal, Gerrard, 229, Newfoundland; New Orleans, Drummond; Nylgherries; Ohio, Doubleday; Oran, several collectors; Portugal, Welwitsch, Lange, Durieu, and others; Saxony; Sleswig Holstein, Hansen; Smyrna, several collectors; Spain, Willkomm, Durieu, Bourgeau, 2612, &c.; St. Helena, Burchell; Swan River, Drummond; Tangier and Tetuan, Sir J. D. Hooker, Salzmann; Smyrna, Heldreich and several others; Vancouver, Douglas; Westphalia, several collectors.

S. arvensis, L., var. *pentandra*, Herb. J. Gay, is *S. vulgaris*, as is also "*S. dicta major*" of Herbarium Cliffortianum, and I cannot in the slightest distinguish specimens in Herb. Gay, labelled *S. arvensis*, L., var. *hirsuta*, and *S. arvensis*, var. *glabriuscula* (both collected by Salzmann in Tangiers), *S. arvensis*, var. *viscosa*, Heldreich, from *S. vulgaris*, as it is figured by Reichenbach, and as it is found in the neighbourhood of Kew. *S. vulgaris*, var. *gracilis* is a small weak form about three inches in height, with slender stems, simple below, and sparingly branched above.

The distribution of *S. sativa* seems to prove that it affects colder countries than *S. vulgaris*, the *only* exceptions to this rule being specimens from Smyrna collected by Heldreich: Spain, Bourgeau, 2379; and Portugal, Welwitsch, 812. From Iceland examples are sent by Paullsen; St. Petersburg, Dr. Regel; Saxony, Hausmann, 981; Herford (Westphalia), Weihe—in company with *S. vulgaris* and *maxima;* Sleswig Holstein, Hansen, 449; and there are also specimens from Stockholm and Upsala. On the label of the specimens from the latter locality is printed, "In agriis Upsaliensibus loco Linneano." All the English, Irish, and Scotch specimens at Kew belong to *S. sativa*.

In addition to the above there are many Spergulas in such an imperfect state that it is impossible to name them critically. I believe, however, that in any case they would not materially affect the facts or alter the contrast in the geographical spread of the two plants.

RECENT ADDITIONS TO THE MOSS-FLORA OF THE WEST RIDING.—SUPPLEMENTARY LIST.

By C. P. Horkirk, F.L.S.

The following eleven species and varieties are supplementary to my previous list ('Journ. Bot.,' 1879, pp. 337, 365). They have been furnished to me for publication by my friend, Mr. W. West; were for the most part gathered by himself, and all, except one, have been confirmed by either Mr. Boswell or Rev. J. Fergusson, so that the fullest reliance may be placed upon the accuracy of the nomenclature.

Andreæa falcata, Schpr. **L.** Ingleborough, April, 1878, also Baugh Fell, April, 1879; Messrs. Parsons, Nuttall and West.

Rhabdoweissia denticulata, Brid. **L.** Howgill Fells, April, 1879, Dr, Parsons.

Dicranella crispa, Hedw. **A.** Shipley Glen, Nov., 1879, W. West.

Campylopus alpinus, Schp. (*Dicranodontium longirostre*), forma *alpina*, Auct. **L.** Ingleborough, April, 1878, W. West.

Grimmia apocarpa, var. *rivularis*, Nees & H. **L. W.** Baugh Fell, Arncliffe, The Strid; all W. West.

Entosthodon Templetoni, Hook. **L.** Cantley Spout, April, 1879, in fruit, W. West.

Fissidens crassipes, Wils. **W.** Arncliffe, October, 1878, in fruit, W. West.

Hypnum Cossoni, Schp. **L.** Howgill Fells, April, 1879, W. West.

H. falcatum, Brid., var. *virescens*. **W. A.** Arncliffe, Malham, Gordale; all W. West.

H. cupressiforme, L., var. *filiforme*. **L. W.** Sedbergh, Whernside; Bolton Woods; all W. West.

H. cupressiforme, L., var. *compressum*. **A.** Rombald's Moor, common, W. West.

SHORT NOTES.

New British Fungi.—The following species of Fungi, new to the British Flora, were collected during the meeting of the Woodhope Club at Hereford last autumn: descriptions of them are given in 'Grevillea' for December:—*Agaricus* (*Tricholoma*) *atrocinereus*, *A.* (*Clitocybe*) *amarus*, *A.* (*Collybia*) *extuberans*, *A.* (*C.*) *laxipes*, *A.* (*Mycæna*) *sudorus*, *A.* (*M.*) *lineatus*, *A.* (*M.*) *stanneus*, *A.* (*M.*) *coccineus*, *A.* (*Leptonia*) *chloropolius*, *A.* (*Hebeloma*) *mussivus*, *A.* (*H.*) *peltiginosus*, *A.* (*Inocybe*) *asterosporus*, *A.* (*I.*) *hirsutus*, *Coprinus sociatus*, *Cortinarius* (*Phlegmaum*) *largus*, *C.* (*Myxacium*) *Riederi*, *C.* (*Inoloma*) *penicillatus*, *C.* (*Dermocybe*) *miltinus*, *C.* (*Telamonia*) *paleaceus*, *C.* (*T.*) *urbicus*, *C.* (*T.*) *scutulatus*, *C.* (*Hydrocybe*) *uraceus*, *C.* (*H.*) *fasciatus*.

The Source of Damiana.—This has been recently determined to be be a species of *Turnera*, which was described by Mr. Lester F. Ward in the 'Virginia Medical Monthly' for April, 1876 (p. 49). This description is likely to be overlooked, so we think it well to extract it here:—"*Turnera aphrodisiaca*, L. F. Ward. Calyx tubular, funnel-form, the lobes shorter than the tube. Styles three, distinct; stigmas flabellate. Stems woody, the branches reddish, densely canescent or lanulose, as well as the petioles and lower portion of the midrib. Leaves obovate to oblanceolate, six to nine lines long, two to three lines wide, on short petioles, strongly crenate-dentate, the teeth with resolute margins, prominently veined beneath, nearly glabrous above, glandular below, bearing fascicles of smaller leaves in their axils together with the flowers. Flowers short pedicelled or nearly sessile, axillary, or petiolary, *i.e.*, developed either from the centre of axillary fascicles of minute leaves, or from between these and the base of the petioles, or, in some cases, from the petiole itself above the base; bibracteolate, the bracts ovate, long acuminate, ciliate. Anthers somewhat sagittate, introrse, the cells thin, ovaries dehiscent from the apex to near the base. Seeds large, long, kidney-shaped, or curved, grooved lengthwise and pitted; only a few maturing, the rest abortive and persistent." It is found in "dry rocky places in Western Mexico," and is allied to *T. carpinifolia*, DC. *Bigelovia veneta*, Gray, and one or two other plants are also known as *Damiana*.

Note on Micræa, *Miers*.—In Bentham & Hooker's 'Genera Plantarum' (ii., 803), among the "genera exclusæ v. dubia" of the order *Gentianeæ*, is the following:—"*Micræa*, Miers, 'Trav. Chil.,' ii., 529, ex 'Endl. Gen.,' 605, nomine tantum nota est." Among Mr. Miers' MSS. are careful drawings and a full description of the plant, which is there identified with *Ruellia dulcis*, Cav. Mr. Miers, who named the plant in MS. *Micræa dulcis*, distinguishes it

generically from *Ruellia*, and says it is remarkable for having a a fifth sterile stamen, and for the peculiar hairs that cover the testa of its seeds.—James Britten.

Notices of Books and Memoirs.

Monographiæ Phanerogamarum. Prodromi nunc continuatio, nunc revisio. Auctoribus Alphonso et Casimir DeCandolle aliisque Botanicis ultra memoralis. Vol. ii. Araceæ. Auctore Engler. G. Masson, Paris, September, 1879.

It is now nineteen years since Schott published his 'Prodromus Aroidearum,' which has remained until now the standard monograph of the Order. During the time that has since elapsed a large number of species have been described in scattered works, and our collections have been enriched by a large amount of additional material, which has made it requisite that a new monograph should be written. This has been undertaken by Prof. Engler, of Kiel, and forms one of the new series of monographs under the editorship of the MM. DeCandolle. The first of these was reviewed in this Journal for 1878, p. 309, where the purpose, style, and character of the work is fully set forth; therefore all that it is necessary to do in reviewing the present volume is to give an outline of the general plan, and criticise its contents. The author includes in the Order *Araceæ* the genus *Pistia*, and the *Lemnaceæ* as sub-families; but as the *Lemnaceæ* have been so recently monographed by Hegelmaier, they are omitted from the present book. The work is divided into two parts. The first part, occupying fifty-five pages, is devoted partly to the anatomy and morphology of the stems, leaves, and flowers, and partly to the geographical distribution of the Order. The second part is entirely systematic, containing a synopsis of the genera, or what the author calls a natural system of the *Araceæ* (p. 62); after which follow descriptions of the genera and species. The whole concludes with two very useful indices; the first being an index of the numbered collections seen and determined by Prof. Engler, with a reference to the page and species under which each number will be found quoted in the body of the work; the second, of the genera, species and synonyms. No plates are given. Such is the plan, and an excellent one it is; but, unfortunately for those who require to use the book, the systematic part is worked up with such little care, and so many inaccuracies and discrepancies occur, that it is far from being a complete or satisfactory monograph. The tables of geographical distribution are perhaps the most interesting feature of the work, and, although inaccurate in some particulars, are still sufficiently correct to give a good idea of the general distribution of the *Araceæ*; the plant-regions adopted are those proposed by Prof. Grisebach. The tables show that about thirteen-fourteenths of the whole are confined to the tropical

regions, the majority belonging to the New World. Over 400 species inhabit Tropical America; Tropical Asia and the Indian Archipelago have over 200 species; and Tropical Africa only about 30 species. It is remarkable that although Arads abound on the eastern side of the Andes of South America, only one species has yet been found in Chili. According to these tables, no true Arads have been found in New Zealand, the Sahara, California, or the Prairie region of North America; the Azores, New Hebrides, Fiji Isles, and the Pampas of South America have each one species. Of the principal tribes or subfamilies, the *Pothoideæ* are most numerous in species in the New World, but the genera number most in the Old World; the genera of the *Monsteroideæ* are about equally divided between the two hemispheres, but the species are rather more numerous in the western hemisphere; the *Lasioideæ*, *Philodendroideæ*, and *Colocasioideæ* have more genera, but fewer species, in the Old World than in the New World; the *Aroideæ* are nearly all Old World species, and are most abundant in India and the Indian Archipelago. From this it appears that the tendency to variation has been to produce a large number of generic deviations and fewer specific ones in the eastern hemisphere; and in the western hemisphere, where there are fewer genera, two or three of them have a very large number ef specific deviations. In the Cape column it will be noted that the genus *Stylochiton* is omitted, and the Australian column contains only three true Arads, whilst in the body of the work seven species are mentioned as Australian, and Mr. Bentham, in the 'Flora Australiensis,' enumerates ten species. How is it, by the way, that this work is only quoted for a few species, and that the 'Flora of Hong Kong' is not quoted at all? The synopsis of the genera on p. 62 is founded upon entirely new principles, the primary grouping into subfamilies being based upon the anatomical structure of the stem and leaves, the absence or presence of latex vessels in the fibro-vascular bundles, their form and arrangement, the presence or absence of intercelluar hairs, &c. It is doubtful if these characters (even if in all cases correct, which requires verification) have the value here assigned to them; besides which they are practically useless, for before a genus can be determined by this system, it is necessary to examine microscopic sections of the stem or leaf, which, besides causing a great waste of time, requires a patience, skill, and knowledge that all who might require to use this book do not possess. The system does not appear to be any better than that of Schott, and is very involved; and the use of letters and figures to denote the floral structure, giving it the appearance of a series of mathematical problems, does not add to its simplicity. If these anatomical characters have any value, it is curious that *Gamochlamys* (a fresh leaf of which was sent to Engler from Kew) should be placed in subfamily vii., whilst *Spathantheum*, with which *Gamochlamys* is now found to be identical, is placed in subfamily viii., ten genera intervening!

The descriptions of the genera and species are on rather a better plan than those of Schott in his 'Prodromus,' the synonyms,

figures, and collectors being quoted under each, but they would have been much improved if the author had headed them with a brief distinctive diagnosis, similar to those employed by A. DeCandolle in his monograph of the *Smilaceæ*. The type adopted for the synonyms is the same as in the first volume: some improvement in this respect is much needed. The genera and species are much reduced in number, and the reduction of many of Schott's species seems carried too far. Schott, in his 'Prodromus' (published in 1860), enumerates over 960 species; since then a large number of others have been described, yet the total number of species enumerated by Engler is only 800, including 31 here described for the first time; he has reduced many of Schott's species to synonyms without having seen the types, not having consulted the English herbaria, in which a large number of Schott's types are preserved: there is no statement as to what herbaria have been seen by him, so that it is difficult to know to what extent the descriptions have been made from authentic specimens. It is to be regretted that the author did not examine the types in the herbaria of the British Museum and Kew; had he done so, the synonymy might have been made much more correct, and several doubtful species might have been cleared up, such as *Homalomena major*, *minor*, and *rostratum*, Griff. (published by a misprint as *H. Roshalum*), *Arum Griffithii*, Sch., &c. Some important generic changes are made; thus *Thomsonia* and *Staurostigma*, being older names, are adopted in place of *Pythonium* and *Asterostigma*; *Brachyspatha* and *Conophallus* are reduced to sections of the genus *Amorphophallus*; *Leptopetion*, *Cyllenium*, and *Ischarum* to sections of the genus *Biarum*; *Tapinocarpus* and *Calyptrocoryne* to *Theriophonum*; and *Heterostalis* to a section of *Typhonium*. Only one new genus is created—*Porphyrospatha*, Engl., a split off from *Syngonium*. One of the new species, viz., *Arisæma tripartitum*, Eng. (Oldham, 819), is not an *Arisæma*, but identical with *Pinellia tripartita*, Sch.; it is incorrectly described by Engler. In most of the genera a grouping clavis is given to facilitate the determination of the species; this is a great improvement upon Schott's 'Prodromus,' and of great use, but unfortunately, in some instances, the author has not made a happy selection of characters; thus in *Anthurium* the form and colour of the berries are used as primary characters in the clavis; this is very misleading, as the berries of a large proportion of the species are unknown, and when known will not always be found to fit with his clavis; *e.g.*, *A. dominicense* (p. 154) is placed in a group characterised as having "baccæ subglobosæ, virescentes" (p. 153); this plant fruits every year at Kew, and the ripe berries are obovoid and bright purple-red! Sometimes also his description of the berries is at variance with the clavis; thus on p. 116 is a group with "baccæ subglobosæ," under which are placed *A. coriaceum*, *A. Olfersianum*, and *A. lanceolatum*, and the berries of all these he describes as obovoid! In the genus *Arisæma*, also, *A. decipiens*, Sch., is placed in the wrong group, owing to his having misunderstood Schott's description; the spadix of this species is straight, subtruncate, and only reaches

to the mouth of the spathe-tube, but it is placed by Engler with *A. filiforme* in a group in which the appendix is very long, filiform, and pendulous; the habitat, too, of *A. decipiens* is Khasia, as Schott stated in his original description, and not Java. The wording of some of his primary grouping characters might with profit have been made much simpler; for instance, on p. 192 is a group thus characterised:—"Foliorum adultorum nervi laterales I. (costulæ) costæ mediæ æquicrassæ, liberæ vel omnes vel nonnullæ in costas posticas inferne connatæ, in partitiones aut in segmenta exeuntes:" this means that the adult leaves are either palmipartite, pedatipartite, or digitate. On p. 451 is a statement that *Dieffenbachia Parlatorei*, Lind. & André, certainly does not belong to that genus, but probably to *Philodendron;* this is incorrect, for not only is the habit and character of the plant such that it is difficult to understand how he could be deceived, but the inflorescence is that of *Dieffenbachia*. The synonymy of this genus is very confused. Some plants seem to be imperfectly or inaccurately described; this is notably the case in the genus *Steudnera*, where, following C. Koch and Sir J. Hooker, the ovary is erroneously described as "2–5 loculare," and the correct description given by Schott in 'Bonplandia,' x. 222, where the ovary is described as one-celled with parietal placentas, is neglected.

Press errors are very numerous, and no list of errata is given; some of these errors, such as occur in the genus *Chamæcladon*, are very confusing. On p. 346 the lamina of *C. saxorum* is described as "oblongo-elliptica," and the measurements given for it are '2, 5 dm. longa, fere 1 cm. lata," that is, 10 inches long, and nearly half an inch broad, which would represent a linear leaf; and on p. 347, by the use of the ablative plural, and omission of the word lamina, the description of the petiole of *C. obliquatum* is rendered unintelligible. Many good figures are not quoted, notably some of Schott's beautiful and accurate 'Icones.' Several species are altogether omitted, *e.g.*, *Amorphophallus chlorospatha*, Kurz; *A. longistyla*, Kurz; *Anthurium Saundersii*, Hook. f.; *A. macrospadix*, Lem.; *Philodendron serpens*, Hook. f.; *P. melanochrysum*, André; *Alocasia Thibautiana*, Mast.; *Ischarum angustatum*, Hook. f.; *I. Fraasianum*, Sch.; *Sauromatum sessiliflorum*, Kth.; and of *Zantedeschia occulta*, Spr., and the genus *Arisacontis*, no mention is made. The index of the numbered collections seen and determined by the author is an excellent and most useful appendage to the book, but is by no means exhaustive of the material that must exist in the various herbaria, for at Kew alone he might nearly have doubled the list. Some of the determinations do not appear to be correct, at least according to the Kew material; thus Wallich, 8928, is stated to be *Arisæma curvatum*, Kth., but this number is the type of *Heterostalis foliosa*, Sch., a totally different plant: Hahn, 1020, is referred to *Philodendron Karstenianum*, var. *dispar*, but this number is a *Monstera*. From the index of genera, species and synonyms a considerable number of names is omitted. It is much to be regretted that more care has not been given to this monograph.

N. E. Brown.

Classification and Description of the American Species of Characeæ. By B. D. Halsted. Proceedings of the Boston Society of Nat. Hist., vol. xx., pp. 169–190.

Under the above title an account is given of some of the Charas of the United States. Eighteen species are enumerated, of which fifteen are common to Europe; of the remaining three, one is new, *C. Robbinsii*, which would appear to be a very remarkable plant, especially from the description of the leaves "ending in a *whorl of large bracts*"; another, *C. gymnopus*, is of wide extra-European distribution; and the third, "*Nitella gelatinosa*," being monœcious, is evidently not the Australian *N. gelatinosa*, A. Br. Among the more prominent United States species altogether unnoticed in this paper, we may cite *Chara sejuncta*, *C. intermedia*, *Nitella prælonga* and *N. acuminata*, and the account of the *Characeæ* in the 'Plantæ Lindheimerianæ,' in 'Boston Journ. Nat. Hist.,' 1845, has apparently been overlooked. We must take exception to the statement that in *Tolypella intricata* the antheridia are terminal, on which assumption this species is here placed under the genus *Nitella*. It is hardly necessary to mention that were this the case the genus *Tolypella* would not be tenable. In the introduction a short account is given of the structure and development of the Charas. It is evident that the author has examined a large number of specimens, and it is to be hoped that the American representatives of this too-much neglected group will continue to receive his attention.

H. & J. G.

On the Popular Names of British Plants. By R. C. A. Prior, M.D. Third Edition. Williams & Norgate. 1879.

The earlier editions of this book have been so fully noticed in this Journal (i. 378, ix. 23), that it is unnecessary to do more than call attention to the appearance of a third edition of a work which is invaluable to all who are interested in tracing the derivation of English plant-names. There are many slight alterations and corrections, showing that Dr. Prior is still at work upon the subject; and a few new derivations are added, to one or two of which—*e.g.*, that of Ragged Robin, at p. 195—we should be inclined to take exception. We also notice that an error of synonymy which crept into the second edition is uncorrected in this: *Orobus tuberosus*, L., which was given in the first edition as the Latin equivalent of Kipper-nut, is not the same as *Vicia Orobus*, DC., but *Lathyrus macrorrhizus*, Wimm. But the trifling nature of such blemishes as this is really a very strong testimony to the value of the book as a whole. It is strange that some of our best known names—*e.g.*, Cowslip and Paigle—should remain without any satisfactory explanation. With Britten & Holland's 'Dictionary of English Plant-names' and this volume, which is its indispensable companion, the popular nomenclature of the plants of this country is probably more fully elucidated than is the case with any other branch of Natural History.

J. B.

Other New Books.—J. Klinge, 'Vergleichende, Histologie untersuchung der Gramineen-und-Cyperaceen–Wurzela' (3 tab.) St. Petersburg, 1879 (2 *mk.* 80 *pf.*) (Mém. Acad. Imp. Sc. S-Pétersb., &c., 7, tab. xxvi., no. 12). — Otto Kuntze, 'Methodik der Species-beschreibung und Rubus' (1 tab.) Leipzig, 1879. — F. von Thümen, 'Die Pocken des Weinstockes' (*Gloeosporium ampelophagum*, Sacc.), (1 tab.) Vienna, 1880. — W. H. Fitch & W. G. Smith, 'Illustrations of the British Flora' (12*s.*) L. Reeve & Co. — G. Bentham, 'Handbook of the British Flora,' ed. 4 (12*s.*) L. Reeve & Co. — H. Baillon, 'Natural History of Plants,' vol. v. (25*s.*) L. Reeve & Co.

Articles in Journals.—November.

Annales des Sciences Naturelles, ser. 6, viii., 5–6. — J. Vesque, 'New researches on the development of the embryo-sac in Angiospermous Phanerogams' (tt. 12–21).

Bull. Soc. Bot. France (xxvi., No. 1),—Ramond, 'On vegetation of Norway.' — P. von Tieghem, 'On secondary liber-ligneous formations of leaves.' — G. Bonnier & C. Flahault, 'Distribution of plants in the central region of the Scandinavian peninsula.'— P. von Tieghem, 'On the fermentation of cellulose.' — E. Prillieux, 'Corrosion of grains of Wheat coloured rose by Bacteria.' — M. Cornu, 'On *Hypocrea alutacea*.' — P, von Tieghem, 'On the pretended cilia of Bacteria.' — L. Quelet, 'Diagnoses of some critical species of Fungi.'— Battaudier & Trabut, 'Excursion round Algiers (*Buffonia Duvaljouvii*, n. sp.)' — P. Sagot, 'Observations on the influence of the hygroscopic state of the air on vegetation.' — Abzac de la Dowze, 'Additions to Des Moulin's catalogue of plants of the Dordogne.' — G. Genevier, 'Biographical notice of Dr. Ripart.'— P. van Tieghem, 'Development of *Spirillum amyliferum*, sp. n.' — M. Cornu, 'Note on mycological part of the general herbarium at the Muséum.' — Foucaud, 'Herborisation in Charente-inférieure in 1878.' — Boullu, 'List of plants collected in the Iles Sanguinaires.'— A. Franchet, 'Stirpes novæ vel rariores Floræ Japonicæ.' — G. Rivière, 'On the nature of tendrils and the disposition of appendicular organs in the Vine.' — Prillieux, 'On the nature and cause of the formation of the tubercles which occur on roots of *Leguminosæ*.' — L. Marchand, 'Monstrosity of *Linaria Elatine*' (tab. 1). — P. Sagot, 'On dimorphism in fruit of *Jubelina riparia*.' —Malbranche, 'On the species in *Rubus*, and especially in the type *R. rusticanus*, Merc.' — G. Bonnier & C. Flahault, 'Observations on the Cryptogamic Flora of Scandinavia.' — G. Bonnier, 'On the morphological situation of the pollen sacs in *Helleborus fœtidus*.'— P. van Tieghem, 'On the spores of some Bacteria.' — M. Cornu, 'Disease of *Rubiaceæ* in hot-houses, caused by an *Anguillula*.' — Id., 'Value of anatomical characters in species of *Crassulaceæ*.'— A. Legrand, 'Two new Elatines for Central France.' — D. Clos, 'Stipules morphologically considered.' — Launes, 'Catalogue of plants in basin of the Ubaye (Basses Alpes.)'

American Naturalist.—J. C. Martindale, 'Colorado plants.'—W. Trelcase, 'Fertilisation of native species of *Clitoria* and *Centrosema*.'

Botanisker Notiser (Nov. 3).—V. B. Wittrock, 'On *Linnæa borealis*' (contd.)—P. G. E. Theorin, 'Hymenomycetes Gothoburgenses' (contd.)—D. Bergental, 'Localities in South Halland and North Bohnslän,'—J. E. Zetterstedt, 'Vegetation of Visingsö.'

Œsterrische Bot. Zeitschrift.—R. F. Solla, 'Researches on the intercellular substance.'—G. Beck, 'On some Orchids of Lower Austria.'—F. v. Thümen, 'Symbolæ ad fl. Mycolog. Austriacum' (contd.)—L. Celakowsky, 'Botanical Notes.'

Hedwigia.—Rehm, 'Remarks on the *Ascomycetes*' (contd.)—G. Winter, 'Mycological Notices.'

Bot. Zeitung.—K. Prantl, 'On the influence of light on the bilaterality of the fern-prothallium.'—J. Moella, '*Æschynomene aspera*, Willd.'—W. E. A. Voight, 'Anatomy of the *Marchantiaceæ*' (tab. 9).—A. de Bary, '*Æcidium abietinum*' (tab. 10).

Grevillea.—B. Carrington, 'New British *Hepaticæ* (*Riccia glaucescens*, Carr., sp. n., *R. tumida*, Lindb., *Gymnomitrium crassifolium*, Carr., sp. n., *Jungermannia nevicensis*, Carr., sp. n., *Diplophyllum myriocarpum*, Carr., sp. n.)—E. Boudier, 'Dehiscence of Asci in *Discomycetes*.'—De Thuemen, 'Fungi Ægyptiaci,' ser. ii. (*Oidium medicagineum*, *Sorosporium desertorum*, *Uredo Isiaceæ*, *Sphæropsis Calotropidis*, spp. nov.)—M. C. Cooke, 'A new genus of *Discomycetes*' (*Berggrenia*).—Id., 'New Zealand Fungi' (many new species).—Id., 'Natal Fungi' (many new species).—C. B. Plowright, 'Propagation of *Sphæria fimbriata*.'—'Woolhope Club Meeting, 1879' (contains descriptions of several fungi new to Britain, of which a list is given at p. 20 of this Journal.

Bull. Bot. Soc. Belg. (vol. xviii., pt. i.)—F. Crépin, 'Primitiæ Monographiæ Rosarum' (contd.)

Flora.—J. Müller, 'Lichenes Japonici' (several new species).—H. Conwentz, 'On a Miocene Conifer from sulphur-mines of Comitini at Girgenti.'—K. A. Henniger, 'Hybrids of plants' (contd.)—S. Schunck, '*Gnaphalium sylvaticum*, β. *rectum*.'—L. Celakowsky, 'On viridescent ovules of *Hesperis matronalis*' (contd.)—O. Böckeler, '*Cyperaceæ* of Tropical Africa' (*Kyllingia Soyauxii*, Soyaux, No. 175, *K. Naumanniana*, Naumann, No. 153, spp. n.)

Proceedings of Societies.

Royal Society.

November 27, 1879.—The President, W. Spottiswoode, Esq., in the chair.—A Report on Phyto-Palæontological Investigations on the Fossil Flora of Sheppey, by Baron Ettingshausen, Professor in the University of Graz, Austria, was read, of which the

following is a summary:—One of the most important localities for the Eocene Flora of Great Britain, and perhaps of the tertiary formation generally, is the Isle of Sheppey, in which are found great numbers of fossil fruits and seeds. I feel sure that we possess in them the key to a more precise determination of many of the genera and species of fossil plants which in other localities are known only by their leaves. Amongst the Sheppey fossils are now and then found fragments of the basis of the leaf of a palm, probably of *Sabal major*: on one such fragment I found the apothecia of a *Sphæria*. Of the *Gymnospermæ* there were found fruits and seeds of *Sequoia Bowerbankii*, also fragments of twigs. The seeds of the *Cupressineæ* and *Abietineæ* had lost their wing-like expansions, which shows that the fruits and seeds were carried some distance in water, consequently their delicate membranous wings were injured and broken off by rubbing. There are, therefore, no perfect winged fruits and seeds to be found. In fact, even the firmer wings of the Acer-fruit have been entirely lost, and it is impossible to determine the species of the Acer-nucules which remain. The appearance of the *Salisburia* seeds is interesting; they are very remarkable for their sharp, prominent edge. The easily-determinable leaves of this genus have not as yet been found in the Eocene Flora of Great Britain. *Agave* is indicated by a valve of fruit; *Smilax*, of which leaves are not unfrequently found at Bournemouth, is represented by a berry. Of *Musa*, of which only leaves had as yet been found, there are seeds. Of *Amomum*, two kinds of fruit have been found. These have hitherto been mistaken for smaller fruits of *Nipadites*. The many species of palms are of particular interest. The fruits and seeds of *Sabal major*, *Trinax Bowerbankii*, *Elæis eocenica*, *Iriartea striata*, *Livistona eocenica*, have been found. Of the *Sabal* and *Iriartea* the leaves are found at Bournemouth. *Elæis eocenica*, the commonest palm of the Sheppey Flora, is nearly allied to *E. melanococca*, and *Livistona eocenica* to *L. chinensis*. I do not yet know whether the *Aroidea* seed, which I have placed in *Aronium*, might be united with the *Aroidea* leaf of Bournemouth. On the other hand, I think it is very likely that some of the kinds of oak fruits correspond with some of the kinds of oak leaves which are to be met with at Bournemouth. Two of the Bournemouth species are also found in the Miocene Flora, and one of these, *Quercus Lonchitis*, also in other Eocene Floras. A small nut shows all the characters of *Corylus*, which is found in the Miocene Flora. The absence of *Fagus* is very remarkable, as two kinds of leaves, which can only belong to this genus, have been found in Bournemouth. *Fagus* is frequently found in the Miocene and Post-Tertiary formations, and also in the Cretaceous formation, and may still be found in Sheppey. The Liquidambar-fruit of Sheppey may belong to the same species as the inflorescence of *Liquidambar*, which I found amongst the fossils of Bournemouth. The Laurus-berry, which I have found amongst the Sheppey fruits, is placed by me in *Laurus Lalages*, the leaves of which have been not only found in Bournemouth, but also in the Austrian Eocene (Sotzka, Hæring), where

they occur associated with berries. The occurrence of a species of *Nyssa*, I think, may be also accepted for the Bournemouth strata. Of the *Proteaceæ*, besides *Petrophiloides*, a seed belonging to the *Proteæ* occurs, perhaps corresponding with the leaf which I have seen among the fossils of Alum Bay. In Bournemouth and Alum Bay were found the seeds of some other *Proteaceæ* which are not in Sheppey, as they have delicate wings. Some of the cones referred by Bowerbank to *Petrophiloides* belong to *Sequoia*. The *Gamopetalæ* are represented by many genera, of which almost all appear also in the Miocene Flora. The fruit of *Cinchonidium* of Sheppey and the leaves of a species of *Cinchonidium* from Bournemouth may belong together. I accept the same for the *Apocynophyllum* fruit of Sheppey and the corresponding leaf of Bournemouth. This last accords in all its characters with *A. Reussi*, which also appears in the fossil Flora of Sagor. But I have not found up to the present time, in the Eocene Flora of Great Britain, any leaf belonging to the characteristic genus *Strychnos*, the seeds of which are met with at Sheppey. Of the *Sapotaceæ* there are two species of seeds, which perhaps correspond with two species of *Sapotaceæ* leaves of the Bournemouth Flora. One of these extends throughout in the Tertiary Flora; the other, on the contrary, seems to be peculiar to the Eocene Flora. Two species of *Diospyros*, which are common both to Sheppey and Bournemouth, are peculiar to this Flora. The species of *Symplocos* is common to Sheppey and Sagor: in these two localities the putamen was found. In corresponding abundance are represented the *Dialypetalæ*. They are specially characteristic of the Eocene Flora in general, and of the Sheppey Flora in particular. To the first belong *Magnolia eocenica*, *Eugenia eocenica*, *Sapindus eocenicus*, *Metrosideros microcarpa*, and *Bauhinia primigenia*, whose leaves or fruits are to be found associated together in Bournemouth. To the last belong the genera *Menispermacites*, *Victoria*, *Thlaspidium*, *Corchorites*, *Theobroma*, *Lawsonia*; the species *Illicium Apollinis*, *Nelumbium microcarpum*, *Cucumites Sheppyensis*, *Cotoneaster Sheppyensis*, *Prunus prisca* and *Druidum*, *Amygdalus eocenica* and *Sporadum*, *Podogonium Sheppyense*, &c. Belonging also to other Eocene Floras and to the Miocene Flora we have here only the Dialypetalous plants, *Nelumbium Buchii*, and *Eucalyptus oceanica*. Amongst the fruits and seeds of Sheppey we find also some species of herbaceous or tender plants whose leaves would not be preserved in the Tertiary strata. To these belong the seeds of *Solanites elegans*, *Menispermites abutoides*, *Cucumites Sheppyensis*, the fruits of *Thlaspidium ovatum*, and of *Corchorites*.

Linnean Society of London.

November 6, 1879. — Prof. Allman, F.R.S., President, in the chair.—W. H. Twelvetrees, Esq., of Orenburg, Russia, was elected a Fellow of the Society.—Mr. W. T. Thiselton Dyer exhibited some photographs of vegetation, including trees of *Cinchona Ledgeriana*, taken in the Botanic Garden of Buitenzorg, Java. — Mr. W. A.

Shoolbred showed a series of stereoscopic photographs of groups of plants, on behalf of Mr. T. H. Worsley Benison.—The following botanical papers were read:—'Note on the structure and habit of *Hemileia vastatrix*,' by Dr. Morris. The author adds a few points to our knowledge of this destructive parasite on coffee-leaves, in addition to those given in the Rev. R. Abbay's paper (Journ. Linn. Soc. xvii. 173). As it was first described from the dried leaves, the fungus was very imperfectly known, and Mr. Cooke seems to have mistaken the deciduous wart-like papillæ for the spores. The orange-yellow sporanges contain spores, which Mr. Abbay describes as attached to the inner surface of the sporange. This, however, is opposed to Mr. Morris's observations. Certain dark brown bodies underneath the sporanges and in the substance of the leaf, described as of doubtful nature by Mr. Abbay, are, according to Mr. Morris, composed of closely packed threads of the mycelium lying within the cavity of the stomata. During the south-west monsoon (February till April) the bark and leaves externally are covered by the mycelium. In the wet weather its filaments do not enter the stomata, but remain outside. It is in this stage that the conidia of Abbay (secondary spores of Thwaites) are formed, but the author had failed to discover them; although kept on glass in a starved condition, the conidioid growth supervenes. The author describes a kind of resting stage during the dry season, when knotted masses lie exteriorly, underneath which the chlorophyll of the leaf is wanting. It is during the stage when the disease is exterior, *i. e.* before penetration into the leaf-tissues, that remedial agents, such as dusting with sulphur and lime, have a chance of being effective, though there is a serious disturbing element in the fact of large areas of abandoned crop still continuing to propagate the fungus.—'On the Origin of the so-called Scorpioid Cyme,' by the Rev. George Henslow. The author pointed out some errors in the dichotomous cyme:—1. Opposite pairs of bracts being successively in plains *at right angles*, the resulting sympode would be a volute and not a helix. 2. The position of the bracts (when present as in *Borago*) is not opposite to the flowers. 3. There are always *two* rows of flowers, not a single row. 4. The appearance of a flower in the fork between the two branches of the inflorescence, as in *Myosotis*, is not usual, and is due to an adhesion between the terminal and the highest axillary raceme; this has given rise to a false impression of dichotomy. 5. Authors have hitherto confounded the true scorpioid raceme (as it is now proposed to call it) with spicate degradations of sympodial inflorescence. Mr. Henslow refers it to the indefinite system, and explains its origin by a new principle of phyllotaxis, which he first discovered in *Lagerströmia*, viz., in resolving opposite and decussate leaves into alternate ones; instead of their lying, as is usually the case, on a continuous spiral line, the line *oscillates* through three-fourths of a circle; and if a line be drawn from flower to bract in *Borago*, exactly the same projection as for the foliage of *Lagerströmia* will represent the so-called scorpioid cyme of the *Borragineæ*. In practical illustration of the above Mr.

Henslow demonstrated his theory by some ingeniously contrived apparatus, rendering abstruse points easily comprehensible.

November 20, 1879.—Prof. Allman, F.R.S., President, in the chair. Messrs. Winslow Jones, of Exeter, and William Wickham, of Alton, Hants, were elected Fellows of the Society.—Sir J. D. Hooker, C.B., exhibited a specimen of, and read a paper on, the discovery of a variety of the Cedar of Lebanon on the mountains of Cyprus, with a letter thereupon from Sir Samuel Baker, F.R.S. This tree differs from known forms of *Cedrus* in the shortness of the leaves and in the smallness of the female cones, &c. The name *C. Libani* var. *brevifolia* seems therefore appropriate for this Cyprus cedar. Sir S. Baker was informed by the monks of Trooditissa of its existence, and they believed it to be the scriptural "Chittim-wood." The trees are very scarce, and only grow in a secluded spot; the wood is of superior quality. Mr. E. M. Holmes exhibited microscopic slides of rare British Lichens, Hepaticæ, and Fresh-water Algæ. An alga, which had been found to choke the filter-beds at Bradgate Reservoir, Leicester, was shown to be a form apparently hitherto undescribed, and bearing resemblances to *Zooglœa*, although the Rev. M. J. Berkeley had believed it to be the *Echinella articulata* of 'English Botany.' Mr. Holmes likewise exhibited the leaves, flowers, and portion of the trunk of *Andira Araroba*, the tree yielding Goa powder. This powder derived its name from the Portuguese colony of Goa, in India, where it had long been used as a remedy for obstinate cases of ringworm. Its source for many years had been a mystery, and on account of the drug yielding a large quantity of chrysophanic acid, it had been supposed to be prepared from some lichen. Quite recently it had been found that the dry cane came from Bahia, by way of Lisbon, and was thence exported to the east. The secretion appears to corrode and destroy the woody tissue, and ultimately itself becomes deposited, filling the cavities of the heartwood.—Mr. H. Marshall Ward read an important paper, 'Contributions to our Knowledge of the Embryo-sac of Phanerogams.' In this contribution the following plants have been systematically examined, and the various stages of the ovule delineated, viz., *Butomus umbellatus*, *Alisma Plantago*, *Anemone japonica*, *Lupinus venusta*, *Œnothera biennis*, *Pyrethrum balsaminata*, *Anthemis tinctoria*, *Lobelia syphilitica*, and *Verbascum phlomoides*. After describing the microscopical sections, the author compares these with the accounts of Strasburger, Vesque, and Warming, but his own researches lead him to adopt a modified view of the cell division and development. He advances the following:—The ovule, so far as its nucleus is concerned, arises as a group of cells which divide and become arranged in groups of sister cells symmetrically related to the shape of the whole organ; one cell group leads in growth, and, fulfilling a special purpose, becomes the embryo-sac. Further feeble division of this latter produces a watery cell with two nuclei. Each nucleus again produces four nuclei by bipartite division, followed by grouping, and a nucleus from the top group moves towards the middle sap cavity. Each group of four cells is

a prothallus, and the cell producing this a macrospore. The two most successful macrospores behave similarly to those of some vascular cryptogams, and finally germinate, producing a prothallus of four naked nuclei. The egg-cell is an oosphere, all that is left of the lower part of the rudimentary archegonium, its upper part probably being represented by the two "synergidæ," which are to be looked upon as having acquired a secondary function from being merely protective and guiding neck-cells of an archegonium.

Botanical News.

The 'Gardeners' Chronicle' is authorised to state that during the ensuing summer a students' garden will be thrown open in the Royal Gardens, Kew, where students will be permitted, under certain regulations, to procure botanical specimens for scientific study and observation.

The herbarium of the late Prof. A. Grisebach, of Gottingen, consisting of about 40,000 species, has been bequeathed to the University of that place. Dr. Grisebach was the author, among other works, of the 'Vegetation der Erde' and the 'Flora of the British West Indies.' He was born at Hanover, in 1814, and was appointed Professor of Botany and Director of the Botanic Garden at Gottingen in 1841—a post which he retained until his death in May last.

We have received the seventh edition of Prof. Morren's very useful 'Correspondance Botanique.' It now contains 154 pages, and is scrupulously brought up to the date of its publication (November, 1879). We are glad to learn from Prof. Morren's prefatory note that it is is intended to continue to issue the work annually, about September in each year.

A new part of Bentham and Hooker's 'Genera Plantarum,' completing the Dicotyledons, is announced for publication this month.

It is with much pleasure we observe that Mr. N. E. Brown, of the Kew Herbarium, has been elected an Associate of the Linnean Society.

Dr. O. Beccari has resigned the Directorship of the Botanic Garden and Museum of Florence.

Dr. Hermann Bauke, well-known from his work on Pycnidia, Fern-prothallia, &c., died on the 15th December, in his twenty-eighth year. He was remarkable not only for the care with which he carried out observations in their nature surrounded with obstacles, but also for the clearness with which he appreciated the relative values of the facts before him, and their general bearings. He gave great promise of a useful career.

Original Articles.

JOHN MIERS.

John Miers was born in London on the 25th of August, 1789. His early years were spent in business with his father, who was a jeweller. At this time he devoted much attention to scientific pursuits, especially to chemistry. He carried on original investigations, and his first contributions to science were two chemical papers, published in Thomson's 'Annals of Philosophy' in 1814, on the composition of nitrogen, and on the experiments which he conducted with the view of determining the constituents of nitrogen. The zeal with which he prosecuted these investigations, and the influence of Faraday and other chemists and physicists whose acquaintance he made at this time, would have decided the line of his future labours, and the characteristics of careful observation and persevering application which distinguished him in all his pursuits, would, no doubt, have given him a high place among the illustrious men who, during the early years of this century, laid the foundations of the true science of chemistry, had it not been for an unforeseen circumstance which altered the whole future of his life.

In the year 1818 Lord Cochrane (afterwards Earl of Dundonald), fretting at his enforced professional inactivity, resolved to proceed to South America, and aid the Spanish colonies in that continent to secure their independence. He believed that a high future was before these struggling republics, and while his mission was in the first instance to lead them in war, he made overtures to Mr. Miers to join him in developing the reported mineral riches of Chili. It was resolved to erect extensive machinery in Chili for smelting, refining, rolling, and manufacturing copper into sheathing. The inducements were powerful and alluring, and led to sinking a considerable capital in the undertaking by the two promoters. Copper of fine quality was said to be procured in abundance from the mines of Chili, and could be purchased for about half the price it bore in England. Nearly all the copper was exported in a crude state, and as the copper sheathing used in Chili was sent from England it appeared that a fortune might be rapidly made by introducing improved machinery for the conversion of the ore, and preparing the metal for the market in Chili. Mr. Miers accordingly despatched a large quantity of machinery to Chili in 1818; and in the beginning of 1819, when scarcely thirty years of age, he set sail for South America, accompanied by his wife, to whom he had been married a few months previously.

In the end of March he reached Buenos Ayres, and immediately started on the journey across the Pampas and over the Cordilleras to Chili. The two volumes 'Travels in Chile and La Plata'

contain a plain but graphic record of the difficulties of this long and fatiguing journey.

Unable to continue in this new country the scientific pursuits on which he had so successfully entered before leaving London, the attention of Mr. Miers was directed to its Natural History. He made important observations on the geological structure of the Cordilleras, the phenomena of earthquakes, and the changes of level on the sea-line; he collected specimens of animals, chiefly birds and insects, but he specially devoted himself to botany. He had not hitherto given any attention to this science, and he was unable in Chili, from the want of books, to compensate in any way for his want of knowledge. Nevertheless his enthusiasm and singular energy were exhibited in the way in which he overcame every obstacle in his investigation of the plants which he observed and collected in his various journeys. He carefully dissected a large number, and formed a collection of upwards of two hundred drawings, in which the various details were so faithfully depicted that they supplied material for his scientific works many years after, when he was able fully to interpret them.

He visited England in 1825, and during his few months' stay he prepared for publication the two volumes entitled 'Travels in Chile and La Plata,' which, besides the record of his travels, contain a history of the country, and a narration of the great difficulties which had to be encountered from the people themselves in every effort made to secure better government, or any moral or material improvement.

Occasional references are made throughout the volumes to the plants observed, and two lists are appended to the work, the one containing twenty plants believed to belong to new genera, and the other enumerating 215 plants belonging to species or to genera already known. No descriptions are given, but in his subsequent memoirs Mr. Miers has illustrated and described most of these plants.

When in England in 1825 he became acquainted with Brown and Lindley, and made a beginning in the scientific study of plants, which was of great service to him on his return to South America in 1826. He again crossed the Continent to Mendoza, and on the return journey formed his principal collection of the plants of the Pampas. He settled for some years at Buenos Ayres, where he erected a mint, and then removed to Rio de Janeiro to do the same for the Government of Brazil. He spent seven years in Rio actively employed as an engineer, and during these years he greatly increased his notes on the Flora of South America and his drawings of the living plants which he observed and collected in the neighbourhood of Rio. He finally left South America in 1838.

On his settling in London he devoted himself to the working out of the valuable materials he had brought with him. He was elected a Fellow of the Linnean Society in 1839, and in 1841 he published, in the Transactions of that Society, his first botanical paper on some new Brazilian plants belonging to *Burmanniaceæ*, and

this was followed, ten years later, by his memoir on the family, in which he pointed out its relations to *Orchideæ* in possessing minute seeds covered by a delicate net-like testa, and borne on parietal placenta. Another interesting Order he treated of in 1841 when he published his account of *Triuris hyalina*, afterwards monographing the Order in the Transactions of the Linnean Society in 1855. He early investigated the Order *Solanaceæ*. In 1851 he published a general review of the *Menispermaceæ*, and set himself to the collection of materials for an exhaustive monograph of this Order, which was at that time in a state of great confusion. Many species and even some genera had been established on single sexes of plants, and in specimens in herbaria it was extremely difficult, if not often impossible, to match the sexes of the same species. And as specimens in distant herbaria could not be compared side by side Mr. Miers made upwards of 700 tracings of Menispermaceous plants from the principal herbaria in England and on the Continent. These he had bound in four volumes, and resolved to place them with his herbarium in the British Museum. He dissected the flowers and fruit wherever it was possible; and in the progress of his work he discovered characters in the structure of the seed of the greatest importance in classification. He was able to separate plants that had previously been united, as no appreciable differences had been detected. Mr. Miers began the publication of his complete monograph of the Order in the 'Annals and Magazine of Natural History' in 1864, continuing it at intervals till 1867. The whole was reissued as the third volume of his 'Contributions to Botany,' and published in 1871, illustrated with sixty-seven quarto plates lithographed by his own hand. This monograph is perhaps the most important single contribution made to botany by Mr. Miers. In addition to the Natural Orders already mentioned he has revised and monographed the following:—*Olacaceæ* (1851), *Icacinaceæ* (1852), *Canellaceæ* (1858), *Winteraceæ* (1858), *Styraceæ* (1859), *Calyceraceæ* (1860), *Bignoniaceæ* (1861), *Tecophileaceæ* (1863), *Conantheræ* (1864), *Ehretaceæ* (1869), *Hippocrateaceæ* (1870), and *Apocynaceæ* (1878).

These represent only a portion of the numerous papers which during his active life he published. Many of his memoirs on genera or single species abound in careful observations and interesting speculations. Take, for instance, his investigations into the structure of the seed in *Gripidea* and other *Loasaceæ*, and the structure of the gynecium in *Myostoma*, especially in relation to the method by which the pollen grains fertilise the ovules in this plant, and the curious speculations and deductions in regard to the abnormal conditions of the access of the pollen influence to the ovule, and to the growth of the seed.*

* I cannot refrain from calling attention to the want of proper feeling and the unfairness (which, I regret to say, is not infrequent) of the editor of 'Nature' in adding a paragraph to a communicated obituary notice of Mr. Miers, in which he completely misrepresented the published views of Mr. Miers as to pollen, and to his attempts at justification when Dr. Trimen called the attention of the readers of that paper to the error.

The pages of our Journal contain several papers by Mr. Miers. His contributions in the different scientific journals amount altogether to nearly eighty separate papers. Some of these were reissued in quarto form with carefully executed illustrations, mostly lithographed by his own hand from his original drawings. They consist of his 'Illustrations of South American Plants,' vol. i., 1850, and vol. ii., 1857; 'Contributions to Botany,' vol. i., 1861, vol. ii., 1869, and vol. iii., 1871. His memoir on the '*Apocynaceæ* of South America' was published as a sixth volume, uniform with these, in the year 1878, when its author had attained the great age of eighty-nine.

All his work was characterised by the thorough nature of his investigations, the persevering efforts he made to exhaust authentic materials within his reach, and the fidelity and minuteness of his descriptions. He had a very quick sense of differences, but he sometimes failed to distinguish the real value of the differences he detected. He did not always clearly note whether the differences were due to the absence of analogies or affinities, and hence the characters which he detected and clearly pointed out for his genera were sometimes based on differences which could scarcely claim to be considered of generic importance. On the other hand, the persistent differences in the vegetative parts, or modifications in the reproductive organs of allied plants, which he pointed out, fully justified his giving them specific rank, though as long as such different views are entertained in regard to the limits of species systematic botanists will be found who take exception to what they characterise as an unnecessary multiplication of species.

Mr. Miers was elected a Fellow of the Royal Society in 1843, and was a member of several foreign scientific societies. He served as a juror in the Brazilian section of the Exhibition of 1862, and the value of his services to Brazil were recognised by the Emperor, who decorated him first with the Cross and after with the Grand Cross of the Order of the Rose.

His genial manners and upright character secured for him everywhere friends. He was entirely devoted to the scientific studies which occupied so large a portion of his life. He greatly increased his own collections by the addition of the plants of later collectors, so that his herbarium at his death consisted of more than 20,000 sheets. He numbered each plant, and repeated this number on every packet of dissections or separate note or drawing referring to it, so that erroneous correlation of detached materials is rendered impossible. He bequeathed this fine herbarium, with all his notes and drawings, to the British Museum; some time before his death he presented his duplicates to the Herbarium at Kew.

In June, 1879, he was compelled by failing health to give up active work. He became gradually weaker until the 17th October, when he expired, in the ninety-first year of his age, at his residence in Addison Road, Kensington.

William Carruthers.

ALABASTRA DIVERSA

AUCTORE S. LE M. MOORE.

Pars tertia.

(Continued from p. 8).

NEURACANTHUS NIVEUS, *sp. nov.*

Caule erecto robusto folioso dense albo-tomentoso basi pulvinato-incrassato ibidemque radices paucas simplices emittente, foliis magnis ovatis vel ovato-lanceolatis acutis vel obtusiusculis basi in petiolum brevem abbreviatis firmis supra saturate viridibus mox fere glabris subtus dense albo-tomentosis, spicis ad axillas superiores ovoideis, bracteis ovato-lanceolatis longe tenuiterque acuminatis membranaceis piloso-villosis, calycis pilosi lobis subulatis longe acuminatis, corollæ pilosæ tubo crasso labii postici lobis triangularibus antici ovatis lobo mediano intus piloso, capsula ——.

Hab.—In agris Djurensium repperit Schweinfurth (No. 1963).

Pedalis vel ultra. Folia 7·0–9·0 cm. long., 3·2–5·0 cm. lat., petiolo nunquam 1·0 cm. long. suffulta. Spicæ 2·5 cm. long., basi ad 3·5 cm. diam. Bracteæ vix 1·0 cm. long. Calyx 0·9 cm., et corolla 1·0 cm. long. Flores (ex Schweinfurth) violacei.

Cum *N. sphærostachyde* Dalz. comparanda, abs qua caule folioque subtus tomentoso et bracteis minoribus acuminatis faciliter dignoscenda.

NEURACANTHUS AFRICANUS, *T. And. MSS.*

Caule sat tenui folioso lignoso glabro pallide brunneo, foliis magnis subsessilibus lanceolato-lyratis basi cordato-truncatis scabriusculis membranaceis læte viridibus, spicis gracilibus elongatis quam folia vero brevioribus, bracteis firmis late ovatis spinoso-acuminatis plerumque 5-nerviis concavis siccis pallide viridibus, calycis pubescentis mox fere glabri corollæ tubum excedentis lobis parvis setaceis, corollæ tubo brevi sat crasso limbi labio postico breviter 2-fido labii antici lobis rotundatis, capsula oblongo-ovoidea apice sensim acutato-rostrata 2-sperma.

Hab.—Ad Lupata Afr. Trop. Or. anno 1860 legit Kirk. (Acanth. No. 10 in hb. Kew).

Caulis 0·25 cm. diam. Folia plerumque 8·0–12·0 cm. long., medio 4·0–5·0 cm. lat. Spicæ (in specimine unico a me viso haud omnino evolutæ) ad 6·0 cm. long. et circiter 0·6 cm. lat. Bracteæ plerumque 0·7 cm., calyx circiter 0·65 cm., corolla vix 0·7 cm. long. Capsula 0·8 cm. long., rostrum ejus 0.3 cm. long., albidum.

Videtur ad *N. trinervium* Wight proxime accedere, cujus foliæ haud lyrata, spicæ longiores, bracteæ hirsutæ majus conspicue nervosæ, &c.

CROSSANDRA GREENSTOCKII, *sp. nov.*

Spithamea vel minus foliis subsessilibus approximatis oblongis vel oblongo-ovatis obtusissimis basi attenuatis ad nervos pubescentibus deinde puberulis, spicis terminalibus longe (vel foliorum

præsentia breviter) pedunculatis, pedunculis folia æquantibus vel iis brevioribus erectis molliter villoso-pubescentibus, bracteis late ovatis acuminatis utrinque superne debiliter spinoso-serratis membranaceis crebre glanduloso-pubescentibus siccis viridibus, bracteolis linearibus, calycis lacinia postica late ovata apice 2-vel 3-acuminate spinoso-dentata, laciniis anticis et lateralibus oblongis spinoso acuminatis omnibus margine breviter glanduloso-ciliatis, staminibus prope apicem tubi insertis, capsula oblonga apice valide mucronata, seminibus 4 longissime appendiculatis.

Hab.—Occurrit in ditione Transvaaliana unde eam misit Atherstone (hb. Kew), Bolus (specimen in campis prope Pretoria lectum No. 3088 in hb. Kew), Rev. W. Greenstock (specimen in hb. Mus. Brit. ad Pilgrim's Rest lectum).

C. niloticæ Oliv. proxima, cujus folia angustiora et tenuiora, bracteæ integræ ciliatæ minus firmæ, calyx parum diverso, capsula minora et acutiora.

Folia 6·0–15·0 cm. long., membranacea, nervo mediano prominente. Pedunculus usque ad 10·0 cm. long., plerumque vero brevior et interdum subsessilis. Spicæ 4·0–9·0 cm. long. et 2·5 cm. lat. Bracteæ nervosæ vix 2·0 cm., bracteolæ 0·6 cm. long. Calycis lobus posticus 0·9 cm., lobi antici 0·7 cm., laterales 0·65 cm. long. Corolla circiter 1·5 cm. diam., coccinea. Capsula 1·6 cm. long., nitens. Semina 0·4 cm. diam., albida.

Asystasia Charmian, *sp. nov.*

Caule folioso acute quadrangulari geniculato retrorsum pubescente, foliis membranaceis lanceolatis integris obtuse acutis in petiolum brevem attenuatis utrinque æqualiter viridibus piloso-pubescentibus, spicis pluri- et magnifloris quam folia longioribus gracilibus hirsuto-pubescentibus, bracteis ovatis leviter acuminatis calyce brevioribus hirsutulis, calycis 5-partiti lobis subæqualibus linearibus hirsutulis, corollæ glabræ tubo recto e basi late in faucem campanulatam amplificato limbi lobis inæqualibus (antico majore) ovatis obtusis, staminibus 4 omnibus perfectis per paria lateralia insertis ac brevissime connatis, antherarum loculis subæqualibus (loc. uno altius inserto) basi albide calcaratis, connectivo pro genere lato, stylo crassiusculo inferne pubescente apice minute 2-lobo, ovario oblongo pubescente, capsula ignota.

Hab.—Ad Kitui in Ukamba (Hildebrandt, 2724).

Foliorum lamina ad 7·5 cm. long. et 2·0 cm. lat., petiolus fere ad 1·0 cm., et spicæ (haud omnino evolutæ) ad 10·0 cm. long. Bracteæ 4·0 cm., calycis lobi fere 1·0 cm. et corolla (intus setulis retrosis munita) 2·7 cm. long. Flores prominenter reticulato-venosi. Antherarum calcar albidum basi dilatatum.

Videtur ex affinitate inter omnes species africanas *A. macrophyllæ*, T. And. (*Dicentranthera*), et precipue *A. scandenti*, Ldl. (*Henfreya*); ab his vero multis de notis longe recedit.

Lepidagathis myrtifolia, *sp. nov.*

Caulibus tenuibus aliquanto flexuosis fortasse repentibus vel decumbentibus, foliis ovato-oblongis acutiusculis brevissime

petiolatis fere glabris coriaceis nitidis, spicis radicalibusve caulinis subsphæroideis multifloris interdum ad apices ramorum parum elongatis et foliis commixtis, bracteis ovatis vel lanceolatis plerumque spinose acuminatis villosulis subcoriaceis eleganter reticulato-nervosis, calycis laciniis quam bractea paullo minoribus postico et anticis omnino connatis lanceolatis lateralibus linearibus omnibus spinoso-acuminatis villosulis, corollæ tubo medio leviter constricto limbi sparsim villosuli labio postico breviter 2-fido antici lobis rotundatis undulatis, antheris glabris, ovula quoque in loculo unica.

Hab.—In ditione Bongoensi coll. Schweinfurth (No. 2493).

Caulis 0·1 cm. crassus, mox fere glaber. Folia plerumque circiter 2·5 cm. long. et 1·0–1·2 cm. lat., læte viridia. Bracteæ inferiores quam superiores breviores interdum ovatæ breviter cuspidulato-acuminatæ vel acutatæ vel obtusæ, flavido-brunneæ scariosæ, circiter 0·5–0·8 cm. long., superiores plerumque circiter 1·5 cm. long., virides. Corollæ 1·6 cm. long. Capsula haud visa.

Mihi viditur cum *L. molli* T. And. comparanda, cujus spicæ sat similes sed folia elongata linearia membranacea.

LEPIDAGATHIS MEDUSÆ, *sp. nov.*

Caule robusto erecto subtereti strigose hirsuto fortasse deinde glabro vel fere glabro, foliis crebris brevissime alato-petiolatis anguste lineari-lanceolatis breviter acuminatis 5-nerviis juvenalibus utrinque (precipue vero subtus) strigose hirsutis mox pagina superiore strigose pilosis vel puberulis subcoriaceis subtus pallidioribus, spicis cylindricis in axillis superioribus sessilibus bracteis unilateraliter arcte imbricatis multifariis ovatis vel oblongis longe caudato-acuminatis precipue ad marginem et acumen et nonnunquam dorso hirsutis, calycis laciniis anticis oblongis basi connatis lateralibus linearibus postico ovato omnibus longe caudato-acuminatis scariosis præcipue superne piloso-hirsutis, corollæ extus piloso-hirsutæ limbo postico breviter bifido labii antici segmento mediano ovato segmentis lateralibus oblongis, antheris ciliatis basi calvis.

Hab.—Crescit in ditione Bongoensi ubi repperit Schweinfurth (No. 4076).

L. Heudelotianæ Nees quam maxime affinis, ob hirsutiem vero et folia latiora 5-nervia et bracteas firmiores longius acuminatas haud difficile recognoscenda.

Folia 6·0–8·0 cm. long. et 0·5–1·3 cm. lat.; petiolus circiter 0·3 cm. long. Spicæ plerumque 3·0–4·0 cm. long., circiter 2·0 cm. lat. Bracteæ 0·9 cm. long.

Two plants have apparently been distributed under No. 4076. The one, although probably a *Lepidagathis*, is glabrous with narrow acuminate shining leaves and slenderer in habit than *L. Medusæ*. The extremely immature state of the spikes renders further identification impossible.

LEPIDAGATHIS PENICULIFERA, *sp. nov.*

Caule robusto subtereti ad nodos obscure tumido primo albo-villoso deinde glabro, foliis sessilibus lineari-lanceolatis spinose

acuminatis piloso-villosis deinde glabris? in specimine unico a nobis examinato secus ramulos perbreves congestis, spicis ramos defoliatos coronantibus vel in eorum axillis superioribus positis peniculum in mentem revocantibus, bracteis multifarie unilateraliter arcte imbricatis ovato-oblongis plus minus caudato-acuminatis vel acutis juvenalibus hirsutis senioribus glabratis scariosis, calycis laciniis liberis 3 ovatis acuminatis vel obtusis 2 linearibus omnibus præcipue superne strigillose hirsutis scariosis, corollæ labii antici lobo mediano ovato lobis lateralibus oblongis, antheris basi glabris, reliqui characteres desunt.

Hab.—Crescit in agris Mittuensium (Schweinfurth 2794).

Species insignis præcedenti affinis sed multis de notis dispar *L. clavatæ* Dalz. habitum quippiam simulat.

Folia 3·0 cm. long. et 0·5 cm. lat., trinervia, subcoriacea. Spicæ 4·0–6·0 cm. long., circiter 1·5 cm. diam. Bracteæ plerumque circiter 1·1 cm. long., crustaceæ. Calycis lobi latiores ad 1·0 cm. long., angustiores quam ii paullo longiores, concavi.

Siphonoglossa nummularia, *sp. nov.*

Caule decumbente? subtereti rigide ramoso geniculato crispe pubescente deinde pnberulo, foliis minimis breviter petiolatis late subrotundatis coriaceis pubescentibus, bracteis quam calyx paullo brevioribus anguste spathulatis puberulis, calycis laciniis 5 subæqualibus lanceolatis puberulis, corollæ tubo sub limbo breviter ac leviter ampliato, staminibus exsertis antherarum loculis æqualibus loculo inferiore basi obscurissime producto, capsula ——.

Hab.—In Kaffraria legit T. Cooper (No. 370 in hb. Kew).

Ab *S. tubulosa* (*Justicia*, E. Mey.) diversissima vestitu foliis minimis, floribus minoribus, &c.

Folia 0·6 cm. long., sicca atra. Petiolus 0·15 cm. long., pubescens. Bracteæ 0·15 cm. et calyx 0·2 cm. long. Corollæ tubus 1·2 cm. long., medio vix 0·1 cm. lat., puberulus; limbus circiter 0·5 cm. diam.

Hypoëstes strobilifera, *sp. nov.*

Caule erecto quadrangulari puberulo sparsim folioso foliis subsessilibus elongatis linearibus obtusis basi truncatis membranaceis scabriusculis, spicis terminalibus ovoideis vel breviter cylindraceis strobiloideis multifloris, bracteis magnis ovato-spathulatis cuspidulatis pubescentibus bracteolas 6 ovatas acuminatas vel ovato-lanceolatis et (in spica a me examinato) flores duos tertiique rudimentum includentibus, calycis laciniis bracteolis interioribus subæqualibus inter se inæqualibus lineari-lanceolatis pubescentibus decoloribus, corollæ puberulæ tubo tenui fere uniformi limbi lobo postico late rotundato-ovato antico lanceolato brevissime 3-fido, staminum exsertorum filamentis compressis, stigmatis cruris subæqualibus, capsula acutata fere glabra 4-sperma, seminibus minute tuberculatis.

Hab.—A Schweinfurth reperta in ditione Bongoensi vigens (Nos. 2553, 30).

Videtur sesquipedalis. Internodia foliis subæquilonga. Folia

fere ad 12·0 cm. long. (plerumque minora) et ad 1·2 em. lat. Spicæ 2·0–3·5 cm. long., 2·0–3·0 cm. diam. Bracteæ plerumque 1·2 cm. long., circiter 0·6 cm. lat., superiores vero minores. Flores mediocres, rosei. Capsula 0·7 cm. long.; semina 0·1 cm. diam., brunnea.

Species memorabilis nec foliis sparsis angustis longissimis nec spicis strobiliformibus cum ulla congenerorum comparanda.

Hypoestes callicoma, *sp. nov.*

Herba elata sparsim foliata, caule quadrangulari pilis strigosis retrorsis hirsutulo-piloso, foliis membranaceis breviter petiolatis linearibus vel lineari-lanceolatis apice obtuse induratis pilis strigosis appressis munitis dein scabridis pagina superiore læte viridibus inferiore pallidioribus, capitulis terminalibus axillaribusve breviter cylindraceis densifloris, bracteis membranaceis linearioblanceolatis aristato-acuminatis obscure puberulis apicem versus setas paucas flavidas more cristæ ferentibus, bracteolis quam bracteæ brevioribus subhyalinis linearibus acutis lateraliter compressis carinatis et (præcipue dorso) puberulis, calycis laciniis subæqualibus anguste-linearibus pubescentibus, corollæ tubo gradatim amplificato basi paullo dilatato limbi labio postico integro antico leviter emarginato, filamentis crassiusculis antheris parvis basi acutis, capsula parva bracteis bracteolisque inclusa lineari-oblonga apice valide breviterque mucronata puberula, seminibus quoque in loculo 2 minimis.

Hab.—In regione Angolana apud montes Bemba dictas legit Monteiro, necnon ex ditione Bongoensium habuit Schweinfurth (No. 2525).

Herba ex Monteiro 3 ped. alta. Folia ad 6·0 cm. long. et 1·0 cm. lat. Capitula 1·5–3·0 cm. long. Bracteæ trinerviæ 1·1 cm., bracteolæ uninerviæ 0·65 cm., calycis laciniæ 0·3 cm. et corolla vix 1·0 cm. long. Flores rosei. Antheræ flavæ. Capsula 0.6 cm. long. Species ob bracteas aristatas cristatas facile notata.

Hypoestes antennifera, *sp. nov.*

Caule foliato tetragono molliter crebreque pubescente, foliis magnis membranaceis petiolatis ovatis breviter acuminatis vel cuspidatis basi attenuatis supra sparsim strigoso-puberulis subtus pallidis molliter tomentosis, capitulis ad axillas confertis, bracteis magnis lanceolatis longissime acuminatis pubescentibus apicem versus glandulas multas brunneas ferentibus patulis, bracteolis quam bracteæ fere duplo brevioribus lineari-lanceolatis longissime acuminatis puberulis apice decoloribus, calycis laciniis subæqualibus lanceolatis acuminatis minute pubescentibus hyalinis, corollæ extus pubescentis tubo tenui sub limbo parum ac gradatim amplificato recto limbi labio postico integro antico breviter 3-fido lobo mediano quam laterales majore, staminibus exsertis, disco conspicuo bilabiato, stylo apice brevissime inæqualiter 2-fido, capsula lineari obtuse acuta, seminibus quove in loculo 2 suborbiculatis tuberculatis.

Hab.—N'di (Taita) Afr. Trop. Or. ubi coll. Hildebrandt (No. 2563).

Foliorum lamina ad 11·0 cm. long. et 5·0 cm. lat.; petiolus ad 1·8 cm. long., molliter pubescens. Bracteæ 1·7 cm., bracteolæ 1·0 cm., et calycis laciniæ vix 0·5 cm. long. Corollæ tubus 1·5 cm. long., limbus 1·7 cm. diam. Antheræ roseæ.

Differt ab *H. insulari* T. And. cui proxima caulis foliorumque vestitu, bracteis longioribus apice glanduloso pubescentibus, corolla paullo minore pubescente aliisque notis. Ab *H. aristata* R. Br. multis de punctis longe recedit.

Nescio cur cl. Bentham *Justiciam Ansellianam*, T. And. ad *Diantheram* refert: antherarum ejus loculo inferiore manifeste calcarato, nec ut scribit Anderson basi calvo. Species me judice ad calcem sect. *Raphidosporæ* ponenda cum *J. matammensi*, Schfth. et tertia in hb. Kew. conserv. in Afr. Aust. lecta planta.

Justicia fittonioides nob. melius ad sectionem *Rostellariam* referri debet.

Capsici anomali Fr. & Sav. vidi exemplaria japonica a Bisset sine loci indicatione lecta, et ab Oldham ad Kino Ohosima (No. 330), necnon tertium ex herb. Lug.-Bat. comm. sub nom. Miqueliano "*C. cordiforme* Mill., var. *truncata*." Itaque vidi hujus ut videtur speciei varietatem fructu viridi et calyce quam in typo majore in ins. Bonin reperta (Wright, No. 200).

NOTES ON THE FLORA OF NORTHAMPTONSHIRE.

By G. C. Druce, F.L.S.

The records in 'Topographical Botany' for Northamptonshire being incomplete, the following additions and explanations may not be altogether uninteresting.

Northamptonshire is about seventy miles long from Crowland Bridge in the N.E. to Aynhoe in the S.W., and varies from seven to twenty-six miles in breadth. It has an area of 630,000 acres, of which the large proportion of 580,000 acres are under cultivation, some 25,000 acres more being natural woods and coppices, including remains of the royal forests of Whittlebury, Salcey, and Rockingham. Its common lands are completely insignificant, thus accounting for the absence or rarity of ericetal plants, while from the well-drained land and absence of bog its uliginal species are rare and decreasing. Though boasting no great elevation, Northamptonshire rises from almost the sea-level below Peterboro' to 200 feet at Northampton, 430 feet near Braunston, and at Arbury Hill, near Badby, to 804 feet; a range of hills of tolerable height begins at Wakerley, overlooking the Welland, and runs south-west to Braybrooke, and another proceeds from Daventry, by Barby and West Haddon, to Welford, and thence by Cold Ashley to Oxendon, the latter portion being the field of Naseby; yet, although these elevations are not lofty, they form the great watershed of central England, while the escarpments of the numerous valleys from the frequent alternate layers of pervious and impervious strata furnish those springs of pure water which have long been the boast of

the county. As might be imagined, the rainfall in the western and much more elevated portion of the county is considerably higher than the lowlands of the eastern side.

Adopting the river system as a basis of division into botanical districts, the following seems to be the best arrangement :—

1. The Cherwell district, drained entirely by that river into the Thames basin, includes some interesting marsh ground near King Sutton and Croughton, where *Epipactis palustris* still lingers, Newbottle Spinney, and the hills about Charwelton.

2. The Avon district, drained by the Leam and Avon into the Severn basin, includes the hills of Staverton, the high ground of Barby, and Honey and Hempslow Hills.

3. The Ouse district, drained by the Ouse and Tove into the Ouse system, contains the old forest of Whittlebury, Cosgrove Quarries, and some interesting ground about Wappenham.

4. The Welland district, drained by the Welland from Naseby to Crowland, is a narrow strip of land which about Harringworth, Wakerley, and Collyweston is very rich in rarities.

5. Nene *a* district. The portion drained by the two heads of the Nene till they join at Northampton includes Salcey Forest, Badby and Plain Woods, Harleston Firs and Daventry Reservoir. In this district occurs Boro' Hill, Holdenby, and Naseby.

6. Nene *b* district. That portion drained by the main stream of the Nene from Northampton to Thrapstone and its tributaries, the Ise and Harpers Brook. It contains portions of Rockingham Forest, and the woods of Sywell, Yardley Chase, and Brigstock.

7. Nene *c* district. The portion drained by the main stream of Nene from Thrapstone to the Cambridge border below Peterboro', and also that drained by the Willowbrook. This includes the famous quarries of Barnack and Weldon, the magnificent woods of Bedford Purlieus, Barnwell Wolds, Southorpe and Wittering Heaths, and the great level of the fens. It includes considerable variety of soil, and is undoubtedly the richest in rarities of all the districts.

Thalictrum flavum, L. By Nene side, near Northampton ; also in Ouse and Welland districts.

Myosurus minimus, L. (queried in Top. Bot.) Occurs in sandy cornfields on Hunsbury Hill, Nene *a*; Grendon, *Miss Brent*, Nene *b*.

Ranunculus fluitans, L. In River Nene, Welland, and Tove; plentiful above Northampton in shallow swift-running water.

R. Drouetii, Schultz. At Blisworth, Nene *a*; a large-flowered form occurs at Grafton Regis, Ouse. Dykes below Peterboro' in plenty.

R. trichophyllus, Chaix. In a pond at Gayton water charged with lime, Nene *a*.

R. penicillatus, Hiern. Nene *b*, below Northampton ; rare.

R. Lingua, L. Extinct in Morton's localities. Plentiful and fine in pond near Harpole with *Carex Pseudo-cyperus*, Nene *a*.

R. parviflorus, L. Abundant on moat-side of Fotheringhay Castle, Nene *c*.

**Helleborus viridis*. L. Naturalised near Benefield, *Rev. M. J. Berkeley ;* and about Cogenhoe.

**H. fœtidus*, L. Well established on Weldon quarries, Nene *c ;* borders of Yardley Chase, Ouse.

Anemone Pulsatilla, L. Still abundant on the quarries of Barnack and Southorpe, Nene *c*, where it was noticed by Ray.

Nymphæa alba, L. Plentiful and truly wild in Nene, from Oundle eastwards, Nene *c ;* Cherwell (*French & Beesley*).

Diplotaxis tenuifolia, DC. Grew in abundance on the south bastion and walls of Northampton Castle, its only locality in the county; but the recent extension of the L. & N. W. railway system has removed the castle, so the plant must now be considered extinct.

D. muralis, DC. Grimsbury rail bank, Cherwell (*French*).

Sisymbrium Sophia, L. Confined to the Nene Valley, where it occurs in *a* and *b* districts, as at Harleston, Hunsbury Hill, Duston, Higham Ferrers, &c. A most abundant plant at the sewage works, Northampton, where, from the greater richness of soil, the plant is sometimes quite glabrous.

Erysimum cheiranthoides, L. Naturalised on rail banks at Kingsthorpe, Blisworth, &c., Nene *a ;* below Peterboro', in places possibly indigenous, Nene *c*.

**Hesperis matronalis*, L. Overthorp (*A. Beesley*), Newbottle Spinney (*T. Beesley*), Cherwell.

**Cheiranthus Cheiri*, L. Northampton and Barnwell Castle ; and on Peterboro' Cathedral.

Cardamine amara, L. Decreasing or extinct in many of its old localities ; still plentiful by canal side at Yardley, Gobion, Cosgrove, and at Furtho, Ouse.

C. sylvatica, Link. Brook-side, Kingsthorpe, Harleston, &c., Nene *a ;* Delapre, Arthingworth, Nene *b ;* Stoke Bruern, &c., Ouse.

Arabis Thaliana, L. Plentiful in sandy soil, and more frequently on sandstone walls throughout county.

A. hirsuta, L. (queried in Top. Bot.) Plentiful on the quarries of Collyweston and Easton, Welland; Barnack, Weldon, and Stanion, Nene *c*.

**Armoracia rusticana*, Bab. Man. So abundant by river sides and in osier-beds near Northampton, that were not its history and persistence known the plant would undoubtedly be considered indigenous.

Lepidium Smithii, Hook. Rail banks beyond Kingsthorpe, Nene *a*. Not typical *Smithii*, but a form with shorter styles and yellow anthers.

**L. Draba*, L. New Duston, &c., Nene *a ;* most abundant and fruiting freely on and about the sewage works, Nene *b* ; and from the distribution of sewage manure likely to be introduced to many parts of the county.

Nasturtium siifolium, Reich. Occurs by rail-side near Kingshorpe, Nene *a ;* and at Furtho, Ouse.

**Reseda alba*, L. Duston, Nene *a*. Appearing at wide distances

in this parish, principally on the ironstone quarries, doubtless owing its origin to the gardens in the village where it is cultivated.

Viola permixta, Jord. Growing with *V. hirta* and *odorata* at Courteenhall, Nene *a*. Quite typical *permixta*.

V. Riviniana, Reich. Generally distributed; a very large-flowered form occurs in Whittlebury Forest, and one with very small leaves and numerous flowers in Harleston Firs.

V. Reichenbachiana, Bor. Whittlebury Forest, Ouse; Boughton, Nene *a*; Ecton, Nene *b*. The plant has the under side of lower leaves of a purple colour, very marked when fresh; I have not seen this in our *V. Riviniana*.

Polygala depressa, Wend. In all the districts.

P. vulgaris, L. Castle Ashby, Nene *b*; Wittering and Southorpe Marsh, Nene *c*.

Silene puberula, Jord. On the quarries of Collyweston, &c., Welland; Lamport and Duston, Nene *a*; Barnack, Nene *c*.

Mœnchia erecta, Sm. In dry ridings of Harleston Firs, very rare, Nene *a*.

Cerastium semidecandrum, L. Barnack, Nene *c*; Cosgrove, Ouse.

C. apetalum, Thuil. In Harleston Firs, very common.

Stellaria glauca, With. By Nene side, and side of canal above Northampton, abundant, Nene *a*.

S. uliginosa, Murr. Throughout the Nene Valley, often growing with *Montia rivularis*, Gmel. An apetalous form occurs in Harleston Firs.

S. neglecta, Weihe. Cultivated fields, Dallington, Nene *a*.

S. Boreana, Jord. Pattishall, &c., Nene *a*; Castle Ashby, Nene *b*.

Sagina apetala, L. Creaton, Harleston, &c., Nene *a*; Potter's Pury, Ouse.

S. ciliata, Fries. Harleston and Blisworth, Nene *a*.

Hypericum dubium, Leers. Coppice Moor brook-side, near Yardley Gobion, on limestone, rare, Ouse.

Malva moschata, L. Coppice Moor, &c., Ouse; Brampton, Holdenby, &c., Nene *a*; near Kettering, Nene *b*; Barnack, Nene *c*; Easton-on-Hill, &c., Welland.

Linum angustifolium, Huds. Hill Morton, Avon (*H. W. Trott*).

Geranium pyrenaicum, L. Only at Castle Ashby; Nene *b*. This plant, although frequent east of Oxford, does not appear to extend into the Cherwell district of Northamptonshire.

G. pusillum, L. Dallington, Dane's Camp, Nene *a*; Kettering, &c., Nene *b*; Easton-on-Hill, Welland.

G. lucidum, L. King Sutton, Cherwell (*French*); Brampton, Lamport, Nene *a*. Barnack, Nene *c*. Only in these widely separated localities, and perhaps not indigenous in the first three places.

Erodium cicutarium, Herit. Local, but still generally distributed in Nene, Welland, and Cherwell districts; probably overlooked in others.

**E. moschatum*, Herit. Banks of Nene, Northampton, abundantly in 1878; near Caistor, Nene *c*.

Ulex nanus, Forster. Plentiful in Harleston Firs, and in Badby Wood, Nene *a*.

Genista tinctoria, L. Near King Sutton (*French and Beesley*), Cherwell; dry banks, Astwell (*Miss Scott*), Ouse; Collyweston, Deene, &c., Welland; Weldon (*Lewin*), Burnack (*Jones*), Nene *c*. Like *Geranium lucidum*, jumping over the central portion of the county, and occurring only on the eastern and western extremities.

Anthyllis Vulneraria, L. A rare plant in the county, and almost confined to the lower portion of the Nene Valley, where, by the old Roman road, near Fotheringhay, on the quarries of Wansford and on Wittering Heath, it is abundant; very sparingly on Roade spoil-banks, Ouse.

Medicago denticulata, Willd. Bank of Nene, Northampton, in abundance; possibly introduced by skin-washing. Spoil-banks, Kingsthorpe (*Sir John Robinson*).

M. maculata, Sibth. Cultivated fields, Upton; banks of Nene with last species.

Trifolium medium, L. East Haddon, Horton, Nene *a*; Weldon, Nene *c*; Fineshade (*Lewin*), Welland; a rare and very local plant.

T. arvense, L. Kingsthorpe, rare, Harleston quarries, Nene *a*.

T. scabrum, L. Hedge-bank, Franklin's Knot (*French*), Cherwell.

T. minus, Relhan. Generally distributed.

Astragalus hypoglottis, L. Splendid specimens on Southorpe quarries, by side of Bedford Purlieus, &c.; Nene *c*.

A. glycyphyllos, L. Generally distributed in Ouse, Welland, and Tove districts.

Hippocrepis comosa, L. With about the same range as *Astragalus hypoglottis*; it also occurs on the quarries of Collyweston.

Vicia angustifolia, Roth. Nene and Welland districts.

V. Bobartii, Forst. At Upton, Nene *a*.

(To be continued).

ON TWO ADDITIONS TO THE BRITISH MOSS-LIST.

By H. Boswell.

Bryum Origanum, Bosw.*—A moss found in Teesdale by Mr. Wesley was so named and described in the 'Naturalist' (Hudders-

[* The following diagnosis of this moss is from the 'Naturalist,' vol. v., p. 33 (Oct., 1879):—

"*Bryum Origanum*, Boswell. Stems elongated about an inch or more, copiously radiculose and forming dense soft tufts. Leaves ovate and ovate-lanceolate, shortly pointed, scarcely acuminate, concave, nerved almost to the apex; cells leptodermous oblong, and nearly rectangular; margins plane, slightly recurved when dry, formed of a single row of narrower cells. Shady old wall, Teesdale, June, 1879. J. S. Wesley.—In dense soft tufts; foliage full green; the young leaves at the summit rosy pink, the old foliage of former years and lower part deep brown; stems and leaves matted with numerous radicles. Habit and general aspect much as in *B. barbatum*, Wils., or some forms of *B. æneum* from Norway: from the former it differs in the form of the leaves, which are not piliferous-acuminate, in the nerve ceasing below the apex, in the form of the cells and their very thin walls."]

field) for last October. This species, if such it eventually prove to be, is a Westmoreland as well as a Yorkshire plant, having since been found in the neighbourhood of Levens, near Kendal, by Mr. Barnes, who remarks that he has noticed it as peculiar for several years, and never known exactly what to call it. A small specimen which he sends appears to be identical in all essentials with Mr. Wesley's Teesdale plant, but a little shorter and more robust. From small forms of *B. pallens*, which Mr. Barnes also sends, and which bear a good deal of resemblance to it, the new moss may be readily known by its denser tufts; while the leaves of *B. pallens* are also distinctly bordered with several rows of narrow cells, their apices serrulate and the nerve excurrent. Its aspect is that of *B. barbatum*, Wils.

Dr. Braithwaite has been kind enough to send me a couple of morsels of a *Bryum* which he has received from Dr. Lindberg, under the name of *B. calcareum;* one of them gathered in Ireland, the other in Norway. On examination I am unable to distinguish either of these from *B. pallens*, of which I should be disposed to consider them merely starved or dwarfed forms; one having male flowers and the rosy-pink or reddish tint so frequent in that species, and in *B. turbinatum* when growing on bare surfaces in boggy places. I have seen just such near Oxford.

Fissidens serrulatus, Brid.—Mr. Curnow sends from Cornwall a couple of forms of *Fissidens polyphyllus*, which grows in several places about Penzance, and therewith a third specimen for examination, which I have no hesitation in referring to *F. serrulatus*. This highly interesting addition to the British cryptogamic flora, not hitherto suspected to be a native of this country, was long supposed to be restricted to Madeira and the neighbouring islands, but found some years ago in Portugal. No moss has been more fertile in originating doubts and differences of opinion, and it is one of a number of closely allied species, difficult to discriminate, including *F. Hornschuchii*, Mont. (*F. serrulatus*, Hornsch.), *F. sylvaticus*, Griff. (*F. javanicus*, Dz. & Mlkb.), and other tropical species. *F. Welwitschii*, Duby., another near relative pertaining to South-west Africa, has lately been found in Portugal, and appears very close to *F. polyphyllus*. At the time of the publication of 'Bryologia Britannica' English botanists were but little acquainted with these, and Wilson was induced to unite together his own *polyphyllus*, *F. serrulatus*, and *F. asplenioides*, Hedw. Between the two former there are, however, differences enough, and no bryologist, with our present means of knowledge and half of Wilson's experience, would unite them. Of *F. asplenioides* I know little, having seen but some few poor specimens; judging by size alone they should be widely distinct. *F. serrulatus*, while closely approaching *polyphyllus* in size and habit, is well marked by the following characters:—Its leaves do not taper towards the point, but are straight in outline, obtuse, their apices strongly serrate, the margins of the conduplicate portion being finely serrulate throughout, and the dorsal lamina surrounded with a conspicuous border of yellowish

coloured cells somewhat larger than the rest, while the basal cells are uniform. In *F. polyphyllus* the leaves taper gradually to a point; they are destitute of a border; entire, except at the serrulate apex; and the cells of the base are gradually enlarged from the margin inwards towards the nerve, those of the long-decurrent angles being linear-oblong. Another difference between the two is found in the male flowers—triphyllous in *F. serrulatus*, 8 or 9 leaved in *polyphyllus*.

As far as our islands are concerned it can scarcely be hoped that this interesting species will be found, except on the western or south-western coasts; Cornwall, the South of Ireland, perhaps the Hebrides. It belongs to a group representing a more southern flora, whose presence here is probably due to the influx of the Gulf-stream; *Daltonia splachnoides*, *Hookeria læte-virens*, *Myurium Hebridarum*, &c. Visitors to Killarney should bear it in mind: *F. polyphyllus* is plentiful thereabouts, and the other may occur too, as both grow in Cornwall very near each other, and yet, though the locality has been much investigated, this by no means small moss has been hitherto overlooked, and by some of the keenest and most practised eyes.

The following is a translation of a passage in a letter from Dr. Schimper, received since the foregoing was written, by my excellent friend, Dr. Wood, who had communicated the discovery to him:—

"The discovery of *Fissidens serrulatus* in England is a most interesting circumstance, and one proof the more that the British Isles possess a great many species in common with the South of Europe, and especially with Spain, Portugal, and the Canary Islands.

"In fact, England with its adjoining islands is a veritable Eldorado of mosses, participating as it does in the bryological flora of the North, of the South, and of the Intermediate Zone, and there are doubtless other discoveries to be yet made."

All botanists will regret to hear that, since gathering this interesting moss, Mr. Curnow has had the misfortune to fall and break a leg, but appears to be doing well, and it may be hoped that this is not his last discovery.

Brachythecium salebrosum. — Not seeing 'Grevillea' very regularly, I was surprised at the note upon this in the October number (Journ. Bot., 1879, p. 305), as I see no reason why the accuracy of Dr. Spruce should be doubted in the matter of a moss so easy to know. It seems less common in Britain than in North America or Germany, but perhaps is sometimes passed by as *B. rutabulum*. I have gathered it in Oxfordshire several years ago, and in the winter of 1877 Mr. Lees found it near Market Rasen, in Lincolnshire, and sent it to me. But certainly I have very seldom received it from correspondents, which fact seems to indicate that it is not of very general occurrence in Britain. In 1859 and 1861 I found the var. γ. *palustre* (*H. Mildeanum*) plentiful on the coast near Southport, but never met with it elsewhere: its aspect is different

enough, but it possesses no character of specific value; and the course adopted in the second edition of the 'Synopsis,' of placing it as a variety under *salebrosum*, is justified by the slenderness of the distinctive features, which are chiefly those of habit. How it should come to be thought likely that a bryologist of Dr. Spruce's attainments should confuse either form with a moss so different in aspect and characters as *Camptothecium aureum* one is puzzled to guess, this last much rather resembling *C. lutescens*, or even *Homalothecium*; nor do I see why anyone need feel it difficult to understand *B. salebrosum* aright who can refer to 'Bryologia Europæa,' or to 'Bryol. Britannica' and the 'Synopsis' of Schimper.

ON TWO NEW BROMELIADS FROM RIO JANEIRO.

By J. G. Baker, F.R.S.

Following close upon Mr. L. C. Meyer's Bromeliads from Trinidad, an interesting packet of well-dried specimens has come from Dr. Glaziou, collected in the neighbourhood of Rio Janeiro. Amongst other things it contains specimens of the very distinct *Billbergia nutans*, H. Wendl., figured lately in the 'Botanical Magazine' (tab. 6423), of which the native locality was not previously known, and further examples of *Æchmea fasciata*, *Glaziovii*, *floribunda*, and *suaveolens*, *Tillandsia Gardneri*, *stricta*, *regina*, and a second large *Vriesia*, which is either *T. procera*, Marl., or a close ally. My main object in this present note is to name and describe two very distinct novelties included in the series; one a distichous *Æchmea*, and the other a *Nidularium* of much larger size than any species already known, which will be a great acquisition to our stock of cultivated Bromeliads when Dr. Glaziou is able to procure and send living specimens.

Æchmea (Platyæchmea) multiceps, *Baker*, n. sp.—Leaves with a lorate lamina 3–4 feet long, 2½–3 ins. broad at the middle, not rigid in texture, thinly lepidote on the back, deltoid-cuspidate at the tip, the edge-prickles brown-black, close and minute throughout. Inflorescence a bipinnate panicle, with a stout loosely woolly flexuose rachis, the lower branches abont half a foot long, spreading horizontally, subtended by short scariose adpressed lanceolate bract-leaves, the flowers of each branch clustered into ten or a dozen globose distichous sessile heads ½–⅝ in. broad, containing each six or eight flowers, the upper heads of the branch aggregated, the lower separated. Flower-bracts cordate-orbicular, coriaceous, about ¼ in. long and broad, minutely cuspidate, striated vertically, furnished with a little loose deciduous tomentum. Calyx with ovary ovoid, ¼ in. long; sepals minute, deltoid-cuspidate. Petals with an oblong lamina protruded about $\frac{1}{12}$ in., spirally twisted after flowering.—Rio Janeiro, *Glaziou*, 11,681!—Remarkable for its small Lamprococcus-like flowers, combined with an inflorescence rather like that of *Æ. glomerata*, but the heads distichous, not multifarious.

NIDULARIUM GIGANTEUM, *Baker*, n. sp.—Leaves in a dense sessile rosette; dilated oblong base 4–5 ins. long by 3 ins. broad; lamina ensiform, 2–3 ft. long, 1–1¼ in. broad at the middle, tapering gradually to an acute point, moderately firm in texture, not lepidote on either surface, the lower edge prickles close, lanceolate, brown-black, $\frac{1}{12}$ in. long, the upper minute and distant. Peduncle stout, stiffly erect, glabrous, 8–9 ins. long, bracteated by several large erect lanceolate reduced leaves similar in texture to those of the basal rosette. Flowers in a dense globose head about 4 inches in diameter, which is overtopped by an outside whorl of lanceolate spine-toothed coriaceous red-tinted bracts 5–6 ins. long; flower-bracts linear or linear-subulate, shorter than the flowers. Calyx including ovary 2 ins. long, glabrous, like the rest of the plant; sepals lanceolate, striated, coriaceous, glabrous, acuminate, 1½ in. long. Corolla seen only in an undeveloped state, and its colour not known.—Rio Janeiro, *Glaziou*, 11,692!—The Nidularia may be divided into two groups: one with lorate obtuse leaves, like *N. fulgens*, the other with ensiform leaves narrowed gradually to a point, as in *N. sarmentosum* and *Scheremetiewii*. The present plant belongs to the second group, and differs from the species already known by its peduncled capitulum and very large calyx.

HAMPSHIRE BOTANY.

BY FREDERICK TOWNSEND, M.A., F.L.S.

THE following notes are taken from materials for my work on the Flora of Hampshire, which I hope soon to publish :—

Nasturtium sylvestre, Br., and *Nasturtium amphibium*, Br. I have only uncertain records of these as Hampshire plants.

Cardamine amara, L. This is recorded by Mr. W. L. Notcutt, in the 'Phytologist,' as occurring "By the Titchfield River," near Fareham. Another record is given by Mr. F. I. Warner, to whom it was communicated, I believe, by the late Mr. R. S. H. Hill, of Basingstoke: the record is, "Crooked Billet, Hook." Hook is about six miles eastward of Basingstoke.

Hypericum montanum, L. The late Mr. Spicer recorded this as occurring at Itchen Abbas; so I am informed by Mr. F. I. Warner, who has not seen a specimen. I know of no other notice of it as a Hampshire plant on the mainland.

Trifolium maritimum, Huds. The Messrs. Groves have already recorded this as occurring at Newtown, Isle of Wight. I gathered it there myself this year, and also near Yarmouth, in the Island: this latter station is about four miles from the former one.

Alchemilla vulgaris, L. This is recorded by Gerard, p. 802, as follows:—"It groweth of itselfe wilde in divers places as in the towne pastures by Andover, and in many places in Barkshire and Hampshire, in their pastures and copses or low woods;" but

it is not given in Mr. Clarke's list of Andover plants. Specimens from near Basingstoke are in Mr. R. S. H. Hill's herbarium, gathered in 1839 and 1856. Mr. Reeks records it for E. Woodhay in the Newbury Field Club 'Transactions.' All these stations are in N. Hampshire. I lately found the plant in S. Hampshire, on the banks of the Stour, a mile above Hern Bridge.

Œnanthe silaifolia, Bieb. *Œ. peucedanifolia*, Sm., is entered in the 'Botanist's Guide' (Turn. & Dill.) as occurring "at East How in the parish of Subborton." The station is doubtless given on the authority of Merrett, who at p. 84 of his 'Pinax' says, "*Œnanthe angustifolia*, Lob., p. 894. *Filipendula angustifol.*, G., 1059. At *East How* in the Parish of *Subborton*, seven miles from *Petersfield*, *Hampshire*. Mr. Goodyer." I shall be glad of any other information of *Œ. silaifolia* as a Hampshire plant.

Œnanthe Phellandrium, Lam. I have this recorded from several stations in South Hants, but have reason to believe that some of them at least refer to *Œ. fluviatilis*, Colem. I shall be glad to know of stations in Hants for *Œ. Phellandrium* as distinct from *Œ. fluviatilis*, and would gladly receive specimens.

Pimpinella magna, L. The only record I have for this as a Hampshire plant is that in Mr. Clarke's Andover list; and Mr. Clarke tells me he suspects his *P. magna* was the large form of *P. Saxifraga*. Mr. H. C. Watson cannot find the record of this plant on the faith of which he entered it for South Hants in 'Top. Bot.'

Sium latifolium, L. Two records exist for this as a Hampshire plant:—one, "In the Stour at Heron Court near Christchurch," communicated to Dr. Bromfield in a letter from Mr. Curtis; the plant is figured in Curtis's 'Brit. Entom.' from specimens gathered at Heron Court. The second record is "near Fordingbridge," given in the 'Botanist's Guide' on Dr. Maton's authority. There is no more recent record of the plant for Hampshire.

Herniaria hirsuta, L. I found this in considerable plenty in waste ground on the border of a field near Christchurch, on the Iford Bridge Road. It has not as yet been recorded as a native of England. I secured numerous specimens for distribution by the Botanical Exchange Club. Botanists who have the opportunity should examine this neighbourhood carefully, for it would be more satisfactory that its claim to be considered native should rest on more than one station.

Asarum europæum, L. This is entered for "Red Lynch" in the 'New Forest Handbook' (p. 102), lately published at Lyndhurst.

I would ask any botanist who can give me further information respecting any of the above-named plants as natives of Hampshire, mainland or the Isle of Wight, to be so kind as to do so in the pages of the 'Journal of Botany,' or by letter addressed to me at Honington Hall, Shipston on-Stour.

MISSOURI
BOTANICAL
GARDEN.

ON THE BOTANY OF THE BRITISH POLAR EXPEDITION OF 1875–6.

By Henry Chichester Hart, B.A., Naturalist to H.M.S. 'Discovery.'

Having been prevented by ill-health from working out the materials which I collected while serving on board H.M.S. 'Discovery,' I trust the following essay, though appearing later than I could wish, may not be devoid of interest. The acconnt given in the appendix to Nares' Voyage* is so brief that it by no means exhausts the subject; dealing, as it does, only with the collections made north of latitude 80°, and giving no account of the local distribution or peculiar circumstances of growth and habitat which can only fall under the notice of the collector himself.

My numerous field notes, which were accumulated from day to day, and the advantages which I have had in consulting collections made by my friends, Drs. Moss and Coppinger, have enabled me to enter into much greater detail, and to give separate accounts of the various stations visited from Egedesminde, lat. 68° 42′, to the northernmost land reached by the Expedition at Cape Columbia, lat. 83° 8′.

Those botanists who have gained their experience in our own temperate regions, or even on the European Alps, cannot easily form an idea of the peculiar conditions of an Arctic flora. It is only on the low ground of the more southerly parts of Greenland visited, as at Egedesminde, Disco, Rittenbank, and Proven, that the surface is uniformly covered with vegetation for any extent, and this consists of small-tufted perennials of low matted growth, through which the Arctic willows and *Ericaceæ* trail and extend their branches, the first alone rarely rising under the shelter of a cliff to a height of three or four feet. Through this brownish green carpet, which is about the hue of an Irish mountain bog, conspicuous and beautiful blossoms of *Rhododendron*, *Azalea*, *Diapensia*, *Pyrola*, and other ericaceous plants, are lavishly scattered; while the cream-coloured *Dryas*, the snowy-white *Cerastium* and *Stellaria*, the pink *Silene*, and the gorgeous red-purple *Saxifraga*, often form luxuriant sheets of colour, the latter being comparable to our Scotch heather, though richer in its effects. True blue flowers, as *Veronica alpina*, rarely occur; true reds are never met with, and most of all is felt the absence of a green sward, such as the eyes are accustomed to at home. As we advance further north the vegetation (except, perhaps, that of lichens) rapidly diminishes, both in variety and growth; and after leaving Upernavik, ground covered with herbage is rarely met with, and only at low levels. Foulke Fiord, a few valleys along Hayes Sound, and Discovery Bay, were much the richest stations explored; yet even in these favoured spots the plant-bearing surface is very limited, patchy, and easily distinguished at a distance: a consolation arising from this is, that

* 'Voyage to the Polar Sea,' by Capt. Sir G. S. Nares, R.N., K.C.B., F.R.S. London. 1878. (Botany by Sir J. D. Hooker, Prof. Oliver, and others.)

the probability of any species escaping observation is reduced to a minimum.

I may mention here that, with regard to vertical distribution, lichens follow a different law from phanerogams, seldom appearing in any considerable quantity near sea-level, and occurring most abundantly at from five hundred to a thousand feet above it, an altitude at which most flowering plants have disappeared; nevertheless some phanerogams, I think, maintain life at a higher elevation than any lichens. On the other hand, mosses have a similar distribution (vertically) with the flowering plants; yet in that most desolate of regions, along the west shore of Smith Sound from Cape Louis Napoleon to Cape Baird, lat. 79° 40′ to 81° 32′, lichens appeared to be quite as scarce as phanerogams, which are here reduced to some fifteen or twenty species.

An important characteristic in Arctic plant-life is the almost entire absence of seedlings, *Kœnigia islandica* at Disco being the only annual observed; seeds, however, if ripened elsewhere, do germinate under the influence of an Arctic sun, though they will not, I believe, ripen; hence it is no doubt possible that some plants may have been introduced by currents of air or water, or by the agency of birds or other migratory animals.

Observations upon these and other conditions of Arctic vegetation were chiefly made in Discovery Bay (where I was stationed for within a few days of a year), and will be found more fully dealt with under that heading further on.

I will now give a brief notice of the various stations visited: they may be arranged, with their latitudes, in the following order from south to north; and for convenience of reference I have assorted them into thirteen districts numerically. Longitudes being comparatively unimportant, I have omitted throughout:—

I. Egedesminde, 68° 42′; Disco, lat. 69° 15′; Rittenbank, lat. 69° 42
II. Proven, lat. 72° 20′.
III. Upernavik, lat. 72° 48′; Kangitok, lat. 72° 58′.
IV. Cape York, lat. 76°.
V. Foulke Fiord, lat. 78° 18′.
VI. Cape Sabine, lat. 78° 45′.
VII. Buchanan Straits=(Hayes Sound); "Twin Glacier"; "Edward's Grief"; "Deserted Village;" "Ptarmigan Hill";—lat. 78° 52′ to 78° 56′.
VIII. Walrus Island (=Norman Lockyer Island); Franklin Pierce Bay; Gould Bay; Cape Hilgard; Cape Louis Napoleon; Station north of Cape Frazer; Dobbin Bay;—lat. 79° 25′ to 79° 45′.
IX. Joiner Bay; Cape Collinson; Cape Wilkes; Rawling's Bay; Radmore Harbour;—lat. 80° 3′ to 80° 22′.
X. Bessels Bay; Hannah Island; Cape Morton;—lat. 81° 4′ to 81° 7′.
XI. Polaris Bay, lat. 81° 40′.
XII. Bellot Island; Musk Ox Bay and Fiord; Discovery Bay; St. Patrick's Bay; Shift Rudder Bay; Cape Beechey;—lat. 81° 40′ to 81° 53′.
XIII. Floeberg Beach, lat. 82° 27′; Cape Joseph Henry, lat. 82° 50′; Ward Hunt Island, lat. 83° 4′; Cape Columbia, lat. 83° 8′.

After each plant, besides its distribution amongst these districts, letters E, W, or G may be found; these roughly divide the whole area visited into three well-marked sections.

E indicates east shores north of Humboldt Glacier, and of 80° lat. (Districts 10 and 11).

W indicates west shores visited, all north of 78° 45′. Ellesmere Land and Grinnell Land. (Districts 6, 7, 8, 9, 12, 13).

G indicates Greenland station visited, south of Humboldt Glacier and of 78° 13′ lat. (Districts 1, 2, 3, 4, 5).

I. Egedesminde; lat. 68° 42′. Sept. 29 to Oct. 2, 1876.

We visited this island when homeward bound, and the season was too far advanced for successful botanising. It is a low-lying granitic island, or rather series of islands, very barren and exposed. There is here little soil or sheltered valley-ground to harbour plants. At the date of our visit most of the *Ericaceæ*, *Pyrola*, *Cerastium alpinum*, *Polygonum viviparum*, and a few grasses, were still in flower. I noticed here *Polygonum aviculare* in small quantity near the settlement, perhaps a colonist, and a few stunted plants of *Saxifraga stellaris* were gathered. I also picked a leaf which, I feel convinced, belonged to *Viola palustris*, the only representative of its family found in Arctic Greenland. These latter three were not observed elsewhere.

Disco, lat. 69° 15′, July 6 to 15, 1875, and Sept. 25 to 29, 1876.

This is the best explored botanical locality in all Greenland, but my experience leads me to believe that its resources are by no means perfectly kuown. A week's collecting upon the island of Disco, in 1875 (Disco botany was quite over at the time of our visit in 1876), yielded 119 species. R. Brown, in his 'Florula Discoana' (which comprises a district ranging over nearly a degree and a half of latitude, and lying mostly to the north of Disco, and is the result of over three months' exploration), enumerates one hundred and twenty-nine plants, of which about sixteen are mere varieties; and many are from the mainland and more southern localities. My list contains about twenty-eight species from Disco not mentioned in Brown's list. If we deduct from Brown's total sixteen varieties, and about eight which are only found south of Disco, and probably do not occur there, we have a residue of one hundred and five; adding to these twenty-nine in my list, and about twenty-five probable plants from Lange's list (occurring both north and south of Disco), we may place the Flora of Disco at about one hundred and fifty-eight vascular plants.

The following species do not appear to have been previously obtained in Disco:—

Ranunculus affinis, Br. This is found in East Greenland, north coast (Buchenau); "common in Spitzbergen and Melville Island" (Hooker); Cumberland Gulf, Davis Straits (Taylor); and might, therefore, be expected to occur in West Greenland.

Draba alpina, L., var. *glabra*. Not recorded south of Omenak Fiord, lat. 70° 47′. by Lange.

Cerastium latifolium, L. Was previously recorded from Arctic

East Greenland by Scoresby, and is quoted as a Greenland plant by Watson, but has since been excluded from the Arctic flora.

(*Gnaphalium sylvaticum*, L. I gathered specimens appearing to be typical *G. sylvaticum* as distinct from *G. norvegicum*, Gunn., in Englishman's Bay).

Habenaria albida, Br. Not recorded north of 64° 14′ by Lange, nor noticed by Brown ; nor is it given in Walker's plants of Greenland, gathered by H.M.S. Fox, nor in Durand's list of Kane's plants. Arctic in Greenland, Hooker.

Listera cordata, Br. South Greenland to lat. 64° 10′ in Lange's list; an addition to the Flora of Arctic Greenland. Arctic elsewhere only in Europe.

Polypodium Dryopteris, L. South Greenland to lat. 64° 10′, Lange ; an addition to the Flora of Arctic Greenland. Arctic elsewhere in East America and Europe.

Sir Joseph Hooker remarks that "no less than fifty-seven Arctic Greenland species are absent in Arctic East America:" *Listera cordata* adds another to the number. Further, he says that "perhaps the most remarkable fact of all connected with the Greenland Flora is that its southern and temperate districts, extending south to lat. 60°, do not add more than seventy-four species to its flora." The last two species given above reduce this number to seventy-two, and since these two South Greenland plants are thus Arctic also in Greenland, they tend to confirm his apparently paradoxical remark that " Greenland, as a whole, is more Arctic in its vegetation than Arctic Greenland is."

These two plants add two to the genera, as well as to the species, of Arctic Greenland.

In Disco, the valleys around Godhavn, Lyngemarken, and especially Englishman's Bay, are most attractive for the botanist, the latter yielding several new species. The island is chiefly composed of gneiss, syenite, and trap ; upon gneiss and other granitoid rocks the *Ericaceæ* seem to thrive best: they were plentiful at Egedesminde. Disco is somewhat triangular in form, and about sixty-five miles in length from east to west and from north to south ; the interior is an ice-capped plateau attaining a maximum height of about 5000 feet. From the plateau of Skarvelfield (3300 feet), the highest ascent I made, a good view of the island may be obtained. Up to within a few hundred feet of that altitude, on patches bare of snow, a few plants still maintained a footing, as *Saxifraga nivalis*, *S. oppositifolia*, *S. cæspitosa*, *Potentilla nivea*, and *Eriophorum Scheuchzeri;* mosses and lichens seemed comparatively scarce.

Our visit here was somewhat early for botany, the summer only setting in thoroughly while we were there. The Governor of Disco informed me that the season of 1875 was about a month later than usual.

RITTENBANK, lat. 69° 42′, July 16, 1875.

Here we formed a boating excursion to examine loomeries and see the Itifdliarsuk Glacier from a ridge at the head of Svarte Vogel Bay, about ten miles away. I landed a couple of times

during the cruise, and obtained *Cassiopeia hypnoides* and *Lychnis alpina* just in bloom, two of the prettiest Arctic flowers. At the head of the bay I gathered, for the first time, *Vesicaria arctica;* this is one of the very few non-European Greenlandic plants, finding here its southern limit in Greenland. The rock at Rittenbank is glacially smoothed gneiss with erratic boulders perched in all directions.

II. Proven, lat. 72° 20′, July 19 to 21, 1875.

A small gneissose island, containing a good deal of heavy soil in many places, and, on the whole, good for botany, especially in sedges and grasses. Proven is about 560 feet above sea-level at its highest point, and about three miles long by two broad. Near the governor's settlement *Lychnis affinis* and *L. triflora* formed pretty beds of pink and white flowers. *Turritis mollis* (another non-European Greenlandic plant), was here first met with; Lange gives lat. 70° for its northern range. *Phleum alpinum*, *Carex scirpoides*, *C. alpina*, and *C. capillaris* were also gathered here. The vegetation on this island seemed to me rather more luxuriant than at Disco, but this was probably due in great measure to the advance of the season. Nevertheless Proven is a very snug sheltered little island, and is free from the chilling effects of a perpetual cap of ice. Many species have disappeared since Disco, but *Ericaceæ* and *Saxifragaceæ*, *Gramineæ* and *Carices*, are still well represented.

III. Upernavik, lat. 72° 48′, July 12; and Kangitok, lat. 72° 58′, July 23, 1875.

Uperuavik Island gave me an impression of extreme barrenness and a much reduced flora. *Ranunculus pygmæus* and *R. hyperboreus* were, however, more common here than elsewhere, and I noticed an especially luxuriant growth of lichens. The Heath family, which is so well and beautifully represented at Egedesminde, Disco, and Proven, here dwindles to *Cassiopeia tetragona* and *Diapensia lapponica;* while of other plants about half seem to have disappeared since leaving Disco. Kangitok is a small low island botanically uninteresting; it appeared to be the northern limit of *Diapensia lapponica*.

These islands are composed of red granite and gneiss; our visit to each was limited to a few hours. The summit of Upernavik (450 feet) was completely barren, except for *Salix herbacea* and a few lichens.

IV. Cape York, lat. 76°, July 25, 1875.

An exposed headland, about 1000 feet high, composed of porphyritic granite, crumbling into great banks of fragments, amongst which numbers of little auks have their breeding-places. Upon the guano here accumulated *Cerastium alpinum*, *Alopecurus alpinus*, *Cassiopeia tetragona*, and several Saxifrages were very luxuriant. *Phippsia algida*, a high Arctic grass, was here first gathered. Some mosses also formed pleasant bright green patches.

(To be continued.)

SHORT NOTES.

Symphytum peregrinum, *Ledeb.*—In the 'Botanical Magazine' for December (t. 6466), Sir Joseph Hooker adopts Mr. Baker's suggestion in the last Report of the Botanical Exchange Club (quoted in 'Journ. Bot.,' 1879, p. 250), as to the identity of the "*Symphytum asperrimum*" of cultivation with *S. peregrinum*, Ledeb. The plant in question has long been familiar to British botanists as a partially naturalised species; and we therefore reproduce the 'Bot. Mag.' diagnosis of the plant, with Sir Joseph's sketch of its history; the figure accompanying the description is very characteristic.

"The history of this plant, which is now well known under the erroneous name of *Symphytum asperrimum* (or Prickly Comfrey) is still obscure. That it is not the true *S. asperrimum* of Don, figured by Sims in this work (t. 929), is obvious from a comparison of that plate, in which the calyx is correctly represented as short, and shortly 5-cleft to the middle only, with obtuse lobes, and which has curved prickles on the stem, arising from conspicuous white tubercles. It agrees well with the character of *S. peregrinum* given in Ledebour, except that the appendages between the stamens are rather shorter (than longer) than the anthers, and the style is not always bent below the top (stylo infra apicem infracto), though it is sometimes so above the middle. From *S. caucasicum* it differs in the stem not being hirsute, nor the leaves softly hoary, and in the calyx being deeply divided. In the Report of the Botanical Exchange Club cited above (in which work I find the plant for the first time referred, though doubtfully, to *S. peregrinum*) it is suspected to be a garden hybrid between *S. asperrimnm* and *S. officinale*, which latter is said to be often planted for forage. This may be so, but there is no evidence of its hybridity, and Ledebour gives a habitat for the indigenous *S. peregrinum*, namely, Sawunt in the Talysch Province of the Caucasus, at a height of 4000 feet above the sea; and I have seen excellent dried specimens in the Kew Herbarium, collected by Besser (under the erroneous name of *S. caucasicum*, Bieb.), and by Wilhelms, collected in Iberia in 1824, and sent under the name of *S. asperrimum* to the late J. Gay, who has attached to the specimen the note, "Je crois que c'est le *Symphytum caucasicum*, M. B. et nullement le *S. asperrimum*." Boissier in his 'Flora Orientalis' (vol. iii., p. 175) indeed says of *S. peregrinum* and another, "Formæ hortenses forsan hybridæ." Lastly, for my own part, I see very little reason to regard it as other than a very large form of *S. officinale*, with the stem fistular below, probably originating from cultivation, and not from hybridization. The specimen here figured flowered in the Royal Gardens from plants of "Prickly Comfrey," presented by Mr. T. Christy, who has been the means of widely diffusing the culture of this *Symphytum* as a fodder plant, under the above name. For some notes of its use as a cattle-food I must refer to the 'Report

of the Progress and Condition of the Royal Gardens during the year 1878,' p. 12."

The following is the diagnosis of the species :—

"*Symphytum peregrinum ;* caule elato ramoso setis subreversis hispido, foliis inferioribus longe petiolatis elliptico-lanceolatis acuminatis superioribus sessilibus, omnibus molliter hispidis ciliatisque, petiolis decurrentibus, calyce fere ad basin 5-partito segmentis triangulari, lanceolatis sensim acuminatis hispidulis, corolla calyce triplo v. quadruplo longiore, tubo angulato medio constricto supro medium subcampanulato, ore breviter 5-fido, dentibus latis apicibus recurvis, appendicibus antheras subæquantibus. *S. peregrinum*, Ledebour, Ind. Sem. Hort. Dorpat. 1820, p. 4 ; Fl. Ross., vol. iii., p. 114 ; DC. Prodr., vol. x., p. 37 ; Briggs [Baker] in Report of Bot. Exchange Club for 1877–8, p. 17 [Journ. Bot., 1879, p. 250]. *S. asperrimum*, Bab. Fl. Bathon, 32."

Scirpus parvulus, *R. & S.*, in Surrey:—Dr. Eyre de Crespigny has sent me a specimen of the above plant, gathered by him last autumn above Hammersmith Bridge on the Surrey side of the Thames. I sent a specimen to Mr. H. C. Watson, who confirms the name.—A. Bennett.

Notices of Books and Memoirs.

Florideernes Morphologi. Af J. G. Agardh. Med 33 Taflor: till Kongl. Svenska Vetenskaps-Akadamiens. Stockholm, 1879, pp. 199, royal 4to.

De Algis Novæ-Zelandiæ marinis. In supplementum Floræ Hookerianæ scripsit J. G. Agardh. Lunds Univ. Arsskrift. Tom. xiv., pp. 32, 4to.

In the first part of his work on the *Florideæ*, published in 1851, which forms the second part of his well-known 'Species, Genera, et Ordines Algarum,' Professor Agardh expressed his intention of giving, at a future time, a general view of the whole organisation of the Florideæ, with additional details as to their anatomical structure and fructification. This intention the Professor has now carried out in the first of the above-mentioned works. Viewed only as the result of the patient and elaborate observations and minute examination of Algæ, pursued during so long a series of years by an algologist of such eminence as Prof. Agardh, the 'Morphology of the Florideæ' cannot bnt be an important and valuable contribution to the literature of this class of plants, and, as such, will be fully appreciated by those algologists who are able to read Swedish, in which language the work is written. It is to be hoped that the work may be soon translated. The illustrations, which consist of figures of little-known Algæ, and of microscopic details of the structure and fructification, are beautifully executed by Swedish artists.

We must endeavour, although very briefly, to give some idea of the contents of this admirable work. The first part describes the general aspect and external parts of the plants. The second part describes the fructification, and treats at considerable length of the antheridia, sphærospores, and capsular fruit and cystocarp; also of the so-called "double-fructification." In this part the author discusses the statements promulgated by MM. Bornet and Thuret relative to the fertilisation of the Florideæ, and, after minute examination of the species which formed the subject of their investigations, and of a great many other species, British and foreign, at all periods of growth, he states that his own researches do not confirm the views of the French algologists. Those botanists who take an interest in the study of British marine Algæ will find in Professor Agardh's new work much that will interest them as to the structure and fructification of several hitherto imperfectly-known plants found on these coasts.

The second work mentioned at the head of this notice appeared in the 'Transactions of the University of Lund.' It is a list by Prof. Agardh, of the marine Algæ of New Zealand, collected principally by Dr. Berggren, and is supplemental to that of D. Hooker and Harvey, whose nomenclature is followed, except in cases where a change of name has been rendered necessary by further and more accurate examination. Some new species are described, and to others notes are appended. This list will be found a valuable contribution to the knowledge of the Algæ of New Zealand.

MARY P. MERRIFIELD.

Aroideæ Maximilianæ. By Dr. PEYRITSCH. Carl Gerold's Son. Vienna. Large folio, coloured plates. November, 1879.

THIS book is a similar production to Schott's 'Icones Aroidearum,' with which, by reason of its size and the beauty and excellence of the plates, it forms a companion volume. The purpose of the work is to describe and figure the Aroids introduced into cultivation from Brazil, under the auspices of the Archduke Maximilian, afterwards the Emperor of Mexico. It was originally commenced by Dr. Schott, by whom all the descriptions but one were made, and under whose supervision most of the plates were prepared. After his death the work changed authors no less than five times, passing through the hands of Dr. Wawra, Dr. Kotschy, M. Reissek, Dr. Fenzl, and finally to Dr. Peyritsch, by whom it has been completed. Although some of the descriptions have been slightly modified by the subsequent authors, yet they remain substantially the same as Schott left them. It is printed in large, clear type, on good stout paper; the descriptions are in Latin, but the habitats and the explanations of the plates are given in German: this appears to be the one defect of the work. The species described in it amount to thirty-eight in number; some of them, perhaps, might better be regarded as varieties than species; out of the thirty-eight species described no less than thirty are figured. The plates, drawn by W. Liepoldt, are forty-two in number, and are really magnificent,

the large size of the book giving full scope to the artist; there is also a handsome frontispiece. The most remarkable species delineated is *Montrichardia linifera*, to which two plates are devoted; it is an aquatic or marsh plant of singular appearance, having very stout, erect, tapering stems, 6–12 feet high, with large, distant, long-petioled, sagittate leaves; the spathes are large and cymbiform, yellowish inside, green without; the yellowish spadix resembles that of *Philodendron;* the ovaries are connate, and when ripe are consolidated into a large oblong dark greenish fruit. The genus *Montrichardia* is one that is poorly represented in herbaria, and not too well known, so that these figures are really a welcome addition to our knowledge of it. The figure of an inflorescence (most probably monstrous) of *Philodendron brevilaminatum* is also very interesting, reminding one forcibly of the genus *Dieffenbachia*, the ovaries being scattered and 2–4-lobed, and are surrounded by some clavate staminodia.

N. E. Brown.

Other New Books.—M. Nencki, 'Contributions to the Biology of the *Bacteriaceæ*' (2 tab.), Leipzig, 1880.—Ferd. von Mueller, 'Eucalyptographia' (Decades 3 & 4), Melbourne; London (Trübner), 5*s*. each.—D. & A. N. M'Alpine, 'Biological Atlas' (24 tab.). London, W. & A. K. Johnston, 1880, 7*s*. 6*d*.—Hanstein, 'Das Protoplasma' (Heidelberg, Winter, 1880).—N. J. C. Müller, 'Handbuch der Botanik,' vol. i., pt. i. ('Anatomie und Physiologie') (Heidelberg, Winter).—A. Minks, 'Das Microgonidium' (Basel, George, 1879). — C. Luerssen, 'Medicinisch-Pharmaceutische Botanik' (Band ii., pt. 4; Leipzig, Haessel, 1879).—T. F. Allen, 'Characeæ Americanæ,' Part. ii., New York, 1*s*. 6*d*.

Articles in Journals.—December.

Cohn's Beitrage (Band III., Heft. i.)—T. Hielscher, 'Anatomy and Biology of *Streptocarpus*' (3 tab.)—E. Beinling, 'Investigations into origin of adventitious roots and leaf-buds on leaves of *Peperomia*' (2 tab.)—G. Schroeter, 'Life-history of several species of 'Rust' (contd.)—O. Kirchner, 'Life-history of *Volvox minor*' (1 tab.)—A. Wernich, F. Cohn, &c., 'Researches on *Bacteria*' (contd.; 2 tab.)

Flora.—L. Celakovsky, 'On viridescent ovules in *Hesperis matronalis*' (concluded).—K. A. Heninger, 'On Hybrids' (concluded).—O. Böckeler, 'Cyperaceæ of Tropical Africa' (concluded). many new species.—W. Nylander, 'Note on the colour of Lichens' —Id., 'Note on the hypothallus.'

Botaniska Notiser.—F. W. C. Areschoug, 'On *Leycesteria formosa*.'—O. Nordstedt, 'On *Vaucheria* (2 tabs.)—L. K. Rosenvinge, 'On *Vaucheria sphærospora*, var. *dioica*.'—Th. Krok, 'Swedish Botanical Literature, 1878.'

Hedwigia.—J. Schröter, 'A fungal disease of the berries of *Vaccinium Myrtillus*.'

Magyar Nov. Lapok.—Cardinal Haynald, 'On the gums and resins of the Bible.'—(Supplement) A. Kanitz, 'Plantæ Roumaniæ hucusque cognitæ.'

Œsterr. Bot. Zeitschrtfi.—M. Willkomm, 'The *Brassiceæ* of the Spanish-Portuguese Flora.'—G. Beck, 'On some Orchids of Lower Austria' (concluded).—A. Heimel, 'Botanical Notes.'—S. Schulzer, 'Mycological Notes.'—R. Traxler, 'Localities for Bohemian Plants.'—V. Borbas, 'Malformed Leaves.'

American Naturalist.—F. Brendel, 'Sketch of N. American Botany.'

Proceedings of Societies.

Linnean Society of London.

December 4, 1879.—Prof. Allman, F.R.S., President, in the chair.—Samuel Wright, St. Neots, Huntingdon; George Malcolm Thomson, Dunedin, N. Z.; J. G. Otto Topper, Adelaide; Major Collet, Kurrum; Henry Byron Spotton, Ontario; John Cameron, Bangalore; and Sir Samuel Wilson, Victoria, were elected Fellows of the Society.—Dr. Maxwell Masters read a paper "On certain relations between the Morphology and the Functions in the leaves of Conifers." He called attention to the contrasts to be drawn between the leaves of the spruce-firs (*Picea*) and those of the silver-firs (*Abies*), as regards their arrangement, relative position, form, relative size, and internal structure, as described by Bertrand, McNab, and others. The leaves of the silver-firs are endowed with a power of motion in virtue of which they are raised or depressed; the leaves of the spruces, on the other hand, are comparatively motionless. In those cases where the leaves have the power of movement there is usually a well-marked layer of "palisade cells" which are absent in the motionless leaves. This circumstance has led the author to correlate the difference before alluded to with varying degrees of functional activity and with the adaptations manifested to secure as far as possible to each leaf an equally favourable amount of exposure to light, &c., &c. Allusion was also made to the movements of revolving mutation observable in the "leader-shoots" of many Conifers during the season of active growth.—Mr. C. B. Clarke read a paper "On Indian Begonias," supplementing the author's account of Indian Begonias in the Flora of British India. Mr. Clarke treated of the classification of the whole genus (*i. e.*, of the whole Order), except *Hildebrandtia* and *Begoniella*, and maintained that it (the group) can be naturally divided into the six subgenera employed in the Flora of British India. He discards the differences in the stamens and styles for subgeneric characters, and employs exclusively the structure and dehiscence of the fruit.

December 18.—Prof. Allman, F.R.S., President, in the chair.—Mr. H. Seebohm was elected a Fellow of the Society, and Messrs. A. D. Bartlett, N. E. Brown, of Kew, and F. H. Waterhouse were

elected Associates.—Mr. B. Daydon Jackson exhibited a complete series of the various editions of Dillenius's 'Historia Muscorum,' Oxford, 1741, and its reprint, Edinburgh, 1811, in illustration of the following communication. The Rev. J. M. Crombie read a paper "On the Lichens of Dillenius ('Historia Muscorum'), as illustrated by his Herbarium." The latter collection is preserved in the Botanic Gardens at Oxford; and the specimens, though well-nigh 150 years old, are still in a good state of preservation. The earlier writers on Cryptogamic Botany in their synonymy and nomenclature made constant reference to his descriptions, hence the present importance and value of an analysis of his material, and the more so as hitherto no systematic examination has been attempted, though some old writers have compared a few forms. Notwithstanding very considerable accuracy of identification of the Dillenian Lichens, serious mistakes appear to have crept in. Mr. Crombie reviewed the series, giving a conspectus and technical data adapted to the present standpoint of Botany.

Geologists' Association.

January 2, 1880.—Mr. G. S. Boulger read a paper on "The Geological and other causes of the distribution of the British Flora," of which the following is an abstract:—Geographical Botany dates from Humboldt's invention of isotherms and altitudes. Since his time we have been indebted to Meyen, Schouw, Watson, Edward Forbes, Thurmann, DeCandolle, Grisebach, and, for a natural system of distribution, more especially to Sir Joseph Hooker and Mr. Bentham. The causes of distribution may be divided into three heads: genetic or original, means of dispersal, and checks to dispersal or causes of survival within a limited area. The chief means of dispersal are birds, ocean currents, rivers, wind, man, and hairy or woolly quadrupeds. The checks to dispersal may be classed as barriers, *e.g.*, oceans, deserts or mountain-chains, climate, soil, watersheds, and the struggle for existence with pre-established forms; climate consists chiefly in temperature and humidity, and is by far the chief physical (as opposed to genetic) cause of distribution; temperature depends on latitude, proximity to the ocean, and altitude. Climates form two distinct classes, continental and insular, the latter being moister and more uniform, *i.e.*, have a less hiberno-æstival variation—The west coast of Britain, for example, is more insular in climate than the east.—Their native climate is as clearly reflected in the vegetative system of plants as in their method of fertilisation in the reproductive organs. Soils affect distribution mainly by their differences of texture and consequent permeability, but also by their chemical composition, especially by the presence or absence of lime. Watersheds affect distribution in that plants are mainly carried down rivers, and, though perhaps an agency of secondary importance, are the most available of all natural bases of mapping, because capable of nearly exact circumscription. Analyzing the 1600 British flowering plants, we find 20 confined to the Channel

Islands; 40, mainly dwarf alpine perennials, confined to Scotland; 16, mainly moisture-loving, such as mossy Saxifrages, and mainly also belonging to the Asturian flora of Forbes, confined to Ireland; 100 so universal as to tell us little as to internal distribution; and some 300 either easily overlooked, and therefore probably not truly mapped, of recent and non-natural introduction, or confined to single localities. The remainder may be classed with regard to requisite moisture as Hygrophilous, Xerophilous, or Noterophilous, the former division including most shade-loving or Nemophilous plants, the Dryads of Martius, and the Xerophiles most but not all Calcophiles or lime-loving plants. Typical Hygrophiles are *Caltha*, *Cardamine pratensis*, and *Lychnis Flos-cuculi*, mainly confined to alluvial soil, and *Geum rivale;* typical Nemophiles, *Lychnis diurna*, *Oxalis Acetosella*, and *Asperula odorata;* typical Xerophiles, *Erophila verna*, *Campanula rotundifolia*, *Daphne Laureola*, *Fagus sylvatica*, and *Carduus acaulis:* typical Calcophiles, *Ophrys apifera*, *Aquilegia*, *Lychnis vespertina*, *Specularia*, *Neottia*, *Pulsatilla*, &c. England is divisible into nine tolerably natural botanical provinces, viz., 1. The Thames and South-east, westward to the axial watershed and that of the Axe and Otter, entirely Neozoic; 2. East Anglia, the valleys of the Blackwater, Stour, and Yare; 3. East Fen and Secondary, the valleys of the Wash and Humber; 4. The vale of Severn, including that of the Bristol Avon, but not that of the Wye; 5. The Peninsula of Devon and Cornwall; 6. The Welsh Mountains, including the Wye, but not the Dee; 7. The Lowlands of Cheshire and Lancashire, from the Dee to the Lune inclusive; 8. The Lake Mountains, with the valley of the Kent; 9. Northumberland and the valley of the Tees.

Botanical News.

Prof. Bayley Balfour left London early last month for Socotra with the purpose of investigating the Natural History of that Island, on behalf of the Committee appointed by the British Association at their meeting at Dublin in 1878, and for which a grant of £130 has been made by the Association, and a further grant of £175 from the Government Fund administered by the Royal Society. The topography of Socotra has been well described by Lieut. Wellstead in the Geographical Society's Journal for 1835; but the zoology, botany, and geology may be said to be entirely unknown. When Hildebrandt left Europe for Madagascar in the autumn of last year it was his intention to visit Socotra; but though the island is seen by all who pass through the Red Sea to the East, it is extremely difficult to reach, and Hildebrandt was compelled to pass it. Prof. Balfour carries with him strong official recommendations to the Government authorities at Aden. It will be necessary for him to make special arrangements for proceeding from Aden to Socotra, but it is expected that he will return to

Aden in the Government vessel which carries the annual subsidy to the chiefs from the British Government whereby its protectorate of the island is secured. Mr. Alexander Scott, a young and able gardener from the Edinburgh Royal Gardens, accompanies Prof. Balfour. The zoological and geological collections, when worked out, are to be placed in the British Museum, and the botanical collections in the herbaria at Kew and the British Museum.

Mr. Andrew Taylor has succeeded Mr. John Sadler as Assistant Secretary to the Botanical Society of Edinburgh.

Mr. Spencer Le Marchant Moore has resigned his post in the Kew Herbarium. All communications should be addressed to him at Arundel House, Lewisham, S.E.

We are glad to learn that Mr. T. R. Archer Briggs' 'Flora of Plymouth,' to the proposed publication of which we referred in our last volume, is already in the press. We extract the following indications of the style and scope of the work from the prospectus:—The author will give the results of his own observations on the vegetation of this area, combined with all the existing records of importance concerning it that he has been able to collect. He will give the class of each species as a native, or otherwise, of the tract dealt with; state the nature of the spots where it grows, together with its comparative frequency and distributiou therein. These particulars will sometimes be followed by critical remarks and other observations on the plant, as a Plymouth species. The introductory portion of the work will comprise a sketch of the physical features and surface conditions of the area, of its geology, river drainage, and climatology. This portion will also include a short account of the progress of botanical investigation relative to Plymouth and its neighbourhood. The work will be illustrated by a coloured map to show the six botanical districts founded on the river drainage, as well as the position of most of the stations recorded for the plants. The price to subscribers will be half-a-guinea; subscribers' names to be sent at once to the author, Richmond Villa, Plymouth.

Under the title of the "Epping Forest and County of Essex Naturalists' Field Club" an association was established on the 10th of last month, for the study and investigation of the natural history, geology, and archæology of the county of Essex (special attention being given to the fauna, flora, geology, and antiquities of Epping Forest); the publication of the results of such investigations; the formation of a library of works of local interest and other publications; the formation of a museum; and the diffusion of information on Natural Science and Antiquities. Mr. William Cole, Laurel Cottage, Buckhurst Hill, is the Secretary of the Club.

Prof. Ascherson, of Berlin, has undertaken a journey to Egypt.

Dr. Trimen left England for Peradenia on January 22nd. Mr. Marshall Ward, who has been deputed by the Colonial Government to investigate the coffee-leaf disease (*Hemileia vastatrix*), left a fortnight previous.

Original Articles.

A SYNOPSIS OF THE SPECIES OF *ISOETES*.

By J. G. Baker, F.R.S.

In the present paper I have attempted to draw up short comparative descriptions of all the known species of *Isoetes*. The genus has been studied very carefully during the last twenty years by A. Braun, Durieu, Engelmann, and Milde; but their papers are very widely scattered, and often difficult of access. We hoped, as in the case of *Characeæ*, that A. Braun would have published a general monograph of the genus, but this he did not live to accomplish. A few years before his death he worked up all the Kew specimens, and since that we have received a rich addition from the herbarium of Gay, so that I have had authenticated specimens to examine of nearly all the Old World forms that have been named and described, although for some of them the material has been too scanty to allow me to characterise them as fully as I could have wished. For the North American forms our material in London is less complete; but Dr. Engelmann, who has a monograph of them just ready, has kindly helped me with them by letter, and I have implicitly followed his lead.

KEY TO THE SPECIES.

Group 1. Aquaticæ.

Veil none. 1. *I. triquetra*. 2. *I. Gunnii*. 3. *I. elatior*.

Veil partial. 4. *I. lacustris*. 5. *I. echinospora*. 6. *I. azorica*. 7. *I. pygmæa*.

Veil complete. 8. *I. Stuartii*. 9. *I. Lechleri*.

Group 2. Subaquaticæ.

North American species, with a 2-lobed rootstock.

Veil partial. 10. *I. Bolanderi*. 11. *I. Tuckermani*. 12. *I. saccharata*. 13. *I. riparia*.

Veil complete. 14. *I. melanospora*.

Australian and New Zealand species, with a 3-lobed rootstock.

15. *I. Muelleri*. 16. *I. Kirkii*. 17. *I. alpina*. 18. *I. Drummondii*.

Group 3. Amphibiæ.

Rootstock 2-lobed. (All North American species).

Veil partial. 19. *I. Butleri*. 20. *I. melanopoda*. 21. *I. Engelmanni*.

Veil complete. 22. *I. Nuttallii*. 23. *I. flaccida*.

Rootstock 3-lobed. (Species of the Mediterranean region).

Veil none or very narrow. 24. *I. setacea*. 25. *I. adspersa*. 26. *I. Malinverniana*.

Veil nearly or quite complete.

27. *I. velata.* 28. *I. Perralderiana.* 29. *I. dubia.* 30. *I. tegulensis.* 31. *I. Boryana.* 32. *I. tenuissima.* 33. *I. olympica.*

Species of Tropical Africa.

34. *I. Welwitschii.* 35. *I. nigritiana.* 36. *I. Schweinfurthii.* 37. *I. æquinoctialis.*

Species of Japan and Tropical Asia.

38. *I. japonica.* 39. *I. coromandelina.* 40. *I. brachyglossa.*

Species of Australia. 41. *I. tripus.*

Species of Tropical America.

42. *I. amazonica.* 43. *I. cubana.* 44. *I. Gardneriana.*

Group 4. TERRESTRES.

45. *I. Duriæi.* 46. *I. Hystrix.*

Group 1. AQUATICÆ. — Species inhabiting lakes and ponds where they are permanently submerged. Leaves without stomata, accessory bast-bundles, or persistent bases.

1. I. TRIQUETRA, A. Br. in Verh. Branden, 1862, 36.— *I. andina*, Spruce MSS.—Rootstock very thick (nearly 1 in. diam.), 2-lobed. Leaves 60–100, stiffly erect, firm in texture, dull green, 2–3 in. long, one-sixth in. broad at the middle, with a channelled triquetrous tip, and a distinct crisped border reaching from the base half way up, without either stomata or accessory bast-bundles. Sporangia oblong, truncate at the apex, ¼ in. long, copiously dotted; veil none. Macrospores obscurely tubercled between the ridges, more distinctly tubercled on the lower half. Microspores smooth, brown or white.

Hab. Andes of Quito, *Spruce!* Peru, *Lechler.*

2. I. GUNNII, A. Br. in Berl. Monatber., 1868, 535.—Rootstock 3-lobed. Leaves 50 or more, stiffly erect, opaque, dark green, 2–3 in. long, $\frac{1}{12}$ in. broad at the middle, narrowed suddenly at the tip, with a short brown uncrisped border running up from the base, without stomata or accessory bast-bundles. Sporange small, orbicular; veil none. Macrospores large, smooth, chalk-white. Microspores smooth.

Hab. Tasmania, forming large masses in the mountain-lakes, alt. 3500–4000 feet, *Gunn*, 1563!

3. I. ELATIOR, F. M.; A. Br. in Linnæa, XXV. (1852), 722; Berl. Monat., 1868, 536.—*I. tasmanica*, F. M.; Durieu in Bull. Bot. Fr. 1864, 104, ex parte.—Rootstock 3-lobed. Habit of *I. lacustris.* Leaves 30–50, flaccid, dark green, diaphanous, reaching a foot in length, ½ lin. broad at the middle, the lanceolate base running up the edge as a distinct membranous uncrisped border for 3–4 in., without stomata or accessory bast-bundles. Sporange small, brown, orbicular, unspotted; veil none. Macrospores small, white, finely granular. Microspores smooth.

Hab. Tasmania, in lakes, *Archer!*

4. I. LACUSTRIS, Linn.; Hook. Brit. Ferns, t. 55; Durieu, Bull. Bot. France, 1861, 164; A. Br. in Verh. Branden, 1862, 17.—*I. atrovirens*, T. Fries.—*I. macrospora*, Durieu.—*I. Morei*, D. Moore.—Rootstock 2-lobed, generally about ½ in. diam. Leaves generally 20–50, 3–6 in. long, ½–1 lin. diam. at the middle, dark green, flaccid, diaphanous, tapering to the point, the edge decurrent from the base short and narrow, without stomata or accessory bast-bundles. Sporangia subglobose or oblong, ⅙–¼ in. long, unspotted; veil partial. Macrospores large, white, strongly granulated. Microspores quite smooth.

Hab. Widely spread in the lakes of Northern and the mountains of Central Europe; rare in North America. Durieu, in Bull. Bot. Soc. France, xi. 102, separates the American plant by its larger macrospores as a species as *I. macrospora*. *I. Morei*, D. Moore in Journ. Bot., 1878, 353, t. 199, from Lough Bray, Wicklow, is a large flaccid form with leaves about a foot long. *I. crassa*, *setacea*, and *tenella* of Leman and Desvaux represent three forms of this species as to robustness of growth.

5. I. ECHINOSPORA, Durieu in Bull. Soc. Bot. France, viii. 164; A. Br. in Verh. Brand., 1862, 24; Bab. in Journ. Bot., 1863, t. 1.—Rootstock ½–¾ in diam., 2-lobed, rarely 3-lobed. Habit of *I. lacustris*, but leaves more slender, generally 20–50, 4–6 in. long, about ½ lin. broad at middle, flexible, diaphanous, light green, tapering gradually to the point, the edge decurrent from the dilated base narrow and short. Sporange globose or oblong, ⅛ in. long, unspotted; veil short. Macrospores middle-sized, distinctly spinulose all over. Microspores slightly papillose.

Hab. The type widely spread in the lakes of Northern and Central Europe, often associated with *I. lacustris*. In *I. Braunii*, Durieu (*I. ambigua*, A. Br.), of North America, Greenland, and Iceland, the leaves are darker green, with a few stomata, the veil larger, the sporange spotted, and the microspores smooth. In *I. muricata*, Durieu, of New England, the leaves are longer, the unspotted sporange half covered by the veil, and the spinules of the macrospore shorter; and in *I. Boottii*, A. Br., of Boston, U.S.A., the leaves are stiffly erect, with a few stomata, and the macrospores rather smaller, with very slender spinules.

6. I. AZORICA, Durieu; Milde Fil. Eur., 278.—Rootstock probably 2-lobed. Habit of *I. echinospora*. Leaves 2–3 in. long, under ½ lin. broad at the middle, light green, diaphanous, without stomata or accessory bast-bundles. Sporangia subglobose, unspotted, 1–1¼ lin. long; veil large, but partial. Macrospores middle-sized, reticulated over both halves. Microspores granulated.

Hab. Azores, in a shallow pool in the island of Corvo, *H. C. Watson*, 349; a few specimens collected in the year 1842.

7. I. PYGMÆA, Engelm. in Amer. Nat., 1874, 214.—Rootstock 2-lobed. Leaves 5–10, ½–1 in. long, dark green, tapering rapidly to the point, without stomata or accessory bast-bundles. Sporange globose; veil very narrow. Macrospores middle-sized, marked

with small, regular, rarely confluent papillæ. Microspores minutely papillose or nearly smooth.

Hab. California, on the eastern declivity of the Sierra Nevada, alt. 7000 feet, *Bolander;* discovered in 1866.

8. I. Stuarth, A. Br. in Berl. Monatber., 1868, 539.—*I. humilior*, F. M.; A. Br. in Linnæa, 1852, 722, ex parte.—Rootstock 2-lobed. Habit of *I. lacustris*. Leaves 4–6 in. long, pale green, diaphanous, narrowed gradually to the point, without stomata or accessory bast-bundles. Sporange small, globose; veil complete. Macrospores with very numerous tubercles, which are sometimes confluent.

Hab. Tasmania, in the South Esk River, *C. Stuart!* *I. Hookeri*, A. Br. *loc. cit.*, from the same station, seems to be another form of the same species, with stiffer dark green leaves narrowed suddenly at the tip, and macrospores with smaller distinct tubercles.

9. I. Lechleri, Metten. Fil. Lechler, ii. 36; A. Br. in Verh. Branden, 1862, 35.—Rootstock 2-lobed. Leaves 12–20, stouter than in *lacustris*, 3–4 in. long, $\frac{1}{12}$ in. diam. at the middle, dark green, flexible, diaphanous, tapering gradually to an acute point, without stomata or accessory bast-bundles, the broad membranous margin decurrent from the dilated base running half-way up the lamina. Sporange globose; veil complete. Macrospores middle-sized, smooth. Microspores minutely tubercled.

Hab. Cordilleras of Peru, *Lechler*, 1937! *I. socia*, A. Br. *l. c.* 36, was afterwards regarded by him as a form of this species. *I. Karstenii*, A. Br. *loc. cit.*, gathered by Dr. Karsten at a height of 8000 feet in the Andes of New Granada, differs only by its muricated microspores.

Group 2. Subaquaticæ.—Species inhabiting shallow water. Leaves with a few stomata, but without either accessory bast-bundles or persistent bases.

10. I. Bolanderi, Engelm. in Amer. Nat., 1874, 676.—*I. californica*, Engelm. MSS. olim.—Rootstock deeply 2-lobed. Habit of *I. echinospora*. Leaves 5–20, 2–4$\frac{1}{2}$ in. long, $\frac{1}{3}$–$\frac{1}{2}$ lin. diam., tapering to a fine point, diaphanous, bright green, with stomata, but without accessory bast-bundles. Sporange mostly oblong, unspotted, covered $\frac{1}{3}$–$\frac{1}{4}$ by the veil. Macrospores small, finely granulated. Microspores more or less papillose or spinulose.

Hab. Sierra Nevada of California, in ponds and shallow lakes at 5000–10,000 ft., *Bolander*. Var. *Parryi*, Engelm., from the falls of the Yellowstone, differs by its rather smaller macrospores and almost smooth microspores.

11. I. Tuckermani, A. Br.; Engelm. in Gray Man., edit. v., 676.—Rootstock 2-lobed. Habit of *I. echinospora*. Leaves 10–30, 3–4 in. long, $\frac{1}{3}$ lin. diam. at the middle, bright green, diaphanous, tapering to the point, with a few stomata, but without accessory bast-bundles. Sporange small, globose, sometimes spotted; veil partial. Macrospores middle-sized, the upper half covered with

parallel anastomosing ridges, the lower half reticulated. Microspores nearly or quite smooth.

Hab. Ponds near Boston, associated with forms of *echinospora*, *Tuckerman!*

12. I. SACCHARATA, Engelm. in Gray Man., edit. v., 676.—Rootstock 2-lobed. Leaves 10–15, 2–3 in. long, slender, diaphanous, olive-green, furnished with stomata, but without accessory bast-bundles. Sporange small, ovoid, nearly unspotted, only the upper edge covered by the veil. Macrospores middle-sized, minutely tubercled. Microspores papillose.

Hab. On Wicomico River, eastern shore of Maryland, between high and low tide, *Canby*.

13. I. RIPARIA, Engelm. in Gray Man., edit. v., 676.—Rootstock 2-lobed. Leaves 15–30, resembling those of *lacustris* in size and texture, 4–8 in. long, $\frac{1}{3}$–$\frac{1}{2}$ lin. diam. at the middle, deep green, diaphanous, furnished with stomata, but without accessory bast-bundles. Sporange oblong, spotted, $\frac{1}{6}$ in. long; veil partial. Macrospores middle-sized, white, strongly granulated all over. Microspores large, tubercled.

Hab. Gravelly banks of the Delaware, and margin of ponds in New England.

14. I. MELANOSPORA, Engelm. in Oaks United States, ii., in note.—A dwarf gregarious, usually monoicous species, with a 2-lobed rootstock. Leaves few, slender, distichous, furnished with stomata, but without accessory bast-bundles. Sporange small, globose; veil complete. Macrospores minute, sometimes blackish, obscurely granulated. Microspores obscurely papillose.

Hab. Georgia, on Stone Mountain, in shallow depressions of the base granite rocks near the summit, *Canby*. Discovered in 1869.

15. I. MUELLERI, A. Br. in Berl. Monatber., 1868, 541.—Rhizome 3-lobed. Habit of *I. echinospora*. Leaves about 3 in. long, pale green, diaphanous, narrowed to the point, furnished with stomata, but without accessory bast-bundles. Sporange globose; veil complete. Macrospores with numerous minute unequal tubercles confluent into ridges.

Hab. Queensland, in ponds at Rockhampton, *O'Shanessey*. Discovered in 1867.

16. I. KIRKII, A. Br. in Berl. Monatber., July 22, 1869; Kirk in Trans. New Zeal. Instit., ii. 107, t. 7.—Rootstock 3-lobed. Habit of slender forms of *I. echinospora*. Leaves 10–20, 3–4 in. long, $\frac{1}{2}$ lin. diam. at the middle, pale bright green, diaphanous; tapering to the point, furnished with a few stomata, but without accessory bast-bundles. Sporange small, globose; veil complete. Macrospores small, beset all over with minute unequal tubercles.

Hab. New Zealand, in lakes at a low level in the northern island, *Kirk!*

17. I. ALPINA, Kirk in Trans. New Zeal. Instit., vii., 377, t. 25.—Rootstock 3-lobed. Habit of *I. lacustris*. Leaves 20–50, about $\frac{1}{2}$ ft. long, $\frac{3}{4}$–1 lin. diam. at the middle, dark green, diaphanous, tapering to the point, furnished with a few stomata, but without accessory bast-bundles. Sporange oblong, $\frac{1}{6}$–$\frac{1}{5}$ in. long; veil complete. Macrospores middle-sized, smooth. Microspores finely tubercled.

Hab. New Zealand, in lakes of the mountains of the southern island, alt. 1700–3000 ft., *Kirk! Cheeseman! Berggren!*

18. I. DRUMMONDII, A. Br. in Berl. Monatber., 1863, 593; 1868, 542.—Rootstock 3-lobed. Habit of European *I. tenuissima*. Leaves 6–12, scarcely diaphanous, 2–3 in. long, $\frac{1}{4}$–$\frac{1}{3}$ lin. diam., tapering to the point, furnished with stomata, but without accessory bast-bundles. Sporangia small, globose; veil none. Macrospores small, chalk-white, with numerous tubercles, which are distinct between the grooves, but over the basal half confluent into ridges.

Hab. Swan River, West Australia, *Drummond*, 989!

(To be continued.)

ON THE BOTANY OF THE BRITISH POLAR EXPEDITION OF 1875–6.

By HENRY CHICHESTER HART, B.A., Naturalist to H.M.S. 'Discovery.'

(Continued from p. 56).

V. FOULKE FIORD, lat. 78° 18′, July 28, 29, 1875.

This fiord is well known as the winter-quarters of Dr. Hayes, 1860–61. Its sides are from one to two miles apart, rising to a plateau 1500 to 2000 feet in height. The rock is chiefly red gneiss, surmounted here and there, as at the upper end of the glacier, by basalt, traps, and sandstone, which in many cases has been eroded and given rise to a fertile valley at the head of the fiord. Along this valley to Alida Lake, at the foot of Brother John's Glacier, is about one mile. A hard day's climbing brought a party of us up the north side of the glacier, across the *mer-de-glace* at its head and down by its southern side. This walk gave me an impression of greater life and growth than any other in the Arctic regions; the southern side of the valley is the head-quarters of myriads of little auks, and the result is a richness of soil under the bird cliffs which leads to a rank and rapid vegetation. Here first I found the pretty and sweet-scented *Hesperis Pallasii*; typical *Dychnis apetala* and *Dryas octopetala* also grow here in company with their commoner and more southern forms, *Lychnis affinis* and *Dryas integrifolia*. Upon the plateau, from twelve hundred to fifteen hundred feet, I gathered also, for the first time, *Saxifraga flagellaris*; it appeared to be confined here to high levels. At this station also, in the neighbourhood of Point Jensen, Dr. Coppinger was fortunate

enough to discover the beautiful *Pedicularis capitata*, afterwards met with very sparingly in Hayes Sound and Discovery Bay. This plant was hitherto believed to be confined to Arctic Asia and America, and is, therefore, an addition to the flora of Greenland. *Cardamine bellidifolia* is a characteristic and abundant plant here, as is also *Ranunculus sulphureus*; *Saxifraga cernua* attains an extraordinary growth here, and the masses of rose-pink flowers of *Epilobium latifolium* near the glacier were very beautiful. *Stellaria humifusa*, not met with further north, is also very plentiful at low levels. Here, no doubt, more remains to be found, and it was to me a source of the greatest regret that on our homeward voyage we did not revisit this most interesting of all our havens.

VI. Cape Sabine, lat. 78° 45′, July 29 to Aug. 4, 1875.

From this point northward, along the western shores of Smith Sound, the Phanerogamic botany has been hitherto entirely unknown; all remarks henceforward may, therefore, be viewed as especially interesting. Cape Isabella, lat. 78°, had yielded a couple of flowering plants to Dr. Hayes's Expedition, 1860–61.

Cape Sabine is a barren headland with a few islands around it. The formation is chiefly red syenite, with scattered drift of sandstone in many places. *Empetrum nigrum*, which was very common here, was not met with further south; a fair variety of species (about thirty-five) was observed, but almost in all cases the plants were few and stunted. Here, however, the Saxifrages seemed to thrive, of which six species occurred abundantly often in close proximity, *S. nivalis* being, as is invariably the case, the least conspicuous and plentiful.

VII. Hayes Sound (Buchanan Straits), lat. 78° 52′ to 78° 56′, August 4 to 6, 1875.

Here we touched and had opportunities for landing at several points on the southern shore, which is for the most part low and fertile, extending, as at Twin Glacier Valley, to considerable plains. The rock is sedimentary and mostly sandstone; the Flora is rich and varied, some very pretty plants, as *Epilobium latifolium*, flowering profusely; *Pedicularis capitata* was again met with in small quantities. At a considerable and rather recent-looking Esquimaux settlement, which I have called "The Deserted Village," the vegetation was, for the latitude, exceptionally luxuriant, *Carex stans* here attaining a height of close on two feet, a growth which no other herbaceous plant north of Disco could compare with. *Ranunculus sulphureus* was also conspicuous. Three ferns—*Cystopteris fragilis*, *Woodsia hyperborea* and *W. glabella*—grow here upon high ground (500 to 1000 ft.) a little way inland; the two latter I gathered nowhere else. *Woodsia hyperborea* is not given by Hooker as occurring in East Arctic America, though it is a Greenland plant, while *W. glabella*, though an East Arctic American plant, does not appear in Greenland. Their occurrence in company is therefore very singular, since their Arctic range would appear to be widely distinct.

A great change in the Flora of this coast takes place here; *Vaccinium uliginosum*, *Cassiopeia tetragona*, *Pedicularis flammea*, *Carex alpina*, *Hierochloe alpina*, *Lycopodium Selago*, and the two Woodsias find here their northern limit. This Sound forms (as far as we know) the northern boundary of Ellesmere Land and the southern of Grinnell Land; it is from twenty to thirty miles in width, with a large island (Backe Island) some ten or twelve miles across, situate in its eastern opening. From Hayes Sound to Cape Lieber, about 160 miles, there stretches a barren cliff-girt coast with no harbourage for plant-life in any quantity. The rock is an unyielding, hard limestone, which is seldom diversified with valleys and seems incapable of forming soil; for many leagues on the plateau inland (1500 to 2500 feet) this formation rolls away in a scene of unbroken desolation—a vast shingle of hard angular blocks devoid almost of even lichen life. Districts VIII. and IX. come under this division, and include many points at which we landed during August, 1875, and August and September, 1876. *Braya alpina* was first met with on the cliffs of Walrus (Norman Lockyer) Island in lat. 79° 30′, but became frequent afterwards; *Cerastium latifolium* (var. *cæspitosum*), a rare plant, found previously by me at Disco, was gathered by Dr. Coppinger in Gould Bay in lat. 79° 43′; *Saxifraga cæspitosa* (not *uniflora*) occurred at Radmore Harbour in lat. 80° 22′, a form I only met with elsewhere at Disco. Nothing else was noticed worthy of mention, and these two districts yielded only some two dozen species, several of which probably only occur at Dobbin Bay. This coast, though seemingly so impoverished when compared with Discovery Bay, is nevertheless superior botanically to Polaris Bay and Bessel's Bay; and a botanist visiting these latitudes without having explored Grinnell Land to the north of Archer Fiord, an area north of all the others, would carry away a most erroneous impression on the subject, reckoning, as he would, some thirty instead of seventy species.

X. Bessel's Bay and Hannah Island, lat. 81° 4′ to 81° 7′, August 24, 25, 1875.

This shore is composed of a hard limestone with little or no talus or low ground, descending from 800 to 1000 feet to the sea. It is almost destitute of vegetation, clad with an ice-cap, and has many glaciers discharging to the sea. Upon Hannah Island *Carex nardina* was very plentiful; while on the shores of Bessel's Bay Dr. Moss obtained specimens of *Poa alpina*, a high latitude in Greenland for this grass, which was subsequently obtained in Polaris Bay.

XI. Polaris Bay, lat. 81° 40′, May 12 to 18, 1876.

My visit here was much too early for any satisfactory exploration of the botany of this district. Nevertheless a severe and continuous gale of wind, which detained our sledges for some days, exposed the surface in many places and enabled me to recognize several withered plants. Later on, however, in July and August, Dr. Coppinger, during a lengthened sojourn here,

made a careful collection of all the species he could observe; that collection, as well as other excellent ones of his from different stations (including one made by me in Discovery Bay), has fortunately come under my examination, and from it and my own observations I am enabled to give an account of this district.

The rock about Polaris Bay is a hard slaty limestone, turning into shale in places; near the shore for some distance lies a plain of considerable extent, rising gradually for a mile or so inland, and then, by a series of abrupt declivities, to a higher plain of 600 to 1200 feet. The lower plains are tolerably sprinkled with vegetation, but the higher level is composed of barren shingle which in many places the snow never leaves; about a mile inland, and at an altitude of no more than 300 feet, a blue edge, two feet thick, of a diminutive glacier may be seen, while a few miles to the south the Petermann Glacier discharges into the straits. Heavy floeberg ice from the Polar Sea also drifts to this coast and remains throughout the summer, tending no doubt to lower the temperature; and I am inclined to think that a colder summer upon this shore plays an important part in causing the remarkable difference which exists between the flowers upon the opposite sides of the straits. Opportunities of interchange of species must occur; summer-torrents commonly carry blocks of frozen soil laden with plants to the ice foot, or to the marine ice at Discovery Bay or elsewhere; ice rafts may then carry them to other shores as the wind or tide directs, and, once having reached the land, they will often be forced, by the pressure of some outside travelling floe, to a distance from the sea, and in a safe position to form a new colony.

No plants occurred in Polaris Bay which were not common upon the opposite shore, except, perhaps, the form *Dryas octopetala*, which is barely worth mentioning apart from *D. integrifolia*. Saxifrages were extraordinarily scarce, only two species occurring as against seven in Discovery Bay. *Cyperaceæ* appear to be entirely absent, though six species at least occur upon the opposite side. The entire flora only numbered twenty-two species, less than a third part of that upon the west shore of the straits, twenty-five miles off. In Polaris Bay the proportion of Monocotyledons to Dicotyledons is 1 to 45, in Discovery Bay it is 1 to 2·9, and the decreasing proportion of Monocotyledons to Dicotyledons in Polaris Bay denotes a more Arctic vegetation.

XII. Discovery Bay, lat. 81° 42′, Aug. 25, 1875, to Aug. 20, 1876.

For a radius of about fifteen miles from the 'Discovery's' winter-quarters the country was thoroughly explored by me, and others belonging to that ship; while north of this, to Floeberg Beach, the coast was visited and examined at numerous points by parties belonging to the 'Alert.' Discovery Bay yielded sixty-six flowering plants (49 Dicotyledons, 17 Monocotyledons), one fern, and two horse-tails: almost all these were to be found close to the harbour, and several not elsewhere; with one or two exceptions the whole Flora of Grinnell Land is to be found upon Bellot Island in Discovery Bay.

Four principal valleys intersect this country,—The Bellows, the Long Valley, Musk Ox Fiord, and St. Patrick's Fiord; of these the Bellows is the chief, being a long raised fiord about a mile wide, commencing at sea-level and running in a north-westerly direction for about twenty miles to the base of the United States range of mountains (5000 to 6000 feet).

In these valleys and upon their slopes with a southern aspect, or about their entrances near sea-level, is to be found most of the vegetation of the district. Inland, and between these valleys, the general appearance of the surface is a vast, barren table-land, or series of table lands from 2500 to 4000 feet, clad in perpetual snow, with here and there blown bluffs or bare declivities. These stretch away westward to meet the inland range of mountains, a range which I was unable to visit owing to the late return of the sledge-parties. It is not, however, probable that these mountains would have produced anything botanically interesting, but their geological structure and the towering heights of some of the peaks were to me sources of great attraction.

The most luxuriant growth at this latitude is found on banks facing from south to east at from two to five hundred feet above sea-level—as upon Buttercup Banks, on Mount Cartmel, Bellot Island, and between the ship and Musk Ox Fiord, Although there is a deep clay in the valleys in many places, the surface is for the most part barren; when the thaw sets in, this clay and large pieces of mud banks from the brows and valley-slopes become disintegrated, and, sliding down, are carried by torrents towards the sea. Sometimes plants, especially *Salix arctica*, successfully exert a binding effect and partially arrest this wholesale denudation, but it is common to see blocks of half-frozen mud and ice containing plants and roots torn out and hurried to the shore.

Although, in appearance, many plants, especially *Cruciferæ*, bring their fruits to perfection, yet, north of Disco, no annuals occur. The duration of the sun's power in these latitudes is not, I believe, sufficiently long to thoroughly ripen the seed; seedlings are never met with, and the extension of the range of any given species would seem to be due to the creeping-powers of the individual (a power which, with very few exceptions, all possess) or to plants being drifted *downwards*, as described above. This creeping, of course, occurs only to a limited extent, obstacles soon being met with to check it; hence it is evident that the vegetation must by degrees gradually accumulate at low levels where the soil is secure, and, according as the land rises from the sea, which it is still doing at a considerable rate, the flora, as a rule, descends. Upon the other hand, the lichens occur chiefly at a high level, occupying, as they do, what was formerly the sea-margin or near it, and, being firmly attached to the solid rock, these have not been so liable to be carried down to the lower levels.

Though seeds of the indigenous plants do not germinate in the higher Arctic regions, ripe seeds brought hither will do so. Dr. Ninis planted seeds under a shelter of glass ashore in Discovery

Bay; when the sun was strong and at its greatest altitude in the daytime, this protection raised the inside temperature a degree or two, but at most times the inside and outside temperatures were uniform, or nearly so, and constantly as low as 33° F.; the seeds planted were peas, beans, celery, wheat, mustard and cress—all of these germinated and grew. Nor is the excessive cold of the winter months in these regions, involving as it does upwards of one hundred degrees of frost, fatal to the vitality of mature seeds; wheat, which had been left at Polaris Bay by Hall's Expedition of 1871, and which had been thoroughly and entirely exposed to the weather for four successive winters and summers, germinated when sown in Discovery Bay; while the beans and peas we experimented upon had experienced, upon the ship's upper deck, the whole severity of our winter, with a minimum temperature of 71° F. It is thus quite possible that migratory birds, currents of air or water, or other agents, may in some rare cases introduce mature seeds to a soil prepared to receive them, but it should always be kept in mind that much importance ought not to be attached to the distribution of plants by such means.

As a rule the various flowering plants occur in tufts or patches, the same species growing in considerable quantity at each station, and perhaps not again to be met with, or not for a considerable distance; green colonies are sometimes thus formed, the brightest and largest of which will be found to be due to *Carex fuliginosa*. *Saxifraga nivalis* is a remarkable exception; it seems to have no spreading power, and is only to be found very rarely in single scattered plants, it holds a very precarious tenure, and will probably soon become extinct.

Plants are no doubt distributed by drifting pieces of the ice-foot and other masses of ice which have lain ashore, serving as rafts to convey them from bay to bay: this must, however, be of less avail than might be expected, since the range of so many species is extremely confined; for instance, Bellot Island, lat. 81° 40′, contains two species, *Saxifraga rivularis* and *Silene acaulis*, which were not found for two degrees to the south of it, and one, *Arnica montana*, not observed north of Proven, lat. 72° 20′. Three species occur in Discovery Bay not met with elsewhere: these are, *Arenaria grœnlandica*, *Androsace septentrionalis*, and *Deschampsia cæspitosa*. *Hesperis Pallasii* and *Pedicularis capitata* are both rare and extremely limited in their distribution, and several species occurring at Disco, in lat. 69° 14′, reappear here for the first time.

Many plants, though occurring in clusters, by no means give a green effect to the landscape, *Epilobium latifolium*, *Salix arctica*, and others never hiding the shingle upon which they grow—most sedges and all grasses only grow in tufts, or by sending up single separate stems with little or no leaf-growth. *Dryas integrifolia* forms sods of rich brown turf, while the Saxifrages as a rule cover much ground with a greenish brown growth.

The rock *in situ* forming this part of Grinnell Land is azoic, and generally a black clayey shale,—sometimes, as about ten miles up St. Patrick's Fiord—forming an excellent, fine-grained black

slate, with true cleavage; near the mouth of this fiord masses of hematite appear, and a few miles up there are beds of a hard pale unfossiliferous limestone, which is of rare occurrence. Drifted foreign and sometimes fossiliferous rocks, rounded boulders, ice-scrapings, and other evidences of glacial action are to be met with in many places at high elevations (1000 feet and upwards) above the old sea shores; on the summit of Mount Cartmel (1800 feet), the slaty shingle is grooved and fluted in unmistakable fashion, and the last condition of this land, while its lower parts were beneath the sea, was evidently the same as the present ice-capped, glacier-forming era of the opposite continent of Greenland.

The following notices of the arrival of summer may be interesting:—

In 1876 the sun was above the horizon on February 26th; on May 10th, ptarmigan had begun to get summer colours; on May 14th, at Polaris Bay, leaf-shoots of *Saxifraga oppositifolia* put forth young leaves, the thermometer standing at 9° F.; snow buntings arrived at Polaris Bay on the 15th of May; the first trickle of water upon a black rock-surface was seen upon May 16th; on the 27th of May, shoots of *Stellaria longipes* were in growth; on the 29th, flies made their appearance; June 7th, *Saxifraga oppositifolia* was first seen in flower, and a day or two afterwards *Draba parviflora* came into blow; June 13th was the first warm summer's day of the year.

Besides the difficulties due to the climate, there are others in the way of plant-growth; lemmings swarm here, and subsist entirely on vegetable matter, which is also the support of numbers of hares, musk oxen, ptarmigan, and brent geese. Individuals of these watched or dissected by me led to the following conclusions: the musk ox will eat almost any herbage, but seemed especially fond of *Carex fuliginosa* and *Salix arctica;* the brent goose prefers shoots and heads of *Ranunculus nivalis*, *Eriophorum capitatum*, and *Cerastium alpinum; Saxifraga cæspitosa* was the favourite food of hares, everything else was rejected by a leveret which I kept in confinement; ptarmigans appear to subsist entirely upon willow tops (*Salix arctica*); the reindeer will reject everything for *Stellaria longipes*, while the seed tops of Drabas and Poppies form the chief food of the snow bunting; *Saxifraga oppositifolia* and Drabas support hosts of lemmings, and the former is no doubt eaten by all in the early part of the season, being the first to form fresh growth.

The tufts, shoots, and stems of many arctic plants, especially *Saxifraga oppositifolia*, *S. cæspitosa*, and several Drabas become to all appearances dead at the close of the season, but next summer buds start forth at the apex and axils of these stems to form fresh flowering branches; this is commonly the case, the vigour becomes quiescent, frozen as it were, and the plants do not shed their withered sprays; hence it is usual to find dense clusters of old leaves and branches attached to a plant, as in *Dryas integrifolia* and *Saxifraga tricuspidata*, etc. Many years leaves may be found on one sample of *Saxifraga oppositifolia* or *Festuca ovina;*

Splachnum Wormskioldii and other mosses have the same habit, and in favoured situations, where not exposed to floods and secure from drifting thaw at the opening of the season, these accumulations form an excellent turf: this usually occurs only in small quantities, but once a footing is established the process is sure if not rapid. *Dryas integrifolia* and *Saxifraga cæspitosa* are the chief turf-builders.

The commonest plants in Discovery Bay were *Saxifraga oppositifolia*, *S. cæspitosa*, and *Dryas integrifolia*, and their flowers were also most abundant, the former covering many square yards with its magnificent sheets of red-purple; the ground that it grows on and the plant, except the flowers, being scarcely visible. I have never seen any wild plant to compare with this Saxifrage for a rich display of colour. Its flowers occur of every shade of pink and purple, varying in hue at different periods of the season, and it remains in blow from the earliest spring to the latest summer.

The thawing of the snow is the signal for growth to commence, and after that all plants alike have to take their chance of being submerged and swamped for a time. *Vesicaria* and *Hesperis* seemed alone to demand a comparatively dry situation throughout; on the other hand some sedges, cotton sedges, and other plants which we are accustomed to regard as marsh plants, have to subsist on soil as dry and hard as iron during most of the summer.

The rarest plants in Discovery Bay were *Pedicularis capitata* (two small colonies), *Arnica montana* (one plant), *Arenaria grænlandica* (a few plants), *Cardamine pratensis* (a couple of plants), the two *Equiseta* (three small colonies), *Saxifraga rivularis* (a couple of plants), and *Trisetum subspicatum* (a few plants).

The only scented flowers in Discovery Bay belonged to *Hesperis Pallasii*, which in a strong sun gives forth a delicate odour of hawthorn.

Salix arctica and the species of Poa and Draba are eminently variable in their growth; of these, *Salix arctica* is usually tolerably constant for any given district. *Saxifraga cæspitosa* var. *uniflora* has two very well-marked forms, united by a series of slight gradations; the same may be said of *Papaver nudicaule* and *Dryas*, and the extremes are to be met with sometimes side by side. Moreover, the degree of hairiness in all plants is very variable, seeming often to follow a reverse law to animal life, and decreasing to the northward: this might be expected, as it is probably a useless and luxuriant effort of growth; this is observable in *Pedicularis hirsuta*, in *Salix arctica*, *Draba hirta*, and others; the colours yellow and white are also very unstable and interchangeable, as amongst all the Drabas; in *Saxifraga cæspitosa*, often yellow; in *Papaver nudicaule*, sometimes pure, and often nearly pure, white; and in *Dryas integrifolia*, which is frequently yellow.

On the sides of mountains with a southern aspect, I estimated the line of perpetual snow in the neighbourhood of Discovery Bay at fourteen to fifteen hundred feet above sea-level. Spaces blown clear of snow occur at higher levels upon exposed ledges, hillocks, &c., and these will still support a few of the hardier flowering plants. The snow-fall is, however, never of any great depth, and during

the winter of our experience did not probably exceed a foot and a-half at the most, except where drifted. Upon the vertical range of species, I made the following observations with an aneroid :—

At 2000 feet occur—*Papaver nudicaule*, *Draba alpina*, *Saxifraga oppositifolia*, *S. cæspitosa*.

At 1500 feet—*Poa arctica*, *Cerastium alpinum*, *Stellaria longipes;* the last two very scarce and stunted.

At 1400 feet—*Saxifraga cernua*, *Oxyria reniformis*, *Saxifraga flagellaris*, *S. nivalis*, *S. tricuspidata*, *Alopecurus alpinus*, *Potentilla nivea*, *Cerastium latifolium*.

At 1000 feet—*Pedicularis hirsuta*, *Lychnis apetala*, *Eriophorum capitatum ;* the latter not appearing at lower levels.

At 800 feet—*Hesperis Pallasii*, *Taraxacum Dens-leonis*.

At 700 feet—*Erigeron uniflorus*, *Androsace septentrionalis*, *Pedicularis capitata* (*Saxifraga tricuspidata* disappears), *Equisetum variegatum*.

At 500 feet—*Salix arctica*, *Pedicularis sudetica*, *Potentilla frigida*, *Draba androsacea*, *D. hirta*.

At 400 feet—*Alsine verna*, *Vesicaria arctica*, *Draba parviflora*, *Carex fuliginosa*.

At 300 feet—*Cochlearia anglica*, *Erigeron compositus*.

Up to the highest of the above altitudes, two mosses (*Tortula leucostoma* and *Orthothecium chryseum*) occurred with the Phanerogams there mentioned. Lichens were not observed. I may here mention that I cannot agree with Professor Theodor Fries, who, in his admirable paper upon that branch of the botany of our expedition (Linnean Society's ' Journal of Botany,' vol. xvii., 1879), speaks of lichens as " belonging to the flora that approaches nearest to the north pole." Certain phanerogams surpassed them in vertical range; and from the latitude 83° 6′, whence Lieut. Aldrich brought home one lichen (*Gyrophora cylindrica*); he also brought home one phanerogam and two others from lat. 83° 4′. I believe the latter, if there be any difference, will hold their own against lichens in the struggle for life to the farthest northern land.

Some plants seem to be unable to flower in Discovery Bay. Thus, *Epilobium latifolium* and *Polygonum viviparum* formed buds which did not nearly arrive at perfection ; *Arenaria grænlandica*, *Arnica montana*, *Saxifraga rivularis*, and *Cardamine pratensis* made no effort to flower, while others, as *Saxifraga cernua*, *S. nivalis*, *S. tricuspidata*, and *Festuca brevifolia* only blossomed very sparingly; male catkins of *Salix arctica* became extremely rare northwards, scarcely occurring (if at all) beyond lat. 80, while female catkins continued to be plentiful. Again, the anthers of others, as *Alopecurus alpinus* and *Stellaria longipes*, rarely open so as to shed their pollen, as they do abundantly in lower latitudes, where its rich colours are often conspicuous. These instances tend to confirm my observation that arctic plants are independent of reproduction by seed. Butterflies and other insects, whose office it often is to fertilise flowers, occur here; and though the function is no longer in use, as it must have been in a more temperate climate, they remain as a relic of a former more extensive arctic fauna.

On guano soil or organic matter, as around old Esquimaux settlements at Hayes' Sound, about aukeries and below bird-cliffs, as at Cape York and Foulke Fiord, certain plants are most at home, as all Saxifrages (except *S. oppositifolia*), and especially *S. cernua*, *Stellaria longipes*, *Lychnis affinis*, *Ranunculus sulphureus*, *Alopecurus alpinus*, *Cerastium alpinum*, *Salix arctica*, and most mosses, especially *Splachna*. On the other hand, the species which seem to take first to freshly-formed glacial mud, free from organic matter, are *Papaver nudicaule* (especially the form *P. alpinum*), *Drabas*, *Braya alpina*, *Saxifraga oppositifolia*, *Carex fuliginosa*, *Phippsia algida*, *Dryas*, *Potentilla nivea*, *Lychnis apetala*, *Poas*, and *Festucas*, *Eriophora*, and most lichens may be included as growing upon inorganic rock.

(To be continued).

NOTES ON THE FLORA OF NORTHAMPTONSHIRE.

By G. C. Druce, F.L.S.

(Continued from p. 46.)

Prunus insititia, L. Dallington, Loddington, Collingtree, &c., Nene *a*; Abington, Yardley Chase, Nene *b*; Brigstock Woods, Nene *c*; Whittlebury Forest, Ouse.

P. domestica, L. In old hedgerows in several localities, as Floore, Nene *a*; Grafton Regis, Ouse, &c.

P. Cerasus, L. Harleston, Nene *a*.

**Poterium muricatum*, Spach. Cultivated fields, Southorpe, Nene *c*.

Potentilla procumbens, Sibth. Plain Woods, Nene *a*; Silverstone Wood, Ouse.

Comarum palustre, L. Biggin (*Rev. M. J. Berkeley*).

Rubus rhamnifolius, W. & N. Harleston Firs, Nene *a*; Silverstone Woods, Ouse.

R. discolor, W. & N. Generally distributed.

R. thyrsoideus, Wimm. Hunsbury Hill, Moulton, &c., Nene *a*.

R. leucostachys, Sm. Hunsbury Hill, very fine, Harleston, Nene *a*; Yardley Gobion, Ouse.

R. amplificatus, Lees. Harleston Firs, Nene *a*.

R. rudis, Weihe. Harleston Firs, plentiful, Tiffield and Gayton, Nene *a*; Silverstone, Ouse.

R. radula, Weihe. Harleston, rare, Nene *a*; Silverstone Woods, Ouse.

R. Kahleri, Weihe. Harleston, Plain Woods, Gayton, &c., Nene *a*.—c. *pallidus*. Tiffield, Nene *a*.

R. diversifolius. Lindl. Only less frequent than *discolor* round Northampton, and especially abundant at Duston, also in Ouse district.—Var. *pilosus*. Gayton and Upton.

R. corylifolius, Sm. Frequent and generally distributed.—a. *sublustris*. Houghton, Nene *b*.—b. *conjungens*. Duston, Nene *a*. Stoke Bruerne, Ouse.

R. althæifolius, Host. Plain Woods, Nene *a;* Grimsbury, Cherwell (*French*).

R. cæsius, L. Generally distributed.

Rosa spinosissima, L. Very local, and only on the sandy soil of Boro' Hill, Badby Wood, and Harleston.

R. Doniana, E. B. Hedge near Kettering (*Lewin*), Nene *b.*

R. mollissima, Willd. Apparently confined to a small space about Blisworth and Plain Woods, Nene *a.*

R. tomentosa, Sm. Foxhall, Nene *b;* Welden, Nene *c.*

R. scabriuscula. Plain Woods, Nene *a.*

R. lutetiana, Lem. Generally distributed, as at Plain Woods, Whittlebury Forest, Barnwell Wolds.

R. surculosa, Wood. Middleton Road, Cherwell.

R. sphærica, Gren. Hunsbury Hill and Rothersthorpe Road, Nene *a.*

R. dumalis, Bechst. Harpole, Gayton Road, &c., Nene *a;* Yardley Gobion, Ouse.

R. biserrata, Merat. Delapre, Nene *b;* Helpstone, Welland.

R. urtica, Lem. Very common in all the districts.

R. arvatica, Baker. Buxworth, Nene *a;* Near paper-mills, Nene *b.*

R. dumetorum, Thuill. Gayton Road and Hunsbury Hill, Nene *a.*

R. pruinosa, Baker. Warkworth, Cherwell.

R. tomentella, Lem. Between Gayton and Blisworth, Nene *a;* Roade, Denshanger, Ouse.

R. andegavensis, Bast. Grimsbury, Cherwell (*French*).

R. verticillacantha, Merat. Nene side, Rothersthorpe Crossing, Hunsbury Hill, Nene *a.*

R. Reuteri, Godet. Weedon to Farthingstone; very good typical at Gayton, just above railway crossing, in high hedge with *dumalis*, *coriifolia*, &c.

R. implexa, Grev. Borough Hill, Dodford side, Nene *a.*

R. coriifolia, Fries. With *R. Reuteri*, as above; also near Silverstone, Ouse.

R. Borreri, Woods. Side of railway, Delapre meadows, Nene *b.*

Pyrus Aria, L. Cogenhoe, Abington, &c., Nene *b;* Bugbrooke, Nene *a.*

P. communis, L. Occurs near Coton, Avon; Roade, Nene *a;* Castle Ashby, Nene *b;* Barnwell Wolds, Nene *c.* There are two varieties, one flowering much earlier than the other.

P. acerba and *P. mitis.* Both occur in the old forests of Whittlebury, Salcey, Rockingham, &c.

Peplis Portula, L. Badby Wood, in damp riding and pond side near Farthingstone Castle dyke, Nene *a;* very rare.

[*Lythrum Hyssopifolia*, L. Berkeley MSS., 'Top. Bot.' This has not been seen by Mr. Berkeley, the locality, Sutton Heath, Nene *c*, being given him by Mr. Henderson. I have searched in vain for it there.]

Epilobium brachycarpum, Leight. Harleston, Duston stone-pits, Nene *a.*

E. obscurum, Schreb. Upton Meadow, Nene *a;* Wellingboro' Nene *b;* North dyke-side, Peterboro', Nene *c;* Wicken, Ouse.

E. tetragonum, L. Blisworth, Nene *a;* Geddington, Nene *b*.

E. roseum, Schreb. Arthingworth brook (*Lewin*), Nene *b*.

Myriophyllum verticillatum, L. Higham Ferrers, Nene *b;* North bank-dyke, Peterboro'; rather local, Wakefield pond, Ouse.

M. spicatum, L. Castle Ashby pond, Nene *b;* Wakefield, Ouse.

Callitriche verna, L. Dallington, &c., Nene *a;* Cogenhoe, &c., Nene *b;* Peterboro', Nene *c;* Stoke Bruerne, Ouse; Ufford, &c., Welland.

C. platycarpa, Kutz. Holdenby, Nene *a;* Delapre, Nene *b*.

C. hamulata, Kutz. Higham Ferrers, Nene *b;* Cosgrove, Ouse.

Sedum album, L. On walls in and about villages; generally distributed.

[*S. Forsterianum* and *S. reflexum* of Baker's History are probably *S. reflexum*, L., which occurs in the localities given, and in many other places; and is quite naturalised by canal side near Grafton Regis.]

Cotyledon Umbilicus, L. Kingsthorpe, on wall above the village spring, 1879, nearly covered with *Parietaria;* on Brampton Bridge, almost hidden by ivy, 1878; very rare; these localities are given in Baker's History; Litchboro' and Canons Ashby, abundant, covering every wall, Nene *a*. I should certainly think it indigenous in the two latter places; Peterboro' Cathedral, extinct. These localities are almost, if not quite, the eastern limit of this plant.

Parnassia palustris, L. Rapidly decreasing, but still plentiful at Wittering, Nene *c*.

Hydrocotyle vulgaris, L. Dallington Heath, rare, Nene *a;* Foxhall bog, Nene *b;* Wittering, Nene *c;* Wakefield, Ouse.

Eryngium campestre, L. Sides of Watling Street, near Brockhall, Nene *a*. Not lately found. Specimens from the locality are cultivated in the gardens of Col. Clarke, at Welton, and Mr. Thornton, of Brockhall.

Helosciadum inundatum, Koch. Side of Ouse, Denshanger; Irthlingboro' meadows, Nene *b*.

H. repens, Koch. Foxhall Bog, Nene *b*.

Œnanthe silaifolia, Bieb.? King Sutton Bog (*French & Beesley*).

Galium erectum, Huds. Borders of Whittlebury Forest, Ouse.

G. Witheringii, Sm. Nene bank, &c., Nene *b*.

Asperula cynanchica, L. Abundant in the Wittering district, Nene *c*, and like *Genista*, &c.; also occurring at Wappenham, Ouse.

Valeriana Mikanii, Syme. Whittlebury Forest, Heathencote, &c., Ouse; Bedford purlieus, Nene *c*; Yardley Chase, Nene *b*. The plant of woodlands and hedgerows.

V. sambucifolia, Mikan. Brooks and canal sides, as at Hunsbury Hill, &c. Not quite so frequent as *Mikanii*. Intermediates occur, and show all gradations.

*[*Carduus tenuiflorus*, Curt. in 'Top. Bot.', seems to have disappeared from its old habitat, where probably it was only a casual.]

Carlina vulgaris, L. On the old quarries and calcareous ground, as at Blisworth, with *Gentiana Amarella*, Nene *a*; Southorpe, Weldon, &c., Nene *c*; Collyweston, Welland, and Cosgrove, Ouse.

Arctium majus, Schukr. Brampton, Rothersthorpe, Nene *a*, and in the other districts.

A. minus, Schukr. Also generally distributed.

**Anthemis nobilis*, L. Only as a garden escape or waif of culti vation on railbanks.

Artemisia Absinthium, L. Abundant on the ironstone quarries, Denton, Nene *b*.

Doronicum plantagineum, L. On a bank near Denton, Nene *b*.

Bidens cernua, L. Marsh by canal side above Northampton, Nene; in similar situation near Yardley Gobion, Ouse.

**Inula Helenium*, L. King's Cliff and Marholm (*Berkeley*), Nene *c*.

I. dysenterica, L., var. *discoidea*. Harpole, Nene *a*.

Solidago Virgaurea, L. Very rare. Var. *angustifolia* occurs in Badby Wood; type on Boro' Hill, Nene *a*.

Hypochæris maculata, L. Southorpe (*Berkeley*), Nene *c*. I found a couple of specimens in 1878 (queried in 'Top. Bot.')

Picris hieracioides, L. Harpole, Blisworth, Nene *a*; Grafton Underwood, Nene *b*; Weldon, Nene *c*; Yardley Gobion, Ouse.

Crepis taraxacifolia, Thuill. Harleston brickyards abundantly, and also in field near Dallington, about a mile from former locality, Nene *a*.

Hieracium vulgatum, Fries. Boughton; Badby Woods, Nene *a*; Bedford purlieus, Nene *c*; Wicken Wood, Ouse.

Erica cinerea, L. Harleston Heath, Nene *a*; Peterboro', Nene *c*.

Monotropa Hypopitys, L. Castle Ashby Wood, 1873 (*Miss Brent*), Nene *b*; Walcot (*Berkeley*); Welland.

Cuscuta europæa, Murr. Near Northampton, Nene *a*; King's Cliff (*Lewin*), Nene *c*.

C. Epithymum, Murr. Harleston, Nene *a*; on *Calluna*.

C. Trifolii, Bab. Harleston, Nene *a*; Yardley Gobion, Ouse.

Verbascum virgatum, With. Harleston Heath, Nene *a*; Sewage-works.

Digitalis purpurea, L. Almost absent from the county; Harleston Heath, Nene *a*, possibly introduced; Badby Woods, plentiful, not in Notcutt's list of Daventry plants, but given for this locality in Baker's History.

Antirrhinum Orontium, L. Thornhaugh (*Berkeley*); Barnack, Nene *c*.

**Linaria Cymbalaria*, Mill. Abundant in numerous localities, as on Peterboro' Cathedral.

Veronica scutellata, L. Harpole; Gayton, Nene *a*; Wittering Marsh, Nene *c*.

**Mentha viridis*, L. By Nene side, with *Armoracia*; Dodford, Nene *a*.

M. piperita, Huds., var. *officinalis*, Hull. Plentiful between Duston and Nobottle, Nene *a*.

M. hirsuta, L., var. *subglabra*, Baker. Gayton Canal, &c., Nene *a*.

M. sativa, L. Harleston, Tiffield, &c., Nene *a*; Wansford, Nene *c*; Denshanger; Coppice Moor; Ouse, all *M. rivalis*.

M. rubra, Sm. Canal-side, Hunsbury Hill, Nene *a*. Not typical *rubra*.

Thymus Chamædrys, Fries. Plain Wood, Nene *a*; Wittering Heath, Nene *c*; Cosgrove; Wicken Wood, Ouse.

Calamintha Acinos, Clairv. Harleston, in sandy fields side of Heath, Nene *a*; abundant in sandy fields at Southorpe, Wittering, Burleigh, &c., Nene *c*.

**Marrubium vulgare*, L. Brampton, Kingsthorpe, Blisworth, Nene *a*; Kettering, Nene *b*; Pilsgate (*Jones*); Welland.

Nepeta Cataria, L. This grows freely on the borders of Whittlebury Forest.

[*Stachys germanica*, L. Gathered wild in some quarries between Fineshade and Wakerley, by Mr. Lewin, several years ago, when it was plentiful; it has now disappeared, the site being brought under cultivation.]

Lamium incisum, Willd. Near Brigstock, Nene *c*.

Teucrium Scorodonia, L. One of our rarest plants, occurring only in small quantity in Harleston Firs, near the old boundary-wall, Nene *a*.

Myosotis collina, Reich. On old walls, as at Lamport, Dallington, Nene *a*; Brigstock, Nene *b*; Wittering, Nene *c*; Collyweston, Welland.

Symphytum tuberosum, L. Kirby Hall (*Lewin*); Welland; Castle Ashby (*Miss Brent*). Mr. Lewin thinks it was wild at Kirby, from whence specimens were gathered and distributed through the Exchange Club by Notcutt.

S. officinale, L. The white-flowered form alone occurs, generally distributed.

Cynoglossum officinale, L. Upton road-side, Nene *a*; Stanion, Nene *b*; Farming Woods, Southorpe, Nene *c*; Cosgrove, Ouse; Stamford Warren; Welland.

Lysimachia vulgaris, L. Denford, Nene *b*; Wansford, Nene *c*; Cosgrove, near canal, Ouse.

Anagallis cærulea, Sm. Potter's Pury, Ouse, &c.

Samolus Valerandi, L. Nene banks, Northampton, Nene *a*; Denford; Thrapstone, Nene *b*; Welland banks (*Jones*).

Chenopodium album, L. *C. candicans*, Lamk. Common in wheat-fields and in dry situations. *C. viride*, L. Among turnip and potato crops. *C. paganum*, Reich. With preceding, and on rich waste ground.

C. ficifolium, Sm. Waste ground, Peterboro' sewage farm, Nene *c*.

C. Bonus-Henricus, L. Dallington; Duston; Quinton, Nene *a*; Great Houghton; Weekley, Nene *b*.

Atriplex deltoidea, Bab. Harpole, Nene *a*; Sewage-works, Nene *b*; Peterboro', Nene *c*.

A. erecta, Huds. Sewage-works, Nene *b*; Barnack, Nene *c*.

A. Smithii, Syme. Sewage-works, Nene *b*; Old Stratford, Ouse.

Rumex nemorosus, Schrad. Duston, Nene *a*; Denshanger; Wicken Wood; Whittlebury Forest, Ouse.

R. maritimus, L. (queried in 'Top. Bot.') Found last August growing sparingly by some of the cross drains below Peterboro'.

Polygonum maculatum, Dyer. Var. *densum*; plentiful by dyke sides below Peterboro', growing with *Polygonum nodosum*, Pers., var. *album*, &c.

P. biforme, Wahl. Kingsthorpe railway-side, Nene *a*.

Mercurialis annua, L. Ploughed fields, King's Cliff (*Lewin*).

Ceratophyllum aquaticum, E. B. Nene near Castle Bridge, Northampton; Fawsley Park fish-ponds, Nene *a*; Boughton fish-pond, Nene *b*; Peterboro' dykes, Nene *c*; Furtho, Wakefield, Ouse.

Urtica Dodartii, L. Near Kettering (*Lewin*), Nene *b*.

Ulmus glabra, Mill. Frequent about Cransley, &c., Nene *b*.

Quercus pedunculata, Ehrh. The 'Queen's' and 'Salcey' oak are this variety.

Carpinus Betulus, L. Rare; Upton; Yardley Chase.

Populus alba, L. Dallington, Nene *a*; Great Billing, Nene *b*; Moorend, Ouse.

(To be concluded.)

ON THE DISTRIBUTION OF *HYPNUM SALEBROSUM*, HOFFM., IN BRITAIN.

BY E. M. HOLMES, F.L.S.

MR. G. DAVIES, by questioning the evidence of the occurrence of *Hypnum salebrosum*, Hoffm., as a British moss, has done good service by eliciting more accurate information concerning the characteristic features as well as the geographical distribution of the species. One or two points, however, remain which it might be interesting to clear up. Having had the opportunity of examining the specimens in the British Museum, which have been alluded to in the 'Journal of Botany' for 1879 (pp. 305, 344, 359), I am glad to be able to confirm the statements of Dr. Spruce and Mr. F. A. Lees.

In Wilson's herbarium there exist two specimens labelled, "On trees, Oakcliff Wood, Kirkham Hill, Yorkshire, Oct., 1848," which exactly answer to Dr. Spruce's description of the species. These specimens are marked also "forma capsulis parvis," apparently in Dr. Spruce's writing. In appearance they correspond to the figure given by Schimper in 'Bryol. Eur.,' t. 16, c. 1. No other specimen in Wilson's herbarium appears to be the true plant; all the others labelled *H. salebrosum* being *H. Mildeanum*, except a few sent to him as *H. salebrosum*, which have been

corrected by Mr. Wilson, and referred to *H. glareosum* and *H. lutescens*. It is interesting to note that Mr. Wilson had either observed the difference between *H. Mildeanum* and *H. salebrosum*, Hoffm., or that it had been pointed out to him by Dr. Spruce, since the abbreviation Hoffm. is doubly underlined by him on Dr. Spruce's specimens, and also on a barren specimen from Cork received from Mr. I. Carroll, and carefully distinguished, as "the first sent," from others afterwards sent by Mr. Carroll, which are undoubtedly *H. Mildeanum*. The specimen labelled "the first sent" is unfortunately not in fruit, and is so fragmentary that I hesitate to pronounce whether it be *H. salebrosum*, Hoffm., or *H. velutinum*, especially as the apex of the leaf is not so elongated as in typical *H. salebrosum*, but more nearly resemble that of *H. velutinum*.

An interesting note occurs in Mr. Wilson's herbarium concerning these two plants, *H. Mildeanum* and *H. salebrosum*, which further confirms the view that Wilson recognised a difference between them. The note is as follows:—"T. Drummond's Forfar specimens approach to *H. campestre* in aspect, but have a different seta. The seta of *H. salebrosum*, from Southport and Ainsdale, when viewed by very oblique light of the sun, shows obscure and scattered papillæ, but these are less evident than in *H. campestre* (from Bruch), and there is always a glossiness and more purplish hue; leaves more spreading and of a less membranous texture, evidently plicate when dry."*

A specimen from Mr. Mitten, labelled by himself "*H. salebrosum* (*H. plumosum*, Br. & Schpr.), on the roots of beech trees in the ashen plantation, Hurstpierpoint, Dec., 1846," is evidently a broad-leaved form of *H. Mildeanum*. This is probably the plant alluded to by Mr. Lees in 'Journ. Bot.,' p. 360.

In Wilson's herbarium there are numerous specimens of *H. glareosum*, from Helk's Wood, Ingleton, but none of *H. salebrosum*, Hoffm. In the British herbarium at the British Museum there occur specimens of the true plant from Highbridgehall, Roxburghshire, A. Brotherston, April 1st, 1875; and between Market Rasen and Tealby, F. A. Lees, 1877.

The distribution of this species in Britain, since it is evident that Mr. Lees' plant and Dr. Spruce's are identical, will be as follows:—

Near Forfar, Drummond, 1824 (on Dr. Spruce's authority).
Near Kirkham Abbey, R. Spruce, Nov., 1846!
Highbridgehall, Roxburghshire, A. Brotherston, April, 1875!
Ledsham Park, West Riding, Yorkshire, 1876!
Market Rasen, Lincolnshire, F. A. Lees, 1877!

From the dates above given, it will be observed that although found fruiting in Nov., it was found in Forfarshire fruiting in spring. The same difference in time of fruiting is noticeable in

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* A Forfarshire specimen from Drummond of *H. salebrosum* in the Kew herbarium has a rough fruitstalk, from which it would appear that his specimen grew intermixed with *H. rutabulum*.

Schimper's specimens, and in both cases the later fructification appears to be due to a higher elevation and colder atmosphere. Hoffmann, in his original description, also mentions spring as the time of fruiting. "*H. salebrosum* caule reptante, ramis confertis pinnato-depressis, foliis ovatis acutis 3-striatis; striis oppositis inæqualibus capsula e seta lævi cernua operculo conico. Locis saxosis. *Vere.*"—(G. F. Hoffmann, 'Deutschland Flora,' ii., 74). Mr. Lees' specimen, from between Tealby, near Market Rasen, corresponds closely to the var. γ. 1, tab. 16, in 'Bryol. Eur.'

H. Mildeanum is probably a much more widely distributed plant in this country, and often overlooked as a form of *rutabulum*. In the British Museum there occur specimens in Wilson's herbarium, from Ainsdale Sands, Southport; Bidston Marsh; near Newton Viaduct; Birkdale; Crosby; Cheshire, F. P. Marrat; St. Andrews, C. Howie; Glasnevin, Dublin, D. Orr; Leigh Woods, Somersetshire, W. Wilson; Hayle and Falmouth, Cornwall, W. Curnow; Cork, I. Carroll; and Hurstpierpoint, Mr. W. Mitten; all, without exception, labelled "*H. salebrosum.*" Mr. Boswell records it from Oxfordshire; Mr. Lees from Lincolnshire; and I have seen it growing at Plymouth, in Devonshire; and Biddenden, in Kent.

With regard to the distinctive features of the two plants, there is little to be added to the excellent descriptions given by Dr. Spruce and Mr. Lees from their own observation and that of M. Renauld. I may add, however, that in examining under the microscope the specimens in the British Museum I found much greater difficulty in distinguishing between forms of *H. glareosum* and *H. salebrosum* than between the latter and *H. Mildeanum*. Apart from the fructification, *H. salebrosum* differs chiefly from *H. Mildeanum* in the leaves being *distinctly* serrate in the former, the upper edge of the serrature being somewhat convex, so as to give an almost denticulate character to the serration. In *H. Mildeanum* the leaves are nearly entire; no one who has compared the two under the microscope could well confound them again. As regards the fructification Mr. Marrat, a very careful observer, writes on the Cheshire specimen "inflorescence sometimes synoicous." It appears to me doubtful how far the fact of the inflorescence being monoicous, dioicous, or synoicous should form a specific difference, unless other distinctive characters occur. In some species it is undoubtedly constant; in others exceedingly variable. So far as pinnate ramification and general habit go, *H. salebrosum* seems to me to glide almost imperceptibly into *H. glareosum*, specimens of which in the British Museum from Stockton Forest, collected by Dr. Spruce in 1846, are exactly intermediate, having the densely imbricate leaves of *H. glareosum*, with the shorter, more distinctly serrate apex of the leaf of *H. salebrosum*. The possibility of hybrids occurring between these plants may, however, account for this, since Mr. Lees states that he has found the two plants in one district. *H. Mildeanum* again, as regards habit of growth, appears to verge on one side towards *H. rutabulum*, and on the other towards *lutescens* or *H. campestre*. The latter, which surely should

occur in this country, is easily distinguished from *H. rutabulum;* if a *branchlet* be examined under the microscope, the leaves as viewed laterally are seen to be remarkably convex, the apex appearing almost piliferous; but if a single leaf be examined, it becomes flattened out under pressure, the convexity is lost sight of, and the leaf seems to differ from that of *H. rutabulum* only by its longer point. In the field some regard should evidently be paid to habitat, *H. salebrosum* preferring decaying wood, rotten sticks in fir plantations, &c.; *H. glareosum*, grassy banks and margins of woods, especially if the soil be slightly calcareous; and *H. Mildeanum*, damp sandy places, near gutters by road-sides, or on commons. The following characters will probably serve as a rough guide to recognise these plants in the field:—In *H. glareosum* the densely imbricated leaves, giving the stem a more cylindrical character, the long points of the leaves and the prostrate pinnate branching; in *H. Mildeanum* the erect, rigid-looking leaves, slightly compressed habit of the plant, usually semi-erect growth, and the leaves frequently more densely imbricated near the point, giving the tops of the branches an appearance slightly resembling that of *H. cuspidatum* or *H. sarmentosum;* and in *H. salebrosum* the spreading leaves like those of *H. rutabulum*, and the smooth fruitstalk.

SHORT NOTES.

Is Asarum europæum, *L.*, a Hampshire Plant?—Possibly Mr. Townsend may be helped to answer this question by the following note:—In May, 1874, the late Mr. J. Hussey (of Salisbury) took me to what he considered the only South England station for this plant—a lane in S. Wilts, a mile or more N.N.E. from Redlynch, and between two and three miles from the Hants border. He had before found it there in great quantity, and so far back as 1840. This year it was only after a long close search that we discovered it, nearly overpowered by ivy, &c., but still extending some twenty or thirty yards along the east bank of the lane. He said there was some reason to suppose that the plant had been introduced by (if I remember aright) Dr. Maton. There surely ought not to be any great difficulty in ascertaining whether this S. Wilts station is the one referred to "in the 'New Forest Hand-book' (p. 102), lately published at Lyndhurst."—W. Moyle Rogers.
[A specimen of *Asarum* collected in 1879 at Downton, S. Wilts, not far from the Hampshire border, was presented by Miss F. M. King to the British Museum herbarium.—Ed. 'Journ. Bot.']

Rees's Cyclopædia.—In 'Journ. Bot.' for 1877 (pp. 107–8) I gave the approximate dates of the volumes of Rees's Cyclopædia, so far as I then knew. I have recently met with some additional information, contained in 'Aikin's Annual Review,' a work which professed to review all important publications of each year. I

append the same in tabular form to match my former contribution, to which it must be considered supplementary :—

VOLUME.	PART.	DATE.	FIRST ARTICLE.	LAST ARTICLE.
[I., II.]	1—3	1802	A	Antalkalines * ?
II.	[4]	1803	Antamba * ?	Arteriolomy
III.		1804	Arkery	Battersea
IV.		1805	Battery	Booth

B. D. Jackson.

New Luminous Fungus.—The following description of a new luminous fungus from the Andaman Islands is given by the Rev. M. J. Berkeley in the 'Gardeners' Chronicle' for February 21 :—*Agaricus* (*Pleurotus*) *Emerici*, n. sp.—"Pileus at first spathulate, quite smooth, dark brown; at length suborbicular, soon changing to white, with a slight tinge of yellow; minutely virgate; stems obsolete; gills of the same colour as the pileus, narrow interstices smooth. Pileus about half an inch across, attached behind without any stem, either nearly flat or helmet-shaped, emitting a most brilliant light, the entire substance being luminous. The species was found by Major Emeric S. Berkeley, who is now located at Port Blair."

Notices of Books and Memoirs.

Biologia Centrali-Americana; or, Contributions to the Knowledge of the Fauna and Flora of Mexico and Central America. Edited by F. Ducane Godman and Osbert Salvin.—Botany. By W. B. Hemsley. Parts i. and ii. (Sept.–Nov., 1869) [*Ranunculaceæ—Meliaceæ*], pp. 184, tt. 13. London: Dulau & Co.

These two parts are the first which have appeared of a work which aims at being "as complete a record as possible of what is known of the animal and vegetable life of the country under investigation." The country included comprises "the whole of Mexico from the valleys of the Rio Grande and Gila on the north, the five Central-American States of Guatemala, Honduras, San Salvador, Nicaragua, and Costa Rica, British Honduras, and the Colombian State of Panama as far south as the Isthmus of Darien." The editors have been collecting material for the work, both personally and from other explorers, during the last twenty-two years; and they have secured the co-operation of well-qualified naturalists in the various branches of the subject, Mr. Hemsley being entrusted with the whole of the Botany.

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* In vol. ii., there is no clue to the end of Part 1 and the commencement of Part 2. I have therefore been obliged to guess the place.

Our interest is naturally for the most part limited to the botanical portion of the work. Mr. Hemsley is already known as a careful and painstaking botanist; and we therefore looked forward with pleasurable anticipations to his elaboration of the plants of an interesting region. The plan of the work is to follow the classification of Bentham and Hooker's 'Genera Plantarum' so far as practicable, the species being arranged under each genus in alphabetical order—an arrangement which may be convenient, but is hardly scientific. Under each species is given the distribution through the Central American region, the collectors' numbers being usually quoted, although it is not always to ascertain whether these have actually been seen by the author. Descriptions of the new species—most of which had already been published by Mr. Hemsley in his 'Diagnoses of Mexican Plants'—are given, with amended characters of certain plants which had been previously imperfectly described; while the quarto plates of the more interesting novelties by Mr. W. H. Fitch leave nothing to be desired.

A few points seem to us to call for criticism. We have already referred to the alphabetical arrangement (which is not always strictly adhered to), and we may add that each species is distinguished in its genus by a serial number. There seems little advantage in this; but when we find that a (sometimes large) number of plants have received no specific name, we fail to see any gain in giving these a number. The large proportion of undetermined plants gives a sense of incompleteness to the book; out of 42 enumerated Abutilons, for example, 12 are unnamed; so are 5 out of the 13 Hiræas, 5 out of 12 Clusias, 4 out of 11 Zanthoxylons, and 4 out of 5 Alsodeias. Mr. Hemsley is no doubt wise in declining to commit himself to a definite pronouncement upon insufficient material; but why these doubtful plants should each occupy at least two lines, and receive a number, we cannot understand; nor can we imagine why Mr. Hemsley did not carry further his investigations of the species. Under the genus *Bursera* he says, p. 177, "Bentham and Hooker unite *Icica* and *Elaphrium* with *Bursera*; but as the species require revision, we have not ventured to give specific names under *Bursera*. Doubtless many of the following numbers belong to the same species." Surely Mr. Hemsley was the proper person to look into this, and to reduce, if necessary, the redundant synonymy; but instead of this, we have under *Bursera* 34 numbers; nos. 1–13 being enumerated as *Bursera* proper (10 of these being unnamed), nos. 14–16 as "published under *Icica*," and the remainder as "published under *Elaphrium*," which statement is hardly true of no. 34, "*Elaphrium* '*torulosum*' in hb. Kew," which does not seem to have been previously published as an *Elaphrium*, and should, we imagine, have been placed under *Bursera*. One of the unnamed Burseras (no. 12) is represented by four numbers from as many collectors; and we should have thought that some determination might have been arrived at upon so much material. To add to the confusion, although all the species are numbered under *Bursera*, there is a

separate alphabetical arrangement under *Icica* and *Elaphrium*. In *Capparis* a further variation in enumeration occurs, "10. *C. frondosa*, Jacq.," being followed by "11. *C. frondosa?*" and "13. *C. karwinskiana*, Schl.," by "14. *C. karwinskiana*, Schl., proxima sed sepala longiora." We do not see why these doubtful plants should receive a separate number; and we may here take exception to Mr. Hemsley's uniform practice (following that of zoologists) in spelling such names as *Karwinskiana* with a small initial. Walpers' reference to 'Linnæa,' under *Polygala calvipes*, is stated by Mr. Hemsley to be incorrect; but this is not the case, the inaccuracy being in Mr. Hemsley's citation from Walpers; and we miss *P. tenella*, Willd. (a Panama species), from the list.

Another matter which seems to us unfortunate is the omission of the Central American plants contained in the British Museum. It seems to be supposed, by those unacquainted with the actual state of the case, that the British Museum herbarium is mainly a duplicate of that at Kew, and it is consequently more or less overlooked by some who are engaged on monographs or local floras. Mr. Hemsley may have had other reasons for neglecting to consult the British Museum collections, but it is none the less a matter of regret that he has not done so. That he could hardly have failed to estimate the importance of that herbarium is evidenced in his enumeration of the species of *Clematis*, the only genus for which it was referred to. Of the 16 named species which Mr. Hemsley enumerates, 2 have been seen by him only in this collection—one, *C. americana*, Mill., from Campeche (Houston and Shakespear); the other, *C. flammulastrum*, Griseb., from Yucatan (A. Schott). In this genus it may be noted we have a plant (*C. Grahami*, Benth.) retained and numbered as distinct, although Mr. Hemsley quotes from a note of the founder of the species, "a *C. caripensi* non nisi foliis pubescentibus differt." Had the plants contained in the Kew herbarium been the only ones quoted, the neglect of the British Museum collections would have been less noticeable, but Mr. Hemsley not unfrequently quotes Hb. Paris for plants which he might more readily have seen in London.

Among the collections in the British Museum herbarium, which should have been included in Mr. Hemsley's enumeration, may be mentioned, besides those of Houston, Shakespear, and A. Schott, already referred to, the study-set of Seemann's 'Botany of the Herald,' a set of Hænke's Mexican plants, a large series (also Mexican) from the herbarium of Ruiz and Pavon, a set of Cuming's Panama plants, and a series of Berlandier's Mexican plants, which includes many numbers not cited by Mr. Hemsley, and others which he had seen only in the Paris herbarium. The plants of the 'Reliquiae Hænkeanæ' seem to be sparingly represented in collections: a reference to *Urena Hænkeana*, Walp. (*U. heterophylla*, Presl.), would, we think, have shown Mr. Hemsley its absolute identity with *U. sinuata*, Sw., as was pointed out by Seemann in 'Bot. Herald,' p. 81: while *U. Swartzii*, DC., which is omitted by Mr. Hemsley, is also in Hænke's collection, and is referred to as Mexican by Presl. (Reliq. Hænk. ii., 127). Another omitted

species is *Hibiscus acuminatus*, Cav. (which will now have to be called *Kosteletskya acuminata*); of this little seems to be known, and the remark "patr. ign." appended to its description in DC. Prod., i. 447 would, if nothing further were ascertainable, have justified its omission from Mr. Hemsley's enumeration; but there is a good specimen in the British Museum from Pavon, labelled "Hibiscus acuminatus de Mexico," which accords well with the description, and leaves no doubt as to locality. A type specimen of Moricand's *Hibiscus lavateroides*, which Mr. Hemsley queries as from Berlandier, is in the British Museum (Berlandier, 127). Some of Cavanilles' types, too, should have been referred to; and a large number of Mexican plants with MS. names, from Ruiz and Pavon, should have been determined. We have not tested the accuracy of the book, so far as its quotations are concerned, but we do not find in it *Sida alnifolia*, *Malachra fasciata*, nor (as already mentioned) *Urena Swartzii*, all of which are given as Mexican by Presl; while other Mexican plants enumerated by the author just mentioned are not given for Mexico by Mr. Hemsley.

There is no necessity to pursue this investigation further; the criticisms already made upon Mr. Hemsley's treatment of the *Malvaceæ* might be carried out with regard to other Orders, and will, we think, be admitted to justify the position we have taken with regard to the neglect of the British Museum collections. We trust that in the future parts of the work this deficiency will be remedied, and that there will be as little delay as possible in completing this important contribution to our knowledge of the Botany of the Western Hemisphere. J. B.

Methodik der Species beschreibung und Rubus. Monographie der einfachblättrigen und krautigen Brombeeren, &c. Von Dr. Otto Kuntze. Leipzig, A. Felix. 1879.

It should be the object of everyone monographing a group of plants not only accurately to ascertain the structure, and, as far as possible, the delimitation of species, but also to examine the genetic bond uniting them more or less continuously into a series. For this to be done thoroughly it is necessary that the entire life-history of each species should be studied, so that each may afford grounds of comparison with the rest. Unfortunately this great task has yet to be undertaken. Numberless memoirs of general interest have been given to the world, but none of them—at least none of those denoted to Angiosperms—record the study of a series of species constituting an order or a genus from the sowing of the seed to its maturation. Occasionally indeed we are presented with phylogenetic schemes, but their scope is too wide to admit any cognisance of species. Therefore it is that the present work, wherein an endeavour is made to solve the riddle of the evolution of some of the brambles, is a matter of great satisfaction to us, although the method pursued is one of inspection only, and as such is open to the charge of empiricism.

The nomenclature adopted is as follows.:—The term *Finiform* is applied to species whose nearest connections have been eliminated. If the *Finiform* is very variable it is called a *Gregiform*. This divides into *Locoforms* and *Typiforms*, which are marked variations of it, having few connecting forms, and these often discoverable away from them: of these *Locoforms* exhibit characters acquired by climate and subsoil, and *Typiforms* a local distribution owing chiefly to correlation with the animal kingdom. Besides these the Gregiform contains *Versiforms*, distinct from it, but not so markedly as the former two; *Ramiforms*, more differentiated than *Locoforms* and *Typiforms*; *Avoforms*, the still existing stem-forms of *Ramiforms* and *Præforms*; those of *Locoforms*, *Typiforms*, or *Versiforms*; *Hybridoforms*, resulting from the crossing of Finiforms; and a few others.

The genetic scheme adopted is the following:—

I. Folia omnia simplicia.
   A. Formæ normales: *Archimonophylli*.
   B. Ramiformæ Dactylophyllorum: *Neomonophylli*.

II. Folia plurima simplicia: *Monophylloides*.

III. Folia composita, floralia interdum simplicia.
   A. Fruticosus; stipulæ æquales semiadnatæ.
      (†) Folia pinnata: *Pterophylli*.
      (††) Folia palmata: *Dactylophylli* et *Neopolyphylli*.
   B. Fruticosus; stipulæ æquales latæ axillares: *Neaxyloides*.
   C. Herbaceus; stipulæ plerumque inæquales partem perulatæ: *Axyloides*.

The group *Archimonophylli* is then taken in hand. *R. moluccanus*, L., is the *Gregiform* in this; *R. veristipulatus*, O. Ktze., the *Ramiform*; and *R. Dalibarda*, L., the *Finiform*. Then follows an elaborate enumeration of the first-named species, which is understood in a very wide sense, after which we come upon a table of gigantic dimensions containing the names of many species of the section, and showing their various structural agreements with the several varieties of the *Gregiform*, and this is supplemented by short notices and taxonomic criticisms on the individual species. The other sections are similarly treated.

The author having had many opportunities of studying the genus in the field during his travels in Asia, stands in a much more commanding position for the enunciation of his views than would be the case had they been arrived at by work upon dried material alone. In spite of this advantage it is impossible not to see that he has attacked the problem from one side only. We think that it by no means results that when the life-history of the genus is worked out the conclusions here adopted will be adhered to in the fuller evidence of facts. The author's fundamental mistake seems to lie in the selection of an unwieldy group consisting mainly of members not in cultivation. Should he try his hand in a more complete way on a smaller one, we venture to think that he will find a more suitable field for the successful employment of his energies.

S. M.

A RECENT Bulletin (No. 13) of the United States National Museum contains a Flora of St. Croix and the Virgin Islands, by Baron H. F. A. Eggers. Of these islands, which lie to the east of Porto Rico, the principal are Vieques and Culebra, belonging to Spain; St. Thomas and St. Jan, belonging to Denmark; and Tortola, Virgin Gorda, and Anegada, belonging to England. The list (which comprises 1013 species of phanerogams and vascular cryptogams, 881 being indigenous and 132 naturalised) is preceded by an interesting sketch of the more noteworthy points presented by the flora, the general character of which, both in St. Croix and the Virgin Islands, is distinctly West Indian. No less than one-third of the whole surface of the islands is covered by a dry shrubby vegetation of a greyish or yellowish aspect, which is styled by Baron Eggers the "Croton vegetation," from the predominating genus comprising its elements. Four new species are described—*Rhus antillana*, *Guilandina melanosperma*, *Anguria glomerata*, *Epidendrum subæquale*.

THE last number of the Journal of the Royal Horticultural Society (vol. v., No. 9, December, 1879) contains an interesting paper, by Mr. H. J. Elwes, entitled "Notes on the genus *Tulipa*," which the author intends as supplementary to Mr. Baker's "Revision" of the genus (Journ. Linn. Soc. xiv., 275–296). Mr. Elwes has cultivated a very large number of Tulips, and his remarks upon them mainly support Mr. Baker's estimate of the proportion to which specific rank should be accorded; but he is disinclined to allow this to a few admitted as species by Mr. Baker, some of which are only known in gardens, and of doubtful origin.

DR. F. BUCHENAU has published a review of the *Juncaceæ* (Bremen, 1880), under the title "Kritisches Verzeichniss aller bis jetztbeschriebenen Juncaceen nebst diagnosen neuer Arten." It commences with a complete list of all the described forms of *Juncus*, *Luzula*, &c., which are reduced to the species retained by the author in the classified enumeration at the end of the pamphlet. Dr. Buchenau describes two new species of *Juncus*—*J. similis*, Buch. (Swan River, Drummond, No. 937), and *J. Radula*, Buch. (Murray River, Victoria, Wawra, No. 493); and one of *Luzula*—*L. effusa*, Buch. (Sikkim, Hooker and Thomson, No. 3). There are also elaborate notes on many of the species.

DR. G. W. S. PIESSE has issued a new edition (the fourth) of his 'Art of Perfumery,' which is a great advance upon former issues of the work, and contains a good deal of information which will be interesting and useful to the economic botanist. There is still room for improvement, however, and Dr. Piesse would do well to have his proofs read by a competent botanist before issuing another edition. We find, on p. 114, "the Sweet Verbena (*Verbena tryphylla*); the *Lipia citriodora*, and *Aloysia citriodora*": these are of course synonyms of the same plant: the spelling is reproduced from the volume before us.

The last part of Bentley and Trimen's 'Medicinal Plants' has been issued. It contains title-pages, index, and preface, besides the concluding portion of the text.

Mr. T. Christy has issued a third part of his 'New Commercial Plants,' which contains some interesting matter concerning forage plants and other economical products.

Other New Books. — Emile Favart, 'Flowers and Plants from Nature,' 60 plates, in 2 vols. (15*s*. each). Nottingham; R. C. Mounteney. — E. de Puydt, 'Les Orchidées, Histoire Iconographique avec revue descriptive des espèces cultivées' (illustrated). Paris; Rothschild (30 *fr*.)—G. Henslow, 'Botany for Children.' London; Stanford (4*s*.).—G. Bentley and J. D. Hooker, 'Genera Plantarum,' vol. iii., pt. i. (*Nyctagineæ—Cycadaceæ*) London; Williams & Norgate.—'Biologia Centrali-Americana: Botany,' pt. iii. (*Olacineæ—Leguminosæ*). London; Dulau & Co.

Articles in Journals.—January.

Bull. Soc. Bot. Belg. (vol. xviii. part 2). — L. Errera, 'Fertilisation of *Geranium phæum*.' — Id., 'Plants of Blankenberg.' — Id., 'On *Dionæa*.' — C. J. Lecoyer, 'Plants of Wavre.' — M. Michel & N. Remacle, 'Additions to the Flora of Fraipont and Nessonvaux' (Liège). — Th. Durand, '*Senecio Sadleri* in Belgium.' — H. Vanden Broeck, 'Plants of Antwerp.'—F. Crépin, 'On a monstrous Ophrys' (*O. arachnites*, Reich.)

American Naturalist. — F. Brendel, 'Sketch of N. American Botany' (concluded).

Hedwigia.— G. Winter, 'Mycological Notices.'

Oesterr. Bot. Zeitschrift. — Memoir of Schulze v. Müggenberg (with portrait). — M. Willkomm, 'Spanish-Portuguese plants.' — H. Zukal, 'On *Oscillaria*.' — A. Hansgirg, 'Plants of Bohemia.'— Vincent v. Borbás, 'On the Flora of Iráz.' — C. J. v. Klinggraff, 'Vegetation of Palestine.'

Magyar Nov. Lapok. — Memoir of Tommasini — G. Entz, 'Algological notes.' — T. Kunszt, 'On the types of Dioszegi's Hungarian herbarium.'

Ann. Sc. Nat. (ser. vi., vol. ix., 1).— J. Vesque, 'On the influence of saline matters on the absorption of water by roots.' — Ch. S. Sargent, 'The forests of Central Nevada.' — P. P. Dehérain & L. Maquenne, 'On the decomposition of carbonic acid by leaves illuminated with artificial light.'

Scottish Naturalist. — A. S. Wilson, 'The Clubroot Fungus' (*Plasmodiophora Brassicæ*). — J. Stirton, 'New and rare Lichens' (many new species). — J. Cameron, 'The Gaelic names of plants' (contd.)

Botanische Zeitung. — A. Kanitz, 'Ed. Fenzl.' — P. Ascherson, 'Phytographical observations.' — J. Boehm, 'On the forces producing pressure in stems.'— J. W. Moll, 'On the emission of drops

and injection in leaves.' — M. Woronin, 'Additional notes on *Plasmodiophora Brassicæ*.' — F. Hegelmaier, 'On the embryogeny and development of the endosperm in Lupinus' (tt. 2). — R. Sadebeck, 'Critical aphorisms on the life-history of Cryptogams.'

Flora.— A. Zimmermann, 'On transfusion-tissue' (t. 1). —W. Nylander, 'Addenda nova ad Lichenographiam Europæam.'

Naturalist.—J. Fergusson, 'New British Mosses' (*Coscinodon cribrosus*, Hedw.; *Bryum rufum*, n. sp. or var.)

Proceedings of Societies.

Linnean Society of London.

January 15, 1880.—Prof. Allman, F.R.S., President, in the chair.—Messrs. J. Poland (of Blackheath), J. Darell Stephens (of Plymouth), and Prof. Allan Thomson were elected Fellows, and T. J. Parker an Associate of the Society.—Mr. J. G. Baker called attention to an instance of a monstrous form of *Carduus crispus* sent by the Rev. T. A. Preston from Wiltshire, in which the capitula were abnormally numerous and aggregated in secondary heads, as in *Echinops*.—Mr. J. G. Baker read a paper entitled "Synopsis of the *Aloineæ* and *Yuccoideæ*." To these two tribes belong all the shrubby and arborescent types of the capsular *Liliaceæ*. The Aloes are marked by their gamophyllous perianth and fleshy leaves, and belong entirely to the Old World, 170 out of the total number of 200 species now known being concentrated at the Cape of Good Hope, and the remainder mostly scattered through the highlands of Tropical Africa. There are four genera, *Aloe*, *Gasteria*, *Haworthia*, and *Apicra*, and they vary in habit from plants half a foot high when in flower with sessile rosettes of a few fleshy leaves to copiously-branched trees fifty or sixty feet in height. Nearly all the known Cape species are in cultivation in English gardens at the present time. The best known officinal species, *Aloe succotrina*, which has been attributed to the island of Socotra, has been found lately in a wild state at the Cape of Good Hope. To the *Yuccoideæ*, in addition to the type-genus, belong *Hesperaloe*, *Dasylirion*, *Beaucarnea*, and *Herreria*. There are about fifty species known, all but the last being concentrated in Mexico and the Southern United States. The Yuccas fruit but rarely under cultivation, the large white pendulous flowers being fertilised in the wild plant by a moth of the genus *Pronuba*. Some of them, as, for instance, *Y. baccata* and *brevifolia*, reach the dimensions of large trees. *Y. baccata* has a fleshy edible fruit resembling that of the Banana in shape and size. *Dasylirion* and *Beaucarnea* resemble *Yucca* in habit, but have very abundant small polygamo-dioicous flowers, and the latter recedes from the Liliaceous type by its one-celled, one-seeded indehiscent capsule. *Herreria*, which belongs to Temperate South America, is a shrubby climber with the habit of *Smilax* and *Dioscorea*.

Botanical News.

We regret to record the death of General William Munro, C.B., which occurred at his residence, Montys Court, near Taunton, on the 29th of January, at the age of about sixty-four. General Munro had seen active service in India and in the Crimea; his last military appointment was that of General Commanding-in-Chief in the West Indies in 1870. As a botanist General Munro was most distinguished by his knowledge of the *Gramineæ*, to which Order he had for many years past devoted his leisure time, and upon which he was justly regarded as the leading authority. At the time of his death he was engaged upon a complete monograph of the whole Order, which was intended to form one of the series of monographs now being issued by the MM. DeCandolle in continuation of the 'Prodromus.' It is to be regretted that this remains incomplete, so that much of the great knowledge acquired by General Munro has passed away with him. His most important memoir was that on the *Bambuseæ*, which included descriptions of all the species, and was published in the 'Transactions' of the Linnean Society in 1870. His extensive knowledge of grasses was at the disposal of all who consulted him. Mr. Bentham ('Fl. Australiensis,' vii., 450) speaks in very warm terms of the assistance he received from General Munro in elaborating the *Gramineæ* of Australia; he determined the grasses of Hong-Kong for Seemann's 'Botany of the Herald,' and his assistance in critical matters has been gratefully acknowledged in the pages of this Journal. His last work was the determination of the grasses brought from Afghanistan by Dr. Aitchison, which he completed only a week or two before his death. General Munro's attention, although principally directed to the *Gramineæ*, was not confined to them: in the 'Garden' for December last he published a descriptive review, signed with his initials, of Himalayan Primroses. Sir J. D. Hooker, in a letter to the 'Times,' says:—"He was a first-rate practical gardener, and established soldiers' gardens wherever he was stationed for any length of time, in India, Canada, the West Indies, &c., and botanical ones, I believe, at Agra and elsewhere." General Munro leaves a place among systematic botanists which bids fair to remain long vacant. He has bequeathed his collections and MSS. to the Kew Herbarium.

Charles Henry Godet, of Neufchatel, died on the 16th of December last, in the eighty-third year of his age. He was the author of the 'Flore du Jura' (1853), and of two or three papers connected with local botany.

The death is also announced of Ferdinand Lindheimer, the collector of the 'Plantæ Lindheimerianæ,' at New Braunfels, Mexico, at the age of about seventy-eight.

The herbarium of the late Alfred French has been acquired by the Botanical Department of the British Museum. His MS. material for the Flora of Oxfordshire is now in the possession of Mr. G. C. Druce, of Oxford.

Original Articles.

A REVIEW OF THE BRITISH *CHARACEÆ*.

By Henry and James Groves.

(Tabs. 207–210.)

The *Characeæ*, from their isolated and uncertain position in the plant-world, have been much neglected, more especially in this country. None of our cryptogamists have given them special study, and Prof. Babington's paper and the subsequent editions of his 'Manual' contain the only satisfactory account of the British forms. It has been suggested to us that a short paper on the subject might be useful, especially as there appears to be much misunderstanding among collectors with regard to some of the species.

The late Alexander Braun's many papers on the *Characeæ* furnish most of the trustworthy information on the subject. His knowledge of the plants was unequalled, but it is to be regretted that much of the value of his work is lost by his disregard for the first principles of botanical nomenclature. Next in importance is Wallmann's work, the only at all complete account of the order which has appeared. The papers by Nordstedt and Wahlstedt on the group are very valuable. Kützing's 'Tabulæ Phycologiæ' may be mentioned as the only work in which there are plates of any number of the species. Among the earlier authors who have added much to the knowledge of the group are Vaillant, Wallroth, Bruzelius, and Agardh. Two most useful sets of fasciculi have been issued; Braun, Rabenhorst, and Stizenberger's 'Die Characeen Europas,' and Nordstedt and Wahlstedt's 'Characeæ Scandinaviæ'; and the Charas have been included in the fasciculi of Areschoug, Rabenhorst, Reichenbach, Fries, Billot, Desmazières, Mougeot and Nestler, &c.

The principal characters given in the earlier British works in which the family is treated, being the colour (resulting usually from greater or less incrustation) and the size, it is often impossible satisfactorily to identify their descriptions with any particular species. In the second edition of Gerard's 'Herball,' edited by Johnson (1633), is the first mention we can trace of any Charas in British books. Two species are given: *Hippuris coralloides*, which is described as new, and *Equisetum fœtidum sub aqua repens*, Bauh.; both of these are probably *C. vulgaris*. In Parkinson's 'Theatrum Botanicum' (1640) a figure of *C. vulgaris* is given under Gerard's second name. Ray, in 'Catalogus Plantarum Angliæ' (1670), mentions the same two species as in Gerard, but the first under Gesner's name *Equisetum s. Hippuris lacustris foliis mansu arenosis*. Plukenet, in his 'Phytographia,' vol. i. (1691),

figures *C. vulgaris* (tab. 29) under Gesner's name, and *C. polyacantha* (tab. 193), which he describes from a plant sent from Ireland by Sherard, as *Hippuris muscosis sub aqua repens;* of the latter there is a specimen in his herbarium in the British Museum. In the second edition of Ray's 'Synopsis' (1696) four species are given, the addition being *C. minus sub aqua repens ad genicula polyspermon*, which is described from Jersey, collected by Sherard, and is probably *Nitella opaca*. Morison, in 'Plant. Hist. Universalis Oxon,' vol. iii. (1699), figures a plant which he describes as *E. fragile majus subcinerea aquis immersum:* this is probably a large slightly-hispid form of *C. vulgaris*. In the third (Dillenian) edition of Ray (1724), Vaillant's generic name of Chara is introduced, and *C. translucens minor flexilis* (*N. opaca?*) is added. In Hudson's 'Flora Anglica' (1762) the four Linnean names are given:—1, *C. tomentosa* (for large forms of *C. vulgaris*); 2, *C. vulgaris* (for *C. fragilis* and the smaller forms of *C. vulgaris*); 3, *C. hispida*; and 4, *C. flexilis* (for *N. flexilis* and *N. opaca*). In Smith's 'Flora Britannica' (1800) the same four are given, but Hudson's *C. tomentosa* is reduced to a variety of *C. hispida*. Withering, in his 'Botanical Arrangement,' (1776), gives in, addition to these, *C. repens* as the name for Sherard's Jersey plant. In 'English Botany,' *C. nidifica* (*Tolypella glomerata*) (1807), *C. translucens* (1808), and *C. gracilis* (1810) are added. S. F. Gray, in 'Natural Arrangement of Brit. Plants' (1821), describes *C. stellata* (apparently *N. tenuissima*), and adds "*C. crinita*" (*C. polyacantha*). Greville, in 'Scottish Cryptogamic Flora,' vol. vi. (1828), adds *C. aspera*. In 1830, Wilson, in 'Hooker's Bot. Miscellany,' describes under the name of *C. gracilis* a dicœcious plant (*N. capitata?*). In Hooker's 'Brit. Flora,' vol. ii., part 1 (1833), eight species, *translucens*, *flexilis*, *nidifica*, *gracilis*, *vulgaris*, *Hedwigii*, *aspera*, and *hispida* are given, *C. Hedwigii* being an addition. The Rev. M. J. Berkeley, in 'E. B. Suppl.,' vol. ii. (1834), figures *C. Hedwigii*, and in a note thereto gives a description of "*C. nidifica*" from Henfield (*T. prolifera*). In 1841, in the second (Johnson's) edition of 'English Botany,' the two genera, *Chara* and *Nitella*, are given. Hooker, in 'Lond. Journ. of Bot.' (1842), records *C. latifolia* (*C. tomentosa*) as British, and in 'Icones Plantarum,' vol. vi., gives a figure of it. Berkeley, in 'E. B. Suppl.,' vol. iii. (1843), figures *C. pulchella* (*C. fragilis*). In 1850 commenced a new era in the knowledge of our Charas, when Prof. Babington, in his monograph in the 'Annals and Magazine of Nat. Hist.,' completely rearranged the species. *C. syncarpa* (Thuill.) was then first definitely separated from *C. flexilis; C. mucronata* and *C. crinita*, Wallr. (*C. canescens*), were added; the number of the *Tolypellæ* was increased from one to four: *C. prolifera* (*T. glomerata*), *C. polysperma* (*T. intricata*), *C. Borreri*) *T. prolifera*), and *C. Smithii* (*T. glomerata*) the two latter being described as new: and *C. pulchella* and *C. Hedwigii* were united as *C. fragilis*, Desv. In Johnson's 'Fern Allies' (1855) there is nothing new, but plates are given of eleven species, some of which are not good. In 1862, Babington, in 'Seemann's Journ. of Bot.,' describes *C. alopecuroides*

as British. Mr. Baker, in the 'Botanical Exchange Club Report' for 1867, gives a revision of the *Tolypellæ*, reducing the certainly British species to two, giving *C. Borreri* as the var. *robustior* of *C. intricata* and mentioning *C. nidifica* as possibly British. In the 'Journ. of Bot,' 1877, Dr. Trimen adds *C. fragifera* to the list.

We have followed Braun's latest opinions in dividing the order into four genera, as the characters based on the position of the reproductive organs, together with the difference of habit, appear to warrant their separation. With regard to the varieties given it must not be inferred that they are intended as subspecies, or, indeed, all as of equal value, as in some instances, with the very variable species, it has been thought desirable to notice as vars. the more extreme forms, although they are often connected by intermediates. The terms "bract-cells," "stipulodes," and "spine-cells" have been employed with some reluctance, as these very simple structures composed of a single cell are so like in character and correlated in their variation that it seems questionable whether some common term might not with advantage be applied to all of them, with a slight modification to denote the position. Another difficulty arises with regard to the coating of the nucule which is composed of five cylindrical cells from the upper portion of which the coronula is formed by a transverse division. These cells, when the nucule is quite young, are almost straight, but as the nucleus increases they envelope it in a spiral coil. We had thought of showing the variation of this covering in different species by stating the number of spirals taken by each cell when the nucule is mature, but, for the sake of convenience, the practice has been followed of giving the number of lines crossing the nucule, visible from one side.

Only those counties have been cited from which we have seen specimens, as so many of the printed localities, of which specimens of the plants referred to exist, have proved to be misnomers. The months given are those in which the nucule is matured.

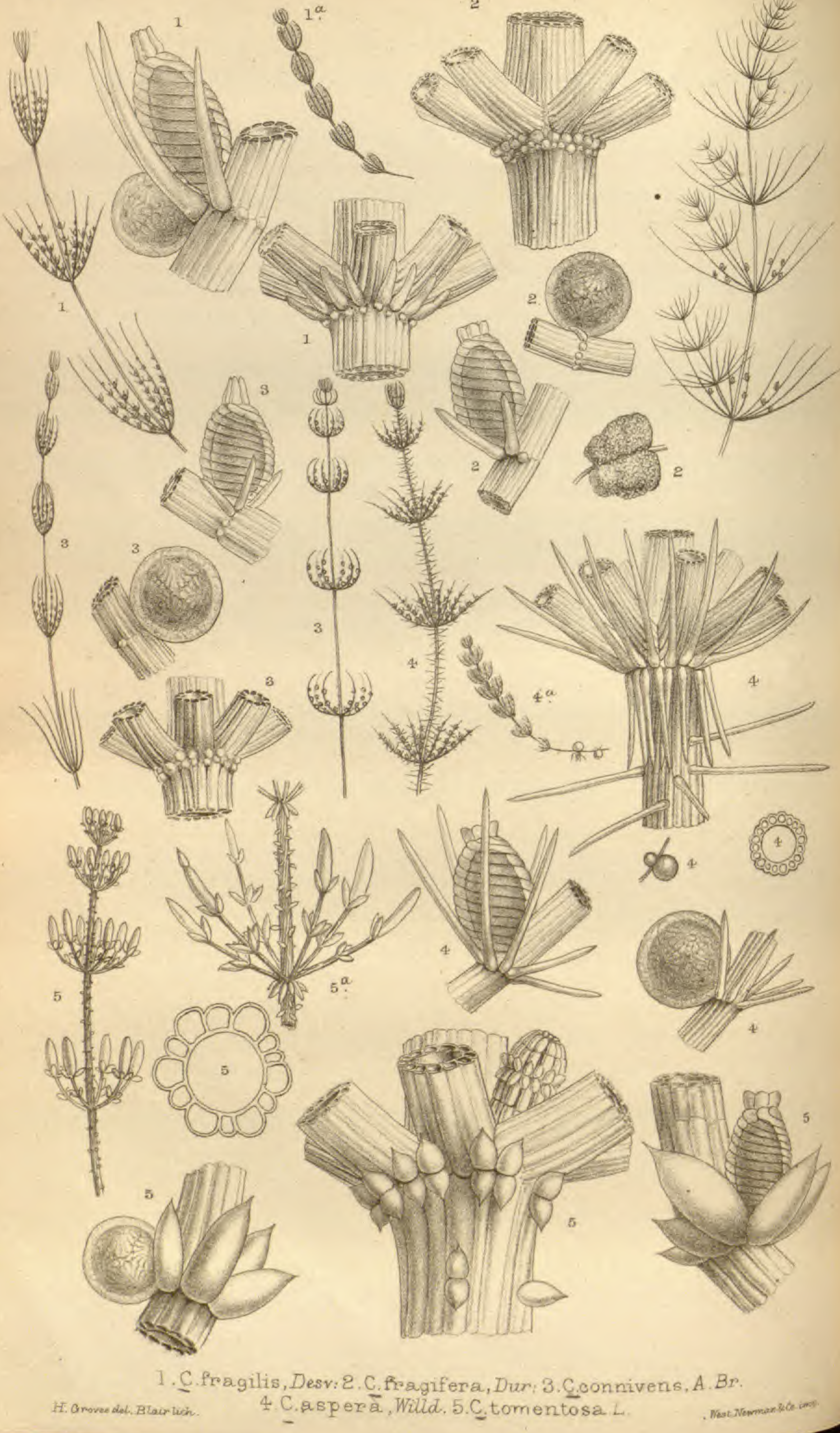
A large number of the specimens, especially of the Nitellas, in our national herbaria have been badly selected and carelessly dried, and in many cases are without fruit. It indeed appears to be a common idea that it is almost impossible to preserve good herbarium specimens; but no plants better repay a little care, and Nordstedt and Wahlstedt's magnificent fasciculi of the Scandinavian species show what may be done by thoroughly careful treatment.

Our best thanks are due to Prof. Babington, who, with his characteristic readiness to help all in the study of our Flora, has afforded us much assistance by specimens and otherwise; to Mr. Baker, Dr. Trimen, and Mr. Britten, for their kind assistance in consulting specimens and books at the British Museum and at Kew; to M. Otto Nordstedt, of Lund, for the determination of specimens; to Mr. A. G. More, for kindly lending us his valuable collection of Charas and obtaining for us the loan of the late Dr. Moore's specimens; to Prof. Dyer, for an opportunity of examining his Irish specimens; and to Mr. Curnow, of Penzance, for a very interesting series of the Cornish plants.

KEY TO THE BRITISH SPECIES.

Coronula of 5 cells, persistent. With 1-2 circles of stipulodes at the base of the whorl. *Charæ*.
Globule taking the place of the centre bract-cell. Stem and branchlets with cortical cells (CHARA).
Stem with three times as many rows of cortical cells as branchlets in the whorls. (*Triplostichæ*.)
Monœcious. Without spine-cells. . . . . 1. *C. fragilis.*
Diœcious.
Stem destitute of spine-cells.
Flexible. Branchlets of the male plant slightly incurved. With composite bulbils. . . 2. *C. fragifera.*
Brittle. Branchlets of the male plant strongly connivent. . . . . 3. *C. connivens.*
Stem spinous. . . . . 4. *C. aspera.*
Stem with twice as many rows of cortical cells as branchlets in the whorls (*Diplostichæ*).
Diœcious. Bract-cells ovate. . . . . 5. *C. tomentosa.*
Monœcious. Bract-cells slender.
Primary cortical cells much larger than the secondary. . . . . 6. *C. polyacantha.*
Primary cortical cells smaller than the secondary.
Stem with many spreading spines. Bracts whorled. . . . . 7. *C. hispida.*
Stem with few small appressed spines. Bracts on the inner side of the branchlets. . 8. *C. vulgaris.*
Stem with as many rows of cortical cells as branchlets in the whorls (*Haplostichæ*). . . . . 9. *C. canescens.*
Globule by the side of the nucule, within the whorl of bracts. Stem and branchlets without cortical tubes (LYCHNOTHAMNUS). . . . . 10. *L. alopecuroides.*
Coronula of 10 cells, in 2 circles, deciduous. Stem without cortical tubes or spines (*Nitellæ*).
Globule lateral between the nucules. Rays of the branchlets unequal (TOLYPELLA).
Sterile branchlets simple.
Sterile branchlets obtuse. Ultimate segments of fertile branchlets of 2-5 cells. . . . . 11. *T. glomerata.*
Sterile branchlets acute. Ultimate segments of fertile branchlets rarely of more than 3 cells. . 12. *T. prolifera.*
Sterile branchlets with lateral rays. . . . . 13. *T. intricata.*
Globules in the forking of the branchlets. Rays equal (NITELLA).
Ultimate segments of the branchlets of 2-3 cells.
Sterile branchlets more than once divided.
Very slender. Sterile branchlets 3 times divided.
Dark green. Whorls dense. Internodes 2-5 times as long as the branchlets. . . 14. *N. tenuissima.*
Light green. Whorls lax. Internodes scarcely exceeding the branchlets. . . . 15. *N. gracilis.*
Robust. Sterile branchlets twice divided. . . 16. *N. mucronata.*
Sterile branchlets (appearing simple) only once divided into 2-4 minute segments. Stem and branchlets very stout. . . . . 17. *N. translucens.*
Ultimate segments of the branchlets of one cell.
Monœcious. Fertile whorls usually lax. . . 18. *N. flexilis.*
Diœcious. Fertile whorls usually dense. . . 19. *N. opaca.*

Tab. 207.



1. C. fragilis, *Desv:* 2. C. fragifera, *Dur:* 3. C. connivens, *A. Br.*
4. C. aspera, *Willd.* 5. C. tomentosa *L.*

H. Groves del. Blair lith. West Newman & Co imp.

Division I.—CHARÆ.

Whorls of branchlets *with* 1–2 *circles of small usually elongated cells at their base* (stipulodes). Internodes composed of a simple tube only, or with a cortex of elongated cells growing upwards and downwards from the base of the branchlets in longitudinal rows, each branchlet producing either one, two, or three rows. Cortical cells often bearing small papillate, or aciculate cells (spine-cells), which are either appressed or spreading. Branchlets of many decreasing segments, the last being a small conical cell; the lower segments usually having cortical cells, and bearing at their joints whorls or partial whorls of elongated cells (bract-cells), and on their inner side, at the nodes, nucules and globules, which are usually solitary. *Coronula of 5 equal cells, persistent.*

1.—CHARA.

Stem and branchlets ecorticate or corticate. Ring of stipulodes in one or two circles. Globule situated below the nucule taking the place of the centre bract-cell. Coronula prominent. Monœcious or diœcious.

§ 1. TRIPLOSTICHÆ—*Stem with* 3 *rows of cortical cells to each branchlet.*

1. C. FRAGILIS, Desv. in Loisel. Not. (1810), p. 137; Coss & Germ. Atl. Fl. Par. (1845), t. 38, f. *c.*; Gant. Oesterr. Char. (1847), p. 20; Bab. A. N. H., 1850, p. 91; Wallm. Act. Stockh., 1854, p. 329; Kütz. Tab. Phyc. (1857), vii., t. 54; Braun, Consp. Char. Europ. (1867), p. 7; Fl. Danica (1869), nos. 2796–8; Braun, R. & S. Exs. 13, 15, 112, 115; Nordst. & Wahlst. Exs. 116–7, 120.

C. globularis, Thuill. Flor. Par. (1799), p. 472.

C. pulchella, Wallr. Ann. Bot. (1815), p. 184, t. 2; Berkeley E. B. S, 2824.

C. pilifera, Ag. Syst. Alg. (1824), Introduction, p. 28.

C. hirta, Meyen. Linnæa, 1827, ii., p. 78?

C. virgata, Kütz. Flora, 1834, i., p. 705. Tab. Phyc., vii., t. 56, f. 2.

C. diffusa, Wallm. in Liljeblad Svensk Flora, ed. iii.

Stem slender, but little branched, sometimes with granular calcareous bulbils at the lower rooting nodes, very regularly and evenly corticate, without spine-cells, whorls of 6–9 branchlets. Lower circle of stipulodes very short. Branchlets of 7–9 joints, the upper 1–2 ecorticate. Bract-cells on the inner side of the branchlets, usually 4, about equalling the nucule in length. Nucule ovoid, 12–14-striate coronula long, somewhat conical; nucleus black, sometimes covered with a calcareous deposit. Globule smaller than the nucule. Monœcious. (Tab. 207, fig. 1.)

b. *barbata*, Gant. Oesterr. Char. (1847), p. 20, t. 2, f. 15. —*C. fragilis*, var. *longibracteata*, Rabenhorst, Deutschl. Krypt. Flor., ii. (1847), p. 200.—*C. trichodes*, Kütz. Flora, 1834, i., p. 705; Tab. Phyc. vii. (1857), t. 56, f. 1.—Bract-cells 2–3 times as long as

the nucule. Upper ring of stipulodes very long, equalling or exceeding the lowest joint of the branchlets.

c. *capillacea*.—*C. capillacea*, Thuill. Fl. Par. (1799), p. 474; Wallm., Act. Stockh., 1854, p. 330; Kütz., Tab. Phyc., vii. (1857), t. 55, f. 2.—*C. viridis* and *foliolata*, Hartm. (fide Wallm.) —*C. setacea*, Chevallier, Flor. Lutet., ed. ii., v. ii., p. 127?; Nordst. & Wahlst., Exs. 119.—Stem more slender and flexible than in the type. Branchlets long and very slender. Stipulodes and bract-cells long. Resembling a large form of *C. fragifera*.

d. *Hedwigii*.—*C. Hedwigii*, Ag. in Bruz. Obs. (1824), pp. 7 & 21; Hook. Brit. Fl., ii. (1833), p. 246; Berkeley in E. B. S., 2762; Kütz. Tab. Phyc., vii., t. 55, f. 1; Fl. Danica, t. 2796, f. 2; Braun, R. & S., Exs. 14, 121; Nordst. & Wahlst., Exs. 115.—Much larger, with spreading branchlets 1–2 inches long. Bract-cells short. Darker green.

e. *fulcrata*.—*C. fulcrata*, Gant. Oesterr. Char. (1847), p. 20, f. 16.—Bract-cells very short, about half as long as the nucule. Stipulodes rudimentary. Resembling the fertile plant of *C. connivens*.

f. *delicatula*, Braun, R. & S. Exs. 75 & 100 (not *C. delicatula*, Desv.)—*C. verrucosa*, Itzigsohn, Bot. Zeitung, 1850, p. 338.—*C. annulata*, Wallm. Act. Stockh. (1854), p. 328?; Nordst. & Waldst., Exs. 118.—Much smaller than the type, 2–4 inches high. Branchlets short, stout, incurved. Often producing bulbils. A lake form. (Tab. 207, fig. 1a.)

In the typical form, a small neat bright green plant, with slightly incurved branchlets ½–1 in. long. Usually little incrusted, but extremely brittle. It was not clearly distinguished from *C. vulgaris* until the time of Wallroth, Desvaux's descriptions being short and incomplete. *C. fragilis* has a very wide distribution occurring in all parts of Europe, also in Asia, Africa, America, and Australia, and is one of our commonest species.

Lakes, ponds, pools, canals, streams, and ditches. July and August.—Cornwall, W.; Devon, S. (and vars. c and d); Wight; Hants, S. (and var. c); Sussex, W. (vars. d, e); Sussex, E.; Kent, E. (var. d); Kent, W. (and var. b); Surrey (and var. d); Essex, S.; Essex, N. (and var. d); Herts; Middlesex; Oxon; Warwick; Stafford; Salop (and var. f); Pembroke; Anglesea; Lincoln, N.; Cheshire; Lancashire, S.; Yorks., S.W. and M.W.; Yorks., N.E. (var. d); Durham? "Teesdale"; Westmoreland; Cumberland; Roxburgh (and var. f); Aberdeen, S. (and var. b); Shetland (var. f); Kerry, N.; Cork, N.; Wicklow (and var. b); Dublin; W. Meath (and var. b); Galway, W.; Cavan; Antrim (and var. f).

II. C. FRAGIFERA, Durieu, Bull. Soc. Bot. France (1859), vi., p. 185; Braun, Consp. Char. Europ. (1867), p. 7; Monatsb. Akad. Berl., 1867, p. 863; Trimen, J. of B., 1877, p. 353, t. 192; Braun, R. & S. Exs., 73; Billot, 3273.

Stem usually very slender and flexible, having large compound bulbils at the lower nodes, much branched. Cortical cells regular, without spine-cells. Whorls of 6–9 branchlets. Stipulodes very small. Branchlets slender, usually flexuous, sometimes slightly incurved, of 9–13 joints, the upper 1–3 shorter, ecorticate. Bract-cells in the female plant 3–5, about half as long as the nucule; in the male 2, very short. Nucules usually 2–3 on a branchlet oval, 11–13-striate, coronula short obtuse. Dicœcious. (Tab. 207, fig. 2.)

Characteristically a very slender and flexible plant, from 6–12 in. high, bright green and unincrusted, but in an extreme form from near Helston (which, however, is connected, by intermediate forms, with the type) it is small and rigid, with short slightly connivent branchlets. It resembles a very slender state of *C. fragilis*, but besides its dicœcious character it may be distinguished from that species by being less brittle and by the branchlets having a greater number of joints. *C. fragifera* is confined to West Europe and North Africa. First found in England by Mr. Ralfs in the neighbourhood of Penzance.

Pools. July and August. Cornwall, W., and Scilly Isles.

III. C. CONNIVENS, Braun, Flora, 1835, i., p. 73; Consp. Char. Europ., p. 7; Monatsb. Akad. Berl., 1867, p. 855; Wallm. Act. Stockh., 1854, p. 327; Kütz. Tab. Phyc., vii., t. 63, f. 1; Chaboisseau, Bull Soc. Bot. France, 1871, p. 149; Journ. Bot., 1878, p. 120; Kralik Pl. Tuinetanæ, 344 and 344 bis.

Stem rather slender, brittle, very regularly corticate, destitute of spine-cells. Whorls of usually 8 strongly incurved branchlets, which in the male plant are often so connivent that the extremities meet or even cross one another. Stipulodes almost obsolete. Branchlets of 7–10 joints, the upper 1–2 ecorticate. Bract-cells in the female plant 3, much shorter than the nucule, in the male 2, very minute, rarely developed at the barren nodes. Nucules small, oval, 12–14-striate, coronula long, conical. Dicœcious. (Tab. 207, fig. 3.)

About 1 ft. high, of a light clear green, usually but little incrusted. The strongly incurved branchlets, and stouter and less flexible habit distinguish this from the closely-allied *C. fragifera*. The Abbé Chaboisseau stated that he was unable to find bulbils on *C. connivens*. It has been found in Western Europe and North Africa.

In fresh-water ditches at Stokes Bay, Gosport, Rev. W. S. Bayton, 1828, Herb. Borrer. Pool, Slapton, Sands, S. Devon, W. Curnow and W. B. Waterfall, July and August, 1878. Our drawing is from the Gosport plant, which differs from the type by its much shorter nucules and longer bract-cells. We have little doubt that both that and the plants from Slapton belong to this species, but some slight uncertainty must exist until a series of specimens has been examined.

(To be continued.)

NEW NEW-ZEALAND PLANTS.

By Dr. S. Berggren.

Phyllachne Haastii, *Berggr.*, *n. sp.*—*P.* foliis imbricatis e basi oblonga plano-convexa semiteretibus apice vix incrassatis, nervo simplici, columna dimidio exserta, stigmatis lobis oblongis recurvis, capsula turbinata, seminibus 6–12 in placenta centrali indivisa.

Kelly's Hill, Canterbury Alps.

This is the plant which I referred to *P. Colensoi*, Hook. f., in Lund's 'Physiograph. Sältskaps Minnesskrift,' 1878. tab. III., fig. 1–27. From that plant this is distinguished by the dull olive-green leaves, the upper half of which is semiterete and not swollen at the tip. The single nerve is unbranched, whereas in *P. Colensoi* there is a lateral branch on each side. The seeds are fewer in number, and the upper part of the placenta is not divided into two branches as in that species.

Dracophyllum Kirkii, *Berggr.*, *n. sp.* — *D.* fruticosum, foliis fasciculatis patentibus e basi vaginante superne dilatata non auriculata angustatis late subulatis concavis apice muticis vel mucronatis supra glaucescentibus subtus striatis, floribus solitariis breviter pedicellatis 2–3-bracteatis, bracteis sepalisque ovatis acuminatis margine ciliatis, filamentis antheris longioribus usque infra medium affixis.

I wrongly referred (*l. c.*, tab. IV., fig. 1–11) this plant to *D. uniflorum*, Hook. f. It is distinguished from all the other species of this genus with solitary flowers by the shape of the leaves, which are almost canaliculate, and like the leaves of those species which have compound inflorescence, especially *D. strictum*. The relative length of the anthers and filaments, as well as the point of insertion of the stamens, presents some difference in this species from both divisions of the genus.

Mount Torlesse, in Canterbury Alps.

Carex Buchanani, *Berggr.* — *C.* rufescens; culmis cæspitosis gracilibus firmis, foliis culmum subæquantibus vel longioribus tenacibus semiteretibus margine scabris, bracteis culmum superantibus superioribus evaginatis inferioribus vaginantibus, spicis 5–6 oblongis infima remota ceteris approximatis terminali cylindracea mascula ceteris femineis ima basi masculis, squamis obovatis longe hispidocuspidatis pallide membranaceis margine laceris, perigyniis ellipticis plano-convexis rostralis bifidis rostro margineque superne ciliato serratis purpureo-maculatis enerviis glabris squama obtectis, stigmatibus 2.— *C. tenax*, Berggr. l. c., tab. VII., fig. 1–7,— a name already used for another species.

Distinguished from *C. Raoulii*, Boott, by the very tenacious semiterete leaves, the terminal spikelet without female flowers, and the nerveless glabrous utricle.

A SYNOPSIS OF THE SPECIES OF *ISOETES*.

By J. G. Baker, F.R.S.

(Concluded from p. 46.)

Group 3. Amphibiæ.—Species inhabiting waters where they are liable to be left dry. Leaves furnished with accessory bast-bundles and abundant stomata. A few small membranous leaf-bases occasionally persistent.

19. I. Butleri, Engelm. in Amer. Bot. Gaz., iii. (1878), 1.—Rootstock 2-lobed. Habit of *I. melanopoda*; said to be dioicous. Leaves 8–12, 3–7 in. long, moderately firm in texture, tapering to the point, furnished with stomata and accessory bast-bundles. Sporangia globose or oblong; veil very narrow. Macrospores larger than in *melanopoda*, marked with distinct or rarely confluent tubercles. Microspores spinulose.

Hab. Limestone gap, near the watershed between the Red River and Arkansas River, Western United States, *G. D. Butler*.

20. I. melanopoda, J. Gay; Durieu in Bull. Bot. Soc. France, xi. 102.—Rootstock deeply 2-lobed. Leaves 15–50, ½–1 ft. long, ¼–⅓ lin. diam. at the middle, moderately firm in texture, opaque, tapering to the point, furnished with stomata and a few accessory bast-bundles, narrowed suddenly into the dilated base. Sporangia globose or oblong, ⅙–⅕ in. long, often bright chestnut-brown, copiously dotted; veil very narrow. Macrospores small, nearly or quite smooth beyond the ribs. Microspores spinulose.

Hab. Shallow ponds and damp prairies, Western United States, from Illinois to Iowa and Texas.

21. I. Engelmanni, A. Br. in Flora, 1846, 178.—Rootstock deeply 2-lobed, often 1–1½ in diam. Habit of stout *I. lacustris*. Leaves 25–100, often a foot long, 1 lin. diam. at middle, diaphanous, pale green, tapering to the point, furnished with accessory bast-bundles and copious stomata, the edge decurrent from the base, short and narrow. Sporange large, pale, oblong, unspotted; veil very narrow. Macrospores middle-sized, white, honeycombed all over. Microspores smooth or nearly so.

Hab. Ponds in the Northern United States from New England to Missouri. Var. *valida*, Engelm., is a large variety, with 100–200 leaves, 1½–2 ft. long, a broader veil, both kinds of spores smaller, and microspores spinulose.

22. I. Nuttallii, A. Br.; Engelm. in Amer. Nat., 1874, 215; *I. opaca*, Nuttall Herb.!—Rootstock faintly 2-lobed. Leaves 20–60, 3–6 in. long, ½ lin. diam. at the middle, moderately firm in texture, pale green, opaque, 3-angled on the back, tapering to the point, with three accessory bast-bundles and numerous stomata, the edge decurrent from the base short and narrow. Sporange small, pale, oblong; veil complete. Macrospores middle-sized, densely minutely granulated. Microspores papillose.

Hab. Damp meadows and edge of ponds in Oregon. Habit of *I. melanopoda*.

23. I. FLACCIDA, Shuttlew; A. Br. in Flora, 1846, 178.—Rootstock 2-lobed. Habit of *I. echinospora*, but leaves much longer, 10–35, 1–2 ft. long, $\frac{1}{2}$–$\frac{3}{4}$ diam. at the middle, diaphanous, light green, tapering to the point, furnished with accessory bast-bundles and copious stomata, the edge decurrent from the base short and narrow. Sporange small, pale, oblong, $\frac{1}{6}$–$\frac{1}{5}$ in. long; veil complete. Macrospores small, covered with papillæ, which are confluent into ridges. Microspores slightly papillose.

Hab. Florida, in deep water. First gathered by Rugel. *I. Chapmanni*, Engelm., has stouter leaves, about $1\frac{1}{2}$ ft. long, larger macrospores, with less prominent tubercles and ridges, microspores smooth or slightly papillose.

24. I. SETACEA, Bosc Dict. Hist. Nat.; A. Br. in Verhand. Branden, 1862, 30.—Rootstock 3-lobed, rarely 2-lobed. Leaves 10–30, often a foot long, $\frac{1}{2}$ lin. diam. at middle, pale green, opaque, moderately firm in texture, tapering to the point, furnished with copious accessory bast-bundles and stomata, the base suddenly dilated, its decurrent edge reaching up the lamina about 2 in. Sporange pale, globose; veil none; tongue as long as the sporange. Macrospores large, pure white, closely finely tubercled all over. Microspores cristate.

Hab. South of France, in ponds nearly dry in summer.

25. I. ADSPERSA, A. Br. Expl. Scient. Alg., tab. 37, fig. 3.—Rootstock 3-lobed. Habit of *I. setacea*. Leaves 12–20, 3–9 in. long, $\frac{1}{4}$–$\frac{1}{3}$ in diam. at the middle, opaque, pale green, moderately firm in texture, furnished with stomata and accessory bast-bundles, the edge decurrent from the base short and narrow. Sporange small, spotted, globose; veil very narrow; tongue twice as long as broad. Macrospores with strong ribs and a few large tubercles. Microspores prickly or crested.

Hab. Algeria and South France, in ponds dried up in summer.

26. I. MALINVERNIANA, Cesati & De Not., Ind. Sem. Hort. Bot. Genuen., 1858, 3.—Rootstock 3-lobed, reaching an inch in diam. Habit of the large varieties of *lacustris*, but leaves much more elongated, 20–50 or more, a foot or more long, $\frac{3}{4}$–1 lin. diam. at the middle, diaphanous, bright green, tapering gradually to the point, furnished with stomata and accessory bast-bundles, the membranous edge decurrent from the base about 3 in. Sporange large, pale, oblong; veil none; lip as long as the short tongue. Macrospores large, white, muricated all over. Microspores smooth.

Hab. Aqueducts in Piedmont, *Moris! De Notaris!*

27. I. VELATA, A. Br. Expl. Sc. Alg., tab. 37, fig. 1; *I. decipiens* and *longissima*, Bory & Durieu in Flora, 1846, 719.—Rootstock deeply 3-lobed. Habit of *I. setacea*. Leaves 20–50, reaching a foot or more in length, $\frac{1}{3}$ lin. diam. at the middle, moderately firm in texture, pale green, opaque, tapering to the point, furnished with copious stomata and accessory bast-bundles, a distinct membranous border decurrent from the dilated base for 2–3 in. Sporange middle-sized, subglobose; veil nearly or quite

complete; lip very short; tongue lanceolate. Macrospores middle-sized, minutely tubercled between the ribs, more prominently tubercled on the lower half. Microspores spinulose.

Hab. Mediterranean region, from Spain to Asia Minor.

28. I. PERALDERIANA, Durieu & Letourn. in Kralik Pl. Alg. Exsic., 157.—Rootstock 3-lobed. Leaves 12–20, ½–1 ft. long, ⅓ lin. diam. at the middle, opaque, pale green, moderately firm in texture, furnished with copious stomata and accessory bast-bundles, the membranous border towards the base less distinct than in *velata*. Sporange pale, globose, ⅙ in. long; veil nearly or quite complete; lip truncate; tongue lanceolate. Macrospores middle-sized, minutely tubercled, Microspores densely spinulose.

Hab. Algeria, *Kralik*, 157! Very near *velata*.

29. I. DUBIA, Gennari Comment., ii., 104.—Rootstock 3-lobed. Leaves about a dozen, very slender, 6–8 in. long, ¼–⅓ lin. diam. at the middle, opaque, pale green, with stomata and a few obscure accessory bast-bundles, the border decurrent from the base short and narrow. Sporange small, pale, globose; veil complete; lip truncate; tongue short, broad ovate. Macrospores like those of *velata*. Microspores dimorphous, some crested, some spinulose.

Hab. Island of Magdalena, off Sardinia, *Gennari!* Very near *velata*.

30. I. TEGULENSIS, Gennari Comment., ii., 106.—Rootstock 3-lobed. Leaves 10–20, very slender, ½–1 ft. long, ¼-⅓ lin. diam. at the middle, opaque, pale green, furnished with stomata and a few weak accessory bast-bundles, the border decurrent from the base short and narrow. Sporange small, pale, globose; veil nearly or quite complete; tongue and lip both short. Macrospores middle-sized, minutely tubercled. Microspore dimorphous, some spinulose, some crested.

Hab. Sardinia. Very near *velata*. The Spanish *I. bætica*, Willk. & Lange Prodr. Fl. Hisp., i., 15, is either the same or a close ally.

31. I. BORYANA, Durieu in Bull. Bot. Soc. France, viii. (1861), 164.—Rootstock 3-lobed. Habit stouter than in *velata*. Leaves 10–30 or more, 4–8 in. long, ½ lin. diam. at the middle, pale green, opaque, tapering gradually to the point, furnished with abundant stomata and accessory bast-bundles, with a broad membranous border shortly decurrent from the dilated base. Sporange oblong or subglobose, pale; veil complete; tongue and lip both short. Macrospores middle-sized, with minute tubercles between the ribs and larger ones over the lower half. Microspores dimorphous, some crested, some spinulose.

Hab. Marshes of the Landes, *Gay! Durieu!*

32. I. TENUISSIMA, Boreau in Bull. Angers, 1850, 259.—Rootstock small, usually 3-lobed, rarely 4-lobed. Leaves 12–20, very slender, 3–4 in. long, ¼–⅓ lin. diam. at the middle, opaque, pale green, tapering gradually to the point, furnished with stomata and usually a few weak accessory bast-bundles, with a short broad

membranous border decurrent from the dilated base. Sporange small, pale, globose; veil complete. Macrospores middle-sized, furnished with large scattered tubercles. Microspores densely spinulose.

Hab. Marshes of Central France, *Boreau! Franchet!*

33. I. OLYMPICA, A. Br., Milde Fil. Eur., 285.—Rootstock 3-lobed. Habit of *I. tenuissima*, but leaves more numerous, 1½–2 in. long, opaque, pale green, furnished with stomata and a few weak accessory bast-bundles. Sporange small, globose, unspotted; veil partial or nearly complete. Macrospores small, furnished with small tubercles between the ridges and stronger ones over the lower half. Microspores spinulose.

Hab. Bithynian Olympus, in swamps of the granitic plain, at 6000 feet above sea-level, *Dr. C. von Fritsch.*

34. I. WELWITSCHII, A. Br. in Kuhn Fil. Afric., 196.—Rootstock 3-lobed. Leaves 6–15, as firm in texture as in *I. Duriæi*, 2–3 in. long, very slender, pale green, ¼ lin. diam., furnished with stomata and accessory bast-bundles. Sporange small, pale, globose; veil very narrow. Macrospores small, greyish, with small tubercles between the prominent ribs and larger ones over the lower half. Microspores granulated.

Hab. Angola, in high spongy pastures of the Province of Huilla, at 3800–5500 feet, *Welwitsch*, 166!

35. I. NIGRITIANA, A. Br. in Kuhn Fil. Afric., 196.—Rootstock 3-lobed. Habit of *I. setacea*. Leaves 12–15, very slender, firm in texture, 6–8 in. long, ⅓ lin. diam. at the middle, pale green, opaque, furnished with stomata and a few weak accessory bast-bundles. Sporange pale, globose, ⅙ in. long; veil very narrow. Macrospores small, greyish, with a single tubercle between each ridge and several over the lower hemisphere.

Hab. In the Niger country at Nupe, *Barter*, 1020!

36. I. SCHWEINFURTHII, A. Br. MSS. — Rootstock 3-lobed. Habit of *I. setacea*. Leaves 12–30, about a foot long, moderately firm in texture, opaque, tapering to the point, ⅓–½ lin. diam. at the middle, furnished with stomata and accessory bast-bundles. Sporange small, globose; veil none. Macrospores small, chalk-white, with high ridges and strongly honeycombed all over.

Hab. Central Africa, in the Kingdom of Djur, *Schweinfurth*, 1962!

37. I. ÆQUINOCTIALIS, Welw.; A. Br. in Kuhn Fil. Afric., 195.—Rootstock 3-lobed. Habit of *I. setacea*. Leaves 6–12, very slender, a foot or more long, ⅓ lin. diam, at the middle, opaque, pale green, firm in texture, tapering to the point, furnished with copious stomata and several accessory bast-bundles. Sporange globose, ⅙ in. diam.; veil partial. Macrospores middle-sized, chalk-white, furnished with strong ridges and prominent tubercles. Microspores densely muricated.

Hab. Angola, in damp pastures of Pungo Andongo, alt. 2400–3800 feet, with *Drosera*, *Dr. Welwitsch*, 50!

38. I. JAPONICA, A. Br. in Verhand. Brand., 1862, 33.—Rootstock 3-lobed. Habit between *echinospora* and *setacea*. Leaves 12–30, 4–6 in. long, $\frac{1}{3}$–$\frac{1}{2}$ lin. diam. at the middle, bright green, diaphanous, tapering to the point, furnished with stomata and accessory bast-bundles, the edge decurrent from the dilated base short and narrow. Sporange small, oblong; veil none. Macrospores deeply and regular honeycombed. Microspores smooth, sometimes crested.

Hab. Japan, discovered by Schottmuller in 1860; regathered lately by Moseley and Dickens.

39. I. COROMANDELINA, Linn. Suppl., 447.—Rootstock 3-lobed. Habit stouter than in *setacea* and *velata*. Leaves 10–20, 9–15 in. long, $\frac{1}{2}$–$\frac{3}{4}$ lin. diam. at the middle, opaque, moderately firm in texture, tapering to the point, furnished with copious stomata and accessory bast-bundles, the membranous base suddenly dilated. Sporange large, pale, oblong; veil none; tongue linear, as long as the sporange. Macrospores chalk-white, with strong ridges and prominent close tubercles.

Hab. Moist soil near Madras, *Wright*, 309! Discovered by Kœnig.

40. I. BRACHYGLOSSA, A. Br. in Verhand. Branden., 1862, 32.—*I. capsularis*, Griff. Ic., t. 116–118, non Roxb.—Rootstock 3-lobed. Habit exactly of *I. coromandelina*. Leaves 20–30, about a foot long, $\frac{1}{2}$–$\frac{3}{4}$ lin. diam. at the middle, opaque, dull green, tapering to the point, furnished with abundant stomata and accessory bast-bundles, the membranous base suddenly dilated. Sporange large, pale; veil none; tongue cordate-ovate cuspidate, broader than long. Macrospores middle-sized, chalk-white, closely strongly tubercled.

Hab. Serampore, *Griffith!* Roxburgh's *I. capsularis*, as shown by his drawings, is a male plant of *Vallisneria spiralis*. Our specimens of this and *coromandelina* are all without microspores.

41. I. TRIPUS, A. Br. in Berl. Monatber., 1863, 559; 1868, 544.—*I. phœospora*, Durieu in Bull. Bot. Soc. France (1864), 103.—Rootstock 3-lobed. Leaves 10–20, very slender, 1–1$\frac{1}{2}$ in. long, $\frac{1}{4}$–$\frac{1}{3}$ lin. diam., opaque, pale green, firm in texture, furnished with stomata and accessory bast-bundles. Sporange small, pale, globose; veil none. Macrospores small, greyish white, covered with dense minute tubercles. Microspores smooth or nearly so.

Hab. Swan River, West Australia, *Drummond*, 990!

42. I. AMAZONICA, A. Br. MSS.—Rootstock 3-lobed. Leaves 10–20, 2–3 in. long, $\frac{1}{4}$–$\frac{1}{3}$ lin. diam. at the middle, firm in texture, furnished with stomata and accessory bast bundles, with a membranous border about $\frac{1}{2}$ in. long decurrent from the dilated base. Sporange small, white, globose, much spotted; veil rudimentary. Macrospores middle-sized, chalk-white, closely strongly tubercled.

Hab. Inundated places near Santarem, *Spruce*, 1081!

43. I. CUBANA, Engelm. MSS.—Rootstock 3-lobed. Leaves 10–50, ½–1 foot long, ½ lin. diam. at the middle, opaque, moderately firm in texture, furnished with stomata and accessory bast-bundles, the membranous base suddenly dilated. Sporange small, oblong, unspotted; veil very narrow. Macrospores small, strongly tubercled. Microspores papillose.

Hab. Cuba, *C. Wright*, 3912!

44. I. GARDNERIANA, Kunze herb; A. Br. in Verhand. Brand. 1862, 34.—Rootstock 3-lobed. Habit of *coromandelina*. Leaves 50 or more, about a foot long, 1 lin. diam. at the middle, slightly diaphanous, tapering to the point, furnished with copious stomata and accessory bast-bundles, with a narrow membranous border running up 2–3 in. from the dilated base. Sporange large, oblong; veil none. Macrospores large, brown, beset with numerous round tubercles. Microspores smooth.

Hab. Marshes, Mission of Duro, Province of Goyaz, Brazil, *Gardner*, 3563! Our specimens are without macrospores. A Paraguay plant, gathered by Balansa (1126) has them chalk-white and closely strongly tubercled.

Group 4. TERRESTRES.—Species growing in damp soil. Leaves furnished with accessory bast-bundles and abundant stomata. Bases of the leaves of a former year regularly persistent on the rootstock round the head rosette in the form of rigid dark-coloured scales.

45. I. DURIÆI, Bory, Comp. Rend. Acad., June, 1844; A. Br. Expl. Sc. Alg., t. 36, fig. 2.—*I. tridentata*, Durieu.—Rootstock deeply 3-lobed. Leaves 10–40, very slender, 2–4 in. long, ⅓ lin. diam., pale green, firm in texture, with abundant stomata and accessory bast-bundles; bases of the old leaves always short and minutely toothed. Macrospores middle-sized, conspicuously honeycombed. Microspores finely granulated.

Hab. Mediterranean region from Portugal to Asia Minor.

46. I. HYSTRIX, Bory, Comptes Rend. Acad., June, 1844; A. Br., Expl. Sc. Alg., t. 36, fig. 1.—*I. Delalandei*, Lloyd.—*I. sicula*, Todaro.—*I. Duriæi*, Hook. Brit. Ferns, t. 56, non Bory.—*Cephaloceraton Hystrix*, Gennari.—Rootstock and leaves exactly as in *I. Duriæi*, but the old leaf-bases in the type furnished with hard spines ¼–½ in. long. Macrospores finely granulose. Microspores echinulate.

Hab. Guernsey and N.E. France to Spain and Asia Minor. Var. *subinermis*, Durieu (*I. Hystrix*, forma desquamata, A. Br.; *Cephaloceraton gymnocarpum*, Gennari), differs by having only short points to the leaf-bases, like those of *I. Duriæi*.

ON THE BOTANY OF THE BRITISH POLAR EXPEDITION OF 1875–6.

By Henry Chichester Hart, B.A., Naturalist to H.M.S. 'Discovery.'

(Continued from p. 78).

It is curious to notice how some flowers, as Saxifrages and Poppies, retain their petals after being buried in the snow at the close of the summer; some Drabas do the same; and this also may be taken as an indication that the seed-ripening stage is far from being reached.

The more northern the latitude, the more stunted most species of course become; some, however, lose but little of their dimensions, as *Dryas*, *Saxifraga oppositifolia*, *S. cæspitosa*, *Carex fuliginosa*, *C. stans*, and *Stellaria longipes;* those which dwarf most are *Lychnis affinis*, *Alopecurus alpinus*, *Saxifraga cernua*, *S. nivalis*, *Cerastium alpinum*, *Papaver nudicaule*, &c. Samples of the same plant gathered early and late in the season also vary very considerably, and in an unusual manner: owing to the shortness of the allotted time, all plants strive to get through their life-stages as rapidly as possible, coming into flower with the utmost haste; thus an early-gathered specimen of *Arenaria verna* with hardly any leaves or stems, but in full flower, is very unlike the same plant two months later with its far-trailing branches and matted foliage; *Potentilla nivea* will flower, too, when about an inch in height, later on reaching a stature of eight or ten inches, and bearing numerous flowers. The most stunted plants seem to be those which suffer most from being shifted about with moving mud, as Poppy, *Cerastium*, and *Saxifraga cernua;* these may often be met with travelling down a hill-side ready to cling to any support. Another check to the natural growth of many plants is that all, even marsh plants, such as *Eriophora*, *Carices*, &c., must be prepared for a thorough baking and drying before the end of the season, though it opens with a wide-spread deluge.

The total number of plants gathered at the different stations gives the following figures, only those districts which were at least tolerably well explored being separately accounted for. The whole number of species enumerated will be found to be one hundred and thirty-seven. Of these,

1. Disco yielded -	119	7. Hayes' Sound yielded	51
2. Proven - -	67	11. Polaris Bay - -	22
5. Foulke Fiord -	44	12. Discovery Bay - -	69
6. Cape Sabine -	35	13. Floeberg Beach - -	29

The numbers before the names refer to the districts as already given.

Greenland, north of the Humboldt Glacier (lat. 79° to 80°), and coming under districts 10 and 11, all north of 81°, yielded 26 species, of which four, viz., *Pedicularis hirsuta*, *Ranunculus nivalis*,

and *Carex nardina* were not met with north of Bessel's Bay, the remainder occurring in Polaris Bay. All Greenland yielded 132 species, and one only, *Braya alpina*, was not found south of the Humboldt Glacier. Districts 1, 2, 3, 4, 5, 10, 11 belong to Greenland.

Grinnell Land contains 69 species. A quotation from Professor Fries' paper "On the Lichens of the English Polar Expedition," before alluded to, will render this part of the subject more interesting. He remarks: "As for the phanerogamous plants, Prof. A. J. Malmgren has already shown that nine species at the most are found on the western coast of Smith Sound; *and no one of these was found to the north of Cape Isabella, situated a little beyond* 78° *north lat.*" Although this land extends through nearly four degrees of latitude, and was well botanized over in many places, every species gathered in it was to be met with in Discovery Bay, the districts north and south of that favoured locality adding none. All the flowers met with on the opposite coast north of the Humboldt Glacier also occur in Discovery Bay. These circumstances are especially interesting, showing as they do in what a marvellous manner one sheltered and favoured locality will preserve a flora for an enormous area: let the climate improve, and the Discovery Bay flora may spread by seed, &c., in all directions; but had it not found a haven there, numbers of species would be missing for diffusion—so accidental may be the original sources of the botanical wealth of a country.

Grinnell Land contained four species which were not found elsewhere—*Phippsia algida*, *Arenaria grœnlandica*, *Androsace septentrionalis*, and *Deschampsia cæspitosa*; of these, however, the first, and I believe the first two, are known to occur in North Greenland on the west coast, and the latter has been gathered on its east coast. Grinnell Land extends from lat. 79° 15′ to lat. 83° 9′, and includes districts 8, 9, 12, 13.

Ellesmere Land, south of Hayes Sound, was only visited in a few places in lat. 78° 52′ to lat. 78° 56′. Good collections were, however, made here, and two ferns from Hayes Sound, *Woodsia hyperborea* and *W. glabella*, were gathered nowhere else. A comparison between the floras of Grinnell Land and Ellesmere Land leads to the following results—Ellesmere Land yielded eleven species not met with in Grinnell Land:—

Ranunculus sulphureus
Potentilla anserina
Vaccinium uliginosum
Cassiopeia tetragona
Pedicularis flammea
Empetrum nigrum
Carex alpina
Hierochloe alpina
Woodsia hyperborea
W. glabella
Lycopodium Selago

To these species Hayes Sound appears to be an effectual northern barrier; on the other hand, Grinnell Land has no less than sixteen species which did not occur to its south, in North Ellesmere Land; with a few exceptions, these are only recorded from Discovery Bay in Grinnell Land:—

Cardamine bellidifolia
C. pratensis
Draba muricella
Cochlearia anglica
Hesperis Pallasii
Braya alpina
Arenaria grœnlandica
Arnica montana
Erigeron compositus
E. uniflorus
Androsace septentrionalis
Luzula campestris
Deschampsia cæspitosa
Trisetum subspicatum
Colpodium latifolium
Equisetum variegatum

To the southerly migration of many species now existing in Discovery Bay and its vicinity, the long cliff-bound barren coast from Cape Louis Napoleon, lat. 79° 45′, to Cape Baird, lat. 81° 35′, is no doubt an insuperable obstacle. The distinction between these two floras is very remarkable: thus Ellesmere Land yielded 61 species; and out of a total of 80 species gathered upon the west shore north of lat. 78° 45′, only 55 are common to both sides of Hayes Sound.

Greenland north of 78°, *i. e.*, that part of Greenland which lies opposite to Grinnell Land and Ellesmere Land, from Smith Sound northward, contains altogether 50 species; of these, the following 24 were not met with north of Foulke Fiord:—

Ranunculus sulphureus
Cardamine bellidifolia
Hesperis Pallasii
Lychnis apetala
Arenaria rubella
Stellaria humifusa
S. longipes
Potentilla anserina
Epilobium latifolium
Saxifraga cernua
S. rivularis
S. nivalis
S. flagellaris
S. tricuspidata
Vaccinium uliginosum
Cassiopeia tetragona
Pedicularis capitata
P. lapponica
Empetrum nigrum
Luzula arcuata
Carex rigida
Eriophorum capitatum
E. vaginatum
Poa pratensis

This list of absentees shows the extreme poverty of the flora of Polaris Bay.

Thus thirty more species (or more than half as many more) were gathered upon the west side of Smith Sound and Robeson Channel than upon the east, north of lat. 78°; further examination would perhaps reduce this difference slightly, but only slightly, since Polaris Bay has been thoroughly explored. Also, two or three plants are recorded by Elias Durand from Washington Land, north of the Great Glacier, in his account of Kane's plants, but several plants there entered are open to grave suspicion. *Stellaria humifusa* and *Poa pratensis* are the only two plants which occurred on the east, but not on the west shore north of lat. 78°, which make the total for these latitudes to be eighty-two species.

Though the Humboldt Glacier, with its sea-wall of blue ice seventy miles long and a hundred feet above the water's edge, intervenes for a latitude of upwards of one degree on the east side of Smith Sound, its effects with regard to the range of Greenland plants would appear far less than those of Hayes Sound and the

coast north of it, upon the opposite shore. But this is only due to the poverty of the flora of the extreme north of Greenland—the paucity of materials for it to modify; indeed this flora, as well as that of the whole of Grinnell Land, would almost appear to be derived from Discovery Bay.

XIII. Floeberg Beach, lat. 82° 27′; Cape Joseph Henry, lat. 82° 50′, Sept. 1, 1875, to July 31, 1876 (H.M.S. 'Alert').

For the following remarks upon Floeberg Beach and other points north of those visited by me, I am indebted to my friend Captain Feilden, naturalist to H.M.S. 'Alert.'

Northward of Cape Union (lat. 82° 15′), the coast of Grinnell Land trends in a N.N.W. direction to Cape Joseph Henry (lat. 82° 50′). The appearance of this coast-line differs very considerably from the western shore of Robeson Channel, which is bounded by precipitous cliffs or frowning headlands rising to an altitude of 1200 to 1500 feet, with a steep talus stretching to the ice-foot. Beyond Cape Union the coast-line at many points is made up of gravel ridges or slopes of mud, old sea-bottoms in fact, stretching landwards to the first range of hills, which rise to a height of 600 or 700 feet. Inland of this old coast-line, many elevations rise to a height of 1200 or 1500 feet; whilst still further may be seen in the distance a sea of snowy peaks, attaining an estimated altitude of 5000 feet.

In the northern portion of Grinnell Land, around Floeberg Beach, plants were most plentiful along the shore-line and in the valleys up to an elevation of 300 feet; but in some favoured spots we found luxuriant patches of sorrel and grasses even at 600 or 700 feet. The richest vegetation occurred on the northern slopes, as these obtain the greatest amount of the sun's rays during the warm months. The most northern point I visited was the neighbourhood of Cape Joseph Henry (lat. 82° 50′) in the end of May and beginning of June; at that season the winter snows had scarcely begun to thaw, but the action of the winds exposed here and there withered remains of prior season's growth; *Salix arctica* was here quite as large and abundant as at Floeberg Beach, a specimen gathered near Cape Joseph Henry in lat. 82° 46′ had a stem seven-tenths of an inch in diameter; withered stems of *Papaver nudicaule*, *Draba alpina*, *Cerastium alpinum*, *Potentilla nivea*, *Dryas integrifolia*, *Saxifraga oppositifolia*, and two grasses were gathered here. My impression is that in this locality the plant growth scarcely differs from that in the neighbourhood of Floeberg Beach.

On the 6th June, at Floeberg Beach, I obtained a single blossom of *Saxifraga oppositifolia*, the first flower observed; by the 12th it was in full flower, and so abundant that some of the northern slopes near the sea-shore were suffused with a purplish glow when seen at a distance. *Lychnis apetala* I have noted as the latest plant to flower; I first saw it blossoming on the 25th of July. With the exception of *Cochlearia officinalis*, of which I only found two or three stunted plants north of Cape Union, I did not observe that any of the other species collected by me at

Floeberg Beach differed in size or luxuriance from similar species growing at Discovery Bay; though the entire failure of so many plants in so few miles of latitude is worthy of consideration. I thing I may safely say that *Oxyria reniformis* was the plant which grew most luxuriantly at the highest elevation around Floeberg Beach.

With reference to the above remarks, it is well to observe that it is due to the configuration of the land that northern slopes obtained the greatest amount of sun's heat in Captain Feilden's latitudes. Eastern and southern slopes are the most favoured around Discovery Bay.

To the many kind friends and botanical correspondents who have given me valuable assistance in the preparation of these notes my warm acknowledgments are due, especially to Mr. J. G. Baker, of Kew, who has most kindly compared and identified for me many of the critical forms, and to the officers of the Dublin Museum of Science and Art, who have given me every facility for carrying on my studies in their Natural History Department. My friend Mr. A. G. More has continually given me the benefit of his valuable advice, and rendered me every assistance in his power.

To Sir Joseph Hooker I am indebted for details respecting the distribution of several Arctic species, and for encouraging me to proceed in my laborious undertaking.

The Rev. J. E. Leefe has very kindly examined all the specimens of *Salix* gathered by our Expedition to which I have had access in Dublin, with the result of referring all the higher northern forms to *S. arctica*.

My colleague, Captain Feilden, has kindly placed at my disposal his notes upon the plants of Floeberg Beach and other localities north of those visited by me.

My results are chiefly drawn from my own memoranda, made during the voyage, and the specimens collected by me, now incorporated in the Herbaria at Kew and in the British Museum. In addition, I have fortunately been able to consult the valuable botanical collections made by Dr. Moss, of H.M.S. 'Alert,' from Disco to Floeberg Beach, now deposited in the Herbarium of Trinity College, and placed at my disposal by Dr. E. P. Wright, the Professor of Botany. I have also carefully studied an interesting series of specimens collected by my shipmate, Dr. Coppinger, to whom I am mainly indebted for the knowledge of the Flora of Polaris Bay, where he was encamped for several weeks during the summer of 1876. With these are incorporated a collection made by myself in Discovery Bay, the whole being now deposited in charge of the officers of the Natural History Department of the Dublin Museum.

To Dr. Steele my sincere thanks are due, for his kindness in allowing me to examine a most interesting series of Arctic plants, which were chiefly made during the various Franklin Search Expeditions.

(To be continued).

NOTES ON THE FLORA OF NORTHAMPTONSHIRE.

By G. C. Druce, F.L.S.

(Concluded from p. 79.)

Salix fragilis, L. Gayton, Rothersthorpe, Nene *a*; Castle Ashby, Nene *b*; Cosgrove, Ouse.

S. rubra, Huds. Nene side, *a*.

S. Helix, L. Osier-beds, Nene side, Northampton.

S. vitellina, Sm. Cosgrove, Ouse.

S. amygdalina, Sm. Nene above Northampton.

S. Smithiana, Willd. Harleston; Nene side; Rush Mills.

S. acuminata, Sm. Castle Ashby, Nene *b*.

S. purpurea, Sm. Blisworth, Moulton, &c.

S. aurita, L. Plain Woods, Nene *a*; Yardley Chase, Nene *b*; Whittlebury Forest, Ouse.

S. viminalis, L. Rush Mills, Great Billing, &c., Nene *b*; Peterboro'.

Acorus Calamus, L. Lamport Rectory pond (*Berkeley*). Sir Charles Isham informs me it is still there.

Potamogeton natans, L. In all the districts.

P. acutifolius, Sch. Drayton reservoir, very fine.

P. prælongus, Wolf. One specimen found in canal, Northampton; River Nene above Northampton, Nene *a*.

P. obtusifolius, M. & K. Wakefield pond, Ouse.

P. mucronatus, Schrad. Nene *a*, Northampton; Stoke Bruerne Canal, Ouse.

P. pusillus, L. Canal, Yardley Gobion, Ouse.

Zannichellia eu-palustris, L. Very fine in Kingsthorpe Spring, Nene *a*; Potter's Pury, Ouse; Moreton Pinkney, Cherwell, and in dykes at Peterboro', Nene *c*.

Triglochin palustre, L. Canal-side, Northampton, Nene *a*; Foxhall, Nene *b*; Wittering; Wansford, Nene *c*; Bradland pond-side; Yardley canal-side, Ouse.

Alisma lanceolata, With. Yardley canal side, Ouse.

**Elodea canadensis*, Rich. In all the streams and ponds.

Orchis incarnata, L. In marshes near Wittering and Southorpe, and probably follows, at scattered intervals, the course of stream running out of the Whitewater near Stamford race-course to the Nene below Wansford. It occurs with *O. latifolia*, sometimes approaching it very closely.

O. latifolia, L. Foxhall, Nene *b*; Wittering, Nene *c*; Croughton, Cherwell.

Habenaria viridis, Br. Barnack (*Jones*); Southorpe, Nene *c*; Wappenham, fine specimens (*Miss Scott*), Ouse.

H. bifolia, Br. Wicken Wood and Whittlebury Forest, Ouse.

H. chlorantha, Bab. Salcey, Badby, Nene *a*; Yardley Chase, Nene *b*; Bedford Purlieus, Nene *c*; Whittlebury Forest, Ouse; Wakerley Wood, Welland.

Ophrys apifera, Huds. Grendon, Nene *b*; Southorpe, Nene *c*.

O. muscifera, Huds. Courteenhall (*Sir Hereward Wake*); Whittlebury Forest; Wakerley Wood, Welland.

[*O. aranifera*, Huds. Southorpe quarries; the habitat now destroyed by a larch plantation.]

Iris Pseudacorus, L. Tove-side, Yardley, &c., Ouse.

I. acoriformis, Bor. Nene-side, Northampton; Wittering below Peterboro', Nene *c*. Very typical.

Polygonatum multiflorum, All. In an old spinney near Heathencote (*Norman*), Ouse.

**Ruscus aculeatus*, L. Hedges, Hardingstone, Castle Ashby, and Peterboro'.

Gagea lutea, Ker. On a steep shady hedge-bank near Roade, Nene *a*.

Allium compactum, Thuill. Roadside near Grafton Regis, sparingly, Ouse, Nene *b*.

**Ornithogalum umbellatum*, L. In a lane near Mears Ashby.

O. nutans, L. Geddington Chase.

Luzula sylvatica, Bich. Fawsley Wood, Nene *a*; Bedford Purlieus, Nene *c*.

L. congesta, Sm. Harleston Firs, Kingsthorpe bushes, Badby, &c., Nene *a*.

Juncus supinus, Mœnch. In Harleston Firs, growing in a wet trench with *Hydrocotyle* and *Blechnum*. Very rare, and perhaps its only locality.

J. squarrosus, L. Harleston Firs, very rare, Nene *a*.

J. compressus, Jacq. Badby, Nene *a*; Wakefield pond-side; road-side, Grafton Regis, Ouse; plentiful by side of Drayton reservoir, Avon.

Schœnus nigricans, L. Wittering, small and local, Nene *c*.

Blysmus compressus, Panz. Foxhall bog, Nene *b*.

Carex pulicaris, L. Foxhall bog, Nene b; Wittering marsh, Nene *c*.

C. nemorosa, Rebent. Fotheringhay, Nene *c*.

C. stellulata, Good. Kingsthorpe bushes, Nene *a*; Foxhall, Nene *b*; Wittering, Nene *c*.

C. remota, L. Blisworth, Plain Woods, abundant, Nene *a*; Yardley Chase; Delapre, Nene *b*; Stoke Bruerne; Whittlewood, Ouse.

C. acuta, L. Harleston, &c., Nene *a*; Wittering, Nene *c*; Yardley Gobion, &c., Ouse.

C. pilulifera, L. Harleston Firs, very rare, Nene *a*.

C. pallescens, L. Badby Wood, Nene *a*, var. *undulata*.

C. panicea, L. Generally distributed.

C. distans, L. Croughton bog, Cherwell.

C. ampullacea, L. Croughton bog, Cherwell (*French*).

C. fulva, Good. Foxhall bog, Nene *b*; Wittering, Nene *c*.

C. flava, L. Foxhall bog, Nene *b*; Wittering, Nene *c*; Croughton, Cherwell.

C. pseudo-cyperus, L. Harpole pond, Nene *a*; Delapre meadows, Nene *b*; abundant by dyke-side below Peterboro', Nene *c*; Bradland pond, Ouse.

C. vesicaria, L. Wittering, Nene *c*; Whittlebury Forest, Ouse.

Phleum nodosum. Harleston Heath, Nene *a*; Cosgrove quarries, Ouse.

Agrostis canina, L. Harleston, Nene *a*.

Aira caryophyllea, L. Harleston, Nene *a*.

A. præcox, L. Boro' Hill; Badby Downs; Harleston, Nene *a*; Roade, Ouse.

Avena pratensis, L. Roade, Ouse; Barnack, Nene *c*.

A. strigosa, Schreb. Harpole, Nene *a*; and in other districts.

Triodia decumbens, Beauv. Foxhall, Nene *b*; very scarce in 1879.

Koeleria cristata, Pers.—*a. vulgaris*. Wittering, Southorpe; Bedford Purlieus, Nene *c*; Roade, Ouse.—*b. gracilis*. Boro' Hill, Nene *a*.—*c. albescens*. Between Wittering and Southorpe, Nene *c*.

Molinia cærulea, Mœnch. Foxhall bog, Nene *b*; Wittering marsh, Nene *c*.

Glyceria plicata, Fries. Blisworth; Kingsthorpe, Nene *a*; Foxhall, Nene *b*; Nassington, Nene *c*; Whittlewood, Ouse.

G. pedicellata, Towns. Brickyards near race-course, Northampton.

Sclerochloa distans, Bab. Sewage-works, abundant, Nene *b*.

Poa nemoralis, L. Daventry, Nene *a*; Southorpe, Nene *c*; plentiful, hedge-side near Yardley Gobion, Ouse.

Festuca sciuroides, Roth. Harleston; Kingsthorpe; Upton, Nene *a*; Thorpe Malsor, Nene *b*; Grafton Regis, Ouse.

F. ovina, L. Hunsbury Hill, Nene *a*; Castle Asbby, Nene *b*; Barnack, Nene *c*; Cosgrove quarries, Ouse.

F. pratensis, Huds. Daventry; Dane's Camp, Nene *a*; Castle Ashby; Geddington, Nene *b*.

Bromus erectus, Huds. Duston, Nene *a*; Castle Ashby (*Rogers*), Nene *b*; Barnack, &c., Nene *c*; Coppice Moor, Ouse.

B. secalinus, L. Blisworth, Nene *a*; Yardley, Ouse.

B. commutatus, Schrad. Dallington, Nene *a*.

Hordeum sylvaticum, Huds. Fineshade (*Berkeley*); Welland.

Asplenium Trichomanes, L. Great Billing; Thrapston (*Rev. H. Ward*); Irthlingboro' River bridge, Nene *b*; Heathencote, Ouse (*Norman*).

Athyrium Filix-fœmina, Bernh. Harleston; New Duston; Badby Woods, Nene *a*; Delapre, Yardley Chase, Overstone (*Mrs. Birch*), Nene *b*; Bedford Purlieus, Nene *c*.

Aspidium angulare, Willd. Badby Woods (*Griffin*).

Equisetum fluviatile, L. Gayton, Harpole, Dallington, &c., Nene *a*.

Chara hispida, L. Abington pond, Nene *b*.

C. fœtida, Braun. Gayton canal and Nene *a*; Foxhall, Nene *b*; Wittering Marsh, Nene *c*; Yardley Gobion, Ouse.

The most interesting districts of Northants are as follows:—Barnack quarries, exhausted for the last 400 years, about four miles from Stamford and two from Ufford station, with the contiguous quarries of Southorpe, are especially productive; in addition to the plants previously quoted for these places may be

mentioned *Gnaphalium dioicum*, still lingering on the north sides of a few of the hollows, and *Aceras anthropophora*, *Verbascum nigrum* and *Atropa Belladonna*, frequent in the more recent quarries: about a mile from Southorpe is Wittering Marsh, caused by a little stream running out of the Whitewater. *Carex paniculata*, *Juncus obtusiflorus*, *Eriophorum angustifolium*, *E. latifolium*, *Epipactis palustris*, *Gymnadenia conopsea*, *Pinguicula vulgaris*, *Carduus pratensis*, and *Menyanthes trifoliata* may still be found. From Stamford an old Roman road now covered with grass leads to Oundle, and afford some uncommon species, *Astragalus hypoglottis*, *Hippocrepis*, *Cerastium arvense*, *Orchis pyramidalis*, *Gentiana Amarella* and *campestris*, &c.; bordering this road are the woods of Bedford Purlieus, where *Convallaria*, *Aquilegia*, and *Melica uniflora* are abundant. Two miles west of Stamford are Collyweston quarries, where *Aceras anthropophora* and *Arabis hirsuta* are plentiful, and *Orchis ustulata* and *Origanum vulgare* also occur.

Harleston Firs, frequently quoted, are some fir woods on the sand, and yield many interesting plants, rare or absent on the oolitic districts of the county. Up to comparatively recent times the locality was a sandy common, and then yielded several species now extinct.

Foxhall Bog is situated on what was once Oldfield, about five miles from Kettering; it is now converted into sheep farms, and the bog recently planted with sallows will soon cease to deserve its name: *Gymnadenia conopsea*, *Carduus pratensis*, *Pinguicula*, *Anagallis tenella*, *Pedicularis palustris*, *Valeriana dioica* were formerly abundant here.

Badby Woods, four miles from Weedon, on the greensand, are also rich, *Vicia sylvatica*, *Equisetum sylvaticum*, *Lathyrus sylvestris*, *Lysimachia nemorum*, *Hieracium boreale* being plentiful.

SHORT NOTES.

Briza maxima, *L.*, in Jersey.—This conspicuous grass, a native of Southern Europe especially in the Mediterranean region, is rapidly becoming naturalised in Jersey. During the last summer (1879) I noticed it in three distinct places in the N., S.W., and E. of the island respectively, namely, at Plemont, by the celebrated caverns; at La Haule, near St. Aubin's, most plentifully, close by the station for *Ranunculus chærophyllus*, L.; and in St. Saviour's parish, to the N.E. of St. Helier's. The late Dr. M. M. Bull, whose death last August has deprived the Channel Islands of its most energetic botanist, informed me, with reference to this grass, that he had first observed it six or seven years ago, and that it was spreading year by year. *Briza maxima* is, I believe, in its native locality (*i. e.*, the Azores, Madeira, Canaries, and the whole of the Mediterranean region) nearly always associated with *Cynosurus echinatus*, L., and *Bromus maximus*, Desv. Both these

have been long known as inhabitants of the Channel Islands, and it is most probable that the *Cynosurus*, at all events, which is a well-known ballast plant, may have been originally introduced at some remote date. The *Briza* bids fair to overrun the island, as it seeds so freely. It has not been yet detected either in Sark, Herm, or Guernsey.—J. Cosmo Melvill.

Hypnum salebrosum, *Hoffm.*—Mr. H. Boswell has kindly pointed out an error in my communication in the last number of this Journal; the moss found by him was not *H. Mildeanum*, as there stated, but *H. salebrosum*. He also reports that he has received the true plant from Dorsetshire, where it was lately gathered by the Rev. H. H. Wood. *H. salebrosum*, Hoffm., is therefore known to occur in Forfarshire, Roxburghshire, Yorkshire, Lincolnshire, Oxfordshire, and Dorsetshire; and *H. Mildeanum* in Fifeshire, Lancashire, Cheshire, Lincolnshire, Kent, Sussex, Somersetshire, Devon, and Cornwall; and, in Ireland, near Cork and Dublin. Mr. Boswell also remarks that a North American form of *H. salebrosum* has an almost cylindrical capsule, and approaches thereby to *H. lætum* and *H. acuminatum;* and that this species is as variable as *H. rutabulum*.—E. M. Holmes.

Extracts and Notices of Books & Memoirs.

TWO NEW NATURAL ORDERS.

Two new Natural Orders—*Balanopseæ* and *Leitnerieæ*—are founded by Bentham and Hooker in the recently issued part of the 'Genera Plantarum,' from which we extract the following descriptions. *Balanopseæ* is placed between *Euphorbiaceæ* and *Urticeæ; Leitnerieæ* between *Platanaceæ* and *Juglandeæ*, the following being the diagnostic characters of each:—

"*Balanopseæ*.—Inflorescentia mas amentacea. Perianthium 0 v. squamula minuta. Stamina 2-∞, antheris subsessilibus. Ovarium imperfecte 2-loculare. Ovula in loculis 2, erecta, anatropa. Fructus indehiscens. Seminis albumen copiosum, carnosum; radicula infera."

"*Leitnerieæ*.—Inflorescentia mas amentacea. Perianthium 0. Stamina ∞, bracteæ affixa. Ovarium 1-loculare, 1-ovulatum. Albumen tenue. Radicula supera. Folia simplicia."

"Ordo CLII. Balanopseæ.

Flores dioici, mas in spicis amentaceis sparsi, breviter pedicellati v. subsessiles. *Perianthium* (v. bracteola?) ad apicem pedicelli e squama unica unilaterali. *Stamina* ∞ (2-12 sæpius

5-6) filamentis brevissimis v. 0. *Antheræ* in toro subsessiles, ovatæ, loculis 2 parallelis dorso contiguis, rima longitudinali latiuscule 2-valvibus, connectivo interdum in acumen minutum producto. *Ovarii* rudimentum 0 v. rarius in flore terminali minutum, 2-partitum. Fl. fœm. intra involucrum e bracteis ∞-seriatim imbricatis solitarii, sessiles. *Perianthium* 0. *Ovarium* sessile, placentis 2 parietalibus imperfecte 2-loculare; apice in stylos 2 fere ad basin 2-partitos desinens, ramis stigmatosis longe subulatis flexuosis. *Ovula* in quaque placenta 2, collateralia, a basi erecta, anatropa, funiculis brevibus supra micropylum in obturatorem dilatatis. *Drupa* involucra persistenti insidens, ovoidea v. oliviformis, 2-pyrena v. abortu 1-pyrena; epicarpium subcoriaceum, nitidum; mesocarpium succulentum; pyrenæ, si duæ, facie plana sese applicitæ, dorso convexæ, duriusculæ v. osseæ. *Semina* in quaque pyrena solitaria, a basi erecta subsessilia, pyrenæ conformia; testa membranacea. *Albumen* carnosum. *Embryo* albumine paullo brevior, rectus, cotyledonibus late ovatis v. oblongis planis tenuibus v. crassiuscule carnosis, radicula tereti infera.

Arbores fruticesve. Folia alterna v. sparsa, sæpe subverticillatim approximata, coriacea, integerrima v. rarius leviter denticulata, pennivenia. Stipulæ 0. Amenta mascula et flores fœminei in ramulis annotinis v. vetustioribus infra folia sparsa, sessilia. Bracteæ squamiformes, ∞-seriatim imbricatæ, ad basin amenti mas minimæ, caducissimæ, sub flore foem. ab exterioribus in interiores gradatim increscentes, sub fructu v. post drupas delapsas persistentes; bracteæ præterea minutæ glanduliformes in rhachi amenti mas plures. Bracteola ad quemque florem a Baillono memorata nobis potius, uti supra, perianthii rudimentum videtur.

Species 6 v. 7, omnes Novo-Caledonicæ.

Ordo e genere unico constans, a Baillono dubie ad *Castaneas* suas (*Cupuliferas*) relatus, characteribus pluribus essentialibus abhorret. Nobis *Euphorbiaceis* multo affinior videtur, Flores masculi omnino *Daphniphylli;* ovula in loculis ovarii gemina collateralia, funiculi obturator, fructus drupaceus, embryo in albumine carnoso rectus, stylorum conformatio et habitus conveniunt, sed a toto ordine differt ovulis seminibusque a basi erectis nec ab apice pendulis.

1. Balanops, *Baill. Adans.* x. 117, 337; *Hist. Pl.* vi. 237, *f.* 207 *ad* 213.—Genus unicum. Character ordinis.

Species uti supra 6 v. 7, quarum examinavimus flores mas in sp. 2, fructus in sp. 3. Flores fœmineos non vidimus, eorum characteres ex descr. Bailloni excerpsimus."—p. 341.

"Ordo CLV. Leitnerieæ.

Flores dioici, utriusque sexus in spicis amentaceis erectis sub quaque bractea solitarii. Fl. mas: *Perianthium* 0. *Stamina* ∞ (3-12), toro basi bracteæ adnato affixa, filamentis filiformibus liberis v. vix basi connatis. *Antheræ* majusculæ, erectæ, basifixæ, loculis parallelis distinctis dorso contiguis longitudinaliter dehiscentibus. Ovarii rudimentum 0. Fl. fœm; *Perianthium* minutum

e squamellis valde inæqualibus basi in discum seu cupulam connatis. *Ovarium* sessile, 1-loculare, in stylum longum indivisum apice recurvum uno latere longe stigmatosum desinens. *Ovulum* unicum, parieti lateraliter affixum, amphitropum, ascendens, micropyle supera. *Drupa* oblonga, compressiuscula, exocarpio tenui; endocarpium durum. *Semen* hilo lineari lateraliter affixum, fructui conforme, testa membranacea. *Albumen* tenue, carnosum. *Embryo* rectus, semine parum brevior, cotyledonibus planis basi cordatis, radicula brevi exserta supera.

Frutices non resinosi, innovationibus sericeo-puberulis. Folia alterna, petiolata, majuscula, integerrima, pennivenia, epunctata. Stipulæ 0. Amenta e ramis annotinis ante folia evoluta, in gemmis solitaria, sessilia, squamis seu bracteis imbricatis demum laxiusculis, inferioribus plurimis vacuis.

Species 2, altera Floridana paludosa, altera Texana minus perfecte nota.

1. LEITNERIA, *Chapm. Fl. S. U. St.* 427.—Genus unicum. Character ordinis.

Species, uti supra, 2. *Cas. DC. Prod.*, xviii., 154. *Hook. Ic. Pl.*, t. 1044. *Baill. Hist. Pl.*, vi., 239, fig. 214 ad 216.

Genus dubie *Myricaceis* adscriptum, nobis potius *Urticaceis* affine videtur, quoad flores mas *Juglandeas* refert, sed habitu, perianthio fœm. infero, &c., distincte differt.

DIDYMELES, *Thou. Hist. Veg. Afr. Austr.* 9, t. 1 (vel 3), arbor Madagascariensis a botanicis recentioribus non observato, a Baillonio primum ad *Rutaceas* dubie relata, serius Hist. Pl., vi. 241. *Leitneriæ* juxtaposita, ex charactere et icone auctoris nobis ab utroque aliena videtur sed affinitas valde dubia."—pp. 396-7.

Biological Atlas. By D. and A. N. M'ALPINE. Edinburgh and London, W. and A. K. Johnston.

The authors intend this to be a guide to the practical study of plants and animals, adapted to the requirements of the London University, Science and Art Department, and for use in schools and colleges. They have succeeded in making a very useful work, exhibiting in a somewhat diagrammatic manner typical specimens of the leading life forms, the characters on which their systematic positions are based, and the main points in their life history. The work, as far as it goes, represents the present stage of biological science. By the use of colour, and by employing the same colour for corresponding systems or organs in the different life forms, great plainness is secured. The Atlas will be a useful companion to any biological hand-book, but its chief use will be in the laboratory or dissecting-room, as designed by its authors. The letterpress consists of little more than explanations of the illustrations, but it is expressed and arranged in such a manner as to convey, or perhaps rather recal, a large amount of information to the student.

W. C.

Das Microgonidium. Ein Beitrag zur Kerntniss des Wahren Wesens der Flechten. Von Dr. Arthur Minks. Basel, Genf, Lyon, H. George's Verlag. 1879.

The subject of the dual nature of lichens is one the approaches to which are so carefully watched, that to say anything about it is almost equal to a conflict in which language, not only personal but violent, is the favourite weapon. The author of the above work does not depart from this mode of discussion until he has had his say. He writes the "epitaph" of the Schwendenerian doctrine, and then calls on mycologists, algologists, and his brother lichenologists to extend their hands to work out in quiet the solution of the difficulties of the question. After reading his book, with the hand of friendship outstretched, it is impossible to see that any particular difficulty remains.

Shortly stated, Dr. Minks's offspring is a theory, backed by his observations and controversial remarks, that microgonidia, which are ultimately transformed into gonidia, exist spontaneously in the hyphæ, rhizines, cortical cells, paraphyses, thecæ, and in the spores and spermatia (!) of lichens. Thus furnished, these organs are, as will easily be seen, equal to the necessities of vegetable life. The Schwendenerian doctrine, as at first announced, may have been startling, and the difficulties to be overcome in its proof hard to dispel; but it must pale in its demand for credence beside the statement that "spermatia are not cells, but compound bodies composed of cells." This is perhaps the extremity to which we are asked to go; but it requires small knowledge of the subject to uphold the assertion that it differs not in nature, but only in degree, from these other propositions offered for our acceptance.

The difficulties attending the manipulation of objects under such high powers of the microscope as Dr. Minks has used in these researches are well known in their effects to all microscopists; and it is very unwise to throw stones when an error is the result of jaded or defective powers of vision under such trying conditions. But in this case of Dr. Minks's microgonidia we have to contemplate not an isolated error, nor a small group of errors but a long series of observations for which the word inaccurate furnishes a feeble description. Many of the bodies described, such as microgonidia in the spores and spermatia, are, we venture to assert, without existence in such situations. How such errors may have arisen it is not for us to explain; but all who have followed the literature of the subject will recal the observations of Dr. Stahl on the hymenial gonidia as suggesting the most probable solution. The small hymenial gonidia which occur in the interstitial spaces of the apothecia of many lichens are the offspring of the ordinary gonidia (thallus-gonidia), and have been carried up in the hymenium by the growth of its hyphæ. When the ascospores are emitted from the apothecia, the hymenial gonidia are cast out also, and, falling in the nieghbourhood of the ascospores, are many of them enveloped by the germinating filaments proceeding from the spores, when the conditions are favourable for growth, Along with the

growth of the hyphæ, these hymenial gonidia increase in size, and ultimately act as the thallus-gonidia of the new lichen. A further experiment, which in its result conclusively proved this was the isolated cultivation of the spores of a species of *Thelidium* with the hymenial gonidia of a *Dermatocarpon*:—the hymenial gonidia of the *Dermatocarpon* belong to the same species of *Pleurococcus* as those of the *Thelidium*. In time Dr. Stahl obtained the thallus of the *Thelidium* complete as regards gonidia and fructification, thus showing that the same species of alga served as the gonidia of two totally different Fungi. From these observations it will be seen that the minute hymenial gonidia are closely associated with the spores, both in the apothecium and in the free state. It is in this association, as observed with probably defective eyesight, or with a bad objective, or with both, that the explanation must be sought for a series of mistakes unparalleled in our experience of botanical literature. The upholders of the views of Schwendener will welcome this book, but the majority of lichenologists will reject it as calculated to bring lichenology and its methods into contempt. G. M.

Under the title 'Botany for Children,' the Rev. G. Henslow has recently issued "an illustrated elementary text-book for junior classes and young children," which is intended to precede Professor Oliver's 'Lessons in Elementary Botany.' We should hardly have thought this necessary; and we do not quite see in what principle Mr. Henslow has gone in his selection of Natural Orders. Only twenty-five of these are chosen for illustration, the others being omitted on account of want of space; among the omissions are the *Umbelliferæ*, *Malvaceæ*, *Borraginaceæ*, and *Scrophulariaceæ*. The little book is well up to date, and there is a good index of terms; the illustrations strike us as being, in many instances, hard and clumsy, although they sometimes show points not often attended to in so elementary a book—*e.g.*, at t. 3, where the apetalous flowers of *Viola* are well shown.

Mr. J. E. Griffith, of Bangor, has commenced a 'Flora of Carnarvonshire and Anglesea' in the 'Naturalist.' So far as we can judge from this first instalment, the enumeration of species is not intended to be critical, nor are the localities given very numerous; while it is strange to find such species as *Helleborus fœtidus* and *Linum usitatissimum* included among British plants with no note of suspicion suggests. The author does not say whether he is himself responsible for the record of the species in the various localities.

A Flora of Hitchin has been commenced in the 'Herts Express' during last month; it contains localities for the plants of the neighbourhood. The statement that "a fitting and competent person is lacking" for the task of compiling a new Flora of Hertfordshire requires correction. Mr. R. A. Pryor, of Baldock, is engaged upon this work, and has already made large collections towards it: he will be glad to receive assistance from anyone acquainted with the botany of the county.

Mr. G. W. Trail has reprinted from the 'Transactions of the Royal Physical Society of Edinburgh' his enumeration of the Algæ of the Frith of Forth.

A condensed edition of Newman's 'History of British Ferns' has been issued at small cost hy Messrs. W. Swan Sonnenschein and Allen. It is a handy little volume, including full descriptions and six plates containing figures (not always very satisfactory ones) of all the species.

Mr. R. D. Fitzgerald's 'Australian Orchids' has reached its fifth part, which contains, amongst others, figures of the new species, *Thelymitra megcalyptra*, *Sarcochilus montanus*, and *Dendrobium falcorostrum*.

The first (specimen) number of a new botanical weekly periodical, called the 'Botanisches Centralblatt,' has been issued. The object of its existence is to supply quickly abstracts, reviews and lists of botanical publications, and general botanical news. Just's 'Botanische Jahresbericht' is necessarily so far behind time that the present publication in no way interferes with it. The editor, Dr. Oscar Uhlworm, of Leipzig, has secured the co-operation of a large staff of botanists. The first number is satisfactory, and if the journal continues to supply these "purely objective" notices without delay it will deserve success.

Articles in Journals.

January.

Nuovo Giornale Bot. Ital.—T. Caruel, 'Fifty genera and species founded upon teratological and pathological specimens.'—A. Bertoloni, 'On the Parasitism of Fungi.'—O. Penzig, 'The crystals of Rosanoff in *Celastrineæ*.'—T. Caruel & F. Cazzuola, 'Observations on the influence of temperature on plants.'—F. von Mueller, 'Note on the synonymy of Eucalyptus.'—L. Nicotra, 'Some vegetable anomalies.'—H. Groves, 'Flora of Sirente.'

Brebissonia.—P. Petit, 'On the Endochrome of Diatomaceæ.'—Id., 'Priority of the name *Gaillonella* (Bory) over *Melosira* (Ag.)'—L. Crié, 'The former climate and fossil remains of the West of France.'—E. Perrier, 'Notice of Ehrenberg' (concluded).—A. de Bary, 'On Symbiose' (concluded).—J. Brun, 'On Diatomaceæ.'

Bulletin of Torrey Botanical Club (New York).—C. F. Austin, 'Bryological Notes and Criticisms.'—W. R. Gerard, 'A new Fungus' (*Simblum rubescens*, tt. 2).

Quarterly Journal of Microscopical Science.—H. Marshall Ward, 'On the Embryo-sac and development of *Gymnadenia conopsea*' (3 tt.)—F. Elfving, 'On the Pollen-bodies of Angiosperms' (1 tab.)—F. O. Bower, 'Development of the conceptacle in *Fucaceæ*' (1 tab.)

February.

Transactions of Linn. Soc. of London (vol. i., pt. vii.)—W. Phillips, 'On a new species of *Helvella*' (*H. californica*) (t. 148).

—C. B. Clarke, 'A Review of the Ferns of Northern India' (tt. 49–61).

Botanische Zeitung.—F. Hegelmaier, 'The Embryogeny of *Lupinus*' (tt. 2) (concluded).—E. Sadebeck, 'Critical aphorisms on the life-history of Cryptogams' (concluded).—A. Gautier, 'On Chlorophyll.'

Œsterr. Bot. Zeitsch.—M. Willkomm, 'Spanish-Portuguese Plants' (continued).—F. A. Hazslinszky, 'An anti-Jordanic species' (*Eurotium* (*Aspergillus*) *glaucum*, De Bary).—J. Gremblich, 'Excursions in the north Chalk Alps.'—C. J. Klinggräff, 'Palestine and its vegetation.'

Hedwigia.—G. Winter, 'Remarks on several *Uredineæ*.'

Magyar Novent. Lapok.—O. Toemoesvary, 'Bacillariæ observed in Dacia.'

Journal of Royal Microscopical Soc.—P. M. Duncan, 'On a part of the life-cycle of *Clathrocystis æruginosa*.'—G. Gulliver, 'Classificatory significance of Raphides in *Hydrangea*.'

Naturalist (Huddersfield).—F. B. White, 'Notes on the antiquity of Mosses.'

Botaniska Notiser.—E. V. Extrand, 'Geographical distribution of the Scandinavian Moss-flora.'—A. P. Winslow, '*Silene inflata*, Sm., and *S. maritima*, With.'

Flora.—A. Winkler, 'Remarks on *Nasturtium officinale*, *Erysimum repandum*, and *Crepis rhæadifolia*.'—C. Kraus, 'On the causes of internal growth' (concluded).—W. Joos, 'On the figures of *Cinchona* in the "Flora Columbiæ."'—J. Klein, 'On the crystalloids of Marine Algæ.'—S. Schulzer, 'Mycological Notes.'—J. E. Weiss, 'The Anatomy and Physiology of thickened roots.'—C. Limpricht, 'On German forms of *Sauteria*.'

Journ. Quekett Microscopical Club.—T. S. Cobbold, 'Embryology of *Achimenes picta*.'

Proceedings of Societies.

Linnean Society of London.

February 5, 1880.—William Carruthers, F.R.S., Vice-President, in the chair.—Mr. Chas. Stewart drew attention to a stained microscopic section of the ovary of *Hyacinthus orientalis*, showing the intra-nuclear network in the cells of the ovules. The nuclei before dividing appear greatly increased in size, with a well-defined network of highly refractive fibres; this network then becomes aggregated at opposite sides of the nucleus, forming two star-shaped masses connected by fine fibre; the latter rupture when the stellate masses become rounded, and form the nuclei of

the two new cells.—Mr. R. Irwin Lynch brought under notice a mounted example of the pods of *Acacia homalophylla*, wherein each seed was attached by a very long, bright red funicle, which lies up and down on each side of the seed. This funicle is supposed to be always detached with the seed, and, from its brilliant colour, to serve as an attraction to birds, and so to assist in the dissemination of the plant.—Mr. C. Baron Clarke then gave an oral *résumé* of the Order *Commelynaceæ*, which Order he had lately worked out for the new series of monographs supplementing DeCandolle's Prodromus. He defined the Order in question by the position of the embryo, not surrounded by the albumen, but closely applied to the embryostega, which is always remote from the liolum. An important auxiliary character is that the three segments of the calyx are always imbricated, so that one is entirely outside the two others. The author divided the Order as follows:—Tribe I. *Polliceæ:* fruit indehiscent. Tribe II. *Commelyneæ:* capsule loculicidal, fertile stamens 3—2. Tribe III. *Tradescantieæ;* capsule loculicidal, fertile stamens 6—5. The Order contains, according to Mr. Clarke's researches, twenty-six genera and 309 species. He remarked on the character of the two-ranked seeds, on which the genus *Dichospermum* had been founded, and which species in various genera exhibit. He also called attention to the remarkable change of colour in the petals of several species (as in *Aneilema versicolor*, Dalz.), which are yellow when fresh, and of a deep blue shade when dry.

February 19, 1880.—W. Carruthers, F.R.S., Vice-President, in the chair.—Mr. Edwin Simpson-Baikie was elected a Fellow of the Society.—Mr. James Britten exhibited specimens of the stems of *Myrmecodia echinata* and *M. glabra*, recently sent from Borneo by Mr. H. O. Forbes, showing the galleries formed by a species of ant allied to, if not identical with, *Pheidole javana*, Mayr. Very young plants of one of the species of *Myrmecodia* were also exhibited, all of which had been attacked by ants. Beccari, in his description of *Myrmecodia*, which he had studied in its native localities, states that the young plants when not thus attacked soon die; the presence of the ants apparently being essential to the existence of the species.—Dr. Maxwell T. Masters also brought forward an example of Pitcher Plant (*Nepenthes bicalcarata*) from Borneo, and he read a note thereon from Mr. Burbidge. Pitchers are perfect traps to creeping insects, by reason of the incurved spinous ridges round the throat of the pitcher. Providing against this difficulty, a certain species of black ant ingeniously perforates the stalk, and so obtains safe inroad and exit to the dead and decaying insects and the water contained in the reservoir. The remarkable Lemuroid *Tarsius spectrum* likewise visits the pitcher plants for the sake of the entrapped insects. These it can easily obtain from the *N. Rafflesiana;* but not so from *N. bicalcarata*, on account of the sharp spurs by which the lid is protected.—Dr. J. E. T. Aitchison read a contribution "On the Flora of the Kuram Valley, Afghanistan." Of 15,000 specimens, or 950 species, collected, the material shows a meeting of floras, European, Persian,

Afghanistan, Tibetan, and Himalayan in character. In the Kuram and Hariab Valleys, the deodar, our finest Himalayan timber tree, forms dense forests, many of which will be found easily worked, and hereafter valuable for exportation. The pine and the oak forests descend and recede much according to the nature of the hill range, its exposure, dryness, or moisture. The walnut and amlok (*Diospyros Lotus*) produce excellent fruit. *Chamærops Ritchieana*, a branching palm twenty feet high when uninjured, forms an aloe-like scrub on the plateau W. to the Darwaza Gar Pass. Of new species and varieties, the genera *Acantholimon*, *Astragalus*, *Oxytropis*, *Cousinia*, *Nepeta*, *Sedum*, *Saxifraga*, *Pleurospermum*, *Cotyledon*, *Eremurus*, *Rosa*, *Rhododendron*, *Clematis*, and *Polygonum* yield noteworthy examples. Ferns were not plentiful, though over a dozen species were found, including *Nephrodium rigidum*, most characteristic, now for the first time found in Afghan. Most of the European edible fruits are found in the orchards. Tobacco is occasionally grown, but plants used in kitchen gardening are rarely cultivated. The climate of the Hariab district is much colder and dryer than Kuram, and the rigour of the winter accordingly reacts on the vegetation. Dr. Aitchison *en passant* gave interesting information relative to the native uses of the plants, and also mentioned that from Kuram to Ali-Khal nearly every house keeps bees, so that a large trade is done in barter for honey.

Botanical News.

The Rev. Eugene O'Meara, M.A., died on the 20th of last January, at Newcastle Lyons Rectory, Hazlehatch, Co. Dublin, at the age of about sixty-five. He was well known to microscopists on account of his researches among Diatomaceæ, a group upon which he published numerous memoirs. He was one of the original founders of the Dublin Microscopical Club.

We have also to announce the death, during the past month, of the Rev. R. H. Webb, of Essendon, Herts., at the age of about seventy-five. In conjunction with the Rev. W. H. Coleman, he was the author of the 'Flora Hertfordiensis' (1849) and of two supplements to the work, as well as of a further list of additions which will be found in this Journal for 1872.

Prof. Thos. Bell, died last month at Selborne, at the age of eighty-seven. He was the oldest Fellow of the Linnean Society, having been elected into that body in 1815.

Dr. Trimen arrived at Peradenia on the 17th of February.

The meetings of the Royal Society will henceforward be held at 4.30 in the afternoon.

The lichen herbarium of Mr. W. Joshua, of Cirencester, has been acquired by the British Museum.

Original Articles.

A REVIEW OF THE BRITISH *CHARACEÆ*.

By Henry and James Groves.

(Tabs. 207–210.)

(Continued from p. 97.)

iv. C. aspera, Willd. Gesells. Nat. Freunde Berl. (1809), iii., p. 298; Wallr. Ann. Bot., p. 185, tab. vi., f. 3; Bruzel, Obs. Char., pp. 12 and 22; Greville, Scott. Crypt., vi., No. 339; Wilson, E. B. S. 2738; Coss. & Germ. Atl. Flor. Par., tab. 38, fig. *d.*; Gant. Oesterr. Char., p. 15; Bab. A. N. H. (1850), v., p. 90; Wallm. Act. Stockh., 1854, p. 322; Kütz. Tab. Phyc., vii., t. 51, f. 2 & t. 52; Braun, Consp. Char. Europ., p. 6; Braun, R. & S. Exs. 11, 12, 50, 98, 99; Nordst. & Wahlst. Exs. 106–114.

C. hispida, "Linn.," Flor. Danica (1829), t. 1940; Ruprecht. Symb. ad Hist. Pl. Ross., p. 85; Nordst. Bot. Not. (1863), p. 44.

C. delicatula and *C. intertexta*, Desv. in Loisel. Not. (1810), pp. 137–8.

C. fallax, Ag. Syst. Alg. (1824), Introd., p. 28.

C. pusilla ? and *C. equisetifolia*, Kütz. Flora (1834), p. 705.

Stem slender, moderately branched, sometimes producing smooth calcareous globular bulbils at the lower nodes, irregularly corticate, the cortical cells* obliquely joined, bearing slender, acute, spreading, spine-cells. Internodes long. Whorls of 6–9 nearly straight or incurved branchlets, in the male plant shorter and more incurved than in the female. Stipulodes prominent. Branchlets of 6–9 joints, usually but 2 ecorticate. Bract-cells 8–10, whorled, of nearly the same length, longer than the nucule. Nucule ovoid, 13-striate, coronula obtuse, spreading. Diœcious. (Tab. 207, fig. 4.)

b. *capillata*, A. Br., Consp. Char. Europ. (1867), p. 6.—Spine-cells many, very long. Usually of a bright clear green.

c. *subinermis*, Kütz. Sp. Alg. (1849), p. 521; Braun, Consp. Char. Europ., p. 6.—Spine-cells very few and inconspicuous, much shorter than in the type.

d. *lacustris*.—Much smaller, 1–4 in. high. Branchlets short, stout, incurved. Spine-cells papillate. A lake form. (Fig. 4a.)

A small plant growing in dense masses, carpeting the lakes, &c., in which it occurs, usually greyish green, sometimes much incrusted.

* The magnified stem in the figure of this species, as well as in that of *C. connivens*, shows too few cortical cells, and in *C. canescens* too many are represented.

C. curta, Kütz. Tab. Phyc. vii., t. 53. *C. aspera*, var. *curta*, A. Braun, is a small form with very short branchlets and many spine-cells, which may probably be found in Britain. *C. aspera* appears to be confined to the northern hemisphere; it is widely distributed in Europe, but more common in the north, also occurring in Asia, North Africa, and North America; it is rare in England, but more common in Ireland.

Lakes, ponds, canals, and brackish pools. July and August.—Cornwall, W.; Hants, "Hut Pond" (var. c); Surrey; Carnarvon; Anglesea (and var. b); Nottingham; York, S.W.; Northumberland, S.; Fife (and var. c); Shetland; Kerry, N.; Wicklow; Westmeath; Galway, "Laverly Common"; Mayo, "Lough Mask" and "Foxford"; Cavan; Antrim.

Var. *capillata*.—Near Holyhead, Anglesea, W. Wilson, July, 1828.

Var. *lacustris*.—Lough Cullen, West Mayo, Hb. More.

§ 2. Diplostichæ.—*Stem with* 2 *rows of cortical cells to each branchlet.*

v. C. tomentosa, Linn. Spec. Plant. (1753), p. 1156; Bruzel. Obs. Char., pp. 13 and 20; Fl. Dan. (1829), t. 1941; Bab. A. N. H., v. (1850), p. 90; Wallm. Act. Acad. Stockh., 1854, p. 317; Kütz. Tab. Phyc., vii., t. 74, f. 1; Nordst. & Wahlst. Exs. 30, 31, 50–4, 88, 89.

C. latifolia, Willd. Gesells. Nat. Freunde Berl., iii. (1809), p. 298; Hook. Lond. J. of Bot., 1842, p. 43; Hook. Icones Plant., vol. vi. (1843), t. 532.

C. ceratophylla, Wallr. Ann. Bot. (1815), p. 192, tab. v.; Fl. Dan. (1819), 1654; Bruz. Obs. Char., p. 20; Gant. Oesterr. Char., p. 16, f. 10; Wallm. Act. Acad. Stockh., 1854, p. 318; Kütz. Tab. Phyc., vii., t. 73; Braun, Consp. Char. Europ., p. 5; Braun, R. & S. Exs. 8, 9, 35, 36.

Stem rather stout, much branched. Primary cortical cells very prominent, with scattered, short, stout, acute, usually solitary, spine-cells. Whorls of 5–7 slightly incurved branchlets. Stipulodes usually small, ovate-acuminate. Branchlets stout, of 4–6 long joints, of which 1–3 are ecorticate. Bract-cells usually 5, whorled, very broad, longer than the nucule. Nucules ovoid 12–14 striate, coronula prominent, spreading. Globules very large. Dicœcious. (Tab. 207, f. 5.)

A large plant, sometimes much incrusted, distinguished by its stout bract-cells, which are very conspicuous. As Linnæus in 'Species Plantarum' distinguishes *C. tomentosa* from *C. hispida* by the character "*aculeis caulinis ovatis*," it is evident that he had our plant in view, and the specimen in his herbarium is a good representative of it; the Linnean name has therefore been retained in preference to *C. ceratophylla*, Wallr., that adopted by Braun.

First discovered in Ireland by Dr. D. Moore in 1841, at Belvidere Lake, Westmeath, and afterwards found by him in a second locality, in the River Shannon below Portumna. *C. tomentosa* is apparently confined to Europe, being commoner in the Baltic districts. The Irish plant is a small form with sometimes only

Tab. 208.

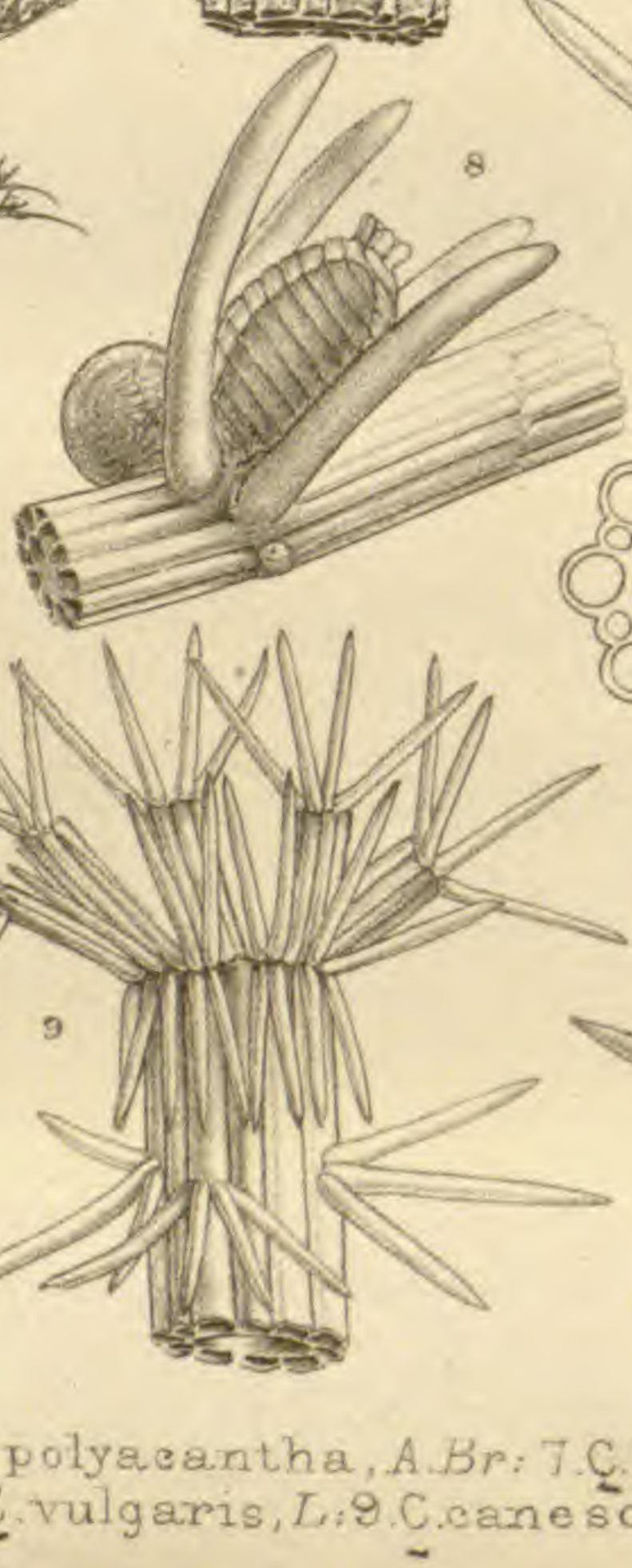














6. C. polyacantha, *A. Br:* 7. C. hispida, *L.*
8. C. vulgaris, *L:* 9. C. canescens, *Lois.*

H. Grove del. Blair lith. *West, Newman & Co. imp.*

the lowest joint of the branchlets corticate, but one of the Portumna specimens in Dr. Moore's herbarium is larger, and is remarkable for its very prominent stipulodes. (fig. 5a.)

VI. C. POLYACANTHA, Braun, R. & S. Exs. 48 (1859); Braun, Consp. Char. Europ. (1867), p. 6; Fl. Dan. (1867), t. 2746.,

Hippuris muscosis sub aqua repens in Hibernia, Pluk. Phytog. (1691), t. 193, f. 6.

C. pedunculata, Kütz. Flora, 1834, i., p. 706 ?

C. spondylophylla, Kütz. Phyc. Gen.; Tab. Phyc., vii., t. 68, f. 2.

C. hispida, var. *pseudo-crinita*, Braun, Ann. Sc. Nat., 1834, p. 355; Cosson & Germ. Atl. Flor. Par., t. 38, f. B 3.

Stem rather stout, little branched. Primary cortical cells more prominent than the secondary, which are joined obliquely. Spine-cells many, long, slender, spreading, usually fascicled. Internodes long. Whorls of 8–10 straight or slightly-incurved branchlets. Stipulodes long, slender. Branchlets of 6–8 joints, the upper 2 ecorticate. Bract-cells 6–10 acute, whorled, longer than the nucule. Nucules 3–4 on a branchlet, sometimes 2 together 12–13 striate. Coronula short, slightly spreading, obtuse. Monœcious. (Tab. 208, fig. 6.)

This is one of our most spinous species, and is usually very much incrusted. It may be distinguished from *C. hispida* by its smaller size, shorter branchlets, comparatively longer internodes, much more densely crowded spine-cells, as well as by the prominence of the primary cortical cells. The smaller forms, when sterile, much resemble some states of *C. aspera*, but may be separated from it by their fasciculed spine-cells. The secondary cortical cells are sometimes so obliquely joined as to render it almost triplostichous, thus presenting a passage to that group. This species was first collected by Sherard in turf-bogs in Ireland, and was figured from his specimen by Plukenet in 1691. It is an uncommon species, and has only been found in Europe, chiefly in the north.

Ponds, fens, and turf-bogs. June. Cambridge; Yorks, N.E.; Fife; Cork (Shanagarry Bog); Galway, E.; Mayo (Foxford).

VII. C. HISPIDA, Linn. Sp. Pl. (1753), ii., p. 1157; Fl. Dan. (1764), vol. i., t. 154; Eng. Bot., 463 (1798); Wallr. Ann. Bot., p. 187, t. 4; Bruzel., Obs. Char., pp. 9 and 20; Coss. & Germ. Atl. Flor. Par., t. 38, f. B; Gant. Oesterr. Char., p. 17, f. 14; Bab. A. N. H. (1850), v., p. 89; Wallm. Act. Stockh., 1854, p. 308; Kütz. Tab. Phyc., vii., t. 65–67; Braun, Consp. Char. Europ., p. 5; Braun, R. & S. Exs. 2, 3, 49, 85, 117; Nordst. & Wahlst. Exs. 55–61.

C. spinosa Vaillantii. Rupr. Symb. ad Hist. pl. Ross. (1846), p. 83.

C. equisetina, Kütz., Flora, 1834, i., p. 706; Tab. Phyc., vii., t. 68, f. 1.

Stem stout, rough, cortical cells irregular, more or less spiral, the secondary larger and more prominent, upper part of stem with many slender, acute, spreading spine-cells. Whorls of 9–11

spreading, or slightly incurved branchlets, stipulodes prominent. Branchlets of 7–9 joints, usually but 1–2 ecorticate. Bract-cells 6–10, acute, whorled, the inner usually much longer than the nucule, the outer shorter, sometimes not half as long as the nucule. Nucule ovoid, 10–12 striate. Coronula spreading. Monœcious. (Tab. 208, f. 7.)

b. *macracantha*. Braun, Consp. Char. Europ., p. 5.—Spine-and bract-cells very long.

c. *gymnoteles*. Braun, Ann. Sc. Nat., 1834, p. 355; Kütz. Tab. Phyc., vii., t. 66, f. *a*.—Spine-cells few. Branchlets with several ecorticate joints.

d. *rudis*. Braun, R. & S., Exs. (1857), 4, 86.—*C. rudis*, Braun, Consp. Char. Europ. (1867), p. 6; Nordst. & Wahlst., Exs. 62–66.—*C. subspinosa*, Rupr. Symb. ad Hist. pl. Ross. (1846), p. 225?—Stem more slender than in the type, secondary cortical cells very strongly developed, almost hiding the primary, spine-bearing cells. Bract- and spine-cells shorter and more obtuse. A well marked form. (Fig. 7a.)

e. *horrida*.—*C. horrida*, Wahlst. Skand. Char. (1862), p. 24; Braun, Consp. Char. Europ., p. 6; Braun, R. & S., Exs. 71, 87; Nordst. & Wahlst., Exs. 98–101.—*C. baltica*, var. *fastigiata*, Wallm. Act. Stockh., 1854, p. 314.—A small form. Spine-cells short, patent, very numerous. Branchlets straight, spreading. Unincrusted.

The largest British species, sometimes 3 ft. or more in height, with sterile branchlets 4 in. long. Usually much incrusted. In ordinary forms it may be distinguished from *C. vulgaris* by its much stouter stem, more numerous and spreading spine-cells, and by the presence of bracts on the outer side of the branchlets. We have received a very interesting sterile form from Prof. Churchill Babington, which resembles *C. papillosa* Kütz. (*C. intermedia*, Braun), in general appearance. Among the specimens sent us by Mr. Curnow is a remarkable plant from the Lizard Downs, which we had considered a form of *C. hispida*, but, from a fresh specimen recently shown us by Mr. A. Bennett, it would appear to belong to the section having the primary cortical cells more prominent than the secondary, and to hold a position near *C. baltica*, Fries; a series of specimens collected later on will, no doubt, satisfactorily define its position. We have used the name of *C. hispida* as it has been so generally adopted; and the description in 'Species Plantarum' might be fairly considered to include our plant, although the specimen in the Linnean Herbarium so labelled is *C. aspera*, and the distribution given by Linnæus "*In Europæ maritimis*" is scarcely applicable. *C. hispida* is generally distributed in Europe and extends to North Africa.

Ponds, canals, pools and fen ditches. June. Wight (and var. e); Hants, S.; Sussex, W.; Kent, E. and W.; Surrey; Essex, N.; Oxford; Suffolk, E. and W.; Norfolk, E.; Cambridge (and var. c): Northampton; Salop; Leicester; Cheshire; Yorks,

N.E. and M.W.; Durham (var. d); Roxburgh (var. d); Berwick; Perth (and var. d, "Moss of Thurloch"); Forfar (and var. b); Wicklow (and var. b); Galway, W.; Westmeath (and var. c); Derry (var. c).

Var. *horrida*.—Golden's Common, Freshwater, Isle of Wight. Herb. A. G. More.

VIII. C. VULGARIS, Linn. Spec. Plant. (1753), p. 1156; Wallr. Ann. Bot., p. 179, t. 1; Smith, E. B., 336; Bruzel., Obs. Char., pp. 5 and 21; Rupr. Symb. ad Hist. pl. Ross., p. 80; Bab. A. N. H., v. (1850), p. 89; Kütz. Tab. Phyc., vii., t. 58, f. 1.

C. funicularis and *batrachosperma*, Thuill Fl. Par. (1799) p. 473.

C. fœtida, Braun, Ann. Sc. Nat., 1834, p. 354; Consp. Char. Europ., p. 5; Coss. & Germ. Atl. Fl. Par., t. 37; Gant. Oesterr. Char., p. 18, f. 13; Wallm. Act. Stockh., 1854, p. 304; Bab. Man., ed. vii., p. 461.

C. hispida, var. *gracilis*, Hook. Brit. Flor., ii. (1833), p. 247.

C. longibracteata, "Kütz." Wallm. Act. Stockh., 1854, p. 305.

Stem moderately branched. Primary cortical cells less prominent than the secondary, bearing few, small, obtuse, usually appressed, spine-cells. Whorls of 6–9 incurved, or recurved branchlets. Stipulodes small, obtuse. Branchlets of 5–7 (usually6) joints, the upper 2–3 ecorticate. Bract-cells 4, anterior, longer than the nucule (the posterior bract-cells are usually rudimentary). Nucules ovoid, 12–13 striate, 3–4 on a branchlet. Coronula somewhat spreading. Monœcious. (Tab. 208, f. 8.)

b. *longibracteata*, Kütz., Sp. Alg. (1849), p. 524. — *C. longibracteata*, Kütz. Tab. Phyc., vii., t. 60, f. 1. — *C. fœtida*, var. *longibracteata*, Coss. & Germ. Atl. Fl. Par., t. 3, f. 7. — A large form with branchlets, and bract-cells much longer than in the type.

c. *papillata*, Wallr. Ann. Bot. (1815), p. 183. — *C. decipiens*, Desv. in Loisel. Not., 1810, p. 138 ? — *C. collabens*, Ag. Syst. Alg. (1824), Introd., p. xxviii. — *C. fœtida*, var. *papillaris*, Braun, Ann. Sc. Nat., 1834, p. 355; Coss. & Germ. Atl. Fl. Par., t. 37, f. 6.— *C. fœtida*, var. *subhispida*, Braun, Flora, 1835, i., p. 64. — Spine-cells spreading, longer, and more numerous than in the type, deciduous, secondary cortical cells usually very prominent. This form approaches *C. hispida*.

d. *atrovirens*.—*C. atrovirens*, Lowe, Trans. Camb. Phil. Soc., vi. (1838), p, 551. — *C. vulgaris*, var. *munda*, Wallr. Flor. Crypt. Germ. (1833), p. 111 ?—*C. fœtida*, var. *munda*, Braun.—*C. punctata*, Lebel.—Branchlets spreading, the upper ecorticate joints elongated. Spine-cells few and inconspicuous. Unincrusted, of a dark green.

e. *crassicaulis*, Kütz. Sp. Alg. (1849), p. 523. — *C. crassicaulis*, Schleicher; Kutz. Tab. Phyc., vii., t. 60, f. 2; Braun. Consp. Char. Europ., p. 5. — *C. fœtida*, var, *crassicaulis*, Braun, Ann. Sc. Nat., 1834, p. 355.—*C. longibracteata*, var. *crassicaulis*, Wallm. Act. Stockh., 1854, p. 306. — Stem stout. Bract-cells short, ovate. Spine-cells papilliform. Branchlets stout, connivent, with usually

but half the joints corticate. This is a very distinct plant, and ought perhaps to be regarded as a species. Fig. 8a. (Part of specimen in Herb. Kew, and branchlet of upper whorl.)

A very variable species, the larger form approaching *C. hispida*, but in the smaller and ordinary forms easily distinguishable from it by the more slender stem and few, obtuse, appressed spine-cells. The variation is well summarized in Braun's 'Conspectus':—"Variat *subinermis* et *subhispida*, *macroteles* et *brachyteles*, *longibracteata* et *brevibracteata*, *elongata* et *condensata*, *macrophylla* et *brachyphylla*, aut *stricta*," "aut *convergens*, aut *divergens*, imo *refracta*, valde *incrustata*, rarius *munda*, plerumque *phæocarpa*, rarissime *melanocarpa*"; and a very careful and complete analysis of the forms is given by Braun in 'Characeen Afrikás.' The name of *C. vulgaris* has recently been superseded in England, as elsewhere, by *C. fœtida*, Braun, but we have returned to the original name, although it is open to the same objection as most of the Linnean names, that it included more than the species as we now have it; but the alternative name of *C. fœtida*, A. Br., has less claims to acceptance, as it has held at least three distinct values in the hands of its author. *C. vulgaris* has a world-wide distribution, being common in Europe, and occurring in Asia, Africa, America, and Australia. It is our commonest species, but does not appear to be so abundant in Ireland.

Stagnant and slowly running water. May and June. Cornwall, W. (and var. d); Wight (and var. b); Hants, S. (and var. b); Sussex, W. (and var. b); Sussex, E. (and var. c); Kent, E. and W.; Surrey; Essex, S. and N.; Middlesex (and var. b); Oxon; Suffolk, W.; Norfolk, E. (var. c); Cambridge (and var. c); Bedford; Northampton; Warwick (and var. e); Anglesea (var. b.); Leicester; Nottingham; Derby; Cheshire; Lancashire, S.; York, S.E. (var. c); York, N.E., S.W., and M.W.; Durham; Northumberland; Westmoreland; Roxburgh; Edinburgh; Fife; Forfar; Kerry, N.; Cork, N. (and var. b); Dublin (and var. b); Westmeath.

Var. *crassicaulis*.—Coventry Park, Warwick, 1856. T. Kirk, in the British Museum and Kew Herbaria, &c.

[*C. contraria*, Braun, which closely resembles *C. vulgaris*, but differs in having the primary cortical cells more prominent than the secondary, its strict habit, and smaller size; and *C. papillosa*, Kütz. (*C. intermedia*, A. Br.), which bears somewhat the same relation to *C. hispida*, should be looked for.]

§ 3. HAPLOSTICHÆ.—*Stem with* 1 *row of cortical cells to each branchlet.*

IX. C. CANESCENS, Lois. Notice (1810), p. 139; Reich. in Mössler's Handb., ed. iii., p. 1669.

C. crinita, Wallr. Ann. Bot. (1815), p. 190, t. 3; Bruz. Obs. Char., pp. 10 and 19; Gant. Oesterr. Char., p. 14, f. 8; Bab. A. N. H., 1850, p. 88; Wallm. Act. Stockh., 1854, p. 319; Kütz. Tab. Phyc., vii., t. 69, f. 1; Braun, Consp. Char. Europ., p. 5; Fl. Dan. (1867), t. 2747; Braun, R. & S., Exs. 6, 65–68, 80; Nordst. & Wahlst., Exs. 23–29.

Stem little branched, cortical cells large, bearing densely crowded, fascicled, aciculate, spine-cells. Whorls of 8–10 short, slightly incurved branchlets. Stipulodes long. Branchlets of 6–8 joints, 1–2 ecorticate. Bract-cells 7–11, acute, whorled, at the nodes of all the corticate joints, usually nearly all exceeding the nucule. Nucules oval, 10–12 striate, 3–4 on a branchlet. Coronula small, spreading. Diœcious. (Tab. 208, fig. 9).

A small, rigid, extremely spinous plant, usually but little incrusted. The globule-bearing plant is extremely rare, and in its absence, reproduction takes place by parthenogenesis. Although Loiseleur gave the grey colour (which is exceptional) as one of the chief characters for his species, we think, from the other characters given, that there is not the slightest doubt that he described an incrusted form of our plant; we have therefore adopted his name in preference to the more recent *C. crinita*, Wallr. The only British specimen of this species we have seen is from Budock Pool, near Falmouth, Rev. W. L. P. Garnons in Prof. Babington's herbarium; it has been recorded from Ireland, but the plant circulated under the name of *C. crinita* by Mr. Carroll is *C. polyacantha*. Our description and drawing have necessarily been taken from foreign specimens. *C. canescens* is recorded from Europe, Asia, North Africa, and North America.

(To be continued).

SOME DORSET PLANT-STATIONS.

By the Rev. W. Moyle Rogers.

Fritillaria Meleagris, L., is the only plant mentioned in the following notes which I have not actually seen in the station or stations named. None of these stations find a place in Mr. Mansel-Pleydell's 'Flora of Dorset.' In that work the county is divided into seven districts, formed with reference to the river drainage, and distinguished in his beautifully clear map by the capitals A, B, C. D, E, F, G. These capitals will accordingly be placed before the several stations mentioned in these notes to show to which of his districts such stations respectively belong. The date of all records for Rosæ and Rubi is 1879. Other records for Districts A and E range from 1870 to 1872; and those for the rest of the county from 1874 to 1879, most of these last (especially those for Distr. B) having been at least verified within the last two or three years.

Adonis autumnalis, L. E. Between Stoke Wake and Ansty; a plant or two, on waste ground by roadside. I suppose only "casual."

Ranunculus peltatus, Fries (aggregate). B. Leigh, ditches by roadside on Chetnole Road.

R. Drouettii, Schultz. C. In pool near Lulworth Cove, towards West Lulworth.

R. arvensis, L. F. Roadside between Blandford and Shillingston.

Helleborus fœtidus, L. E. Ibberton; broken rocky waste ground near the churchyard; an "escape."

Aquilegia vulgaris, L. A. Fern Hill, near Charmouth; no doubt indigenous.

Papaver Rhœas, L., b. *strigosum*. C. West Lulworth churchyard, in some quantity.

Senebiera didyma, Pers. C. Lulworth Cove. Far less frequent in Dorset than in Devon.

**Armoracia rusticana*. Bab. Man. A. Banks of the Char, near the mouth. Well established in 1871, and apparently spreading.

Draba verna, L., b. *brachycarpa*. B. Chetnole; the prevailing form, as (it appears to me) usually in S.W. England.

Diplotaxis muralis, DC. B. Near Yetminster railway-station; a few plants; "casual."

Reseda suffruticulosa, L. A. Swanage beach; "casual."

Polygala calcarea, F. Schultz. E. Woolland, on the western slope of Bulbarrow.

Sagina nodosa, Meyer. C. Wool Heath. Along the base of Bindon Hill, between West Lulworth and Arish Mill. Very sparingly in the latter station.

Arenaria serpyllifolia, L., b. *leptoclados*. B. Chetnole, walls, &c., frequent.

Stellaria media, With., d. *umbrosa*. B. Chetnole, lanes.

S. aquatica, Scop. Remarkably abundant in B. Chetnole and neighbouring parishes; and E. Holwell, Hazelbury Bryan, &c.

Linum angustifolium, Huds. A. Whitchurch Canonicorum. Far more local in Dorset than in Devon.

Malva rotundifolia, L. E. Fifehead Neville.

Hypericum montanum, L. C. Near East Lulworth, bushy roadside towards West Lulworth; a few plants at intervals.

Geranium pusillum, L. C. West Lulworth.

Oxalis corniculata, L. B. Chetnole, garden weed.

Rhamnus catharticus, L. B. Chetnole and Yetminster lanes, rather frequent.

R. Frangula, L. A. Near Chardstock, bushy waste ground by road to All Saints.

Genista tinctoria, L. C. Cliffs east of Lulworth Cove, abundant; a form with stem and branches as procumbent as in the *G. humifusa*, Dicks., of the Lizard District, Cornwall, but having glabrous pods.

G. anglica, L. E. Holnest Common.

Lotus tenuis, Kit. C. Near Weymouth, between railway and backwater; abundant, 1875.

Vicia sylvatica, L. (?E.) Wood west of Dogberry turnpike gate, in great quantity.

Lathyrus Nissolia, L. B. Near Chetnole, on Leigh road, a few plants at intervals. E. Fifehead Neville.

L. sylvestris, L. C. Cliffs east of Lulworth Cove; but perhaps only as an "escape," there being ruins of a house near.

Geum rivale, L. B. Woollcombe, Bubb Down. Very local in S.W. England, though found in all the seven districts of Dorset.

Comarum palustre, L. C. Wool Heath, abundant. Local like the last.

Rubus Lindleianus, Lees. B. Chetnole, "Bound Lane." Not in the 'Flora of Dorset.'

R. *leucostachys*, Sm. B. Yetminster; Chetnole; Leigh; frequent. E. Holwell.

R. diversifolius, Lindl. B. Chetnole and Leigh. E. Holwell. Not in the 'Flora of Dorset,' though Babington's 'British Rubi' gives "Poole, *Dors.* (Salter!)" for it.

R. Balfourianus, Blox. B. Chetnole. With reference to this plant, Professor Babington writes to me, "I am obliged to place this under *Balfourianus*, which is an unsatisfactory aggregate plant." Not in the 'Flora of Dorset.'

R. corylifolius, Sm. B. Chetnole; rather frequent.

R. althæifolius, Host. B. Chetnole and Yetminster; in great quantity in the two or three places where observed. Not in the 'Flora of Dorset.'

R. tuberculatus, Bab. B. Leigh, hedge bordering Totnel Common.

Rosa tomentosa, Sm. B. Chetnole and Yetminster; in several places. The type and forms near it. E. Holwell.

R. micrantha, Sm. B. Chetnole lanes, but only in two or three places.

R. canina, L.:—*R. lutetiana*, Leman. B. Chetnole; common. E. Holwell.

R. sphærica, Gren. B. Chetnole, fields about "the Knoll"; several bushes. Not in the 'Flora of Dorset.'

R. dumalis, Bechst., and *R. urbica*, Leman. B. Chetnole and neighbourhood. E. Holwell.

R. obtusifolia, Desv. B. Chetnole; Leigh: Yetminster; quite common. E. Holwell. Not in the 'Flora of Dorset.'

R. ? Reuteri, Godet. B. Chetnole. "Rather *Reuteri* than *subcristata*" is Mr. Baker's note on the label (sent with specimens), on which I had written "*R. ? subcristata*." The large bush (or two) from which I gathered these specimens is the only representative of Mr. Baker's Subcristatæ group of *R. canina* that I have observed in Dorset; and there is no representative of the group in the 'Flora of Dorset.'

R. systyla, Bast. B. Chetnole; Leigh; Yetminster; very common. E. Holwell.

R. arvensis, Huds., b. *bibracteata*, Bast. B. Chetnole and Yetminster. Not in the 'Flora of Dorset.'

Epilobium tetragonum, L. The segregate. B. Leigh, Chetnole, and Yetminster; more abundant than *E. obscurum*, Schreb., the soil being clayey. In 'Topogr. Bot.' the aggregate only is recorded for Dorset; the 'Flora of Dorset' in this instance not distinguishing the segregates.

Ribes Grossularia, L. C. Cliffs near Durdle-door, several bushes.

Sedum Telephium, L., a. *purpurascens*, Koch. C. Between Wool and West Lulworth, thicket by roadside; several plants, Sept., 1874. Certainly a very different plant (as it grows here and in the Teign Valley, Devon) from b. *Fabaria*, Koch, which I have seen only close to the sea, by the "Logan Rock," between Penzance and Land's End, Cornwall. I am not surprised, therefore, to find Dr. Nyman, in his "Conspectus Floræ Europææ," treating them as distinct species.

S. album, L. B. Chetnole and Leigh; on walls, rather frequent, but plainly only as an "escape."

S. reflexum, L. B. Near Sherborne, roadside; and at Chetnole. An "escape" in both places.

Chrysosplenium oppositifolium, L. B. Water lane from Bubb Down to Chetnole. E. Woolland. Considered by Mr. Mansel-Pleydell "uncommon" in Dorset.

Petroselinum segetum, Koch. C. Lodmoor, and by Weymouth Backwater.

Sium angustifolium, L. C. Wool Heath.

Œnanthe pimpinelloides, L. B. Chetnole and Yetminster. C. Lulworth and neighbourhood. E. Woolland and neighourhood. Frequent in all. Widely distributed in Dorset and in S.E. Devon, but becoming scarce in W. Devon, and not yet reported from N. Devon or Cornwall.

Torilis infesta, Spreng. F. Between Hilton and Milton Abbas; bank by roadside.

Sambucus Ebulus, L. E. Woolland; in considerable quantity in one field between the church and the Rabbit Warren.

Asperula cynanchica, L. E. Woolland, abundant.

Valerianella Olitoria, Mœnch. A. Charmouth. The only Dorset station where I have observed it.

Crepis taraxacifolia, Thuil. E. Woolland, in a long strip of waste land below the plantation north of the Rabbit Warren, 1871. Perhaps only a "casual," though there was nothing in the situation or surroundings to suggest such an origin. Not otherwise reported for the county.

Arctium majus, Schk. E. Woolland. The only Dorset station where I have seen it. In the 'Flora of Dorset' said to be "generally distributed," no other species being mentioned. But *A. minus*, Schk. (aggregate), is certainly abundant in districts B (Chetnole, &c.), and E (Woolland).

Carduus eriophorus, L. E. Roadside over a common near Hazelbury Bryan, towards Woolland; a few plants for a short distance.

C. pratensis, Huds. E. Woolland, in a meadow towards Stoke Wake, abundant.

Bidens tripartita, L. E. Fifehead Neville; and between Holnest Common and Holwell. Apparently the less common species in Dorset.

Artemisia Absinthium, L. C. By Weymouth Backwater. G. Near East Lulworth. In both stations no doubt derived from former cultivation.

Inula crithmoides, L. C. On the limestone cliffs to the east of Lulworth Cove, in great quantity.

Solanum nigrum, L. E. Woolland.

Verbascum nigrum, L. C. Between Cerne and Dorchester, waste ground by roadside. The only Dorset station where I have seen it.

Veronica scutellata, L. B. Marshy ground near "Totnel Corner," Leigh.

V. montana, L. E. Woolland Wood.

Orobanche major, L. E. Woolland Wood.

Lathræa squamaria, L. E. Stoke Wake Wood.

Nepeta Cataria, L. C. West Lulworth, hillside towards Durdle-door.

Marrubium vulgare, L. C. Cliffs between Lulworth Cove and Durdle-door, appearing wild. F. Between Shillingston and Blandford, roadside.

Myosotis cæspitosa, Schultz. B. Chetnole, abundant.

Lithospermum officinale, L. A. Undercliff near Charmouth.

Chenopodium olidum, Curt. C. By Weymouth Backwater, on western side, in two or three places, 1874.

C. polyspermum, L. B. Chetnole. Weed in potato garden, abundant, 1875.

C. murale, L., and *C. hybridum*, L. C. West Lulworth, waste ground, in good quantity, 1874.

Atriplex Babingtonii, Woods. C. Near Lulworth Cove.

A. littoralis, L. C. Chesil beach, near Ferrybridge.

Salsola Kali, L. C. Lulworth.

Polygonum minus, Huds. E. Glanville's Wootton, ditch by roadside, 1871.

Daphne Laureola, L. B. Stockwood Common; and between Chetnole and Leigh, roadside.

Epipactis latifolia, Auct. E. Woolland Wood, in great quantity.

Ophrys apifera, Huds. E. Woolland, in same station with *Crepis taraxacifolia*; abundant, 1871 and 1872.

Fritillaria Meleagris, L. B. Near Chetnole (misprinted "Chet-side" in Mr. Pleydell's note in 'Journ. Bot.' for last Nov.), in meadow on the Melbury side, away from gardens. Flowers dingy white. Found in fairly good quantity each spring from 1876 to 1879.

Paris quadrifolia, L. E. Woolland, plantation at N. end of the warren; and Stoke Wake Wood; abundant.

Colchicum autumnale, L. B. Between Ryme and Berwick, bank by roadside.

Alisma ranunculoides, L. B. Leigh, in pool near "Totnel Corner," Leigh. C. Wool Heath.

Sagittaria sagittifolia, L. E. In the Stour near Sturminster Newton.

Carex distans, L. C. Lulworth Cove.

Echinochloa crus-galli, Beauv. B. Chetnole, "casual" garden weed.

Phalaris canariensis, L. C. West Lulworth, "casual" weed in turnip field.

Glyceria fluitans, Br., b. *pedicellata*, Towns. B. Chetnole, frequent.

Sclerochloa maritima, Lindl. C. Lulworth Cove.

Festuca pseudo-myurus, Soyer. B. Chetnole, walls.

Bromus racemosus, Fries. B. Chetnole, meadows.

Aspidium aculeatum, Sw. B. Chetnole, just beyond the last cottage on the Leigh road. Much less common than *A. angulare*, With., in Dorset and Devon.

Osmunda regalis, L. A. Undercliff by "Golden Head," near Charmouth, 1871.

Botrychium Lunaria, Sw. F. Top of Balbarrow, at intervals; very minute plants.

Ophioglossum vulgatum, L. E. Woolland, field N.W. of Woolland House, in great quantity.

The above notes refer only to plants which are either (1) uncommom in Dorset itself or in S.W. England generally, or (2) the distribution of which is very imperfectly known (as in the case of *Rubi* and *Rosæ*). The following stations for plants which are decidedly commoner, but are not known to Mr. Pleydell to occur in all seven districts, are in every instance given to fill a gap in his Flora for the district named; so in not a few cases furnishing just the testimony needed to prove the species in question to be generally distributed.

Senebiera Coronopus, Poir. B. Chetnole.

Silene anglica, L. E. Woolland.

Cerastium glomeratum, Thuil. B. Chetnole.

Stellaria uliginosa, Murr., and *Sagina apetala*, L. (the segregate.) B. Chetnole. E. Woolland.

Hypericum Androsæmum, L. B. Chetnole.

H. humifusum, L. E. Woolland.

Erodium cicutarium, Herit., *Lotus major*, Scop., and *Orobus tuberosus*, L. B. Chetnole.

Spiræa Filipendula, L. E. Woolland.

Pyrus Aucuparia, Gaert. A. Near Charmouth. E. Woolland.

Epilobium parviflorum, Schreb., *E. montanum*, L., *Saxifraga tridactylites*, L., and *Hydrocotyle vulgaris*, L. E. Woolland.

Ægopodium Podagraria, L. B. Chetnole. E Woolland.

Galium Cruciata, Scop., and *Scabiosa Columbaria*, L. E. Woolland.

Pieris hieracioides, L. B. Sherborne and Thornford Road, by Honeycombe Wood.

Carlina vulgaris, L. E. Woolland.

Senecio sylvaticus, L. E. Holwell.

S. erucifolius, L. B. Yetminster.

Achillea Ptarmica, L. B. Leigh and Yetminster.

Vaccinium Myrtillus, L. B. Bubb Down.

Erythræa Centaurium, Pers. B. Chetnole.

Veronica Anagallis, L. E. Belchalwel.

Scrophularia nodosa, L., and *Linaria minor*, Desf. B. Chetnole.

L. Elatine, Mill., and *Origanum vulgare*, L. E. Woolland.
Calamintha menthifolia, Host. B. Leigh.
Lamium Galeobdolon, Crantz. B. Chetnole.
L. amplexicaule, L., and *Stachys arvensis*, L. E. Woolland.
Myosotis versicolor, Reich., and *Lithospermum arvense*, L. A. Charmouth. E. Woolland.
Cynoglossum officinale, L. A. Cliffs near Lyme Regis.
Rumex pulcher, L., *Orchis Morio*, L., and *O. pyramidalis*, L. E. Woolland.
Allium ursinum, L., *Luzula multiflora*, Koch., *Carex remota*, L., *C. vulpina*, L., *C. divulsa*, Good., and *Catabrosa aquatica*, Beauv. B. Chetnole.
Nephrodium dilatatum, Desv. B. Chetnole. E. Woolland.

ON THE BOTANY OF THE BRITISH POLAR EXPEDITION OF 1875–6.

By Henry Chichester Hart, B.A., Naturalist to H.M.S. 'Discovery.'

(Continued from p. 115).

I will now give a table showing what plants occur in the most northerly points, and the latitudes, travelling southwards, at which the different species appear or disappear in the meridian in which our observations and collections were made. In the following list the latitudes given after the letters E. or W. indicate the extreme limits north and south between which the plant was observed upon the East and West coasts respectively.

Table of Latitudes.

Saxifraga oppositifolia. E. 82°; 68° 46′. W. 83° 8′; 78° 45′.
Papaver nudicaule. E. 82°; 68° 46′. W. 83° 4′; 78° 45′.
Alopecurus alpinus. E. 81° 40′; 68° 46′. W. 83° 4′ (?).
Salix arctica. E. 82° 25′; 68° 46′. W. 82° 50′; 78° 45′.
Draba alpina. E. 81° 40′; 69 15′. W. 82° 50′; 78° 45′.
Cerastium alpinum. E. 81° 40′; 68° 46′. W. 82° 50′; 78° 45′.
Dryas integrifolia. E. 81° 40′; 69° 15′. W. 82° 50′; 78° 45′.
Potentilla nivea. E. 81° 40′; 69° 15′. W. 82° 50′; 78° 45′.
Poa flexuosa. E. 81° 40′; 68° 46′; W. 82° 50′; 78° 45′.
Braya alpina. E. 81° 40′. W. 82° 27′; 79° 28′.
Saxifraga flagellaris. E. 78° 18′. W. 82° 27′; 78° 45′.
Cochlearia anglica. E. 72° 20′. W. 82° 27′; 81° 42′.
Taraxacum Dens-leonis. E. 81° 40′; 69° 15′. W. 82° 27′; 78° 45′.
Festuca brevifolia. E. 81° 40′; 69° 15′; W. 82° 27′; 78° 45′.
Draba rupestris. E. 81° 40′; 68° 46′. W. 82° 27′; 78° 45′.
Saxifraga cæspitosa. E. 81° 40′; 68° 46′. W. 82° 27′; 78° 45′.
Oxyria reniformis. E. 81° 40′; 68° 46′; 82° 27′; 78° 45.
Carex nardina. E. 81° 7′; 69° 15′. W. 82° 27′; 78° 45′.

Ranunculus nivalis. E. 81° 6′; 69° 15′. W. 82° 27′; 81° 42′.
Epilobium latifolium. E. 78° 18′; 69° 15′. W. 82° 27′; 78° 56′.
Saxifraga tricuspidata. E. 78° 18′; 69° 15′. W. 82° 27′; 78° 56′
Arenaria verna. E. 78° 18′; 69° 15′. W. 82° 27′; 78° 45′.
Stellaria longipes. E. 78° 18′; 69° 15′. W. 82° 27′; 78° 45′.
Saxifraga nivalis. E. 78° 18′; 68° 46′. W. 82° 27; 78° 45′.
Polygonum viviparum. E. 72° 48′; 68° 46′. W. 82° 27′; 78° 45′.
Eriophorum polystachyum. E. 72° 48′; 69° 15′. W. 82° 27′; 78° 56′.
Carex fuliginosa. E. 72° 48′; 69° 15′. W. 82° 27′; 78° 45′.
Ranunculus affinis. E. 69° 15′. W. 82° 27′; 81° 42′.
Cerastium latifolium. E. 69° 15′. W. 82° 27′; 78° 56′.
Juncus biglumis. E. 69° 15′. W. 82° 27′; 78° 56′.
Lychnis apetala (typical). E. 78° 18′. W. 81° 52′; 78° 45′.
Pedicularis hirsuta. E. 81° 7′; 69° 15′. W. 81° 52′; 78° 45′.
Carex rigida. E. 78° 18′; 69° 15′. W. 81° 52′; 78° 45′.
Lychnis affinis. E. 81° 40′; 69° 15′. W. 81° 50′; 78° 56′.
Luzula arcuata. E. 78° 18′; 72° 48′. W. 81° 49′; 78° 45′.
Cardamine bellidifolia. E. 78° 18′; 69° 15′. W. 81° 47′; 81° 42′.
Cystopteris fragilis. E. 69° 15′. W. 81° 44′; 78° 45′.
Arenaria grœnlandica. W. 81° 42′.
Deschampsia cæspitosa. W. 81° 42′.
Androsace septentrionalis. W. 81° 42′; 81° 40′.
Phippsia algida. E. 76°. W. 81° 42′; 79° 30′.
Hesperis Pallasii. E. 78° 18′; W. 81° 42′.
Pedicularis capitata. E. 78° 18′. W. 81° 42′; 73° 56′.
Carex stans. E. 72° 20′. W. 81° 42′; 78° 56′.
Vesicaria arctica. E. 81° 40′; 69° 42′. W. 81° 42′; 78° 56′.
Luzula congesta. E. 81° 40′; 69° 15′. W. 81° 42′.
Draba hirta. E. 81° 40′; 69° 15′. W. 81° 42′; 78° 56′.
Cochlearia officinalis. E. 81° 40′; 69° 15′. W. 81° 42′; 78° 45′.
Potentilla frigida. E. 81° 40′; 69° 15′. W. 81° 42′; 78° 45′.
Poa alpina. E. 81° 40′; 69° 15. W. 81° 42; 78° 45′.
Colpodium latifolium. E. 72° 48′; 69° 15′. W. 81° 42′.
Trisetum subspicatum. E. 72° 20′; 69° 15′. W. 81° 42′.
Cardamine pratensis. E. 69° 15′. W. 81° 42′.
Erigeron compositus. E. 69° 15′. W. 81° 42′.
E. uniflorus. E. 69° 15′. W. 81° 42′.
Equisetum variegatum. E. 69° 15′. W. 81° 42′.
Draba muricella. E. 69° 15′. W. 81° 42′.
Equisetum arvense. E. 69° 15′. W. 81° 42′; 78° 56′.
Pedicularis lapponica. E. 78° 18°; 69° 15′- W. 81° 42′; 78° 56′.
Saxifraga cernua. E. 78° 18′; 69° 15′. W. 81° 42′; 78° 45′.
Pedicularis sudetica. E. 69° 15′. W. 81° 42′; 78° 56′.
Poa cæsia. E. 69° 15′. W. 81° 42′; 78′ 56′.
Eriophorum capitatum. E. 78° 18′; 69° 15′. W. 81° 42′; 78° 45′.
Glyceria angustata. E. 69° 15′. W. 81° 42′; 78° 45′.
Arnica montana. E. 69° 15′. W. 81° 40′.
Saxifraga rivularis. E. 78° 18′; 69° 15′. W. 81° 40′; 78° 45′.
Silene acaulis. E. 72° 48′; 68° 46′. W. 81° 40′; 78° 56′.
Woodsia hyperborea. W. 78° 56′.

W. glabella. W. 78° 56′.
Vaccinium uliginosum. E. 78° 18′; 68° 46′. W. 78° 56′; 78° 45′.
Cassiopeia tetragona. E. 78° 18′; 68° 46′. W. 78° 56′; 78° 45′.
Carex alpina. E. 72° 20′. W. 78° 56′.
Pedicularis flammea. E. 72° 20′; 69° 15′. W. 78° 56′.
Hierochloe alpina. E. 72° 20′; 69° 15′. W. 78° 56′.
Lycopodium Selago. E. 72° 20′; 69° 15′. W. 78° 56′.
Potentilla anserina. E. 78° 18′; 72° 20′. W. 78° 45′.
Empetrum nigrum. E. 78° 18′; 68° 46′. W. 78° 45′.
Eriophorum vaginatum. E. 78° 18′; 72° 20′.
Poa pratensis. E. 78° 18′; 72° 20′.
Stellaria humifusa. E. 78° 18′; 69° 15′.
Diapensia lapponica. E. 72° 58′; 68° 46′.
Salix herbacea. E. 72° 48′; 69° 15′.
Ranunculus hyperboreus. E. 72° 48′; 69° 15′.
R. pygmæus. E. 72° 48′; 69° 15′.
Draba androsacea. E. 72° 48′; 69° 15′.
Antennaria alpina. E. 72° 48′; 68° 46′.
Turritis mollis. E. 72° 20′.
C. capillaris. E. 72° 20′.
Phleum alpinum. E. 72° 20′.
Ranunculus lapponicus. E. 72° 20′; 69° 15′.
Arenaria arctica. E. 72° 20′; 69° 15′.
Alchemilla vulgaris. E. 72° 20′; 69° 15′.
Campanula uniflora. E. 72° 20′; 69° 15′.
Toffieldia borealis. E. 72° 20′; 69° 15′.
Luzula spadicea. E. 72° 20′; 69° 15′.
Carex scirpoides. E. 72° 20′; 69° 15′.
Loiseluria procumbeus. E. 72° 20′; 68° 46′.
Rhododendron lapponicus. E. 72° 20′; 68° 46′.
Phyllodoce taxifolia. E. 72° 20′; 68° 46′.
Saxifraga Aizoon. E. 69° 55′; 69° 15′.
Lychnis alpina. E. 69° 42′; 69° 15′.
Thalictrum alpinum. E. 69° 15′.
Arabis alpina. E. 69° 15′.
Draba incana. E. 69° 15′.
Potentilla Sibbaldia. E. 69° 15′.
P. tridentata. E. 69° 15′.
Epilobium alpinum. E. 69° 15′.
Angelica archangelica. E. 69° 15′.
Artemisia borealis. E. 69° 15′.
Gnaphalium norvegicum. E. 69° 15′.
Campanula rotundifolia. E. 69° 15′.
Andromeda polifolia. E. 69° 15′.
Mertensia maritima. E. 69° 15′.
Veronica alpina. E. 69° 15′.
V. Saxatilis. E. 69° 15′.
Bartsia alpina. E. 69° 15′.
Armeria vulgaris. E. 69° 15′.
Plantago maritima. E. 69° 15′.
Rumex acetosella. E. 69° 15′.

Kœnigia islandica. E. 69° 15′.
Salix glauca. E. 69° 15′.
Habenaria albida. E. 69° 15′.
Betula nana. E. 69° 15′.
Listera cordata. E. 69° 15′.
Platanthera hyperborea. E. 69° 15′.
Juncus triglumis. E. 69° 15′.
Carex rupestris. E. 69° 15′.
C. rariflora. E. 69° 15′.
Scirpus cæspitosus. E. 69° 15′.
Elymus arenarius. E. 69° 15′.
Woodsia ilvensis. E. 69° 15′.
Polypodium Dryopteris. E. 69° 15′.
Polystichum Lonchitis. E. 69° 15′.
Lycopodium annotinum. E. 69° 15′.
Ledum palustre. E. 69° 15′; 68° 46°.
Pyrola rotundifolia. E. 69° 15′; 68° 46′.
Saxifraga stellaris. E. 68° 46′.
Polygonum aviculare. E. 68° 46′.
Viola palustris. E. 68° 46′.

In the above table the plants are rigorously arranged in the order of their highest latitude; this seemed to me to be the only accurate arrangement in such a list, though it sometimes places ubiquitous plants above those which are genuine northerners; thus, for instance, *Cystopteris fragilis* will be found above several of the higher arctic plants, but a reference to the lower limit will point out its true character. Again, had I consulted other authors, several plants would have had their ranges somewhat altered, but here, as elsewhere throughout this essay, I have relied entirely upon my own observations and collections, or upon those of members of our Expedition.

Dicotyledones.

Ranunculaceæ.

Thalictrum alpinum, L.
Dist.* 1. Lat. 69° 15′. G.
Plentiful at sea-level amongst *Luzula spadicea* at Englishman's Bay, Disco, to the west of Lievely.

Ranunculus auricomus, L. (*R. affinis*, Br.)
Dist. 1 2 - - - - - - - - - - 12 13. Lat. 69° 15′ to 82° 27′. W. & G.
To this form I am inclined to refer Professor Oliver's variety of *R. nivalis*, "floribus minoribus, pilis calycinis pallidioribus" ('Nares' Voyage,' vol. ii., p. 310, ed. 1878). It flowered earlier than the true *R. nivalis*, and disappeared quickly, preferring ground slushy with the first thaw at a high altitude. In Discovery Bay it was confined to a plain from eight to twelve hundred feet above sea-

* *Abbreviations.*— H. W. F., Captain H. W. Feilden, naturalist to H.M.S. 'Alert'; Coll. Moss, collections of Dr. Moss, of H.M.S. 'Alert'; 'Coll. Copp., collections of Dr. Coppinger, of H.M.S. 'Discovery'; Dist., District. E., W., and G., and the district numbers, are previously explained.

level, lying to the west of the ship. I also gathered a couple of specimens at Disco with pale hairy sepals, stem hairy, with several flowers, channelled peduncles, and smooth carpels, which, I believe, belonged to this species.

Shift Rudder Bay and Floeberg Beach, coll. Moss.

R. nivalis, L.

Dist. 1 2 3 4 5 - 7 - - 10 - 12 13. Lat. 69° 15′ to 82° 27′.

E., W., and G.

Flowering later than the last in Discovery Bay, but remaining in blow throughout the summer. Appears to have no choice of station, either with regard to altitude or nature of soil, but growing more luxuriantly at low levels. A favourite food of the brent goose (*Bernicla brenta*). In flower June 17, in Discovery Bay.

Floeberg Beach (Moss coll.)

From sea-level to 2000 feet near St. Patrick's Bay.

(To be continued).

SHORT NOTES.

JUNGERMANNIA EXSECTA IN FRUIT.—While out botanising lately with my friend Mr. E. M. Holmes, we came upon a very fine patch of *Jungermannia exsecta* growing on a bank not far from Trant Station, Tonbridge Wells. A few, though certainly only a few, plants were unmistakeably in fruit. This species does not appear to have been observed in fruit in England before.—THOS. WALKER.

SPRING-FLOWERING FORM OF COLCHICUM AUTUMNALE.—On the 15th of March I was taking a cross-country walk a few miles from Bristol, and passed through some pasture land previously unexplored. In one large field a quantity of daffodils were putting up their flower-buds, and amongst them were distributed the flowers of Colchicum. They appeared here and there over a large area, just peeping above the soil, and, from their small size and pale colour, were not at all conspicuous. The flowering corm is large and plump, in the same condition in which we usually find it in October. The perianth tube is radical, as in the normal form; perianth small, with narrow segments, pale and sickly in colour; anthers shrivelled, not containing pollen. My supposition is that this will not prove to be a permanent form of the plant. I think it likely that the young corms were seriously impeded in their development by the unusually wet and cold weather prevailing throughout last summer, and that many of them, therefore, were not prepared to flower before the first frosts of winter compelled them to postpone the effort altogether. One record of a spring flowering Colchicum is contained in 'English Botany,' where (tab. 1432) a "monstrosity" is figured, bearing an abortive and misshapen flower in the position at the base of the leaves which is occupied by the capsule when fruit is produced. This variety was found in Wiltshire, and is stated to have occurred

during many seasons. Reference is made to it in Hooker and Arnott and the 'Student's Flora.' Probably it has never been found elsewhere. It is quite a distinct form from that I describe. Mr. J. G. Baker, to whom I forwarded a specimen, has been kind enough to answer my enquiries, and tells me that he had never previously seen any spring flowering plant of this species. I may add that I have since found it sparingly in another locality.—Jas. W. White. [Mr. Baker notes upon this as follows:—"This Bristol plant is the ordinary spring form of *C. autumnale*, figured in Reich. Ic. Germ. fig. 951=*C. vernum*, Schrank=*C. vernale*, Hoffm.=*C. præcox*, Spenner. That in Eng. Bot. has a much larger limb, and is green outside."]

Silene eu-gallica in Jersey.—In June, 1879, I found on Gallows' Hill, St. Helier's, Jersey, a profusion of *Silene quinquevulnera*, L., and, upon examining the spot more minutely, detected *S. gallica*, L., with other forms of what is doubtless one Protean species, to which the collective name of *gallica* ought properly to be applied. Most British authors now sink *S. quinquevulnera* into a variety of either *anglica* or *gallica*. In the last (seventh) edition of the 'London Catalogue of British Plants,' however, it is given specific importance, and this must be my chief apology in dilating upon what, to those who have studied this genus, may appear so evident a fact. Dr. Boswell (Eng. Bot., vol. ii., pp. 59–61) takes, in all probability, the correct view of the case, in making *S. gallica* the typical aggregate form, and *S. quinquevulnera* and *anglica* subordinates. *S. gallica* is, however, much nearer the former of these than the latter, being really only an albino state of *S. quinquevulnera*. It is rarely that so good a field for research as to these plants under consideration is found as this St. Helier's locality, for, altogether, five forms were observed, all merging into one another, as follows:—

1. *S. gallica*, L.—Stem erect, branches ascending, not spreading, racemes dense, petals roundish, obvate, large in proportion, undivided, entirely white.

2. *S. gallica rosea*=*S. silvestris*, Schott.—Precisely as the above, but petals unicolorous, rose merging by every gradation into—

3. *S. quinquevulnera*, L., which resembles Nos. 1 and 2 in every way, excepting in the conspicuous red disk of the petals.

4. *S. anglico-quinquevulnera*, which occurred but rarely, was of erect growth, but more slender in every part than typical *S. quinquevulnera*. Petals very small, somewhat jagged, of the size of *S. anglica*, but with the red disk of the preceding form.

5. *S. anglica*, L.—Stem somewhat flexuous, branches spreading, racemes not so dense as in *S. gallica*. Petals elliptical, often jagged, very small, entirely white; occurred very rarely, and only in one place on the hill.

Form 2 is doubtless the *S. silvestris*, Schott, figured in Reich. Flor. Germ. et Helvetiæ: form 4 I cannot find has been noticed before.—J. Cosmo Melvill.

Extracts and Notices of Books & Memoirs.

NEW GENERA AND SPECIES OF PHANEROGAMS PUBLISHED IN PERIODICALS IN BRITAIN IN 1879.

The periodicals referred to in the compilation of this list are:—'Botanical Magazine,' 'Gardeners' Chronicle,' 'Icones Plantarum,' 'Journal of Botany,' 'Journal of the Linnean Society of London,' and 'Pharmaceutical Journal.'

Abies Mariesii, *Masters* (Coniferæ).—Japan. (Gard. Chron., ii., 788, *cum ic.*)

Acalypha spinescens, *Benth.* (Euphorbiaceæ, Crotoneæ).—Malaya. (Ic. Plant., t. 1292.)

Acineta sulcata, *Rchb. f.* (Orchidaceæ).—S. America. (Gard. Chron., i., p. 652.)

Æchmæa Burchellii, *Baker* (Bromeliaceæ).—Brazil. (Journ. Bot., p. 231.)

Æ. Cumingii, *Baker*.—Colombia. (Journ. Bot., p. 227.)

Æ. cymoso-paniculata, *Baker*.—Venezuela. (Journ. Bot., p. 165).

Æ. dactylina, *Baker*.—Panama. (Journ. Bot., p. 161.)

Æ. dichlamydea, *Baker*.—Tobago. (Journ. Bot., p. 133.)

Æ. excavata, *Baker*.—Paraguay. (Journ. Bot., p. 134.)

Æ. Glaziovii, *Baker*.—Rio Janeiro. (Journ. Bot., p. 133.)

Æ. martinicensis, *Baker*.—Martinique. (Journ. Bot., p. 132.)

Æ. mexicana, *Baker*.—Mexico. (Journ. Bot., p. 165.)

Æ. pectinata, *Baker*.—Brazil. (Journ. Bot., p. 233.)

Æ. polycephala, *Baker*.—Jamaica. (Journ. Bot., p. 164.)

Æ. pubescens, *Baker*.—S. America. (Journ. Bot., p. 135.)

Æ. regularis, *Baker*.—Brazil. (Journ. Bot., p. 229.)

Æ. subinermis, *Baker*.—Rio Janeiro. (Journ. Bot., p. 228.)

Albuca Wakefieldii, *Baker* (Liliaceæ).—Trop. Africa. (Bot. Mag., t. 6429.)

Alocasia scabriuscula, *N. E. Brown* (Araceæ).—N. W. Borneo. (Gard. Chron., ii., 296.)

Androcymbium circinatum, *Baker* (Colchicaceæ).—Cape. (Drège, 2706). (Journ. Linn. Soc., xvii., 443.)

A. palæstinum, *Baker*.—Syria. (Journ. Linn. Soc., xvii., 445.)

Anemone Pavoniana, *Boiss. Herb.* (Ranunculaceæ).—Spain. (Journ. Bot., p. 196.)

A. Rossii, *S. Moore* (Ranunculaceæ).—N. China. (Journ. Linn. Soc., xvii., 376.)

Aphelandra pumila, *Hort. Bull.* (Acanthaceæ).—Brazil. (Bot. Mag., t. 6467.)

Aquilegia discolor, *Leresche & Levier* (Ranunculaceæ).—Spain. (Journ. Bot., p. 197.)

Arabis cantabrica, *Leresche & Levier* (Cruciferæ).—Spain. (Journ. Bot., p. 197.)

ARISÆMA GALEATUM, *N. E. Brown* (Araceæ).—Sikkim Himalaya. (Gard. Chron., ii., p. 102.)

ARISTOLOCHIA MOLLISSIMA, *Hance* (Aristolochiaceæ).—China. (Journ. Bot., p. 300.)

A. PROMISSA, *Masters*.—W. Trop. Africa. (Gard. Chron., i., p. 494.)

ARNOCRINUM GLABRUM, *Baker* (Colchicaceæ). Australia. (Journ. Linn. Soc., xvii., 416.)

ASTER TOWNSHENDII, *Hook. f.* (Compositæ).—Colorado. (Bot. Mag., t. 6430.)

BETULA EXALTATA, *S. Moore* (Betulaceæ).—N. China. (Journ. Linn. Soc., xvii., 386.)

BOLBOPHYLLUM BECCARII, *Rchb. f.* (Orchidaceæ).—Borneo. (Gard. Chron., i., p. 41.)

BRASSIA ANTHEROTES, *Rchb. f.* (Orchidaceæ). (Gard. Chron. ii., p. 782.

B. CRYPTOPTHALMA, *Rchb. f.*—Peru. (Gard. Chron., ii., p. 554.)

BURBIDGEA, *Hook. f.* (Zingiberaceæ): B. NITIDA.—Borneo. (Bot. Mag., t. 6403.)

CAMELLIA GRIJSII, *Hance* (Ternstrmœiaceæ).—China. (Journ. Bot., p. 9.)

CAMPANULA ACUTANGULA, *Leresche & Levier* (Campanulaceæ).—Spain. (Journ. Bot., p. 198.)

C. ADSURGENS, *Levier & Leresche*.—Spain. (Journ. Bot., p. 199.

CARLUDOVICA ENSIFORMIS, *Hook. f.* (Cyclantheæ).—Costa Rica. (Bot. Mag., t. 6418.)

CARYOTA OCHLANDRA, *Hance* (Palmaceæ).—China. (Journ. Bot., p. 176.)

CHONDRORRHYNCHA CHESTERTONI, *Rchb. f.* (Orchidaceæ).—New Granada. (Gard. Chron., ii., p. 648.)

CHORIOPHYLLUM, *Benth.* (Euphorbiaceæ): C. MALAYANUM.—Malaya. (Ic. Plant., t. 1280.)

CIRRHOPETALUM MAKOYANUM, *Rchb. f.* (Orchidaceæ).—Brazil. (Gard. Chron., i., p. 234.)

CŒLODEPAS WALLICHIANUM, *Benth.* (Euphorbiaceæ, Crotoneæ).—Penang. (Ic. Plant., t. 1288.)

COLCHICUM CORSICUM, *Baker* (Colchicaceæ).—Corsica. (Journ. Linn. Soc., xvii., 431.)

C. PERSICUM, *Baker*.—Persia. (Journ. Linn. Soc., xvii., 430.)

C. SIBTHORPII, *Baker*.—Greece. (Journ. Linn. Soc., xvii., 427.)

CRASSULA IMPRESSA, *N. E. Brown* (Crassulaceæ).—South Africa. (Gard. Chron., ii., p. 238.)

CROCUS KIRKII, *Maw* (Iridaceæ).—Dardanelles. (Gard. Chron., i., p. 234.)

CYMBIDIUM LOWIANUM, *Rchb. f.* (Orchidaceæ).—Burma. (Gard. Chron., i., p. 332.)

CYPRIPEDIUM MASTERSIANUM, *Rchb. f.* (Orchidaceæ).—Sonda. (Gard. Chron., ii., p. 102.)

DENDROBIUM CERINUM, *Rchb. f.* (Orchidaceæ).—Malaya. (Gard. Chron., ii., p. 554.)

D. FUSCUM, *R. D. Fitzgerald*.—Australia. (Gard. Chron., ii., p. 680.)

D. LEUCOCHLORUM, *Rchb.f.*—Moulmein. (Gard. Chron., i., p. 202.)

DICŒLIA, *Benth.* (Euphorbiaceæ, Phyllantheæ): D. BECCARIANA.—Borneo, Beccari, 1397. (Ic. Plant., t. 1289.)

DIOSCOREA VITTATA, *Hort. Bull.* (Dioscoreaceæ).—Bahia. (Bot. Mag., t. 6409.)

DRACÆNA FLORIBUNDA, *Baker* (Liliaceæ).—Rodriguez? (Bot. Mag., t. 6447.)

DRACOCEPHALUM SINENSE, *S. Moore* (Labiatæ).—N. China. (Journ. Linn. Soc., xvii., 385.)

EBERMAIERA NITIDA, *S. Moore* (Acanthaceæ).—Brazil. (Gard. Chron., i., p. 812.)

ECHIOCHILON LONGIFLORUM, *Benth.* (Borragineæ).—Aden. (Ic. Plant., t. 1277.)

ECHIOGLOSSUM STRIATUM, *Rchb. f.* (Orchidaceæ).—Darjeeling. (Gard. Chron., ii., p. 390.)

EPIDENDRUM PALPIGERUM, *Rchb. f.* (Orchidaceæ).—Mexico. (Gard. Chron., ii., p. 40.)

EUPHRASIA DISPERMA, *Hook. f.* (Scrophulariaceæ). — New Zealand. (Ic. Plant., t. 1283.)

EREMURUS ALBOCITRINUS, *Baker* (Liliaceæ).—Persia. (Journ. Bot., p. 17.)

E. BUNGEI, *Baker*.—Persia. (Journ. Bot., p. 17.)

E. LUTEUS, *Baker*.—Persia. (Journ. Bot., p. 18.)

E. PAUCIFLORUS, *Baker*.—Persia. (Journ. Bot., p. 18.)

FLUGGEA GRIFFITHII, *Baker* (Liliaceæ, Liriopeæ). — India (Griffith, 5839). (Journ. Linn. Soc., xvii., 502.)

[FONTANESIA CHINENSIS, *Hance* (Oleaceæ). (Journ. Bot., p. 136.) =F. FORTUNEI, *Carrière*.

GONIOSPORUM HOLOCHEILUM, *Hance* (Labiatæ).—China. (Journ. Bot., p. 13.)

GLADIOLUS BRACHYANDRUS, *Baker* (Iridaceæ).—Trop. Africa. (Bot. Mag., t. 6463.)

HEDYOTIS AMPLIFLORA, *Hance* (Rubiaceæ).—China. (Journ. Bot., p. 11.)

H. CAPITULIFLORA, *Hance*.—China. (Journ. Bot., p. 12.)

H. EFFUSA, *Hance*.—China. (Journ. Bot., p. 11.)

HYMENOCALLIS MACROSTEPHANA, *Baker* (Amaryllidaceæ). (Gard. Chron., i., p. 430.)

IPHIGENIA GUINEENSIS, *Baker* (Colchicaceæ).—Angola (Welwitsch, 1625–26). (Journ. Linn. Soc., xvii., 451.)

I. NOVÆ-ZELANDIÆ, *Baker*.—New Zealand. (Ib.)

I. PALLIDA, *Baker*.—India. (Ib.)

KICKXIA AFRICANA, *Benth.* (Apocynaceæ).—W. Trop. Africa. (Ic. Plant., t. 1276.)

LEONTICE MICRORRHYNCHA, *S. Moore* (Berberideæ).—N. China. (Journ. Linn. Soc., xvii., 377.)

LEPTOCARPUS DISJUNCTUS, *Mast.* (Restiaceæ).—Cochin China. (Journ. Linn. Soc., xvii., 344.)

LINARIA FAUCICOLA, *Levier & Leresche* (Scrophulariaceæ).—Spain. (Journ. Bot., p. 200.)

L. FILICAULIS, *Boiss*.—Spain. (Journ. Bot., p. 200.)

LEPIDOTURUS LAXIFLORUS, *Bth.* (Euphorbiaceæ).—Trop. Africa (Schweinfurth, nn. 2956, 3072). (Ic. Plant., t. 1297.)

LIMATODES LABROSA, *Rchb. f.* (Orchidaceæ).—Moulmein. (Gard. Chron., i., p. 202.)

LIPARIS TRICALLOSA, *Rchb. f.* (Orchidaceæ).—Borneo. (Gard. Chron., i., p. 684.

LYCASTE LOCUSTA, *Rchb. f.* (Orchidaceæ). — Peru. (Gard. Chron. i., p. 524.)

MÆSOBOTRYA, *Benth.* (Euphorbiaceæ, Phyllantheæ) : M. FLORIBUNDA.—Tropical Africa. (Ic. Plant., t. 1296.)

MASDEVALLIA BACKHOUSIANA, n. sp. (n. var.?) *Rchb. f.*—New Granada. (Gard. Chron., i., p. 716.)

M. PARLATOREANA, *Rchb., f.* (n. sp. vel n. hybr.)—Peru. (Gard. Chron., i., 172.)

MELLERA, *S. Moore* (Acanthaceæ) : M. LOBULATA. — Trop. Africa. (Journ. Bot., p. 225, tab. 203.)

MICROSTYLIS CALOPHYLLA, *Rchb. f.* (Orchidaceæ).—Malaya. (Gard. Chron., ii., p. 718.)

M. METALLICA, *Rchb. f.*—Borneo. (Gard. Chron., ii., p. 750.)

MOQUILEA ORGANENSIS, *Miers.*—Brazil. (Journ. Linn. Soc., xvii., 374.)

ODONTOGLOSSUM CONFERTUM, *Rchb. f.*—Ecuador. (Gard. Chron., i., p. 298.)

O. ELEGANS (n. hybr.? n. sp.?) *Rchb. f.*—Ecuador. (Gard. Chron., i., p. 463.)

O. DIGANTHUM, *Rchb. f.*—Guatemala. (Gard. Chron., i., p. 556.)

O. ORIENTALE, *Rchb. f.*—Ecuador. (Gard. Chron., i., p. 366.)

ONCIDIUM LEUCONOTIS, *Rchb. f.* (Orchidaceæ).—Columbia. (Gard. Chron., ii., p. 424.)

O. ORNITHOPODUM, *Rchb. f.* (Gard. Chron., ii., p. 200.)

O. PYXIDOPHORUM, *Rchb. f.* (Gard. Chron., ii., p. 136.)

ORNITHOGALUM (Heliocharmos) ARMENIACUM, *Baker* (Liliaceæ).—Armenia. (Gard. Chron., i., p. 748.)

PACHYSTOMA THOMSONIANUM, *Rchb. f.* (Orchidaceæ).—Trop. Africa. (Gard. Chron., ii., p. 582.)

PÆONIA OREOGETON, *S. Moore* (Ranunculaceæ).—N. China. (Journ. Linn., Soc., xvii., 376.)

PASSIFLORA CHELIDONIA, *Masters* (Passifloreæ).—Ecuador. (Gard. Chron., ii., p. 40, *cum ic.*)

PELIOSANTHES GRIFFITHII, *Baker* (Liliaceæ, Liriopeæ).—India (Griffith, 5840.) (Journ. Linn. Soc., xvii., 506.)

P. MACROPHYLLA, *Wall MSS.*—India (Griffith, 5841). (Ib., p. 505.)

PESCATOREA GAIRIANA, *Rchb. f.* (Orchidaceæ). (Gard. Chron., i., p. 684.)

P. KLABOCHORUM, *Rchb. f.*—S. America. (Gard. Chron., i., p. 684; ii., p. 167.)

P. LEHMANNI, *Rchb. f.*—S. America. (Gard. Chron., ii., p. 424.)

PHALÆNOPSIS ANTENNIFERA, *Rchb. f.* (Orchidaceæ).—Burma. (Gard. Chron., i., p. 398.)

P. CORNINGIANA, *Rchb. f.* (Gard. Chron., i., p. 620.)

PIPTOSPATHA, *N. E. Brown* (Araceæ): P. INSIGNIS.—N. Borneo. (Gard. Chron., i., p. 138, *cum icone*.)

POLYSTACHYA RUFINULA, *Rchb. f.* (Orchidaceæ).—Zanzibar. (Gard. Chron., i., p. 41.)

POLYGALA AREGUENSIS, *A. W. Benn.* (Polygalaceæ). Paraguay. (Journ. Bot., p. 201.)

P. AUSTRALIS, *A. W. Benn.* S. America. (Journ. Bot., p. 203.)

P. BOLIVIENSIS, *A. W. Benn.*—Bolivia. (Journ. Bot., p. 171.)

P. DARWINIANA, *A. W. Benn.*—Patagonia. (Journ. Bot., p. 203.)

P. GAYII, *A. W. Benn.*—Chile. (Journ. Bot., p. 168.)

P. LEUCANTHA, *A. W. Benn.*—Paraguay. (Journ. Bot., p. 172.)

P. NEMORALIS, *A. W. Benn.*—S. America. (Journ. Bot., p. 172.)

P. PARAGUAYENSIS, *A. W. Benn.*—Paraguay. (Journ. Bot., p. 173.)

P. PEARCII, *A. W. Benn.*—Bolivia. (Journ. Bot., p. 201.)

P. PERSISTENS, *A. W. Benn.*—Chile. (Journ. Bot., p. 170.)

P. PERUVIANA, *A. W. Benn.*—Peru. (Journ. Bot.. p. 173.)

P. PUNCTATA, *A. W. Benn.*—Paraguay. (Journ. Bot., p. 172.)

P. SPRUCEANA, *A. W. Benn.*—Venezuela. (Journ. Bot., p. 203.)

P. SALVINIANA, *A. W. Benn.*—Guatemala. (Journ. Bot., p. 203.)

PHYLLORACHIS, *Trimen* (Gramineæ): P. SAGITTATA.—Angola. (Journ. Bot., p. 353, tab. 205.)

PHYSOSTIGMA CYLINDROSPERMUM, *Holmes* (Leguminosæ).—Trop. Africa. (Pharmaceutical Journal, May 10, p. 913.)

PIMPINELLA SIIFOLIA, *Leresche* (Umbelliferæ).—Spain. (Journ. Bot., p. 198.)

QUAQUA, *N. E. Brown.* (Asclepiadaceæ).—Q. HOTTENTORUM.—Namaqualand. (Gard. Chron., ii., p. 8, *cum ic.*)

RANUNCULUS MŒLLENDORFFII, *Hance* (Ranunculaceæ).—N. China. (Journ. Bot., p. 7.)

SEMPERVIVUM BOISSIERI, *Hort.* (Crassulaceæ). (Gard. Chron., ii., p. 39.)

S. TRISTE, *Hort.* (Gard. Chron., ii., p. 39.)

SCHŒNOCAULON COULTERI, *Baker* (Colchicaceæ). — Mexico. (Journ. Linn. Soc., xvii., 477.)

S. INTERMEDIUM, *Baker.*—Mexico (Coulter, 1568, 1570). (Ib.)

SPENCERIA, *Trimen* (Rosaceæ): S. RAMALANA. — W. China. (Journ. Bot., p. 97, tab. 201.)

STANHOPEA FLORIDA, *Rchb. f.* (Orchidaceæ). (Gard. Chron., ii., p. 615.)

S. REICHENBACHIANA, *Regel.*—S. America. (Gard. Chron., ii., p. 40.)

STILBANTHUS, *Hook. f.* (Amaranthaceæ): S. SCANDENS.—Sikkim, Himalaya. (Ic. Plant., t. 1286.)

TOFIELDIA HIMALAICA, *Baker* (Colchicaceæ).—Sikkim. (Journ. Linn. Soc., xvii., 489.)

TOVARIA ROSSII, *Baker* (Liliaceæ).—N. China. (Journ. Linn. Soc., xvii., 387.)

TRICYRTIS FORMOSANA, *Baker* (Colchicaceæ).—Formosa (Oldham, 570). (Journ. Linn. Soc., xvii., 465.)

VERATRUM MAXIMOWICZII, *Baker* (Colchicaceæ). — Japan. (Journ. Linn. Soc., xvii., 472.)

VIOLA HIRTIPES, *S. Moore* (Violaceæ).—N. China. (Journ. Linn. Soc., xvii., 379.)

ZINGIBER COLORATUM, *N. E. Brown* (Zingiberaceæ). — N. W. Borneo. (Gard. Chron., ii., p. 166.)

European Ferns. By JAMES BRITTEN, F.L.S. With Coloured Illustrations from Nature by D. BLAIR, F.L.S. London: Cassell, Petter, Galpin & Co.

THIS is the title of a work now being issued in parts, and which is intended to bring before the student those species of Ferns which are natives of Europe. There is no illustrated book which occupies the same ground. We have many works with illustrations varying from woodcuts to nature-prints, representing the Ferns of the British Isles, but there are none which take in the Ferns of the surrounding continent. This is no doubt a recommendation to the present work from the publisher's point of view.

The book is projected as a popular, not a scientific, treatise, and to this fact, as we take it, is to be attributed what we regard as its weakest point. The coloured plates, we are told, are its special characteristic, and these coloured plates have been made into pictures in a manner which interferes with their utility. They are reduced figures of the ferns *in situ;* and the reduction of the larger species necessary to bring them within the size of the plates, though the page is a quarto, so far alters their appearance, that they do not present to the eye such a picture of the plant as would always serve to secure the recognition of the original. This is no fault of the artist's; he has drawn his subjects accurately enough, but as we think always happens a reduced coloured figure, unlike a reduced woodcut, does not give an accurate notion of the original. It would have been better to have introduced woodcuts showing the character and habit of each plant, and a coloured portion, as much as the size of the page would allow, natural size, showing its form, its mode of division, and its fructification. In other respects the figures are quite satisfactory; those of the smaller species, which are of the natural size, are indeed very good, and make one all the more regret that in some of the other plates, *Davallia canariensis* in particular, the greater amount of work in the diminished figure has been expended with so imperfect and unsatisfactory a result.

The design of the book being popular, the text is of course worked out on the popular plan. The scientific style is altogether dropped; no technical generic or specific characters are given, but instead there is given a plain and easy and carefully written description of the plant, while a notice of the geographical distribution of each affords material for an interesting paragraph. A note, as a heading to the chapter on each genus, relating the chief

peculiarities presented by the different species, supplies the place of a technical generic character.

An Introduction, of which instalments are given in the half-dozen parts before us, and of which the extent is not yet apparent, will be extremely useful to the general reader, whom we may suppose to be entirely ignorant of fern structure; and to whom therefore an intelligible account of the nature of the several parts of which a fern is composed is of great importance as a means towards the understanding of the book.

Thus it will be seen that the text comprises—first an introduction explanatory of the structure of ferns in general, including a sketch of their geographical range, and passing on to the main features of their cultivation; and secondly, an account of the peculiarities and variations of each genus, and a full description of the species which form the subject of the illustrations. This is clearly and accurately written, and sufficiently attests that the author has the subject well in hand. The plates, which, as we have said, are well-drawn and accurate in themselves, have the demerit in some cases of presenting reduced figures of the originals, a style of portraiture we should recommend the publishers to abandon, if possible, in the case of the portions yet unpublished.

The book is very nicely got up, and is from this point of view highly creditable to all concerned, since faithful representations, accurate descriptions and observations, and tasteful production are combined, and the result will be to present to the public a very elegant and useful volume. T. Moore.

Contributions à la connaissance des organismes qui peuvent se trouver dans la bière et le moût de bière et y vivre. Par Emil Chr. Hansen.

This paper commences with some "Récherches sur les organismes qui, a différentes époques de l'année, se trouvent dans l'air à Carlsberg et aux alentours, et qui peuvent se développer dans le moût de bière." The nourishing liquid selected was clear beer-wort with the hops added, and it was sterilised by prolonged boiling in large-mouthed flasks closed with a layer of filter-paper. Each flask was of one quarter of a litre capacity, and was usually about two-thirds filled. They were then exposed in different situations in the neighbourhood, such as a seat in the Carlsberg garden, various parts of breweries, under cherry trees and gooseberry bushes, and a summer-house and vinery. It would take too long to go into the results in detail; suffice it to say that a considerable difference was observed in the growth induced in different localities. The experiments were continued into the winter in order to judge of the effect of frost upon the growth. It was found that at a minimum temperature of −7° C. and a maximum of 2°, all trace of *Saccharomyces* was sought for in vain, but that *Microbacteria*, *Penicillium glaucum* and *cladosporioides*, and *Mucor stolonifer* could flourish.

The organisms, however, take a longer time to develop in

liquids at low than at high temperature. This is fully established by several experiments with different kinds of beer. One of these results we subjoin :—

DOUBLE MILD COPENHAGEN BEER.

42° C.	3 days.	Mycoderma Pasteurianum.	
,,	2 ,,	*id.*	
33° C.	2 ,,	*id.*	
,,	2 ,,	*id.*	
26° C.	2 ,,	*id.*	
,,	2 ,,	Saccharomyces Mycoderma.	
21° C.	3 ,,	Mycoderma Pasteurianum.	
,,	2 ,,	Saccharomyces Mycoderma.	
15° C.	4 ,,	*id.*	
12° C.	7 ,,	Microbacteria.	
,,	4 ,,	Saccharomyces Mycoderma.	
10° C.	10 ,,	Microbacteria.	
,,	7 ,,	Saccharomyces Mycoderma, Microbacteria.	
5° C.	17 ,,	Saccharomyces Mycoderma.	
,,	14 ,,	Saccharomyces Mycoderma, Microbacteria.	

The fascicle of papers as sent to us contains one of some interest, "Sur l'influence que l'introduction de l'air atmosphérique dans le moût qui fermente exerce sur la fermentation." The apparatus used for this was a brass-capped glass cylinder traversed by a rod movable about its longitudinal axis by clockwork mechanism, and supporting four spirally-arranged brass rotating fans at its extremity. The object of this was to bring all parts of the liquid thoroughly in contact with air, which was introduced through four pipes of peculiar construction screwed into the bottom of the cylinder. The following table shows one of the series of results obtained upon comparison with liquids into which air had not been introduced :—

DATES.	Non-aërated Liquid.				Aërated Liquid.			
	Weight in Centièmes	Extract decomposed by fermentation.	No. of Yeast-cells per unity of volume.	Multiplication of Yeast-cells.	Weight in Centièmes	Extract decomposed by fermentation.	No. of Yeast-cells per unity of volume.	Multiplication of Yeast-cells.
23rd May.		per cent.				per cent.		
8 o'clock a.m.	10	0	41	1	10	0	41	1
Ditto								
8 p.m.	9·67	0·33	126	3	9·51	0·49	140	3·4
24th May.								
8 a.m.	9·18	0·82	179	4·3	8·78	1.22	387	9·4
Ditto								
8 p.m.	8·49	1·51	218	5·3	6·91	3·09	960	23·4
25th May.								
8 a.m.	7·68	2.32	375	9·1	4·95	5·05	1274	31
Ditto								
8 p.m.	6·99	3·01	465	11·2	3·99	6·01	1470	35·8

From this we see that the state of the non-aërated liquid on the evening of the 25th May is almost similar to that of the aërated liquid twenty-four hours before; but that this is to be accounted for by the greater multiplication of the yeast-cells in the latter liquid. It is thus evident that the introduction of atmospheric air—that is of oxygen—is favourable to fermentation.

The fascicle likewise contains short papers on *Mycoderma aceti* and a new species, *M. Pasteurianum;* or Horvath's hypothesis that active repose and movement retard organic development, negatived so far as relates to yeast by the just-mentioned experiments; on *Oidium lactis;* and on red Saccharomyces and red cells resembling Saccharomyces. It is accompanied by two well-executed plates.

S. M.

We have received from Mr. George Maw, of Benthall Hall, Broseley, a specimen-sheet, with accompanying plate, of a Monograph of the genus *Crocus*. The work, which is quarto, will be completed in two volumes, containing about eighty coloured plates from Mr. Maw's drawings, numerous wood engravings, and about five hundred pages of letterpress. Mr. Maw recognises about seventy species of *Crocus;* the work will contain a description of each, with full synonymy and life-history.

Mr. W. B. Hemsley has issued a third part of his 'Diagnoses' of Mexican Plants. It is mainly devoted to *Leguminosæ*, but contains some plants of other Orders, including *Leptorhæa*, a new genus of *Commelinaceæ*.

Dr. Engler, of Kiel, has published the first part of an essay on the evolution of the vegetable kingdom since the tertiary period, under the title 'Versuch einer Entwicklungsgeschichte der Pflanzenwelt.' It relates to the extra-tropical regions of the northern hemisphere. The same author has recently visited the London herbaria in connection with the Monograph of *Burseraceæ* which he is preparing for the 'Suites au Prodromus.'

Other New Books.—F. von Mueller, 'Eucalyptographia' (fifth decade), Trübner & Co.—H. Baillon, 'Dictionnaire de Botanique' (part 12, Cist Comi), Hachette & Co.—R. Braithwaite, 'The British Moss-Flora' (part 1, *Andreæaceæ*).—R. Anslow, 'The Study of Mosses, with a List of the Mosses of the Wrekin," Hobson & Co., Wellington Street.

Articles in Journals.

March.

Journal of Lin. Soc. (London), xvii., Nos. 104–5.—G. Henslow, 'On the origin of the so-called Scorpioid Cyme.'—D. Morris, 'On the structure and habit of *Hemileia vastatrix* (the Coffee-leaf disease).'—J. D. Hooker, 'On a variety of *Cedrus Libani* (var. *brevifolia*) discovered in Cyprus.'—H. Marshall Ward, 'The

Embryo-sac in Angiosperms' (tt. 17–25).—M. T. Masters, 'The relations between Morphology and Physiology in the leaves of Conifers.'—J. M. Crombie, 'The Lichens of Dillenius' "Historia Muscorum."'

Annales des Sciences Naturelles (Botany), sér. 6, tom. ix., nos. 2 & 3. —J. H. Fabre, 'On the *Sphæriaceæ* of Vaucluse' (contains the following new genera:—*Stuartella*, *Navicella*, *Rostrella*, *Verlotia*, *Decaisnella*, *Julella*, *Delacourea*—the first commemorating John Stuart Mill, who was engaged upon a Flora of Vaucluse at the time of his death—and many new species), tt. 1–6.—John Ball, 'On the origin of the European Alpine Flora.'—Ch. Flahault, 'On the modifications of vegetables.'

Magyar Novent. Lapok.—F. Schaarschmidt, 'On the division of the chlorophyll grains.'

Œsterr. Bot. Zeitsch.—H. Wawra, 'On *Bromeliaceæ*.'—J. Freyn, 'Memoir of Tommasini.'—W. Vatke, 'Determination of Hildebrandt's African plants' (*Leguminosæ Cæsalpineæ*).—M. Willkomm, 'Spanish-Portuguese plants' (concluded).—V. v. Borbas, 'Two Heuffelian *Thalictra*.'—C. J. v. Klinggraff, 'Palestine and its vegetation' (continued).

Botanische Zeitung.—H. Ambronn, 'On several cases of bilaterality in the *Florideæ*' (2 tab.)

Grevillea.—M. C. Cooke, 'Reliquæ Libertianæ.'—Id., 'The subgenus *Coniophora*.'—Id., 'Fungi of India.'—Id., 'New York Fungi.'—F. Kitton, '*Diatomaceæ* of Kerguelen's Land.'—W. Phillips and C. B. Plowright, 'New British Fungi' (*Peziza indiscreta*, *P. hirto-coccinea*, *P. nuda*, *Ascobolus viridulus*, *Nummularia gigas*, *Sphæria hyperici*, spp. nov.)—'Woolhope Club Meeting' (continued: contains descriptions of *Cortinarius imbutus*, *Lactarius picinus*, *Marasmius polyadelphus*, *M. splachnoides*, *Hymenula Platani*, and *Peziza aranea*, all new to Britain).—Quelet, 'New Fungi from the Jura and the Vosges'—two plates illustrating *Cortinarius*.

Hedwigia.—G. Winter, 'List of the *Uredineæ* and their host-plants observed in the district of Koch's "Synopsis."'

Naturalist (Huddersfield).—J. E. Griffith, 'Flora of Carnarvonshire and Anglesea.'

American Naturalist.—Lester F. Ward, 'Sexual differentiation in *Epigæa repens*.'

Proceedings of Societies.

Royal Society.

March 4.—"Report on Phyto-Palæontological Investigations of the Fossil Flora of Alum Bay." By Dr. Constantin Baron Ettingshausen. The first investigation of the fossil plants

of Alum Bay was made by Dr. De la Harpe and Professor Heer, who enumerated about forty species. The results of my investigation have raised the number to 116 genera and 274 species, which are distributed into 63 families: 3 are Thallophyta, 2 Filices, 5 Gymnospermæ, 6 Monocotyledones, 28 Apetalæ, 15 Gamopetalæ, 54 Dialypetalæ, and 2 are doubtful. A sub-tropical climate is indicated by the species of Ficus, Cinchonaceæ, Sapotaceæ, Ebenaceæ, Büttneriaceæ, Bombaceæ, Sapindaceæ, Malpighiaceæ, &c. The genera which are common to Alum Bay and Sheppey are:—*Callitris*, *Cupressinites*, *Sequoia*, *Cyperites*, *Smilax*, *Sabal*, *Aronium*, *Quercus*, *Juglans*, *Laurus*, *Nyssa*, *Proteoides*, *Cinchonidium*, *Apocynophyllum*, *Sapotacites*, *Diospyros*, *Symplocos*, *Magnolia*, *Nelumbium*, *Hightea*, *Acer*, *Sapindus*, *Cupania*, *Eugenia*, *Eucalyptus*, *Prunus*, *Amygdalus*, *Podogonium*, *Leguminosites*, *Carpolithes*. This seems to point to so close a connection between the two Floras, that it does not appear advisable to distinguish the leaves of the one from the fruits of the other by separate specific names. By comparing the leaves and fruits of their nearest living analogues, I have provisionally united them in many cases. The small number of ferns and palms is remarkable. Many of the Dicotyledons correspond with Miocene species, and I do not doubt that there is a genetic connection between them. There are also what appear to be certain ancestral species, if I may use the expression, nearly allied to several Miocene species, whose characters they unite. In addition to the great number of Miocene species, whose origin can apparently be traced back to the Eocene, there are not wanting indications that certain Miocene genera were not completely differentiated in the Eocene. I select for mention a few new forms possessing special interest. A *Marattia*, nearly allied to *M. Kaulfussi*, J. Smith, is remarkable as being the first species met in the Tertiary. The *Celtis* is allied to *C. Tapeti* of the Miocene Flora of Parschlug on the one side, and to the living *C. australis* on the other. The only *Adenopeltis* is allied to an American recent species. Two species of *Banksia*, with their seeds, also occur; many leaves formerly named *Banksia* I now agree may belong to *Myrica*. The Proteaceous *Lomatia* is represented by a fruit. Characteristic leaves of *Aristolochia*, and of an *Alyxia* allied to the recent *A. spicata*, R. Brown, and of a *Clerodendron* allied to the East Indian *C. viscosum*, Vent., are found, but rarely. Of *Diospyros* is found calyx, berry, and leaf, the berry occurring also in Sheppey. The *Diospyros* of Alum Bay and of Sheppey are the same species. The species of *Cornus* shows perhaps a genetic relation with Miocene species. The leaves of two species of Malvaceæ belong, I think, to two of the eight species of *Hightea* from Sheppey. A Bombaceous leaflet may belong, from its venation and form, to the Brazilian *Salmalia*; and leaves of *Ternstræmia* are nearly allied to a Miocene form. I have distinguished six species of *Cupania*, and these I provisionally refer to the nearest of the eight Sheppey species. The only *Pistacia* is allied to the well-known *P. vera*. The putamens of two species of *Prunus*, of which one is common to Sheppey, and of an *Amygdalus*

are found. Of the *Papilionaceæ* I distinguish thirty-eight species belonging to ten genera, many of which are also found in Hæring and Sotzka. The comparison of this Flora with that of Bournemouth and with other Tertiary Floras is reserved for further investigations. The most striking fact, however, that my work even at this stage has brought out is, that more than fifty of the species are common to Sotzka and Hæring, while a lesser number are common to Sézanne, to the Lignitic of America, and to other Floras.

Linnean Society of London.

March 4.—Prof. Allman, F.R.S., President, in the chair.—The following gentlemen were elected Fellows of the Society:—S. M. Bairstow (Huddersfield), J. T. Carrington (Aquarium, Westminster), Prof. P. M. Duncan (King's College, London), R. M. Middleton, jun. (West Hartlepool), S. O. Ridley (British Museum), and J. Charters-White (Belgrave-road, S.W.) Mr. E. M. Holmes read a paper on *Codiolum gregarium*, A. Braun, a new British Alga discovered at Teignmouth by the Rev. R. Cresswell. The author considered that the hypnospores described by Braun did not belong to *Codiolum*, but to another Alga usually found growing with it. The growth of the plant and its fructification, contrary to Braun's supposition, lasts through the winter and spring. Mr. Holmes also exhibited specimens of the fructification of *Chætopteris plumosa*, found in Britain for the first time by Dr. J. W. Trail of Edinburgh. The unilocular sporangia in this instance were in a more advanced stage than those figured by Areschoug, and the multilocular sporangia differed in character from the illustration given by the last-mentioned Swedish naturalist.

March 18.—Prof. Allman, F.R.S., President, in the chair.—Messrs. W. Drickenfield Scott (Wimbledon) and Wardlaw Ramsay (Portsmouth) were elected Fellows of the Society. The President said that before entering on the ordinary business of the meeting, it became his melancholy duty to announce the death of Prof. Thos. Bell, at the age of eighty-seven. Prof. Bell was the oldest Fellow of the Society, having been elected into it in the year 1815. He had held the Presidential Chair for many years, and under his judicious and able guidance the Society had marvellously advanced in prosperity. He was a distinguished zoologist, and by his researches had largely advanced our knowledge of the fauna of the British Isles. His labours have left their mark on the Zoology of Britain, and it is hard to say who can take his place in the department of Natural History, in which he had shown himself so loving and conscientious an observer. The Secretary read a communication from Mr. H. M. Brewer, of the Wanganui Acclimatisation Society, "On the Indigenous Timber and on Plants introduced into New Zealand." Among the former, "maraka" (*Leptospermum ericoides*) is useful for spokes, tool-handles, &c.; "kowhai" (*Sophora tetraptera*) forms admirable material for carving, &c.; "totara" (*Podocarpus Totara*) is most durable for piles, railway sleepers, &c.; red birch (*Fagus fusca*), on account of its strength,

is well adapted for beams and framework; and the "matai" (*Podocarpus spicata*) is so durable that a prostrate tree found in damp bush, and supposed to have been there for a couple of centuries, still retained its soundness when cut up. The above are a few of the trees brought into general use, but there are a vast number of others which will become equally valuable when it is better known when to cut and how to season them. Of plants introduced there are quite a host which thrive well out of doors. At Sir George Grey's seat, on the Island of Kawan, quite a brilliant assemblage have been successfully raised. Among others, the coral tree (*Erythrina caffra*), with its brilliant scarlet flowers; *Fourcroyia gigantea*, which produces a fine fibre, and grows well without any cultivation on the waste clay hills; also *F. flavoviridis*, another fibre-yielding plant. *Chamærops excelsa*, *C. humilis*, *Musa textilis*, and *M. sapientum*, equally thrive, the Banana ripening good fruit. *Broussonetia papyrifera*, from which paper is made in Japan, the pomegranate (*Punica granatum*) and the olive (*Olea europea*) hereafter are likely to become important as commercial products. The Natal plum (*Arduina grandiflora*), the fig (*Ficus Carica*), custard apple (*Anona muricata*), *Eriobotrya japonica*, ginger (*Zingiber officinalis*), the tallow tree (*Stillingia sebifera*), cinnamon, camphor, orange, lemon, and citrons, besides many other sub tropical plants, afford sufficient proof of the mildness of the climate and capabilities of the country ultimately to depend on its own resources. Of araucarias and pines, a great number of introduced species have thriven well, some only requiring a little shelter at first. Oaks, elms, poplars, &c., all take naturally to the New Zealand soil, but sufficient has been said to indicate the great variety of flora indigenous and introduced into this flourishing though distant colony.

Botanical News.

Dr. Bayley Balfour has returned from Socotra, bringing with him a large collection of living and dried plants; he has suffered from an attack of fever, but is otherwise in good health. Dr. Balfour has ascended to the summit of one of the highest peaks of the island, which reach an altitude of 5000 feet, and his botanical collections consist of about 6000 species, including full material for the determination of the Aloe and Dracæna which the island has for some time been known to produce, but of which complete specimens have never been procured.

The editorship of the bryological portion of Just's 'Botanische Jahresbericht' has been entrusted to Dr. F. Kienitz Gerloff, of Weilburg, who will be glad to receive any publications relating to Mosses.

We are glad to be able to announce that through the liberality of the Brazilian Government arrangements have been made for the

resumption of the work of the great 'Flora Brasiliensis,' the former grant for which expired some two or three years ago. The editorship rests, as before, in the hands of Dr. Eichler, and there are several important orders still unallotted.

A PENSION of £100 per annum from the Civil List has been awarded to Mr. W. H. Fitch, the well-known botanical artist, in consideration of his services to science.

THE English Dialect Society announces for early issue a reprint of William Turner's rare 'Names of Herbes.' It will be edited and annotated by Mr. James Britten.

WE regret to announce the death of WILHELM SCHIMPER, the eminent muscologist and palæontologist, which took place at Strasburg on March 20th. We hope to give a fuller notice next month.

ROBERT FORTUNE, the well-known plant collector and traveller in China, died on the 13th ult. at Brompton, aged sixty-eight years. Although his numerous discoveries were important chiefly from the horticultural standpoint, he made collections of dried plants during his various travels in China; these were distributed by the Royal Horticultural Society, who commissioned him to collect, and are found in many herbaria. In 1846 he was appointed Curator of the Chelsea Botanic Garden, but this appointment he soon resigned, and devoted himself to the collection in China of young tea plants and seeds for transmission to India. His various works, based upon his travels, are well known.

MUTIUS TOMMASINI, the Nestor of Austrian botanists, died at Trieste on the 2nd of January, in his eighty-sixth year. He published very little, but the value of his private epistolary communications is shown by frequent references in the works of Koch, Bertoloni, and Parlatore. His large herbarium and library has been bequeathed to the Trieste Museum. A lengthened biography of Tommasini appeared in the Oest. Bot. Zeitschrift for 1866.

M. G. SJÖSTRAND, born in 1807, died, on the 17th of March, in the island of Oeland, where he had resided for many years. He had carefully investigated the Flora of Oeland, of which he published an 'Enumeratio' in the Acta Soc. Scient. Upsal for 1850. His most important publication was the 'Colmar Läus och Oelands Flora,' published at Kolmar in 1863.

THEODOR HARTIG died at Braunschweig on the 26th of March at the age of seventy-six. His principal work was on the cultivated plants employed in German forestry, published at Berlin in 1851; he also wrote several papers upon vegetable morphology.

DR. R. H. C. C. SCHEFFER, Director of the Botanic Gardens at Buitenzorg, died recently at the early age of thirty-five.

THE 'Journal' of the Ceylon Branch of the Royal Asiatic Society (Colombo, 1880), contains an enumeration, with notes, of Ceylon *Gramineæ*, by Mr. W. Ferguson, F.L.S.

Tab. 209.







Original Articles.

A REVIEW OF THE BRITISH *CHARACEÆ*.

By Henry and James Groves.

(Tabs. 207–210.)

(Concluded from p. 129).

2.—LYCHNOTHAMNUS.

Leonhardi, Böhm. Charac. (1863), p. 12.—Chara sect. Lychnothamnus, Ruprecht. Symb. ad Hist. pl. Ross., 1845, p. 79.

Stem ecorticate or irregularly corticate. Branchlets ecorticate. Ring of stipulodes in a single circle, conspicuous. Bract-cells whorled. Globules by the side of the nucules, within the whorls of bract-cells. Monœcious.

1. L. alopecuroides, Braun, Monatsb. Berl. Akad., 1867, p. 798.

Chara papulosa, Wallr. Flor. Crypt. Germ., ii. (1833), p. 107.

C. Pouzolsii, Braun, Flora, 1835, i., p. 58.

C. Wallrothii, Rupr. Symb. ad Hist. Pl. Ross. (1845), p. 80.

C. alopecuroides, Braun, Schweiz. Char. (1847), p. 13.; Wallm. Act. Stockh., 1854, p. 281; Braun, Consp. Char. Europ., p. 7; Monats. Berl. Akad., 1867, p. 824; Bab. in Journ. Bot., i. (1863), p. 193, t. 7; Fl. Dan. (1867), t. 2745; Braun, R. & S. Exs. 62, 63, 81; Nordst. & Wahlst. Exs. 20–22.

Stem but little branched, without cortical cells, with many unicellular bulbils. Whorls of 6–8 straight or incurved branchlets. Stipulodes 8–12 long, slender, Branchlets of 4–5 joints, of which the upper 1–2 are much shorter, forming an acute point. Bract-cells 6–8, whorled, spreading, acute, at all but the last joint of the branchlets, longer than the nucule. Nucule oval, 10–12-striate. Coronula small, obtuse (Tab. 209, fig. 10).

A small dark green plant 3–8 in. high, not incrusted. It has only been found, in Britain, in the Salterns at Newtown, Isle of Wight, where it was discovered by Mr. A. G. More in August, 1862, but owing to the Salterns being disused and nearly dry, it is, we fear, lost in that locality. The Isle of Wight specimens appear to be nearest to the var. *Montagnei* of Braun. *L. alopecuroides* occurs principally in France and the Mediterranean district, the var. (species ?) *Wallrothii*, however, inhabits the Baltic.

Division II.—NITELLÆ.

Branchlets furcate, or sometimes, in the sterile whorls, simple, and, as well as the internodes, always ecorticate. Without stipular cells. Globules and nucules at the forkings of the branchlets. Coronula inconspicuous, usually deciduous, of 10 cells in 2 circles, the upper smaller.

3. TOLYPELLA.

Leonhardi in Lotos (1863), p. 12.

Branches many at each node. Branchlets simple or dividing into *unequal* rays. Globules *lateral* at the forkings of the branchlets, and usually surrounded by a number of nucules. Nucules also produced at the nodes of the fertile whorls. Monœcious.

I. T. GLOMERATA, Leon., Lotos, 1863.

Chara nidifica, Sm. E. B., 1703 (1807); Hook. Brit. Flor., ii., p. 245.

Chara glomerata, Desv. in Loisel. Not. (1810), p. 135.

Chara flexilis β. *prolifera*, S. F. Gray, Brit. Pl., ii. (1821), p. 21.

Nitella glomerata, Chevall. Lutet. Flor. Gen., ed. 2, v. ii. (1836), p. 124; Coss. & Germ. Atl. Fl. Par., t. 41, f. H.; Wallm. Act. Stockh., 1854, p. 270; Braun, Consp. Char. Europ., p. 3; Fl. Dan. (1869), t. 2800; Braun, R. & S. Exs. 17; Nordst. & Wahlst. Exs. 43–45.

Chara glomerulifera, Rupr. Symb. ad Hist. Pl. Ross (1845), p. 75.

Chara prolifera, Bab. A. N. H., v. (1850), p. 87 (not Braun).

Chara Smithii, Bab. *l. c.*, p. 86.

Nitella Smithii, Wallm., *l. c.* (1854), p. 271.

Nitella glomerulifera, Kütz. Tab. Phyc., vii. (1857), t. 81, f. 2.

Stem moderately stout, producing many branches at the principal nodes. Sterile whorls of 6–12 long, *simple*, *obtuse*, 3–5 jointed branchlets. Fertile whorls in dense compound heads; branchlets once divided, into 3–4, unequal, 3–5-celled, obtuse rays. Nucules stalked or sessile, ovoid, 8–9-striate; spiral cells prominent. Globules usually stalked. (Tab. 209, f. 11.)

Much encrusted and very brittle. The strongly-curved rays give the fertile whorls a peculiarly contorted appearance. It is recorded by Braun from Europe (North, Mid, and South), Asia, North Africa, and Australia; in Britain it is rare, and apparently almost confined to the South-east of England.

Ponds, brackish pools, and ditches. May. Hants, S.; Sussex, W.; Kent, E. and W.; Essex, N.; Middlesex; Norfolk, W.; Dublin.

II. T. PROLIFERA, Leonh., Lotos, 1863 (name).

Chara prolifera, Braun, Ann. Sc. Nat., 1834, p. 352.

Chara nidifica, Borrer, in note to E. B. S., 2762 (1834) (not Smith).

Nitella prolifera, Kütz. Phyc. Germ. (1845), p. 255; Wallm. Act. Stockh., 1854, p. 269; Braun, Consp. Char. Europ., p. 3.

N. fasciculata, var. *robuster* (*sic*), Braun, Schweiz. Char. (1847), p. 12.

Chara Borreri, Bab. A. N. H., v. (1850), p. 87.

N. Borreri, Wallm., *l. c.* (1854), p. 271.

Chara intricata, var. *robustior*, Baker, Ex. Club Rep., 1867, p. 15.

Stem stout, very much branched. Sterile whorls of 6–20 very unequal, *acute*, *simple*, 3–5-jointed branchlets. Fertile whorls in

large densely compound heads; branchlets divided into 3–4 *acute*, 2–3-, rarely 4-, celled rays. Nucules globosely ovoid. (Tab. 209, f. 12).

A very large plant, of which our figure is a reduced representation. The sterile branchlets are sometimes 7 in. long and very stout. It is a rare species, and has only been found in a few scattered localities in Central and Southern Europe. It was discovered in Britain by Mr. Borrer in 1827, near Rye Farm, Henfield, Sussex, and has since been found by Dr. Moore in the canal near Glasnevin, Dublin.

III. T. INTRICATA, Leonh. Lotos, 1863 (name); Braun, in Cohn's Krypt. Flor. von Schlesien (1877), p. 400.

Chara intricata, Roth. Catalecta Botanica (1800), fas. ii., p. 125.

Nitella intricata, Auct. (Ag. ?); Braun, Consp. Char. Europ., p. 3; Fl. Dan. (1867), t. 2744; Braun, R. & S. Exs. 18, 33, 108; Nordst. & Wahlst. Exs. 46, 48.

Chara fasciculata, Amici, Descriz. di alcune sp. nuove di Chara (1827), p. 16, t. 4, f. 4, and t. 5, f. 3.

Chara polysperma, Braun, Ann. Sc. Nat., 1834, p. 352; Gant. Oesterr. Char. (1847), p. 12, t. 1, f. 3; Bab. A. N. H., v. (1850), p. 88; Wallm. Act. Stockh., 1854, p. 269.

Nitella polysperma, Kütz. Phyc. Gen. (1843), p. 318.

N. fasciculata, Braun, Schweiz. Char., p. 11; Kütz. Tab. Phyc., vii., t. 36, f. 1.

Stem moderately stout. Sterile whorls of 6–10 once or twice divided branchlets; rays unequal, the ultimate *acute*, 3–5-celled. Fertile whorls in very large dense compound heads; branchlets once or twice divided, ultimate rays 4–5 celled, acute. Nucules numerous, globosely ovoid, stalked or sessile, 8–9-striate. (Tab. 209, f. 13.)

Distinguished from both the preceding species by its divided branchlets. It is widely distributed in Europe, and extends to North Africa. In Britain it is very rare, and does not appear to have been found for two successive years in any locality; there is a specimen in Herb. Buddle, but no locality is given.

Ponds, pools, and canals. April and May. Essex, N.; Suffolk, W.; Cambridge; Yorksh., N. (Dalton); Durham; Dublin.

4.—NITELLA.

Ag. Syst. Alg. (1824), Introd., p. 27, ex parte.

Stem rarely producing more than 2 branches at each node. Branchlets simple, or 1–4 times divided into nearly equal rays. Globules in the forking of the branchlets, thus *terminating* the segment from the apex of which the forking arises. Nucules *below* the globules, lateral. Monœcious or diœcious.

§ *Ultimate rays of* 2 *or more cells.*

I. N. TENUISSIMA, Kütz. Phyc. Gen. (1843), p. 319; Coss. & Germ. Atl. Fl. Par., t. 41; Wallm. Act. Stockh., 1854; Kütz.

Tab. Phyc., vii., t. 34, f. 2; Braun, Consp. Char. Europ., p. 2; Braun, R. & S. Exs. 60, 74, 103; Nordst. & Wahlst. Exs. 41.

Chara tenuissima, Desv. Journ. de Bot. (1809), ii., p. 313; Reichenb. Icon. Bot., f. 1055–1068; Gant. Oesterr. Char., p. 10, t. 1, f. 1; Bab. A. N. H., v. (1850), p. 85.

C. flexilis, var. *stellata*, Wallr. Ann. Bot. (1815), p. 178.

C. stellata, S. F. Gray, Nat. Arr. Brit. Pl. (1821), ii., p. 28?

Stem very slender, internodes long. Whorls very dense, of 5–8 short branchlets. Branchlets 2–3 times divided into 3–6 rays. Ultimate rays 2–3-celled, the terminal cell very slender, acute. Nucules oval, 8–9-striate; spiral cells not prominent. Globules large. Monœcious. (Tab. 209, f. 14.)

The smallest British species, 1–4 in. high, usually dark green and somewhat incrusted. Readily distinguished from our other Nitellas by its very small dense whorls and comparatively long internodes. The nucules are ripe in August. It occurs in Central and Southern Europe, Asia, North Africa and North America. In Britain it has only been recorded from the Cambridgeshire Fens, where it was discovered by Prof. Henslow in 1829. S. F. Gray's description of *C. stellata* in 1821, could scarcely refer to any other species, but no locality is given.

II. N. GRACILIS, Ag. Syst. Alg. (1824), p. 125; Coss. & Germ. Atl. Fl. Par., t. 41 E; Wallm. Act. Stockh., 1854, p. 247; Kutz. Tab. Phyc., vii., t. 34, f. 1; Braun, Consp. Char. Europ., p. 2; Braun, R. & S. Exs. 24, 25, 34,* 57–59; Nordst. & Wahlst. Exs. 15–17.

Chara gracilis, Sm. E. Bot., 2140 (1810); Reichenb. Icon. Bot., f. 1069; Gant. Oesterr. Char., p. 10, t. 1, f. 2; Bab. A. N. H., v. (1850), p. 84.

C. flexilis, var. *gracilis*, S. F. Gray, Nat. Arr. Brit. Pl. (1821), vol. ii., p. 28.

C. exilis, Amici Descriz. di alcune sp. nuove di Chara (1827), p. 20, t. 3, f. 6 and 7.

Stem very slender, moderately branched. Whorls of 5–6 extremely slender branchlets. Branchlets 2–3 times divided into 3–4 rays. Ultimate rays 2–3-celled, strongly mucronate. Nucules solitary, at all the forkings of the branchlets, globosely ovoid, 6–7-striate. Monœcious. (Tab. 210, f. 15.)

A very slender and delicate plant, 4–8 in. high, light green, distinguished from the last by its much laxer habit. The nucules are ripe in September. It was discovered by Mr. Borrer in a boggy pool in St. Leonard's Forest, and was described and figured, by Smith, from his specimens. It has since been collected by Mr. D. Orr at Glen Cullen, near Ballybetagh, Co. Dublin. The Irish plant is a smaller, stouter form, and the ultimate rays are shorter; and it is annularly incrusted. *N. gracilis* is widely

* Under Braun, R. & S. Exs. 34, we have *N. gracilis, elongata;* in the Kew set the plant under this number is *C. stelligera*, var. *ulvoides*. It seems to us of little use to issue numbered sets, if all the plants under one number are not the same.

Tab. 210.



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15. N. gracilis. Ag. 16. N. mucronata. Kütz.
17. N. translucens. Ag. 18. N. flexilis. Ag. 19. N. opaca. Ag.

E. Groves del. Blair lith. West, Newman & Co. imp.

distributed in Europe and Africa, occurring also in Asia and North and South America.

III. N. MUCRONATA, Kütz. Phyc. Germ. (1845), p. 256; Tab. Phyc., vii., t. 33, f. 1; Coss. & Germ. Atl. Flor. Par., t. 40 D; Wallm, Act. Stockh., 1854, p. 253; Braun, Consp. Char. Europ., p. 2; Braun, R. & S. Exs. 20, 30; Nordst. & Wahlst. Exs. 82.

Chara furcata, Amici Descr. di alcune sp. nuove di Chara (1827), p. 14, t. v., f. 2 (not Bruz.).

C. flexilis, "L," Reichenb. Icon. Bot., f. 1071–2.

C. mucronata, Braun, Ann. Sc. Nat., 1834, p. 351; Gant. Oesterr. Char., p. 9; Bab. A. N. H., v. (1850), p. 84.

C. Barbieri, Balsamo-Crivelli, Biblioteca Italiana, vol. 97 (1840), p. 190.

C. norvegica, Wallm. Act. Stockh., 1854, p. 252.

C. brevicaulis, Bertol. Flora Italica, vol. x. (1854), p. 19.

Stem rather stout, moderately branched. Whorls of 5–6 stout branchlets. Branchlets 1–2-, rarely 3-, times divided into 2-4 rays. Ultimate rays 2-celled, the upper cell usually short, conical, acute. Nucules oval, 7–8-striate. Monœcious. (Tab. 210, f. 16.)

A dark green plant, 6–12 in. high, often in its laxer forms resembling *N. flexilis*, from which it differs by its 2-celled ultimate rays. It is closely allied to *N. gracilis*, but is stouter, more rigid, and the branchlets are less divided. Generally distributed in Europe, and occurring in Asia, North Africa and North America; discovered in Britain by Mr. Borrer, in a ditch at West Grinstead, West Sussex, but has not since been found. Our figure is taken from Borrer's specimen, which is near the var. *heteromorpha*, Braun, Flora, 1835, i., p. 52.

IV. N. TRANSLUCENS, Ag. Syst. Alg. (1824), p. 124; Coss. & Germ. Atl. Flor. Par., t. 40 B; Wallm. Act. Stockh., 1854, p. 259; Kütz. Tab. Phyc., vii., t. 26, f. 1; Braun, Consp. Char. Europ., p. 2; Braun, R. & S. Exs. 19; Nordst. & Wahlst. Exs. 81.

C. translucens, Pers. Syn. (1807), ii., p. 531; Sm. E. B., 1855 (1808); Bruz. Obs. Char., p. 22; Hook. Brit. Flora, ii., p. 245; Bab. A. N. H., v. (1850), p. 84.

Stem usually stout. Sterile whorls of 4–6 usually once divided branchlets; *rays* 2–4, *very minute*, 2-celled. Fertile whorls *very small and dense;* branchlets 6–8, once or twice divided. Nucules small clustered, strongly 7–8-striate. Monœcious. (Tab. 210, f. 17.)

Our largest *Nitella*, sometimes 4–5 feet high, of a bright green. The very minute rays which appear as small points on the primary joint immediately separate this from all our other species. It is a rare species, occurring in Western and Southern Europe, but reaching to Germany and South Sweden, also to North Africa. It is not uncommon in the South of England.

Ponds, pools, canals, and (rarely) streams. July. Cornwall, W.; Hants, S.; Sussex, W.; Surrey; Essex, S.; Herts;

Suffolk, E.; Norfolk, E.; Salop; Cheshire; Kerry; Galway, W.; Derry, W.

§§ *Ultimate rays* 1-*celled.*

v. N. FLEXILIS, Ag. Syst. Alg. (1824), p. 124; Wallm. Act. Stockh., 1854, p. 261; Kütz. Tab. Phyc., vii., t. 33, f. 2; Braun, Consp. Char. Europ., p, 2; Braun, R. & S. Exs. 22, 23, 54, 55, 101; Nordst. & Wahlst. Exs. 8–14.

Chara flexilis, L. Spec. Plant. (1753), p. 1157 (ex parte); Bruzel. Obs. Char., pp. 15 and 23; Gant. Oesterr. Char., p. 8; Bab. A. N. H., v. (1850), p. 83.

C. furculata, Reichenb. Mössl. Handb., ed. 3, vol. iii. (1834), p. 1664.

C. Brogniartiana, Coss., Germ. & Wedd. Introd. Flor. Par. (1842), p. 152.

Nitella Brogniartiana, Coss. & Germ. Flor. Par. (1845), p. 682, and Atl. 40 c.

Chara commutata, Rupr. Symb. ad Hist. pl. Ross. (1845), p. 77.

Nitella furculata, Nordst. Bot. Notiser, 1863, p. 35.

Stem rather slender. Branchlets slightly incurved, 6–8 in a whorl, once divided into 2–3 long, somewhat acute, 1-celled rays. Fertile whorls usually lax. Nucules 2–3 together, shortly oval, 8–9-striate. Globules large. Monœcious. (Tab. 210, f. 18.)

In its typical form, slender, flexible, light green, and often annularly incrusted, 1–3 ft. high. The fertile whorls rarely form lax heads, when it is *f. subcapitata*, Braun. It is only recorded from Europe and America, and is not common in Britain.

Ponds and pools. June and July. Sussex, W.; Kent, W.; Surrey; Essex, S. and N.; Herts; Cambridge; Warwick; York, N.E.; Northumberland, S.

VI. N. OPACA, Ag. Syst. Alg. (1824), p. 124; Braun, Consp. Char. Europ., p. 1; Braun, R. & S. Exs. 29, 51–3, 77, 105–6; Nordst. & Wahlst. Exs. 5–7.

Chara flexilis, "L." Sm. E. B., 1070 (1802).

C. syncarpa, Auct. (non Thuill.), Reichenb. Icon. Bot., f. 1078–9; Gant. Oesterr. Char., p. 9; Bab. A. N. H., 1850, v., p. 83.

C. flexilis, var. *prolifera*, S. F. Gray, Nat. Arr. Brit. Pl. (1821), p. 28.

C. opaca, Ag. in Bruzel. Obs. Char. (1824), pp. 16 and 23.

C. capitata, var. *opaca*, Braun, Ann. Sc. Nat., 1834, p. 352.

N. syncarpa, var. *Smithii*, Coss. Germ. & Wedd. Introd. Flor. Par., 1842, p. 151.

N. atrovirens & opaca, Wallm. Act. Stockh., 1854, p. 263–4.

Stem rather slender. Barren whorls of 6–7 simple, or 2–3-rayed branchlets. Fertile whorls forming dense heads (in the male plant often much laxer); branchlets once divided into 2–3 (rarely in the male plant 4), acute rays. Nucules 1–3 on each branchlet, strongly 6-striate. Globules very large, solitary. Dicœcious. (Tab. 210, fig. 19.)

This is a very variable species; it may usually be distinguished by the dense heads, and its ultimately becoming almost black, as

well as by the dicœcious character, which separates it from *N. flexilis*. Apparently common in many parts of Europe, and occurring in Asia, North Africa, and North America. It is our most frequent British *Nitella*.

Ponds, pools, ditches, streams, &c. May and June. Cornwall, W.; Devon, S.; Wight; Hants, S.; Sussex, W. and E.; Surrey; Essex, N.; Oxford; Norfolk E.; Cambridge; Northampton; Salop; Lancs., S; York, M.W.; Durham; Cumberland; Fife; Forfar; Aberdeen, S.; Kerry, N.; Cork, N.; Dublin; Galway, W.; Leitrim; Donegal; Antrim.

[We have not been able satisfactorily to refer any British plant to either of the following species, as it is necessary to examine fresh specimens, but probably both occur:—

N. SYNCARPA, Chevallier Lutet. Flor. Gen., ed. ii., vol. ii. (1836), p. 125; Kütz. Tab. Phyc., vii., t. 31, f. 2; Braun, R. & S. Exs. 76; Nordst. & Wahlst. Exs. 1, 2. — *Chara syncarpa*. Thuill. Flor. Par. (1799), p. 473; Reichenb. Icon. Bot., f. 1073–5. This differs from *N. opaca* by its very slender habit and simple branchlets in the female plant, by the globules and nucules being covered with a mucilaginous coating, and by the nucules being faintly striate.

N. CAPITATA, Ag. Syst. Alg. (1824), p. 125; Braun, R. & S. Exs. 26–28, 104; Nordst. & Wahlst., 3, 4. — *Chara capillaris*, Krocker, Flor. Siles., vol. iii. (1809), p. 62. — *C. capitata*, Nees, Denkschr. der K. Baier. bot. Ges. 1818, p. 80, t. 6. — *C. elastica*, Amici, Descriz. di alcune sp. nuove di Chara (1827), p. 9, t. 1, f. 2 and 3. Female branchlets divided into 2–3 rays. Nucules with sharp, prominent spiral cells and, as well as the globules, with a mucilaginous coating. Braun has referred specimens in Herb. Kew, from Llyn Idwal (W. Wilson), Killarney (Harvey), and Kent 'Stowting' to this species.]

REMARKS ON BOTANICAL BIBLIOGRAPHY.

By B. Daydon Jackson, Sec. L.S.

Having been engaged for more than two years in preparing a Guide to the Literature of Botany (now almost completed) for the Index Society, certain defects in the present bibliographical authorities have been forced upon my notice, and I beg to offer some suggestions for the guidance of those who may hereafter undertake the publication of any work on that subject. Previous to engaging in the compilation I have mentioned, I had found Pritzel's 'Thesaurus Literaturæ Botanicæ' equal to my occasional wants, but constant use for a long time of both editions has familiarised me with the merits and defects of that work, probably in a greater degree than the majority of botanists. I will therefore indulge in a few remarks on the 'Thesaurus' itself, before setting forth my own views upon future bibliography.

At the outset, let me say that I am not actuated by the slightest desire to depreciate the labours of Pritzel; on the contrary, I yield to no one in admiration of the patience and assiduity he has displayed in that very painstaking and indispensable volume; but whilst fully admitting the great value of the 'Thesaurus,' it would be idle and foolish to shut our eyes to its shortcomings.

The printing of the first edition, which bears the date of 1851 on the title-page, extended from 1847 to 1851, taking in a portion of the publications which appeared in 1847. The scheme of the work includes not only strictly botanical works, but gardening, medical, chemical, and even philological treatises were inserted—anything and everything in fact which touched upon plants. So comprehensive, indeed, was the plan, that we find entries like the following, the claim to admission being decidedly slender:—

> Sendel (*Nathanael*). Electrologiæ per varia tentamina historica ac physica continuandæ Missus I. . . Elbingæ . . . 1725. 4to. (9555). Followed by three other works, also on Amber (9556–8).

The following have still slighter claims to notice:—

> Sanden (*Heinrich von*). De succino electricorum principe. D. Regiomonti 1714. 4to. (8985).
>
> Tod (*George*). Plans, elevations, and sections of hot-houses, green-houses, an aquarium, conservatories, &c., recently built in different parts of England, for various noblemen and gentlemen. London, . . . 1807. fol. (10346).

The first four fasciculi of the second edition of the 'Thesaurus' were issued in 1872, as far as the name Tournefort, and thence the publication was suspended in consequence of the illness and subsequent death of the author. The work was completed by Dr. C. W. F. Jessen, fasciculi i. to vii. being issued together in 1877. As regards the latter portion, it is somewhat difficult to apportion the blame, in places where the faulty part might have existed in Pritzel's manuscript, or was due to the editor undertaking the thankless task of completing the labours of another. However, some of the errors are unambiguous; thus, the editor is clearly blameable for the very first entry under the heading, Addenda, (p. 356), "Auerswald, † Leipzig, 30 Juni, 1870," for if he had referred to the main entry on p. 10 he would have found that item of information already recorded. Another singularly unfortunate editorial slip is to be found in Visiani's works, where the last *seventeen* in chronological order are omitted from their proper places on p. 333, and are inserted in the addenda in bulk on p. 359. Another lapse may be noted on p. 502, where the name of *Trimen* occurs thrice; the first time owing, no doubt, to an error in transcription, 1868 being taken for 1863, and so placed; the second should read *Trimmer*, whilst the third is right. It would be ungracious not to heartily thank Dr. Jessen for his labours in the compilation of the systematic portion, which he has drawn up in a far more convenient manner than the old one, and moreover has supplied from the previous edition many works unaccountably dropped out from the alphabetical portion of ed. ii.

The second edition contains publications to the end of 1871; a few dated 1872 were probably issued earlier than declared, owing to what is unfortunately a common trick on the part of publishers, that of post-dating books. The interval of twenty-four years had produced a large accession to the number of works which required entry, and yet this edition only contains 10871 numbers, against 11906 in the former issue; that is to say, in spite of the rapid growth of botanical literature in that quarter of a century, fewer titles were mustered. How was this compression obtained?

The original intention was eminently good, namely, to reject those works which were clearly not of botanical interest; the space so gained to be applied for the accommodation of worthier productions, so as not to unduly increase the bulk of the edition.

The unfortunate part of the matter is, that the selection appears to have been inconsistently carried out. The exclusion of the purely horticultural literature was unquestionably good; thus, in the very first column in ed. i., out of nineteen numbers, only five reappear in ed. ii., ten of the rejected being various treatises on Gardening, by Abercrombie. The following, however, are amongst the survivals:—

Guenterrode (*Friedrich Justinian, Freiherr von*). Die Pflaumen. Heft. 1–6. Darmstadt, 1804–8. 8vo. (ii. 3624). Retained presumably on account of its pretty plates.

Volckamer (*Johann Christoph*). Nuernbergische Hesperides, . . . Nuernberg, 1708. fol. (ii., 9848).—*Ibid.* Continuation [Half-title only] 1714. (ii., 9849).

This production, however, contains some purely botanical matter, *e. g.*, Nuernbergische Flora, pp. 209–243, tt. 19.

Of a more doubtful type are these:—

Herrera (*Gabriel Alonos de*). Obra de agricultura. . . . 1513. fol. (ii., 4007).

Elsholz (*Johann Siegesmund*). Neuangelegter Gartenbau, oder Unterricht von der Gartnerei . . Coelln. a. d. Spree, 1666. 4to. (ii., 2672).

Gatterer (*Christoph Wilhelm Jakob*). Literatur des Weinbaues aller Nationen, . . Heidelberg, 1832. 8vo. (ii., 3232).

Schuebler (*Gustav*). Untersuchungen ueber Most- und Weintraubenarten Wuertemburgs. D. Tuebingen, 1826. 8vo. (ii., 8428).

——— Untersuchungen ueber Obst- und Weintraubenarten Wuertemburgs. D. Tuebingen, 1827. 8vo. (ii., 8430).

The next examples have a very dubious claim to inclusion:—

Schuebler (*G.*) Untersuchungen ueber die Regenverhaeltnisse der schwaebischen Alp und des Schwarzwalds. D. Tuebingen, 1832. 8vo. (ii., 8445).

——— Untersuchungen ueber die Temperaturverhaeltnisse der schwaebischen Alp. D. Tuebingen, 1831. 8vo. (ii., 8439).

I venture to think that the next three should have been excluded without the slightest hesitation:—

[Fatio (*Nicolaus*).] Fruit Walls improved, by inclining them to the Horizon. London, 1699. 4to. (ii., 2819).

Fleischer (*Georg Christian*). Lilia Rubenis, sire Dissertatio philologica-critica. . . . D. Hafniae, 1703. 4to. (ii., 2932).

Hagendorn (*Ehrenfried*). Tractatus physico-medicus de Catechu sive terra japonica. Jenae, 1679. 8vo. (ii., 3692),

The next examples are mere excerpts from various journals, and have no claim to be considered independent works :—

Encontre (*Daniel*). Additions à la Flore biblique de *Sprengel*. [Montpellier, 1811.] 8vo. (ii., 2684).

——— Recherches sur la botanique des anciens. [Montpellier, 1813.] 8vo. (ii., 2685).

Trecul (*Auguste*). Recherches sur la structure et le développement du Nuphar lutea. [Paris, 1843.] 8vo. (ii., 9468).

In such cases as the last three it would surely have been better to have excluded them as the majority of similar tracts have been treated, as for instance was done in a wholesale manner in the case of J. F. C. Montagne, where twenty-three papers, entered under his name in Ed. i., do not appear in Ed. ii. Previous to the publication of the Royal Society's Catalogue of Scientific Papers there was a great inducement to include such, lest they might be overlooked, but now there can be little gained by such partial cataloguing.

So far I have named books and pamphlets which might have been excluded with advantage; I now turn to the consideration of those which were rejected in the compilation of the second edition. What were the grounds of shutting out publications like these?—

Durazzo (*Ippolito*). Il giardino botanica dello Zerbino ossia catalogo delle piante ivi coltivate. Genova, 1804. 8vo. (i., 2845).

Eaton (*Amos*). Botanical Exercises. . . . Albany, 1820. 8vo. (i., 2884).

Hirschfeld (*Wilhelm*). Die Ernaehrung und das Wachsthum der Pflanzen nach dem neuesten chemischen und physikalischen Beobachtungen. . . . . Kiel, 1844. 8vo. (i., 4510).

I might easily multiply these examples to a very large total, if it were needed, but these will suffice to show that, probably, several hundreds of titles have been thrown out by what appears to me serious errors of judgment. For samples of wholesale rejection let a comparison be made of such names as *James* Petiver and Rafinesque in the respective editions.

More unfortunate still are the omissions of important works, such as—

Mueller (*Karl August*). Synopsis muscorum frondosorum omnium hucusque cognitorum. . . Berolini, 1849–50. 2 vols. 8vo.

Hofmeister (*Wilhelm*), &c. Handbuch der physiologie. Leipzig, 1867–8. 8vo.

The other volumes by A. de Bary and J. Sachs are given by Pritzel, but the two contributions by the author whose name is given as the director of the series, are thus omitted.

The editor, Dr. Jessen, has done his best to palliate some of his author's omissions by supplying the titles in the systematic portion of the 'Thesaurus.' For instance—

MERRETT (*Christopher*). Pinax rerum naturalium britannicarum . . . Londini, 1667, 8vo (i., 6813), will be found in ed. ii. only on page 500.

This of course is but a partial remedy, for a book is almost entirely hidden if it cannot be seen on reference to the alphabetical part.

The conspicuous advantages of the second edition consist of references to the Catalogue of Scientific Papers, and biographical notices of the various authors. These notices, however, are not invariably accurate: F. T. PURSH is represented as being born in 1794, twenty years later than the fact, and SAUVAGES has a perfect web of mis-statements about him. The entry stands thus:—"BOISSIER DE LA CROIX DE SAUVAGES, *Pierre Augustin* (Sauvagesia, Jacq.) * Alais (Gard), 28 Aug., 1710, † Alais, 19 Dec., 1795." Corrected it should run thus:—"BOISSIER DE LA CROIX DE SAUVAGES, *Francois*, (Sauvagesia, Jacq.) * Alais (Gard), 12 May, 1706, † Montpellier, 19 Feb., 1767." The younger brother, a theological writer, has here been mistaken for the botanist.

This brings me to the subject of the numerous misprints in the second edition, the first being commendably free from them. Cross-references were not overabundant in the previous issue, but they are almost wholly absent from the second, also the references to the collections in which the scarcer books are to be found, are less numerous than in the old edition; in the second becoming rarer as the printing of the work progressed, until the final sheets are nearly free from them.

I have further to point out the large number of duplicate, and even triplicate, entries to be found in ed. ii. I join issue on the propriety of giving a second number, when any work is mentioned in the Addenda, for the sake of supplying additional information. As a single example I adduce, MARTIUS, Flora Brasiliensis (ii. 5902 and 10603), the latter entry informing us of the issue of fasciculi 51–56; here the number of the main entry should have been given, and not a new one, as if it were a different book. But I more particularly complain of a state of things like this:—

Annals of Botany, by *Charles Konig* and *John Sims*. London, 1805–6. 2 vols. 8vo. (ii. 10687 and 4799).

The Phytologist. . . London, 1842–51. 8vo. (ii. 10840, 5696, and 6687).

Ibid. [New Series.] London, 1855–63. 8vo. (ii. 10841, 4500, and mentioned in a note under ii. 5696).

PFEIFFER (*Ludwig*). Synonymia botanica locuplehisima genera . . . Cassellis, 1870. 8vo. (ii. 7109 and 10617).

I have marked more than fifty of these duplicate entries in my own copy of Pritzel. As as instance of one error causing another, I may point out the case of *Franz Romeo* SELIGMANN, whose three productions (ii. 8570–2) are inserted between SECRETAN and SEEMAN on page 293, instead of their proper place on page

294, between Selig and Semmedi. This omission was apparently noticed during the printing, and led to these three being also given in the addenda (ii. 10636–8).

To conclude the very unpleasant task of fault-finding, I must record my vigorous protest against the manner in which Pritzel has altered the spelling of the Christian names of many of the writers. The most flagrant instance of this unwarrantable liberty, I think, will be found in *Carl Anton* Meyer; both in Latin and German he seems invariably to have spelt his name with a C, yet Pritzel chooses to give him a K, the consequence being that this author is driven out of his rightful position in the alphabet, where he should be placed *third* amongst the Meyers, to the *tenth* place, so rendering his productions liable to be overlooked. The absurdity is immensely heightened hy the quotation of the well known initials in more than one place, *e.g.*, Smielowsky, *Timotheus*, . . (Smielowskia, C. A. M.), p. 299. According to the main entries of author's names in Pritzel, these initials, C. A. M., will only fit *Charles Auguste* Moisand, in whose 'Flore Nantaise' (ii. 6355) we might vainly seek for the genus Smielowskia.

Thus far I have pointed out the most noteworthy deficiencies in our standard botanical bibliography; I now proceed to indicate what appear to me requisites in any future similar undertaking.

In the first place, what should be included? Besides the various systematic, descriptive, and physiological books, about which no doubt can exist, there must remain a very large number of productions which can be, as it were, only admitted on sufferance, or rejected with some misgiving. From the classics of the science, there is a gradual descent to the veriest trash; from indispensable authorship to utterly worthless effusions. It would be found almost impossible to draw up rigid rules of inclusion and exclusion which would work satisfactorily, without judging each doubtful case on its own merits. I think that every publication which has for its object the diffusion of knowledge about plants, in structure, affinities, and functions, apart from any utilitarian or cultural consideration, must be included; the difficulties only begin when we take in hand the outlying divisions, such as elementary or economic botany, and travels. As I have said before, each book must be separately judged, but I would strongly urge that as many as can fairly be included, should be, for over-inclusion is far more readily pardoned than omissions, and a complete bibliography should clearly err on that side. It will be for the future bibliographer to choose his own method of work, but he will act discreetly by omitting all purely agricultural, gardening, chemical, and philological treatises, confining himself to Botany simply; he will find ample employment for his powers within the limits thus circumscribed.

I have taken for granted that nothing will be catalogued which has no claim to be treated as an independent publication. An important point now rises for settlement: what constitutes a separate work? A *bona fide* reprint from any periodical or transactions, which has been specially set up in type, is admittedly

an independent production, but where is the line to be drawn between such, and the merest cutting from a journal? In the numerous means which lie between these extremes, where can we say, this shall be included, and that rejected? I think the canon I have laid down for my own guidance a sufficiently satisfactory one, and it has been approved by competent judges in this country. I hold that every reprint which possesses a full title-page and independent pagination, even if the original paging be also retained, is, to all intents and purposes, a separate work, and must be catalogued as such; if, in addition, the original medium of publication be given by the bibliographer, so much the better. To exemplify my meaning as to full and half-titles, DILLENIUS's 'Hortus Elthamensis' has a full title to vol. i., but only a half-, or as some style it, a bastard-title, to vol. ii., running thus, "Plantarum rariorum horti Elthamensis. Tomus alter.," and nothing more. The rule just enunciated may sometimes require to be relaxed, to admit such cases as COEMANS' 'Spicilèges mycologiques,' Nos. 1–8, Brux., 1862–3, 8vo. (ii., 1722), which were reprinted from the 'Bull. Bot. Belg.,' but can only boast of a half-title. Apart from evident exceptions like these, both criteria should be maintained. Much depends upon the printers, some of whom issue the reprints from societies' publications in a form suitable for inclusion under our rule, others so as to be invariably shut out. As many editions should be described as known, with their successive editors.

How should the entries be arranged? As in Pritzel, in the alphabetical order of the authors' names; we want primarily an approximately complete list of books, as near to a perfect library catalogue as possible; an *Index rerum* is an adjunct to this, but should not take its place. Dryander's Catalogus is an example of the results to which excessive refinements in arrangement may lead; we are obliged to consult the alphabetical list of authors in the fifth volume before we can find particulars of the books in the other four.

The name of each author, as a heading to his list of productions, should be expressed in his vernacular, with his Christian names in full, as he himself spelled them; or if he varied the spelling, then according to the majority of instances, or his usage in his later years, with the dates and places of his birth and death, and other particulars, similarly to Pritzel. I have said, in the author's native language, for we have no right to alter or mutilate a man's name, as unfortunately the manner of some is. I fear that no nation can be held free from the reproach of doing this in some degree, but the French cultivate this vice to excess, and the Germans follow hard after them. Cross-references should be inserted in their proper places, to guide the readers to the main entry. For example, let the main entry be:—

L'ESCLUSE, *Jules Charles de*, (Clusia, Linn.) *Arras, 19 Febr., 1526. †Leiden, 4 Apr., 1609.

Then would follow the biographical notices, as in the 'Thesaurus,' and the books in chronological order; where several editions of

the same work are given, I prefer to let the date of the last edition determine its place in the list, since therein the author has had an opportunity of expounding his latest views. The cross-references in this instance would be :—

CLUSIUS, *Carolus*, vide L'ESCLUSE.
L'ECLUSE, *Charles*, vide L'ESCLUSE.

Each work should have the full title-page recited (excluding the laudatory epithets, which are sometimes made so prominent), the place, with publisher's name and date. The pagination of each volume should be stated, together with the number of plates, and the size of the book so expressed as never to be mistaken for pages, thus, 4to, 8vo, or 4o, 8o, etc. Any omissions from the full title, where necessary, as for instance where it is interrupted by a long adulation to the Præses or similar functionary, should be shown by ". . . . . ," or some such well-known sign. Additions to be included in square brackets, thus :—

CARUEL (*F.*) Florula [dell' isola] di Montecristo. Milano, 1864. 8vo. (ii. 1564).

The words so inclosed do not stand part of the title, but were printed in the 'Thesaurus' as if they formed an integral part thereof. Information afforded by the bibliographer, when not in the form of notes in smaller type, should also be enclosed in square brackets, so that the authors of anonymous works, when known, and ascertained dates which are not actually declared in the work itself should be so marked. I consider that the date of presentation of a thesis is not necessarily the date of publication, thus, the date ". . . . die xxx. Decembris . . . ." only fixes the time of oral delivery, and by no means the absolute date of publication, as commonly understood. Such date should therefore always be given, as for instance, [1850], for in these theses the foot of the title-page mentions the place of issue and the printer or publisher, but no date. Again, if the author's name be absent from the title-page, but supplied in his preface without any chance of mistake, I am not sure that I would bracket it; but if there should be more than one introductory epistle, and error may occur in assigning the authorship, then I would show my sense of these circumstances by brackets. As an example, notice "Hortus regius. Parisiis, 1665. fol.," which may be found variously catalogued under VALLOT or JONCQUET from this very cause.

Another item of much-needed reform is in the indexing of theses, the present no-system being to rank them sometimes under the name of the Præses, sometimes under that of the Responsor. A certain measure of excuse may be found for this in the various amount of authorship; thus, whilst we find in many cases the Præses is absolutely the author, in perhaps as many more the true writer is the Responsor. Linnæus corrected with his own hand some of the theses which appear in the 'Amœnitates academicæ'; examples may be seen in the Banksian library and probably elsewhere, so that he must be herein credited with editorship at least. The most flagrant instance of the abuse of this system that I know of is Agardh's 'Aphorismi botanici.' D.

i.-xvi. Lundæ, 1817. 8vo. Here sections of two or three sheets are allotted as theses to sixteen students, the sentences often running on from one to another, even a fraction of a word like *Mo-no-* being divided between two Responsors. The pagination is continuous, irrespective of the several title-pages which are dropped in at these intervals. I consider the best way out of the present bad state of things is, to arrange the theses, when the Præses is named, under his name, with a cross-reference to it from the name of the Responsor, the actual or reputed author. By this means the large collections under such names as Linnæus, Wedel, and Thunberg would still be kept intact, whilst a ready means would be afforded of getting at the works themselves when only the name of the Responsor happens to be known.

The cataloguing of anonymous works need not offer any great difficulty; I think the plan adopted by Pritzel in ed. ii. is good enough for practical purposes, although susceptible of improvements in details. It is, to arrange such works in a separate section, and to take the first *substantive* in all languages as the key-word to determine their special alphabetical order. This regulation would present the eccentricities which too often may be met with, as for instance, in the indexes to Bonplandia, where unimportant words, as *Der*, *Die*, *Wie* are used, to the complete hiding of the important words in the titles. Indexes are rarely pleasant reading, and should be helps, not hindrances like those in Bonplandia, which almost compel the searcher to read them through to ascertain if the information he seeks is contained in the volumes consulted. Almost as great a nuisance are separate indexes for different languages, but this custom is giving way to the sensible plan of one comprehensive index for the whole.

Pritzel's example of the very useful index to anonymous works, which are ranged under the putative authors, should be followed in the future bibliography; likewise, the index to names incidentally mentioned in the titles of books, or not standing first in joint-authors' names. The system of numbering the various works, as in the 'Thesaurus,' is decidedly good, and well worthy of imitation.

Books not actually handled should have the derivation of the title appended. Uniformity is also requisite in spelling out, or otherwise the diphthongs, æ, œ, and the modified vowels, ä, ö, ü, as ae, oe, ue. The Scandinavian å should be arranged in the ordinary sequence with a, and not at the end of the alphabet.

I here quote the rules laid down by the Index Society, for ensuring uniformity in the troublesome matter of prefixes, as having been carefully drawn up, and substantially in accord with Pritzel's usage in Ed. ii., where he abandoned some of the modes adopted in Ed. i.

"Proper names ... to be alphabetically arranged under the prefixes:—

Dal	as	*Dal Sie.*	*Du*	as	*Du Bois.*
Del	,,	*Del Rio.*	*La*	,,	*La Condamine.*
Della	,,	*Della Casa.*	*Le*	,,	*Le Sage.*
Des	,,	*Des Cloisseaux.*			

but *not* under the prefixes :—

D'	as	*Abbadie*	not	*D'Abbadie.*
Da	,,	*Silva*	,,	*Da Silva.*
De	,,	*La Place*	,,	*De La Place.*
Von	,,	*Humboldt*	,,	*Von Humboldt.*
Van	,,	*Beneden*	,,	*Van Beneden.*

"It is an acknowledged principle that when the prefix is a preposition it is to be rejected, but when an article it is to be retained. When, however, as in the case of the French *Du*, *Des*, the two are joined, it is necessary to retain the preposition. This also applies to the case of the Italian *Della*, which is often rejected by cataloguers."

Last, but scarcely least, the vile practice of intermingling I with J, and U with V, must be eschewed as a relic of barbarism; the nuisance of having to discover a name like Ives, and ffnding it sandwiched between Juéry and Jueterbock, must be felt to be duly appreciated.

Assuredly no light task will devolve upon the future botanical bibliographer. In addition to the comparison of Pritzel's 'Thesaurus' with the actual volumes, title by title, the wonderfully rapid growth of botanical literature will inevitably render the undertaking one of much time and great labour. In exemplification of the astounding increase in scientific writing, we may take the Royal Society's 'Catalogue of Scientific Papers'; vols. i. to vi. contain 5743 pages, or an average of 91 pages for each of the 63 years included therein; vols. vii. and viii. have 2357 pages between them, or within a fraction of 236 pages for each year between 1864 and 1873! To accomplish the task, the chief cities of Europe, at least, must be visited, and every available library, whether public or private, thoroughly searched. My own recent experience has taught me the very great difficulty experienced in working up the literature of one's own country, and the difficulty is certainly not lessened when foreign literature is also undertaken. For example, the library of the herbarium at Kew is extremely rich: as a working library, I do not think it is likely to be equalled by any other extant, certainly not surpassed. But elementary works, which constitute no small proportion of botanical publications, are hardly to be found there; such books would be useless lumber in a library intended as an adjunct to the herbarium. Nor does the general library at the British Museum supply this deficiency, for, from the death of Sir Joseph Banks in 1820 until the passing of the Copyright Act in 1847, it was simply an act of grace on the part of any publisher to deposit a copy of his issues in the chief national library. Therefore between these dates the library of the British Museum is disappointingly poor in our native literature, and I have had to seek in private collections for books which ought to be there, but are not. This state of things is not

confined to one country alone, as I have good reason for knowing; the difficulty of getting at locally and privately printed books is one of the problems of librarianship in the present day.

At no very distant date the literature of Botany will have assumed such portentous dimensions that it will be impossible for any one man to compile its bibliography with any pretence to completeness. Then it will most likely be found necessary to work in combination, each country or literary centre contributing its own elaborated quota for final incorporation by one editor.

My own endeavours to compile some sort of supplement to Pritzel (combined with a selected list of botanical works) can only be considered as suggestive. I was naturally compelled to work in the methods adopted by the Index Society, to the necessary exclusion of full bibliographical details, but I think I have done enough to show how much remains yet to do. From the Kew library alone I gathered nearly one thousand titles not given in the 'Thesaurus,' a very large proportion being of earlier date than 1872. This resulted from systematic comparison of each volume with the 'Thesaurus,' a long, but satisfactory task, and one which Pritzel had not accomplished during his brief visit to this country. Until the printing of my *Guide* is complete, I cannot be sure of the actual number of additional works enumerated therein, but I believe that it will amount to more than four thousand. The weakest department in the 'Thesaurus,' that of English botanical literature, has of course claimed my earnest attention, and, were it on that account alone, I venture to hope that my compilation may prove useful to the commonwealth of botanists, to whom I dedicate my efforts.

ON THE BOTANY OF THE BRITISH POLAR EXPEDITION OF 1875–6.

By Henry Chichester Hart, B.A., Naturalist to H.M.S. 'Discovery.'

(Continued from p. 145.)

Ranunculus nivalis, L. (*R. sulphureus*, Sol.)
Dist. - - - - 5 - 7. Lat. 78° 18′ to 78° 50′. E. and W.
Luxuriant at Foulke Fiord and along Hayes Sound.
700 feet at Foulke Fiord.

R. lapponicus, L.
Dist. 1 2. Lat. 69° 15′ to 72° 20′. G.
Not uncommon at Disco, and frequently showing its flowers and terminal leaf alone through the snow. Very luxuriant in the valley behind the village at Proven.
300 to 3000 feet above sea-level at Disco.

R. pygmæus, Wahl.
Dist. 1 2 3 -. Lat 69° 15′ to 72° 48′. G.
Especially common at Upernavik.

R. hyperboreus, Rottb.
Dist. 1 - 3. Lat. 69° 15′ to 72° 48′. G.
Disco and Upernavik. In very wet ground near Upernavik Settlement, this plant is common.

Papaveraceæ.

Papaver nudicaule, L.
Dist. 1 2 3 4 5 6 7 8 9 10 11 12 13. Lat. 68° 42′ to 83° 4′. E., W., and G.
This plant, the purple Saxifrage, and a grass (*Alopecurus alpinus*), were gathered north of the 83rd parallel of lat. by Lieut. Aldrich, R.N., the most northern land yet visited by man. One form of this species is usually of a very different appearance from the other, which is, I believe, *P. alpinum*. *P. nudicaule* (by far the commonest) has the leaf-segments ovate, with rounded, or sometimes bristle-pointed extremities, the petals of a deeper yellow, and more commonly turning to a metallic-green (not "blue-black," as frequently described), and the leaves more glabrous; it occurs in all sorts of available situations, and is usually the first to appear upon drifting glacial mud, but it attains a far more luxuriant growth upon rich organic soil, as that below the bird-cliffs at Foulke Fiord. It will hold up its petals through the snow long after other flowers have disappeared. In flower at Discovery Bay July 2.
Polaris Bay (coll. Copp.); Shift Rudder Bay (coll. Moss); Floeberg Beach and Cape Joseph Henry (H. W. F.); Ward Hunt Island, lat. 83° 4′, and Cape Alexandria, lat. 83° 2′ (Lieut. Aldrich).
Sea-level to 2000 feet in Discovery Bay.

P. alpinum, L., var.
Dist. - 2 - - - - 7 - - - 11 12 13. Lat. 72° 20′ to 82° 27′. E., W., and G.
This variety is not nearly so common as the last, but increases towards the north. It has the leaf segments more rigid, nearly linear, and of a darker green, sometimes quite glaucous; the petals are often pale yellow, and occasionally white, and the hairs on the peduncle more adpressed. It was to be met with only at low levels and upon an inorganic soil, and its petals did not wither to a verdigris green as much as in the last variety. The difference in the leaves and adpression of stem-hairs is somewhat similar to that between the two common English poppies.

Cruciferæ.

Turritis mollis, Hook.
Dist. - 2. Lat. 72° 20′. G.
In small quantities at Proven; not mentioned north of lat. 70° by Lange.

Arabis alpina, L.
Dist. 1. Lat. 69° 15′. G.
Very luxuriant at Englishman's Bay, Disco.
Sea-level to 800 feet at Lyngemarken, Disco.

Cardamine bellidifolia, L.
Dist. 1 2 - - 5 - - - - - - 12. Lat. 69° 15′ to 81° 47′. E., W., & G.

Especially common at Foulke Fiord, between the foot of the glacier and the sea. Frequent in Discovery Bay, and occurring sparingly in St. Patrick's Bay.

Sea level to 100 feet in Foulke Fiord.

C. pratensis, L.

Dist. 1 - - - - - - - - - - - 12. Lat. 69° 15′ to 81° 42′. W. and G.

Growing in small quantities in Englishman's Bay, Disco; not again met with until reaching Discovery Bay, where I found a few plants amongst wet moss (*Splachnum Wormskioldii*) on a slope having a southern aspect near sea-level, about two miles to the west of Discovery Harbour. Lange gives 69° 14′ as the northern range of this plant in Greenland; its reappearance at so high a latitude is very interesting. The Discovery Bay specimens were hardly less luxuriant than the Disco ones; neither had any symptoms of flowering.

Sea-level to 400 feet in Disco.

Vesicaria arctica, Rich.

Dist. 1 - - - - - 7 - - - 11 12. Lat. 69° 42′ to 81° 42′. E., W., & G.

Locally common, but absent from many stations; at the head of Svarte-vogel Bay, near Rittenbank. Common on Bellot Island and in Discovery Bay. Has an erect habit at first, but at length prostrate. Requires dry soil and low levels.

Polaris Bay (coll. Copp.) Hayes Sound (H. W. F.)

Sea-level to 400 feet in Discovery Bay.

D. incana, L. Dist. 1 -.

Englishman's Bay, Disco.

Disco, coll. Moss.

Draba rupestris, Br.

Dist. 1 2 3 4 5 6 7 8 9 10 11 12 13. Lat. 68° 42′ to 82° 27′. E., W., and G.

Common everywhere. Polaris Bay (coll. Copp.); Floeberg Beach (H. W. F. and coll. Moss). In flower June 23rd Discovery Bay.

Sea-level to 500 feet at Discovery Bay.

D. rupestris, var. *parviflora*, Oliver.

Dist. 1 - - - - - - - - - - - 12 13. Lat. 69° 15′ to 82° 27′. W.& G.

This very minute Draba is so named by Professor Oliver. It appeared to me a very distinct form. Very cæspitose in habit, the whole plant about a quarter of an inch in height, and bearing a tiny head or umbel of pale yellow flowers, no bigger than those of our Allseed (*Radiola millegrana*). In flower by the 10th June, and had disappeared at the end of the month.

Disco, Englishman's Bay, rare. Discovery Bay, especially near Alexandra Lake. Floeberg Beach (coll. Moss).

D. androsacea, Wahl (et vars.)

Dist. 1 2 3. Lat. 69° 15′ to 72° 48′. G.

D. alpina, L. (var. *hispida*).

Dist. - - - - 5 6 - 8 9 - 11 12 13. Lat. 78° 18′ to 82° 50′. E. &W.

Increasing to the north. Pale yellow glabrous forms of *D. alpina*, which occurred in Discovery Bay, appeared to me impossible to

separate from *D. androsacea*, Wahl., which is often pale yellow; the colours white and yellow are of no value in describing a species in these latitudes. In flower June 29th, Discovery Bay; Floeberg Beach (coll. Moss); Cape Joseph Henry (H. W. F.)

Sea-level to 2000 feet in Discovery Bay.

D. alpina (var. *glabra*).

Dist. 1 - - - - - - - - - - - 12. Lat. 69° 15′ to 81° 42′. W. and G.

Englishman's Bay, Disco, and Discovery Bay.

D. muricella, Wahl.

Dist. 1 - - - - - - - - - - - 12. Lat. 69° 15′ to 81° 42′. W. and G.

Disco in small quantities, and again at Discovery Bay. Very close to *D. rupestris*, but narrower in the lanceolate silicles, and generally to be distinguished by the keeled leaf and stellate down; it varies much in the degree of hairiness. This species was late in flowering; it is not included in Lange's Greenland list.

200 feet in Musk Ox Fiord.

D. hirta, L.

Dist. 1 2 3 - - - 7 - - - 11 12. Lat 69° 15′ to 81° 42′. E., W. & G.

Decreasing and becoming stunted to the north; flowers of a paler yellow at Dobbin Bay. Flowering June 29th, Discovery Bay.

500 feet at Disco.

Cochlearia officinalis, L.

Dist. 1. Lat. 69° 15′. G.

Abundant at Disco, especially about the governor's house.

C. officinalis (var. *grænlandica*).

Dist. - - 3 - 5 6 - - - - 11 12. E. and W.

Polaris Bay (coll. Copp.)

C. anglica, L. (var. *fenestrata*, Br.)

Dist. - 2 - - - - - - - - - 12 13. Lat. 72° 20′ to 82° 27′. W. & G.

In dry rocky situations at Proven. Very local about Discovery Bay; in river-beds at Watercourse Bay, to the north-east of Discovery Bay, St. Patrick's Bay; Floeberg Beach (H. W. F. and coll. Moss). Sea-level to 400 feet upon raised beaches at St. Patrick's Bay.

Hesperis Pallasii, T. & G. (*Cheiranthus pygmæus*, Adams, *H. minima*, T. & G.)

Dist. - - - - 5 - - - - - - 12. Lat. 78° 18′ to 81° 42′. E. & W.

First met with at Foulke Fiord, where it was very plentiful; also in Discovery Bay, Musk Ox Bay, and Bellot Island. Sometimes very luxuriant; one plant in Discovery Bay had thirteen flowering branches from one rootstock, making a beautiful rose-coloured bouquet, with a faint sweet scent like hawthorn. Plants on Bellot Island were from eight to ten inches in height, and bore great numbers of long fruit-pods. Sometimes the flowers of this species were tenanted by a minute red dipterous insect. Requires a dry situation. In flower 29th June.

Braya alpina, Sternb.

Dist. - - - - - - - - 8 9 - 11 12 13. Lat. 79° 28′ to 82° 27′. E. & W.

First met with this plant on the limestone cliffs of Walrus (Norman Lockyer) Island at about 500 feet elevation; at Cape Collinson, lat. 80° 3′. Not unfrequent in Discovery Bay and St. Patrick's Bay; Polaris Bay (coll. Copp.); Floeberg Beach (coll. Moss). Flowering in Discovery Bay July 7th.

Sea-level to 500 feet on Walrus Island.

Violaceæ.

Viola palustris, L.?

Dist. 1. Lat. 63° 42′.

I insert this doubtfully; a leaf gathered upon Egedesminde at the end of September, 1876, seemed to belong to this species. Lange limits it to 64° in Greenland, but Hooker gives it an Arctic range.

Silene acaulis, L.

Dist. 1 2 3 - - - 7 - - - - 12. Lat 68° 46′ to 81° 40′. W. & G.

Very abundant at Disco, along the summit of cliffs to the west of Englishman's Bay. This plant formed beautiful beds of pink against and amongst the snow (13th July). After leaving Upernavik it did not appear again till we came to Hayes Sound, where it was plentiful at the Deserted Village, Bellot Island, Discovery Bay (Feilden and Moss).

Sea-level at Hayes Sound to 1300 feet at Disco.

Caryophyllaceæ.

Lychnis apetala, L.

Dist. - - - - 5 6 7 8 - - - 12. Lat. 78° 18′ to 81° 52′. E. & W.

First met with true *L. apetala* at Foulke Fiord; it was afterwards frequent in heavy wet soil. Common at Discovery Bay. The usual form of the group to the northward. Shift Rudder Bay (coll. Moss.) Flowered July 8th in Discovery Bay, growing on inorganic soil.

Sea-level to 1000 feet in Musk Ox Fiord.

L. affinis, Wahl. (*Wahlbergella affinis*, Fries).

Dist. 1 2 3 - - - 7 - - - 11 12. Lat. 69° 15′ to 81° 42′. E., W., & G.

Very luxuriant at Proven. Decreasing and becoming stunted to the north. I agree with Fries in keeping this a distinct species from *L. apetala*. In flower 16th July, Discovery Bay. Upernavik (coll. Copp.)

Sea-level to 500 feet in Discovery Bay.

L. affinis, Wahl., var. *triflora*, Br.

Dist. - 2 3 - 5 - - - - - - 12. Lat. 72° 20′ to 81° 42′. E., W., & G.

A very pretty plant, and flowering profusely with the last about the settlement at Proven, at Foulke Fiord, and again at Bellot Island. This form always appeared at low levels, and, with the last, preferred a rich organic soil. Upernavik (coll. Copp.)

L. alpina, L.

Dist. 1. Lat. 69° 15′ to 69° 42′. G.

Rare. Lyngemarken, Disco, and also gathered at Rittenbank by Dr. Coppinger.

Arenaria rubella, Br.
Dist. 1 2 - - 5 6 7 - - - - 12 13. Dat. 69° 15′ to 82° 27′.
E., W., and G.

A variable plant, and depending much upon shelter for its habit of growth; always found in small patches or in single plants. Densely cæspitose at first, straggling and far-trailing at the close of the season. Frequent in Discovery Bay.

Sea-level to 350 or 400 feet in Discovery Bay.

A. arctica, Stev. (*Alsine biflora*, Wahl.)
Dist. 1 2. Lat. 69° 15′ to 72° 20′. G.

Disco and Proven; especially common along the sea-side to the west of Englishman's Bay.

A. grœnlandica, Spr.
Dist. - - - - - - - - - - - - 12. Lat. 81° 42′. W.

This plant was very rare in Discovery Bay, and had neither buds nor flowers. It has hitherto been believed to be confined to a few localities in the mountains of North-East America, Julianehaab and Godthaab in South Greenland, and Upernavik in North Greenland.

(To be continued.)

WILHELM PHILIP SCHIMPER.

Wilhelm Philip Schimper was born at Bornheim, in Alsace, on January 8th, 1808. In early life he devoted his attention to mosses and to fossil plants; and to these apparently widely removed subjects of study he devoted his life. Few scientific men present themselves to their fellow-workers at once as the author of an exhaustive monograph of a great family; but Schimper, having secured the co-operation of Bruch and Gümbel, made his first public appearance in 1836 as the editor and chief author of the 'Bryologia Europæa.' A short paper on five new Chilian mosses appeared in the same year in the French 'Annales,' but Schimper's time was so fully occupied with the labours connected with the two great works of his life—the 'Bryologia' and his 'Traité de Paléontologie Végétale'—that he published comparatively few short memoirs. The great labour of the 'Bryologia' fell chiefly on Schimper; indeed Bruch died in the progress of the work, and Gümbel's assistance was only temporary. The wonderful drawings of every species which illustrate the various monographs that make up the six volumes of the 'Bryologia' are lasting monuments of his diligence, ability, and critical knowledge. Beginning with the almost microscopic *Phasca*, he gives for each species such a minuteness of detail with regard to the various parts and organs that nothing seems to be left for future systematic workers with pen or pencil. The *Sphagna* were not included in this great work, but formed a separate and, so to speak, supplementary volume. In 1860 he produced a Handbook to the European Mosses, reducing into a single volume his labours of nearly a quarter of a century. This he published as a 'Synopsis Muscorum Europæorum.' A

second edition appeared in 1876. The persistent labours which resulted in these works could only have been accomplished by an enthusiast; and the enthusiasm of Schimper may be estimated by the fact that he collected with his own hands the greater proportion of the species figured by him in the neighbourhood of Strasburg, chiefly in the Black Forest and in the Vosges. As he was busily engaged during the week, and unable to take from his official hours time for these muscological excursions, he was in the habit of starting on Saturday afternoons, when he had finished his week's labours, and walking all night to the locality which he proposed to explore. He carried with him the small supply of food that he required, and the apparatus necessary for collecting. The daylight of Sunday he actively gave to collecting, and when darkness put a stop to his work he set out with his burden of mosses on his back, on his return to Strasburg, arriving in time for the official work of Monday; and this was not a rare, but, on the contrary, almost a weekly practice with Schimper.

While Schimper's fame will always rest mainly on his bryological works, yet his contributions to Vegetable Palæontology represent by themselves labours that might have occupied a busy life entirely devoted to them. In 1844 he described and figured the Triassic plants of the Vosges, and in 1862 he followed this up with a similar work on the Devonian Plants of the same region. Perhaps in these works his keen eye for differences, which had been so serviceable in his bryological investigations, led him to recognise in the fragmentary materials that he had to deal with a greater variety of specific and even generic forms than others would accept—as for instance in the specific value given to different parts and conditions of the *Lepidodendron*, elaborately figured and described in 'Le Terrain de Transition des Vosges.' His great work was his 'Traité de Paléontologie Végétale,' consisting of three volumes of text and one of plates, published between 1869 and 1874. In this work he has reduced to systematic order all that was known of the fossil plants of the world. It was a herculean task, and it has been accomplished with a master's hand. Besides the systematic diagnosis given of each species, the work contains a valuable introduction on the conditions in which fossil plants are found, the methods of investigation, and the changes that have taken place in the vegetation of the globe; and the third volume closes with a general exhibition of the various fossil floras based on the data that have been presented in the work itself. The publication of this work has formed an epoch in the intelligent investigation of fossil plants. Schimper was Professor of Geology, and Director of the Museum of Natural History of Strasburg. He was a member of various learned societies, and both the Linnean and Geological Societies of London had recognised the excellence of his labours in the two departments by electing him as a foreign member. Through the liberality of the Baroness Burdett-Coutts his valuable herbarium of mosses has been secured for the Kew Herbarium. He died at Paris on the 20th of March last.

W. Carruthers.

SHORT NOTES.

THE ALLEGED OCCURRENCE OF ORCHIS HIRCINA IN NORTH WALES.—[The assertion that *Orchis hircina* has occurred on the Orme's Head having found its way into various journals, it seems advisable to place on permanent record the result of an investigation into the circumstances of the case, as recorded by Mr. C. W. Dod in the 'Gardeners' Chronicle' for May 15 last. In connection with this, it may be well to add that some at least of the North Wales records, given in 'Topographical Botany' on the authority of Mr. J. F. Robinson, require confirmation. I have given instances of this in the chapter on the Botany of that region contributed to Jenkinson's 'Practical Guide to North Wales.'—ED. JOURN. BOT.]

"Within the last few months a statement has appeared in several local newspapers and gardening journals, to the effect that the Great Lizard Orchis (*Orchis hircina*) has been found at Llandudno. Botanists at a distance will like to know on what authority the statement has been made. The Llandudno mountain, commonly called the Great Orme's Head, contains about a thousand acres of rocky ground, the geological formation being mountain limestone. Every part of it, with the exception of a few steep cliffs on the north-east side, immediately over the sea, is easily accessible. From the days of Pennant it has been famed for its rare plants, and every yard of it has been ransacked by botanists, and many lists of its plants have been published. The list has hardly been added to of late years, but some plants formerly found there have disappeared, through the frequent visits of collectors. Last year, however, a dealer in plants, a native of Kent, settled in Llandudno, and in due time announced that he had discovered there *Orchis hircina*, *Orchis fusca* (syn. *purpurea*), and *Ophrys aranifera*. The last may have possibly been found in Wales before, but the two former have hitherto been believed to be confined to the south-east of England, and *O. hircina* is extremely rare even there. When I came to Llandudno last week, I at once searched for the dealer, and made inquiries of him, and I give the result. He told me that he had found many of *Orchis hircina*, and knew of about twenty more in the same spot, which he was going to dig up as soon as they were tall enough to move. He had only three left. One of these I bought for a sovereign, the price he asked, and offered to pay two for another, if he would show it to me growing wild. He would not do that. He was watched; and others would find them out, and exterminate the whole stock, but as soon as he had dug them all up, he would show me the place he had dug them up from, with which I ought to be satisfied. He had not only found *O. fusca* and *O. aranifera* besides, but within the last few days *Cypripedium Calceolus* also. I asked him to let me see it. He first showed me what appeared to be an *Epipactis*, and on my telling him it was not a *Cypripedium*, he produced what certainly was a small *Cypripedium* of some sort. He told me he was going to dig up some more in a day or two, but would not allow me to go with him to see the

place. I then asked him what other rare local plants he had. The first he showed me, which he said he found on the rocks near the Head, he did not know the name of, but I recognised it as *Claytonia sibirica*, and on my telling him it was not British, he supposed the seed must have blown from some garden. I did not disguise my incredulity, but he continued very good-humoured and communicative, and showed me several letters from botanists at a distance in proof of the truth of all he had said. No one pretends to have seen any of these plants growing wild at Llandudno except himself, but, as he added, he was born and brought up in Kent, so, of course, knew more about Orchises than people were likely to do in North Wales.—C. W. Dod."

Spring-flowering Form of Colchicum autumnale (p. 145).—Mr. White's remarks about this form are fully confirmed by the discovery of precisely similar flowers by Miss Louisa Chapman at Bishop Frome, in Herefordshire, and at English Bicknor, in Gloucestershire. Both corm and flower are just as those described in the May number of the 'Journal of Botany,' and the latter differs from the figure given in 'English Botany' in size and colour outside, as mentioned by Mr. Baker. Considering the dreadful season of 1879, and the pollenless anthers of the plants under consideration, it seems to me that Mr. White's suggestion is correct, and that this peculiar form is merely a temporary one. It will be interesting to see whether the same form will appear again next year.—T. A. Preston.

The same vernal form of *Colchicum autumnale* occurred this year for the first time, as far as I am aware, at Bishopstone, near Hereford; it was confined to one field, but was very abundant there. The leaves were just appearing with it, and the corm in my specimens, instead of being similar to that of the autumnal form, was much larger than usual.—H. N. Ridley.

[It would be interesting to know whether this form, which seems to be unusually frequent this year, has appeared elsewhere. At the meeting of the Société Royale de Botanique de Belgique, held on May 2nd, M. De Vos announced that he had recently seen near Esneux a meadow completely chequered with the flowers of this Colchicum.—Ed. Journ. Bot.]

Leucobryum glaucum in Fruit.—I found last Easter, in company with Mr. George, *Leucobryum glaucum* in fruit, in the birch wood called Egypt, about a mile to the north of Burnham Beeches, Bucks. It was in fine condition, some of the capsules being still adorned with the white calyptra. On mentioning the circumstance to my neighbour, Mr. Latimer Clark, he informed me that he had observed it near the same locality some years ago. Mr. T. Walker, of Tunbridge Wells, found it with very young fruit in Great Rasla Wood, near Great Marlow, in the same district. Although *Leucobryum glaucum* is so common, I have no record of its having been found in fruit in this country, excepting in this district, Bramber in Hampshire, and in the Lake country.—T. Howse.

Extracts and Notices of Books & Memoirs.

ON A POINT IN BOTANICAL NOMENCLATURE.

As the subject of botanical nomenclature has from time to time been brought forward in the pages of this Journal, the following note by Prof. Asa Gray may be of interest. It occurs in 'Silliman's Journal' for May, in a review of the recently issued part of Bentham and Hooker's 'Genera Plantarum,' and has reference to "the genus [there] given as *Argithamnia*, Swartz, Prodr., but which begins as *Argythamnia* of Patrick Browne, a contemporary of Linnæus."

"The history of this name and of its changes is curious, and raises a nice point in the application of the rules of nomenclature. Patrick Browne founded it in the year 1756, wrote the name *Argythamnia*, but gave no etymology. It is pretty clearly inferable that he had αργυρος in view, that he should have written *Argyrothamnia*. We suppose that he shortened it in a way at that time and since not very uncommon, remembering the warning of Linnæus against *verba sesquipedalia*. Unnecessary as it was in this case, it was a trivial curtailment compared with Rafinesque's *Nemopanthes* razed from *Nemopodanthes*, which no botanist has attempted to restore to its full proportions. Adanson adopted the genus under Browne's name in 1763. So did Swartz in his 'Prodromus' in 1788.

"*Argithamnia*, however, is the form adopted by Swartz in his 'Flora,' in 1797, remarking that Browne derived the first part of the name either from αργός, white, or from αργορεος, silvery. But if from the latter Swartz should have written *Argyreothamnia*, if from the former *Argothamnia*.

"Acting, doubtless, on the principle that if the orthography of a name might be changed to make it correct, it might be further changed to make it quite correct, Sprengel in his turn wrote it *Argothamnia*, and Mueller of Argan *Argyrothamnia*. Now all these changes from first to last violate the rule (which is not without exceptions) that botanical names should be retained in their original form. At least mere improvement is no warrant for alteration. Mistakes may, indeed, be corrected. Thus Nuttall's genus *Wisteria*, in honour of Dr. Wistar, was properly corrected to *Wistaria* in conformity with the rules that personal names should retain their orthography as nearly as possible. But upon our theory *Argythamnia* was not a mistake. Bentham and Hooker have acted upon the principle of preserving the original orthography, only they took the genus to originate with Swartz, passing by Browne, evidently because he did not use Linnæan specific names, though that could not affect the worth of his genera. If they had adopted the genus from Browne's original, or from Adanson who took it up in 1763, or from Swartz's 'Prodromus' (1788), or from Jussieu in 1789, eight years before Swartz in his Flora wrote *Argithamnia*, we cannot doubt that they would have held to the original form, *Argythamnia*."

Se e qual valore sia da attribuire nella determinazione delle specie al numero delle strie nelle Diatomee.

Under this title Count Castracane ('Atti Accad. pontif. dei nuovi Lincei,' 1879) contends that the number of the striæ in Diatoms is a specific factor, and suggests that Photomicrography should be employed in the measurements. He gives a list of many species, with the numbers of their longitudinal and transverse striæ.

Under the title 'Miscellanea Botanica,' M. Decaisne has commenced to reprint from the 'Flore des Serres' the matter of specially botanical interest. We have often wished that the valuable botanical contributions of Mr. J. G. Baker and others to the 'Gardeners' Chronicle' could be separated in this manner from the mass of miscellaneous matter which is of no permanent interest to botanists; the 'Garden' also has commenced to publish descriptions of new species, which are likely to be overlooked unless some means is taken to direct attention to them. M. Decaisne's first instalment contains, besides other things, a description of his new genus *Galtonia*, of which *Hyacinthus candicans* is the type; and a review of the species of *Bombax* and *Pachira*.

Dr. Trimen has issued his first official report, entitled 'On Some Trees Yielding India-rubber': the trees described are *Manihot Glaziovii*, *Hevea brasiliensis*, and *Castilloa elastica*.

The 'Botanische Zeitung' of April 30th contains the announcement that Prof. L. Just (Karlsruhe) will in future share with Prof. de Bary the work of editing that magazine. It is requested that all printed matter, notices, and criticisms intended for the 'Botanische Zeitung' be sent to Prof. Just; original manuscripts to Prof. de Bary.

The recently-issued part of the 'Icones Plantarum' contains two new genera—*Astrostemma*, Benth. (*Asclepiadeæ Cynancheæ*), from Borneo, and *Stellularia*, Benth. (*Scrophularineæ Gerardieæ*), from W. Tropical Africa (Welwitsch, No. 5838).

The Report of the Rugby School Natural History Society for 1879 contains a list of additions to the flora of the district, and two papers by Mr. L. Cumming—the first an interesting essay 'On Times and Modes of Flowering in Plants;' the other on 'Phytometeorology.'

The Report of the North Staffordshire Field Club for 1879 contains a list, by Mr. R. Garner, of the rarer plants found in the parish of Stoke.

M. Treub—who has succeeded the late Dr. Scheffer at the Buitenzorg Gardens—publishes in the last part of the 'Verhandelingen der Koninklijke Akademie van Wetenschappen' (Amsterdam, 1879) two important papers—one on Cell-division, with four plates; the other on the Embryogeny of Certain Orchids, with eight plates.

The Boston (U.S.A.) Society of Natural History is issuing a cheap and handy series of "Guides of Sciences Teaching." Botany

has been treated by Mr. George L. Goodale, who has brought together in small compass the leading facts regarding the economy of vegetables: his brochure is entitled "Concerning a few common plants."

OTHER NEW BOOKS. —V. LEMOINE, 'Atlas des caractères spécifiques des Plantes de la Flore Parisienne et de la Flore Rémoise' (fascicles 1 & 2). Paris, Savy. — W. B. HEMSLEY, 'Biologia Centrali-America' (Botany), pt. iv. (*Leguminosæ—Rosaceæ*), tt. 2. — K. PRANTL & S. H. VINES, 'Text-Book of Botany.' W. Swan Sonnenschein & Allen, Paternoster Square. — 'Icones Plantarum,' vol. iv., pt. i. Williams & Norgate.— G. S. V. WILLS, 'Dictionary of Botanical Terms.' Simpkin (1*s.*)

ARTICLES IN JOURNALS.

APRIL.

Nuovo Giornale Botanico Italiano.—L. Caldesi, 'Floræ Faventinæ Tentamen' (contd.) (*Rosa corrugata*, n. sp.)—O. Penzig, 'The genetic relations of *Ozonium* and *Coprinus*' (2 tabb.) (*Coprinus intermedius*, n. sp.) — A. Goiran, 'Phytographic notes' (*Agropyrum Caldesii*, n. sp.)— A. Mori, 'Observations on the "cistoma" of Gasparrini' (1 tab.)

Magyar Novent. Lapok.—F. C. Doell, 'De Tritici genere notula' — F. Fabry, 'Two excursions into the district of Turoc.'

Hedwigia.—Waruztorf, 'Excursions in the Lower Havz.' — G. Winter, 'List of the *Uredineæ* and their host-plants' (contd.)

Oesterr. Bot. Zeitschrift.—A. Heimerl, 'On the Flora of Lower Austria.'—S. Schulzer v. Müggenburg, 'Mycological notes' (contd.) — H. Wawra, 'On *Bromeliaceæ*' (contd.) (*Nidularium Ferdinando-coburgi*, *N. Antoineanum*, *Bromelia? Itatiaieæ*, *Billbergia Reichardi*, *Æchmea petropolitana*, *Æ. organensis*, *Æ. Nöttigii*, n. spp.)— R. v. Uechtritz, 'On *Rosa umbelliflora* and *R. cuspidata*.'— J. Wiesbaur, 'The forms of *Festuca ovina*' (*F. pseudovina*, Hackel ined.) — C. J. Klinggräff, 'Palestine and its vegetation' (contd.)

Botaniska Notiser.— F. Behm, 'A botanical excursion to Oviksfjellen, in Jemtland, in 1876.' — E. V. Ekstrand, 'Notes on Scandinavian Liverworts.'

Scottish Naturalist.—J. Cameron, 'The Gaelic names of plants' (contd.) — F. B. White, 'Fungi of Perthshire' (contd.)

Naturalist (Huddersfield).—H. Boswell, '*Fissidens serrulatus*.'— J. E. Griffith, 'Flora of Carnarvonshire and Anglesea' (contd.)

Botanische Zeitung. — H. Ambronn, 'On Bilaterality in the *Floridea*' (concluded), 2 tab. — J. Baranetsky, 'The division of nuclei in the pollen mother-cells of Tradescantias.'—E. Stahl, 'On the influence of direction and intensity of light on several phenomena of motion in the vegetable kingdom' (1 tab.)

Quarterly Journal of Microscopical Science.—W. T. T. Dyer, 'The Coffee-leaf disease of Ceylon' (*Hemileia vastatrix*), 6 tab.

Abhandl. vom Naturwissenschaft Vereine zu Bremen (vol. vi., pt. 3). — F. Buchenau, 'Malformed flowers in the cultivated Fuchsia.'— W. Focke, 'The vegetation of the winter of 1879–80.'

Science Gossip.— F. Kitton, 'The early history of the *Diatomaceæ*.' — G. E. Marsee, 'Notes on some of our smaller Fungi' (contd.)

Flora (March). — J. E. Weiss, 'Anatomy and physiology of thickened roots (concluded). — W. Nylander, 'Lichenes nonnullæ Insulæ S. Thomæ Antillarum.'— A. Minks, 'Morphological-lichenographical studies.

Id. (April).—J. Klein, 'On the roots of *Æsculus Hippocastanum*.' —O. Kuntze, 'Fifth note on Cinchonas.' — J. B. Kreuzpointner, 'Notes on the Flora of Munich.' — 'J. E. Duby, 'Diagnosis Muscorum Novarum aut non rite cognitum.'

Proceedings of Societies.

Linnean Society of London.

April 1, 1880.—Prof. Allman, F.R.S., President, in the chair.— Mr. John R. Jackson exhibited several stems, with the rhizome attached, of *Arundo donax*. He mentioned that enormous quantities of these have recently been imported into this country from Algeria as a commercial product, and made up into parasol-handles. —Dr. Maxwell T. Masters gave an oral demonstration, being an epitome of his recent studies respecting Japanese Conifers, and examples illustrating the same were laid on the table. The collection, due chiefly to the activity of Mr. Maries, in several respects was most instructive and interesting from a morphological point of view, and explained several peculiarities of their geographical distribution.

April 15, 1880.—The Rev. George Henslow, F.L.S., in the chair. — Mr. S. H. Wintle, of George Bay, Tasmania, was elected a Fellow of the Society.—The only botanical communication read was a paper by Mr. N. E. Brown, 'On some new *Aroideæ*, with observations on other known forms.' Of new species several interesting Bornean forms collected by Mr. Burbidge and others are now described. While in general following Prof. Engler, in his late monograph Mr. Brown nevertheless on good grounds gives preference to the classification of Schott as being the most natural arrangement. Mr. Brown's drawings and dissections showed most accurate and painstaking work.

May, 6, 1880.—H. T. Stainton, F.R.S., in the chair. — Mr. Thomas Christy read a letter from a correspondent, Mr. Blacklaw, of St. Paulo, Brazil, in which it was mentioned that several attempts to rear the Liberian Coffee (*Coffea liberica*) in the above district at different seasons and under different conditions, both under cover and in the open air, had all been unsuccessful.—The

abstract of a paper by Prof. G. Dickie, viz., 'Notes on Algæ from the Amazon and its Tributaries,' was read by the Secretary. This collection was made by Prof. J. W. H. Trail, and the author acknowledged himself indebted to Mr. John Roy for identification of the Desmids, and to assistance from the Rev. G. Davidson for the Diatoms. Of ordinary Algæ 67 species are referred to, 9 being new forms; then follows lists of 31 species of Desmidaceæ and 190 of the Diatomaceæ, in all a total of 288 species.—Mr. G. T. Bettany gave some remarks on the 'Vocabulary of Botanical Terms,' in use in the description of flowering plants.

May 24, 1880, Anniversary Meeting.—Prof. Allman, LL.D., F.R.S., President in the Chair.—At this, the ninety-second annual general meeting, there was a large attendance of the Fellows. The President, after a few introductory remarks of congratulation on the prospects of the Society generally, referred to the obituary, pointing out that several of the oldest members would now no longer appear on our list. The former and worthy President, Prof. Bell, whose works on the British fauna are classical, had died at the age of eighty-one, and found a resting-place at Selborne. Mr. John Miers, another veteran of ninety-one years, had left a monument of industry and botanical research in the many memoirs enriching the Society's 'Transactions,' besides the monographs of the *Menispermaceæ* and *Apocynaceæ*, in themselves extensive. General Munro, a gallant officer and yet excellent observer, had left a place difficult to be filled, for his accurate and wide knowledge of the *Gramineæ* was admitted by all, and he was constantly consulted on the group. Dr. David Moore, of Dublin, had left his mark in valuable researches on the Irish Flora. In Mr. Wilson Saunders the Society formerly had a worthy and valuable officer. Mr. Edward W. Cooke, R.A., represented art, bringing his fervent love of natural objects, especially Botany and Geology, to bear in his paintings with truthful effect. Mr. Thomas Atthey, of Gosforth, Newcastle-on-Tyne, had a more than local reputation as an enthusiastic and able naturalist, and, while studying several of the lower groups of animal and vegetable life, finally devoted himself to the branch of Palæontology. The foreign members, Prof. J. F. Brandt, of St. Petersburg (zoologist), and the botanists, Dr. E. Fenzl, of Vienna, and W. P. Schimper, of Strasburg, had each a world-wide reputation. The President had to regret that, after a full term of service, the Secretaries and Treasurer had proposed to resign office, and this had been acceded to by the Council as a matter of form.—The Secretary (Mr. F. Currey) then read his report. Since the last anniversary the Society had lost by death ten Fellows, three Foreign Members, and one Associate; and three Fellows had withdrawn. On the other hand, there had been an accession by election of twenty-eight new Fellows, three Foreign Members, and four Associates. The library showed a marked increase and improvement, by additions obtained by purchase, exchange, and donations, and had been amply used in biological reference and loan of books. The scientific communications and exhibitions at the meetings during the session had kept pace with

the march of science, and the attendance of the Fellows bore witness to the active interest taken in the proceedings generally.—The Treasurer (Dr. J. Gwyn Jeffreys) then proceeded to read his report :—" In resigning the Treasurership of the Society, which I have had the honour of holding for the last five years, I take the opportunity of congratulating the Society on its increased and increasing prosperity in a financial point of view. Notwithstanding the late depression of commerce, which has to a greater or less extent injuriously affected other scientific societies, as well as the additional yearly expenditure consequent on the removal to Burlington House, and the greater amount of salaries paid, our publications have not been restricted; we have spent considerably more on the library than formerly was the case—two important matters. We are quite free from debt; we have an invested capital of £3730 12s. 8d., and the balance at our bankers and on hand at this date is £522 18s. 2d. Twelve months ago, owing to the unfortunate and long illness of the Librarian, Mr. Kippist, his accounts became confused, and the Assistant-Secretary, Dr. Murie, has since at my request undertaken the receipts and payments, in accordance with the 1st Bye Law in Chapter X. A Special Committee was also appointed by the Council for investigating the financial position of the Society, and then valuable suggestions have been adopted, especially as to the reasonable limitation of the publication expenses, which had increased from £796 14s. in 1876 to £1100 5s. 1d. in 1879. With respect to the compositions, which even if they were altogether invested must seriously diminish the income of the Society, I may remark that during the five years of my office I have received £1968, and invested £920 15s. During the previous five years no part of the compositions appear to have been invested. I have also received and invested £840 for legacies. Our capital has been doubled; it was in 1875 £1860, and is now £3730 12s. 8d. The annual contributions received in 1876 amounted to £694 13s., and last year to £948 12s. I cannot close this short report without expressing my entire satisfaction with the services of our Assistant-Secretary, Dr. Murie, who has so ably and indefatigably edited the publications of the Society, as well as assisted me in my financial duties, and I would mention with much approval Mr. James West, who is not only the Clerk, but also the Acting-Librarian of the Society."—The ballot for Council and Officers having been proceeded with, the following gentlemen retired from the Council:—Messrs. J. Ball, W. Carruthers, F. DuCane Godman, Dr. A. Gunther, and the Rev. G. Henslow. In their places were elected:—Messrs. E. R. Alston, G. Bentham, G. Busk, Dr. M. Foster, and B. D. Jackson. For the Officers, Prof. G. J. Allman was re-elected President; Mr. Fredk. Currey (the outgoing Secretary), Treasurer; Mr. B. Daydon Jackson, Botanical Secretary; and Mr. Edward R. Alston, Zoological Secretary.—Prof. Allman thereafter gave his usual Annual Address, taking for his subject "The Vegetation of the Riviera, a Chapter in the Physiognomy and Distribution of Plants," of which we hope to give a further notice next month.

Botanical News.

Coe F. Austin died at Closter, New Jersey, on the 18th of March, aged forty-eight years. He was for some years the Curator of the Torrey Herbarium, and in 1867 contributed the description of the *Lemnaceæ* to Gray's 'Manual,' besides describing several new phanerogams; but his most important work was in connection with muscology, and especially *Hepaticæ*; a manual on the North American species of the last-named group was in preparation by him at the time of his death. His last work was to describe the *Hepaticæ* for the 'Botany of California.' He also published sets of the Mosses and Liverworts of the United States.

Mr. H. N. Ridley has been appointed an Assistant in the Department of Botany, British Museum.

Mr. W. T. Thiselton Dyer read a paper "On the Botanical Enterprise of the Empire," at the meeting of the Royal Colonial Institute, held on May 11th. This is printed *in extenso* in 'The Colonies and India' for May 15th; it contains an interesting account of the work performed by the various botanical gardens in our colonies.

Nils J. Andersson, the well-known Swedish botanist and traveller, died on the 27th March, at Stockholm, in his sixtieth year. He took part in the expedition of the frigate 'Eugénie' round the earth in 1851–53, and afterwards published several small treatises as the result of his explorations. In 1855 he was appointed Demonstrator of Botany at Lund, but in the following year he was called to Stockholm as Professor of Botany and Superintendent of the Botanical Department of the Royal Museums; in 1879 he retired from his active duties, having during his professorship made numerous scientific journeys to different parts of the Continent. Besides several smaller works, he published various systematic treatises, especially upon the *Salices*; the monograph of this group in the sixteenth volume of DeCandolle's 'Prodromus' (1864) is from his pen.

Mr. B. Daydon Jackson, who was elected Secretary of the Linnean Society on the 24th ult., became a Fellow of the Society in 1869. He has devoted much attention to vegetable histology, has been active in the administration of the Quekett Microscopical Club, and was formerly Treasurer of the S. London Microscopical Club, and is well known as a painstaking British botanist. His reprint of Turner's 'Libellus,' and of the Catalogue of Gerard's garden, have been duly noticed in our columns, and manifested a critical acquaintance with the early synonymy of the plants included in these works. His recent researches in botanical bibliography render him peculiarly well fitted for the post to which he has been elected: we may direct attention to his paper on the subject which appears in the present number of this Journal.

Original Articles.

ENUMERATIO ACANTHACEARUM HERBARII WELWITSCHIANI ANGOLENSIS.

Auctore S. Le M. Moore.

(Tab. 211.)

The examination at Kew of a parcel sent from the Escola Polytechnica of Lisbon, containing specimens collected by the late Dr. Welwitsch in Angola, soon convinced me that the *Acanthaceæ* were not exceptional to the rule, Dr. Welwitsch having discovered a large number of new species and forms referable to this Order. When I paid a visit to the British Museum for the purpose of seeing the splendid set of his specimens there preserved, I was seized with a desire to work up the collection. To this end I applied to Mr. Carruthers, and as Mr. Hiern has been entrusted with the task of publishing the discoveries of the great collector, reference was also made to him. Both gentlemen were good enough to allow me to do as I wished. The result is the present paper.

Since the publication of the eleventh volume of DeCandolle's 'Prodromus,' containing Nees von Esenbeck's elaboration of *Acanthaceæ*, the Order has but seldom been dealt with, so far, that is to say, as relates to the flora of Africa. Indeed with the exception of Count Solms' careful description of Schimper's herbarium, the late Dr. Anderson's enumeration of the African species in the seventh volume of the Linnean Journal, and Klotzsch's work in connection with Peters' 'Reise nach Mozambique,' there is scarcely a work which contains any reference to the Order. This is all the more remarkable, not only because these plants are naturally, from the great beauty of the flowers, usually very attractive, but also because so many explorers, notably Dr. Kirk, Gustav Mann, and the German traveller Hildebrandt, have recently been very successful in the discovery of novelties. We must, however, remember that the Cape Flora, so unfortunately stopped by Dr. Harvey's death, did not reach *Acanthaceæ*, and that Professor Oliver's Flora of Tropical Africa is still a long way from the same Order. Though it labours under the drawback of insufficient description, Dr. Anderson's memoir is the most useful of all the published accounts. It was unfortunate that Mann's collection arrived too late to be incorporated with it, or it would have presented a somewhat different aspect. As an epitome of knowledge at the time it was written, it is fairly satisfactory; but Klotzsch's memoir having a slight advantage of priority, correlation of the types described in the two works is urgently required. The classificatory method being simpler than that of Nees is certainly

a better one, as has been sufficiently proved by its adoption, with a few additions and corrections, by Mr. Bentham in 'Genera Plantarum,' a work which must remain the chief guide to the classification of the genera, until some character more philosophically and phylogenetically valid than the æstivation of the corolla shall have been applied to the Order.

I purpose commencing with an enumeration of all the species collected by Dr. Welwitsch contained in the British Museum. A considerable number of these are also at Kew; but the specimens are, as one would suppose, not in so good a condition, although in most instances they are fairly serviceable ones. After this I shall deal with a few geographical details.

THUNBERGIA, L. fil.

§ Eu-Thunbergia.

T. CYCNIUM (sp. nov.)—Erecta, strigoso-pilosula, foliis ovato-oblongis obtusiusculis lævissime amplexicaulibus irregulariter ac inæqualiter lobulato-crenatis, bracteis magnis lanceolatis, calycis lobis setaceis, corollæ tubo elongato angustissimo sub limbo ampliato bracteas duplo excedente, antheris linearibus æqualibus basi muticis.

Hab. In rupestribus (temp. pluv. inundatis) dumetosis pr. Lopollo distr. Huilla. (No. 5009.)

Frutex altissime scandens, dein dependens. Folia usque ad 4·5 cm. long. et 2·5 cm. lat., firma, margine ciliata, conspicue nervosa. Bracteæ fere ad 4 cm. long., intus papillosæ. Calycis lobi 0·75 cm. long. Corollæ albæ lævissime puberulæ limbus 3·5 cm. diam. Capsula immatura 2 cm. long.

Speciem insignem nulli arcte affinem corollæ tubo elongato angustissimo primo intuitu cognoscere potes.

T. AFFINIS, nob., Journ. Bot., 1880, p. 5.

Hab. In distr. Golungo Alto in sylvis umbrosis imprimis ad fontem de Capopa et prope Gilolo itaque ad Casaballa et sparse ad ripas fl. Lombe in sylvis primit. (Nos. 5109, 5113, 5181, 5154.)

T. HUILLENSIS (sp. nov.)—Ascendens? pilis strigosis appressis albiss parsiuscule obtecta, foliis breviter petiolatis oblongis vel oblongo-lanceolatis obtusis mucronulatisve basi late truncatis vix hastatis, pedunculis solitariis folia excedentibus, bracteis ovato-lanceolatis acutis, calycis segmentis setaceis hirsutulis, corollæ tubo tenui bracteas superante, antherarum loculis subæqualibus longiuscule barbatis muticis, stigmate 2–lobo.

Hab. In pascuis editioribus breve dumetosis de Morro de Monino distr. Huilla. (No. 5025.)

Folia 4–6 cm. long, basi radiatim 5–nervia, subtus conspicue nervosa; petioli 0·5 cm. long. Pedunculi (ex axillis foliorum minorum oriundis) 4·5 cm. longitudine. Bracteæ circiter 2·5 cm. longæ. Corollæ pallide cæruleæ. Capsulam non vidimus.

Ex affinitate *T. Kirkianæ* T. And. abs qua discedit ob folia brevius petiolata latiora vix hastata, bracteas acutas nec acuminatas, calycis lobos longiores, antherasque barbatas muticas (in *T. Kirkiana* vero fere glabras basique aristatas).

§ Meyenia.

T. ARMIPOTENS (sp. nov.)—Volubilis? caule tenui strigose piloso, foliis coriaceis petiolatis lineari-lanceolatis basi hastatis vel truncatis acutiusculis scabridis, floribus solitariis, pedunculis elongatis parum flexuosis scabridis, bracteis ovato-lanceolatis obtusis extus pilosulis margine breviter ciliatis eximie reticulatis virescentibus, calycis lobis parvis deltoideis, corollæ tubo bracteis paullo breviore gracili limbo parum ampliato, antheris basi barbata mutica exclusa glabris, capsula sericeo-puberula.

Hab. In pascuis dumetosis de Empalanca distr. Huilla necnon ad Lopollo. (Nos. 5026, 5027.)

Folia usque ad 4·5 cm. long. et 1·5 cm. lat.; petioli ad 1·2 cm. long., scabri. Pedunculus fere ad 4·0 cm. longitudine, sub fructu incrassatus. Bracteæ 1·2 cm. long., viride reticulatæ. Flores cærulei. Calycis lobi inconspicui, sub fructu circiter 0·15 cm. long., parum inæquales. Antherarum loculi subæquales. Capsula 1·1 cm. long, bracteis inclusa. Semina quove in loculo duo, cinerea, reticulato-insculpta.

Proxima videtur *T. huillensi* nob. sed diversa foliorum indole, calyce brevilobo, bracteis quam corolla longioribus aliisque notis.

T. HYALINA (sp. nov.).—Erecta, ramosa, glabra, ramis gracilibus ex sicco striatis pallide brunneis, foliis firmis amplexicaulibus oblongis obtusis margine hyalino obscurissime denticulato, floribus solitariis (an semper?) breviter pedunculatis, bracteis oblongo-lanceolatis obtusiusculis, calyce vix truncato, corollæ tubo bracteas circiter 2-plo excedente inferne attenuato superne haud multo ampliato, antheris glabris basi muticis, stigmate infundibuliformi.

Hab. In petrosis collinis ad fl. Cuanza. (No. 5164.)

Folia 4·0 cm. long., 1·3–1·7 cm. lat. Bracteæ plus quam 2·0 cm. long., obscure papillosæ. Calyx puberulus. Corollæ tubus circiter 4·5 cm. long. Flores cupreo-purpurei.

T. lancifoliæ, T. And., proxima sed glabritie, foliorum indole, antherisque glabris distincta.

T. lancifolia, T. And.—Hujus speciei exstant varietates sequentes:—

α. *auriculata*.—Folia eximie auriculata. Hab. in locis arenosis dumetosis circa Lopollo distr. Huilla. (No. 5011.)

β. *lævis*.—Caulis præter ad nodos glaber. Pedunculi quam in typo longiores, glabri. Hab. in declivis dumetosis limosis ad orient. de Izanga distr. Amboia et ad Quilombo. (Nos. 5161, 5110.)

γ. *pallida*.—Folia elongata, attenuata, amplexicaulia, ex sicco pallida. Hab. Huilla in dumetis sylvestribus. (No. 5012.)

T. ANGOLENSIS (sp. nov.)—Erecta, canescenti-villosa, foliis sessilibus oblongis vel oblongo-obovatis obtusis, floribus solitariis (an semper?), bracteis foliis consimilibus etsi minoribus, calyce sinuatim dentato dentibus parvis deltoideis inæqualibus, corollæ tubo bracteas haud duplo excedente curvato limbo 5-lobo lobis rotundatis, antheris fere glabris loculis oblique ovoideis brevissime mucronulatis alteroque duorum incurvo aristato, stigmate infundibuliformi.

Hab. In distr. Huilla inter Mumpulla et Humpata in dumetis cum *Gnidio* et *Thesiis*, necnon in dumetis sylvestribus inter Mumpulla et Nene. (Nos. 5037, 5038.)

Folia circiter 3·0 cm. long., pedicellos superantia. Bracteæ ad 2·5 cm. long. Flores circiter 3·0 cm. diam., pulchri, azurei, vel dilute cærulei.

Species distinctissima abhorret a *T. hispida* Solms mihi descriptione tantum nota foliorum forma, calyce, ac verisimiliter vestitu; a *T. oblongifolia*, Oliv. vestitu omnino diverso, foliis latioribus, floribus majoribus, &c.

Species dubiæ.

T. (*Eu-Thunbergia*) sp. nov., glabra, foliis elongatis sessilibus lineari-lanceolatis vel linearibus, floribus solitariis breviter et valide pedunculatis, bracteis magnis late lanceolatis 5-nerviis, calycis laciniis subulato-setaceis glabris, corolla ignota, capsula longirostrata circa 2·0 cm. long., seminibus appresse laminatis. (No. 5062.)

No. 5218 et 5044. Specimina omnino incompleta.

No. 5088 est flos *T. affinis* et ramulus cirrhiferus speciei alicujus ordinis alienæ.

ELYTRARIA, Vahl.

E. crenata, Vahl.

Hab. Distr. Golungo Alto ad ripas riv. Coango ad Cungulungalo et ad Quibôlo. (Nos. 5156, 5209, 5157.)

NELSONIA, R. Br.

N. tomentosa, Willd.

Hab. Ad riv. Coango prope Quibôlo necnon in paludosis sylvestribus Catomba Luinha. (Nos. 5212, 5213, 5214, 5216, 5217.)

HIERNIA (gen. nov., tab. 211.)

Calyx tubuloso-campanulatus fere ad medium subæqualiter 5-lobus, lobis oblongis, obtusis. Corollæ tubus parum curvatus, a basi gradatim ampliatus, limbi patentis æstivatione imbricati lobi ovati, obtusissimi, 2 postici altius connati ac minores. Stamina 4, didynama, exserta, rudimento quinti nullo; filamenta crassiuscula, anticorum fere ad medium tubum posticorum vero altius inserta: antheræ 1-loculares, oblongæ, basi brevissime appendiculatæ, apice leviter attenuatæ ibidemque poro conspicuo dehiscentes. Discus parum prominens. Ovarii loculi pluri-ovulati; stylus crassiusculus; stigma truncatum levissime 2-lobum exsertum. Capsula oblonga, curvata, subrostrata, superne arcte compressa, calycem vix excedens valvis cymbiformibus unilateraliter dehiscens, a basi paucisperma superne sterilis; semina subreniformia, compressiuscula, obscure tuberculata, humectata haud mucilaginosa, retinaculis gracilibus haud induratis fulta. Fruticulus scoparie-ramosissimus, rigidus, viscoso-pubescens; ramuli patentes. Folia parva, submembranacea. Flores in axillis solitarii, brevissime pedunculati, ebracteolati.



Hiernia angolensis *S. Moore.*

H. ANGOLENSIS (sp. unica, t. 211). Caule tenui obscure quadrangulari deinde puberulo, foliis ad 0·7 cm. long. plerumque minoribus sessilibus oblongis obtusis, calyce 0·8 cm. long., marcescente, corolla cærulea 1·0 cm. long., tubo ejus calycem paullo excedente puberula, filamentis superne attenuatis glabris antheris secus marginem haud dehiscentem ciliolatis, capsula 1·3 cm. long. puberula, seminibus vix 0·2 cm. long., brunneis.

Hab. Frequentiss. in sylvis prope Quitive de Cima junio 1860 florens. (No. 5001.)

This most distinct genus, the propriety of the name of which will be recognised by everybody, has sufficient characters to determine its affinity without any doubt. True porous anthers occur in the family only in the Martaban *Ophiorrhiziphyllon*, which, however, has two bilocular anthers and no retinacula to the seeds. *Cardanthera* (*Adenosma*, Nees) is the only genus, besides the one here described, with non-indicated retinacula; but besides the entirely different corolla, andrœcium, habit, &c., our plant has imbricated and not contorted æstivation of the corolla. Its place is doubtless between *Ophiorrhiziphyllon* and *Cardanthera;* and it links together the tribe *Nelsonieæ* and *Ruellieæ*, sub-tribe *Hygrophileæ*.

HYGROPHILA, R. Br.

H. ULIGINOSA (sp. nov.)—Erecta, strigoso-pubescens, caule valido tetragono demum vix glabro, foliis breviter petiolatis oblongis obtusis superioribus lanceolatis, fasciculis paucifloris, calycis lobis elongatis lineari-setaceis pubescentibus, corollæ labio postico 2-fido, staminibus 4 æqualibus antheris basi muticis, ovulis numerosis, capsula subtereti apice acutata polysperma, seminibus orbiculatis.

Hab. In uliginosis ad fluv. Lombe et prope Bumba. (No. 5106.)

Fere 3-pedalis. Folia ad 7·0 cm. long., firma, scabrida. Calycis tubus ægre ad 0·5 cm. long., laciniæ fere usque ad 1·0 cm. long. Corolla purpureo-violacea, extus puberula, magnitudine illarum *H. phlomoidis*, Nees. Capsula lævis, bisulcata.

H. phlomoides, Nees præter characteres minoris valoris calycem ab illo nostræ plantæ omnino diversum præbet.

BRILLANTAISIA, Beauv.

B. alata, T. And.—Oliv. Linn. Trans. vol. xxix. t. 124.

Hab. Frequens ad riv. Coango, Quibôlo, et ad rivos de Quiapoze et Cuango prope Sange distr. Golungo Alto. (Nos. 5149, 5150, 5182.)

Herba gigantea, 5–7-pedalis, caule recto acutangulo superne ramoso.

CALOPHANES, Don.

C. radicans, T. And.

Hab. Distrr. Pungo Andongo et Huilla in herbidis prope Lopollo, itaque ad Calunda et in dumetis siccioribus edit. de Empalanca. (Nos. 5046, 5055, 5075, 5158.)

Fruticulus 1–2-pedalis (quoad No. 5075) caulibus numerosis ramisque e basi ascendenti-erectis quasi cæspites latas fingentibus. Flores apibus gratissimi, pallide sulphurei, sub-aromatici.

Var. *mutica*, nob.—Foliis oblongo-oblanceolatis, 1·5–3·0 cm. long., antheris muticis.

Hab. Pungo Andongo. (Nos. 5089, 5094.)

Dubiæ.

Nos. 5107 et 5189 cujus flores delapsi.

RUELLIA, L.

R. (*Paulo-Wilhelmia*) DIVERSIFOLIA (sp. nov.)—Hirsuta, caule subtereti, foliis ovatis obtusis petiolatis integerrimis, florum fasciculis laxiusculis paucifloris breviter pedunculatis, bracteis magnis oblongo-oblanceolatis ciliatis, calycis laciniis inæqualibus duobus angustis postico majore omnibus obtusis ciliatis, corollæ tubo incurvo superne ampliato limbi 5-partiti lobis subæqualibus oblongis, staminum subexsertorum filamentis per paria lateralia contiguis, ovarii loculi circiter 12-ovulati, capsula oblongo-linearia a basi ipsa circiter 12-sperma, seminibus orbiculatis retinaculis tenuibus fultis.

Hab. In distr. Mossamedes in rupestribus rubro-arenaceis ad 'Boco do Rio Bero,' necnon in dist. Bumbo. (Nos. 5033, 5042.)

Herba suffrutescens, multicaulis, 2–3 pedalis. Folia majora 3 cm. long. et 2 cm. lat., obscure inæquilatera, minima vix 1 cm. long., plerumque verticillata. Corolla alba tubo incarnato extus puberula. Stylus pilosus; stigmatis lobo postico subobsoleto.

I have reduced *Paulo-Wilhelmia* to a section of *Ruellia*, as I cannot see that it has sufficient character to warrant its position as a genus.

R. (*Dischistocalyx*) BIGNONIÆFLORA (sp. nov.) — Caule ramibus erectis subfastigiatis ramoso crebre glanduloso-pubescente, foliis parvis petiolatis ovatis breviter acuminatis glanduloso-pubescentibus membranaceis subtus pallidioribus, floribus apicem versus ramorum breviter pedunculatis vel sessilibus, calycis magni lobis elongatis linearibus obtusis puberulis lobo uno libero duobus paribus et (e confluentia loborum duorum), longe bifidis, corollæ majusculæ tubo puberulo fere ad medium gracili superne lato longeque amplificato limbi lobis rotundatis, antherarum loculis staminis unici quam reliquorum minoribus, ovario oblongo apice attenuato, ovula quove in loculo 5, capsula magna circiter 6-sperma, seminibus orbiculatis pubescentibus retinaculis longissimis suffultis.

Hab. Frequens in rupestribus Preira (seu Praia) de Zemba grande ad Quisembe et in distr. Loando sine loci indicatione. (Nos. 5202, 5063, 5126, 5130.)

Suffrutex 2–3 pedalis, glanduloso-viscosus. Folia plerumque 2·0–4·0 cm. long. usque ad 2·5 cm. lat. Calycis lobi circiter 2·1 cm. long. et 0·25 cm. lat., pilis glandulosis ac simplicibus muniti. Corollæ tubo circiter 6·0 cm. long., basi vix 0·2 cm. et sub limbo 1·0 cm. lat. Flores albi. Capsula 2·5 cm. long., crustacea; semina 0·7 cm. diam.; retinacula fere 0·8 cm. long., incurva.

Ex affinitate *R. thunbergiæfloræ*, T. And. (*Dischistocalyx*, Bth.) sed multis de notis ab illa abhorrens.

I cannot help thinking that Anderson's genus *Dischistocalyx* (misprinted *Distichocalyx* in 'Genera Plantarum') must be considered as a section, though doubtless a very well-marked one, of *Ruellia*. The plant now under notice is different from typical *Dischistocalyx*, insomuch as its calyx is divided into three and not four lobes; but I presume that all species of *Ruellia* with connate calyx-lobes must be referred to § *Dischistocalyx*, whatever the manner and degree of connation.

Dubia.

No. 5063.—Specimen valde mancum.

(To be continued).

CARDAMINE PRATENSIS, L., AND ITS SEGREGATES.

By George Nicholson.

For the last two or three seasons I have collected a good series of forms of this very widely distributed and extremely variable species, and during my attempts to work them out I have fortunately been able to consult the herbaria at Kew and at the British Museum. As mere descriptions of such critical plants as the Cardamines are often totally inadequate for the proper identification of the segregate forms, comparison with authenticated specimens is at times necessary before any one can be at all certain that he has correctly named a given form. This fact has been strongly impressed on my mind whilst going over the large series of *C. pratensis*, its sub-species, and allied species contained in the above-mentioned herbaria. Widely different plants have received the same name from careful collectors and botanists, who, in all probability, have not seen a type specimen of the plant in question, but have been obliged to content themselves with simple descriptions. Considering the wide distribution of *C. pratensis*, a great range of variation might reasonably be expected, but any one who is only familiar with the species as it grows everywhere around us would be surprised at its protean character taken as a whole. If half a dozen, or even more, of the well-defined varieties were submitted to such a one, and the intermediate links were not forthcoming, these forms would probably be looked upon as good species, even should the individual not belong to the "Jordanic" school.

In the 'Students' Flora' the geographical distribution of *C. pratensis* is given as "N. temp., Arctic and sub-Arctic regions," but, it is added, a similar plant grows in Tasmania. Judging from the material at Kew (not perhaps so full as to allow one to express a very decided opinion in every instance), some of the Chilian species founded by Philippi are only geographical outlying forms of the polymorphous *C. pratensis*, and some of them are indistinguish-

able—in herbaria at least—from uncommon forms met with in Europe. Africa must now be added to the list, for Professor Oliver, in his 'Flora of Tropical Africa,' has sunk *C. obliqua*, Hochst. This form, of which I have seen good specimens from Abyssinia, is an exaggerated, strong-growing *pratensis*, with long, leafy stems—the cauline leaves being made up of numerous large rounded leaflets—and rather more densely-flowered racemes. I may say that the Kew specimens, though collected by Schimper and bearing the same herbarium number, 1541, are not so extreme as those at the British Museum.

The synonymy of *C. pratensis* is rather lengthy, and probably, when the genus is thoroughly monographed, the names of several plants which are now given in books as good species will have to be added to the list.

C. pratensis, L.

C. granulosa, Allioni, Auct. ad Flor. Pedemont.
C. dentata, Schult. Observ. Bot. no. 968.; Ledeb. Fl. Alt. iii. 36; Boreau, Flore du Centre, p. 43.
C. sylvatica, Besser (non Link), Primitiæ Floræ Galicieæ, ii., 76.
C. buchthormensis, Willd. Herb. ex Stev.
C. stolonifera, Tausch. (non Scop.)
C. latifolia, Lej. Flore de Spa (non Vahl.)
C. Hayneana, Welw. Reich. Flora Germanica, 676.
C. paludosa, Knaf. Flora, xxix., 293.
C. obliqua, Hochst. in Pl. Schimper Abyss.; Ach. Richard, Voyage en Abyssinie, tome 4, p. 19.
C. Matthioli, Morett. Flora Italica, vii., 29.
C. palustris, Petermann.
C. granulosa, Schur. and *C. fontinalis*, Schur. Verh. der Siebenbürgischen Verein zu Hermannstadt, p. 60.
C. rivularis, Schur. Verh. der Siebenbürgischen Verein zu Hermannstadt, p. 61. Enumeratio Plantarum Transilvaniæ, p. 49.
C. nasturtioides, Schur. Herb Transilv. (non Barnéoud).
C. pseudo-pratensis, Schur.
C. praticola, Jord. Diagnoses d'Espèces Nouvelles ou Méconnues, p. 128.
C. herbivaga, Jord. Diagnoses, p. 129.
C. udicola, Jord. Diagnoses, p. 130.
C. vulgaris, Philippi. Linnæa, 1856, p. 665.
C. grandiflora, Hallier. Bot. Zeit., 1866, p. 209.

I have preferred giving these names under *C. pratensis*, instead of attempting to classify them all under half a dozen, or even three, of the best-defined forms. For example, *C. palustris*, of which there are two sheets of type specimens at the British Museum, is a different plant from *C. dentata*, under which it is placed as a synonym by Nyman in his 'Conspectus Floræ Europæ,' and *C. Matthioli*, Moretti, of which I have seen several examples from Italy, is certainly not quite identical with *C. Hayneana*, Welw.

For all ordinary purposes of critical British Botany, *C. pratensis*

dentata. It seems to affect boggy or damp woody spots, and its long radical leaves are not spreading as in *C. pratensis*, but are erect or ascending, and are composed of much fewer, larger, angled, and toothed leaflets, the terminal one being generally cuneate. The flowers are white or pale lilac, and the inflorescence is more elongated than that of the other forms. The Kew plant which I have sent to the Botanical Exchange Club for distribution was kindly compared with the specimens in the 'Prodromus' Herbarium at Geneva by Mons. C. DeCandolle, and the name confirmed; it seems thoroughly to agree with the figure in Reichenbach's 'Plantæ Criticæ,' tab. 4308 *β*. I have seen specimens collected in Gallicia by Besser, and others from Erfurt, Leipsic, and Stockholm. The *dentata* of 'Herb. Floræ Ingricæ' is the exact counterpart of the Kew plant, as are also those just mentioned. *C. palustris*, Peterm. (Leipsic), is a strong-growing bog form near *dentata;* of this the author makes two varieties, *isophylla* and *heterophylla*, the leaflets of the radical leaves of the latter being rounded, slightly toothed, whilst those of the cauline are ovate, entire.

C. Hayneana, Welw. (Reichenbach's 'Plantæ Criticæ,' t. 4308 *c*), is an extreme form of *pratensis*, of which the figure above quoted gives but a faint idea. It is in fact a variety with quite the habit of *C. hirsuta*, but with flowers about three times the size of those of that species, and with the stem and leaves of *pratensis*. In the British Museum are type specimens collected by Welwitsch himself at Vienna; these have cauline leaves, with numerous small round leaflets and white flowers, hardly half the size of those of ordinary *pratensis*. A plant identical with this in every respect is one from Roemer's Herbarium (now in the British Museum), labelled "C. nova species." In Neilreich's 'Flora von Wien,' where *C. pratensis* is divided into three varieties—*α Hayneana*, *β genuina*, and *γ dentata* —it is stated that these three forms pass imperceptibly from one into the other; *Hayneana* is described as having leaflets as a rule quite round, but sometimes linear or lanceolate. A plant I collected by the Thames, between Kew and Mortlake, agrees thoroughly in habit and size of flower with Welwitsch's, and only differs from that in its lanceolate leaves. This is an uncommon, but a widely spread form. In the British Museum there is a specimen, collected in N.W. America by Douglas, which ought to be placed here; as also another from Newfoundland. At Kew one of Rupert Huter's Tyrolese Plants, labelled *C. pratensis*, L., var. *stricta*, Welw., is exactly *Hayneana*. I cannot distinguish specimens in Herb. Lechler, labelled *C. chilensis*, DC., as well as others (bearing same name) collected by Dr. R. O. Cunningham in 1867–69 at Sandy Point, Cape Negro, St. Nicholas Bay, and Port Grappler (Chili), from the Kew Thames side plant. In Herb. Bentham a specimen from Gratz, Marbourg, comes here. Italian specimens of *C. Matthioli*, Moretti, are intermediate between this and ordinary *pratensis*.

ON LATTAKIA TOBACCO.

By W. T. Thiselton Dyer, M.A., F.R.S., &c.

In 1876 I published a note in the 'Journal of the Linnean Society' (Botany, vol. xv., pp. 246, 247), in which I pointed out that Lattakia* tobacco is produced by *Nicotiana Tabacum*, and that it had been smoked with pine-wood. The latter part of this statement was based on the opinion of Dr. Post, the Professor of Botany at the Syrian Protestant College at Beyrout, that el Ez'r, the name of the tree yielding the wood which was used for fumigation, resulted from a transposition of the letters of el Arz. Dr. Post subsequently informed me that at the time he made this suggestion he had not seen the name written. He pointed out to me that "the apostrophe between the 'z' and the 'r' must indicate, in accordance with the usual custom of Arabic transliteration into English, a letter not transferable into our tongue, probably the 'ain.'" It would then be "a quadriliteral and not a mere transposition of the triliteral Arz." Dr. Post subsequently ascertained that the word is a local one, and not classical, and, therefore, that the conjecture from philological data as to what the tree might be which produced the wood fell to the ground.

Mr. G. J. Eldridge, Consul-General at Beyrout, subsequently obtained specimens of the foliage of the tree which bears the name of el Ez'r, and it was immediately identified by Dr. Post as a *Quercus*, probably *Q. Cerris*, L. Professor Oliver having, however, carefully compared the specimens with those in the Kew Herbarium, informed me that he considered that they belonged without doubt to a variety of *Quercus Robur*, L.

At the time I communicated my note to the Linnean Society I was not aware of the existence of a paper in the 'Technologist' (vol. iii., pp. 161–165) by Mr. Charles Edward Guys on the culture of Lattakia tobacco. In this it is stated (p. 164) that the peculiar mode of preparing this tobacco was the result of an accident. The Nessaries, whose almost sole occupation was the cultivation of tobacco, on one occasion at the time of the harvest, "were at war with Latakia, and determined to keep the crop, when gathered, in a safe place until the return of peace. It being then the commencement of winter, fires were lighted in the cabins, in which, as usual, the tobacco was hanging. The wood that served them for fuel was a species of the *Quercus Ilex*, known by the local name of 'Ozer,' and, as chimneys were unknown, the cabins speedily became filled with smoke, and the tobacco thoroughly impregnated." When the tobacco was offered for sale "the flavour and odour were found to be far superior to that which it possessed before. . . . . A demand arose for this kind of tobacco, and the name 'Abou-Riha' (father of perfume) was given to it in consequence." Dr. Post tells me that he has been informed that the roots of the myrtle are also used to fumigate the tobacco, and that this plant is vulgarly called "Rihan," which signifies aromatic.

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* The name of the place appears to be always spelled locally with a double t.

Mons. N. Vitale, the British Vice-Consul at Lattakia, gives the following brief particulars of the whole procedure of the growth and manufacture at the present day (1876):—

The seeds are sown in March in nursery-beds, carefully worked and manured. From these, in May, the young plants are removed and planted out in the fields a foot apart, and carefully watered. Seven or eight weeks afterwards gathering commences, the leaves, as they are daily collected, being strung on threads and hung to the roofs of the houses, which are without windows. When the collection is finished the fumigation is begun by burning in the houses the wood of "el Ez'r"; the greener the wood the more successful the fumigation. This gives the tobacco its black colour and its almost aromatic odour. It continues till the following April, but produces the best results in winter, and especially in February. When the tobacco is removed from the roofs it is dry, and needs damping before packing. The absorption of water is facilitated by piling it in heaps and weighting it with stones. The merchants who receive it keep it some time in store to allow it to dry and ferment before packing.

ON THE BOTANY OF THE BRITISH POLAR EXPEDITION OF 1875–6.

By Henry Chichester Hart, B.A., Naturalist to H.M.S. 'Discovery.'

(Continued from p. 182.)

Stellaria humifusa, Rottb.

Dist. 1 2 3 - 5. Lat. 69° 15′ to 78° 18′. E. and G.

Frequent, and always by the sea-side, at or near high water mark.

S. longipes, Goldie.

Dist. 1 2 3 - 5 6 7 8 9 - - 12 13. Lat. 69° 15′ to 82° 27′. E., W., and G.

One of the commonest plants at Foulke Fiord; a reindeer shot there by Lieut. Conybeare had its stomach full of this plant in a half-digested state; in this condition it is a dish highly prized by the Esquimaux. Common in Discovery Bay, but flowering sparingly. In flower July 7.

Sea-level to 1500 feet in Discovery Bay.

Cerastium alpinum, L.

Dist. 1 2 3 4 5 6 7 8 9 10 11 12 13. Lat. 68° 42′ to 82° 50′. E., W., and G.

A very variable plant, very stunted in the more northerly regions. In a small enclosure behind the governor's house at Disco it reached a height of ten inches. Flowering the first week in July in Discovery Bay. Floeberg Beach (H. W. F. and coll. Moss); Cape Joseph Henry (H. W. F.)

Same vertical range as the last, and like it very scarce and stunted at the higher levels.

C. latifolium, L. (*C. cæspitosum*, Malmgren).
Dist. 1 - - - - - 7 8 - - - 12 13. Lat 69° 15′ to 82° 27′.
E., W., and G.

It is with considerable hesitation that I record this species from the Arctic Regions; I gathered two specimens at Englishman's Bay, Disco, not in flower; again (Aug. 6) met with it at the "Deserted Village," Hayes Sound; Dr. Coppinger found it in blow at Gould Bay; in Discovery Bay it was rare, and seldom flowering; and Capt. Feilden showed me specimens of it from Floeberg Beach. It always grew in very wet situations, amongst moss and slushy stream beds, and was the last species to come into blow in Discovery Bay, not flowering until Aug. 7, though snow had fallen considerably, and the season was over. It agrees well with Malmgren's *C. cæspitosum*,* which he makes a form of *C. alpinum*. In addition to his characteristics may be mentioned the stem hairs yellowish and minutely glandular, the leaves shining and almost succulent, and the flowers large and conspicuous, in proportion to size of plant and height of flowering stem; the leaves have a pleasant fresh flavour, reminding one of apples, which does not seem to exist in *C. alpinum*. Wahlenberg says of *C. alpinum*:—"Dum folia latiora usque ad ovalia sunt, semper simul pilosiora fuint; quo angustiora eo plerumque glabriora superstite tantum caule piloso" (Flora Lapponica). Exactly the reverse is the case here. Floeberg Beach (H. W. F.)

Sea-level to 1400 feet in Discovery Bay.

Rosaceæ.

Alchemilla vulgaris, L.
Dist. 1 2. Lat. 69° 15′ to 72° 20′. G.

Abundant and luxuriant at Englishman's Bay and by a lake in Blase Dalen, Disco.

Dryas octopetala, L.
Dist. - - - - 5 - - - - - 11. Lat. 69° 15′ to 81° 40′. E.

Polaris Bay (coll. Copp.) and Foulke Fiord.

D. octopetala, L. (*integrifolia*, Wahl., var.)
Dist. 1 2 3 4 5 6 7 8 9 10 11 12 13. Lat. 68° 42′ to 82° 50′.
E., W., and G.

The usual form, flowers often pale yellow. This is the chief ingredient in forming turf, and, with slices of blubber, forms capital fuel. Flowering July 2 in Discovery Bay. Floeberg Beach (H. W. F. and coll. Moss); Cape Joseph Henry (H. W. F.) prefers low levels.

Sea-level to 1000 feet in Disco.

Potentilla Sibbaldia, Syme (*Sibbaldia procumbens*, L. *Potentilla procumbens*, Clairv.)

Dist. 1. Lat. 69° 15′. G.

* 'Phanerogamic Flora of Spitzbergen.' By A. J. Malmgren. 'Journal of Botany,' vol. ii., May 1, 1864, p. 132.

Disco, especially at Lyngemarken. I quite agree with W. Wilson and Sir J. Hooker in referring this plant to the genus *Potentilla;* it appears to have been separated on account of supposed definite stamens, but I observed them to be six, seven, or eight, oftener than five, in number; it has all the habit and other characters of *Potentilla;* it cannot, however, be called *P. procumbens*, since Sibthorp has already appropriated that name for the procumbent rooting form of *P. Tormentilla*, Sibthorp.

P. anserina, L. (var. *grænlandica*, DC.)
Dist. - 2 - - 5 6. Lat.
Sparingly at Proven and Cape Sabine, more common at Foulke Fiord.

P. nivea, L.
Dist. 1 2 3 4 5 6 7 8 9 10 11 12 13. Lat. 68° 42′ to 82° 50′.
E., W., and G.
Common everywhere, and very variable. Typical *P. nivea* gives place to *P. Vahliana*, L., and *P. pulchella*, Br., to the northward. In flower July 8, Discovery Bay. Floeberg Beach and Cape Joseph Henry (H. W. F.)
Sea-level to 1400 feet on Mt. Stephenson, Discovery Bay.

P. frigida, Vill. (*P. emarginata*, Pel.)
Dist. 1 2 - - 5 6 7 - - - 11 12. Lat. 69° 15′ to 81° 50′.
E., W., and G.
Disco, between Englishman's Bay and Lievely; Proven, Foulke Fiord, Discovery Bay. Near Shift Rudder Bay (coll. Moss); Hayes Sound and Polaris Bay (coll. Copp.)

P. tridentata, L.
Dist. 1. Lat. 69° 15′. G.
Common along the coast of Disco, from Englishman's Bay to Point Laxe.

Onagraceæ.

Epilobium latifolium, L.
Dist. 1 - - - 5 - 7 - - - - 12 13. Lat. 68° 42′ to 82° 27′.
E., W., and G.
Seems to prefer stony places by running water, especially in the neighbourhood of glaciers, as at Itifdliarsuk Glacier, near Rittenbank; Brother John's Glacier, Foulke Fiord; and the Twin Glacier, Hayes Sound. I did not see it in flower north of Hayes Sound. In the neighbourhood of Discovery Bay it occurred in two streams in small quantities, producing buds, but no flowers. Floeberg Beach (H. W. F.)
Sea-level to 100 feet at Foulke Fiord.

E. alpinum, L.
Dist. 1. Lat. 69° 15′. G.
Disco, rather rare, headlands to the west of Godhavn.

E. alpinum, L. (var. *origanifolium*, Lam.)
Dist. 1. Lat. 69° 15′. G.
Englishman's Bay, Disco.

Saxifragaceæ.

Saxifraga Aizoon, Jacq.
Dist. 1. Lat. 69° 15′ to 69° 55′. G.
Lyngemarken and Englishman's Bay, Disco. Head of Svarte Vogel Bay, near Rittenbank.

S. oppositifolia, L.
Dist. 1 2 3 4 5 6 7 8 9 10 11 12 13. Lat. 68° 42′ to 83° 8′.
E., W., and G.
Grows in every sort of situation, but luxuriantly only in moist places at low levels. Sometimes produces magnificent effects of purple and rose against the snow, as at Foulke Fiord. This Saxifrage opened its leaf-buds in a perfectly exposed situation at Polaris Bay, with the thermometer at 9° F. on May 14th; and it was the first to flower at St. Patrick's Bay, June 7. Floeberg Beach (H. W. F. and coll. Moss); Cape Joseph Henry (H. W. F.) Gathered by Lieut. Aldrich, at Ward Hunt Island, lat. 83° 4′, and Cape Columbia, lat. 83° 8′, the most northern land yet visited by civilised man.
Sea-level to 2000 feet in Discovery Bay.

S. cæspitosa, L. (var. *uniflora*, Br.)
Dist. 1 2 3 4 5 6 7 8 9 10 11 12 13. Lat. 68° 42′ to 82° 27′.
E., W., and G.
I am inclined to think that this plant entered more largely than any other into the sum total of all our Arctic vegetation; though not flowering as freely by any means as the last, nor perhaps occurring so plentifully at low levels, it has the advantage at high altitudes. It is a very variable plant; cauline leaves entire or tripartite, sometimes palmately lobed with the middle segment tripartite, other plants with both cut and entire leaves on the same stem; leaves glabrous, or even very hairy, dark or pale green; flowers-white, cream-coloured, or pale yellow. The pale yellow-flowered variety has usually a more diffuse habit, longer peduncles, smaller flowers, and the leaves fringed with gland-tipped hairs. In Discovery Bay this latter was common, and looked very different from the white-flowered form. Floeberg Beach (H. W. F. and Moss coll.)
Sea-level to 2000 feet in Discovery Bay.

S. cæspitosa, L.
Dist. 1 - - - - - - - 9. Lat. 69° 15′ to 80° 24′. W. and G.
Typical *S. cæspitosa* with many, or more than one-flowered stems, was gathered only at Disco and at Radmore Harbour.

S. cernua, L.
Dist. 1 2 3 - 5 6 7 8 - - - 12. Lat. 69° 15′ to 81° 42′.
E., W., and G.
At Foulke Fiord, under and amongst the breeding-places of the little auk, this plant was remarkably luxuriant; specimens gathered there were eight and ten inches in height, with many flowers, often as much as an inch across, and with six, seven, or eight petals apiece. Very rarely flowering in Discovery Bay, and then only one on the top of stem late in the season.
300 to 1400 feet.

S. rivularis, L.

Dist. 1 2 - 4 5 6 - - - - - 12. Lat. 69° 15′ to 81° 42′.
E., W., and G.

Common at Disco, Proven, Cape York, and Cape Sabine. Dr. Moss gathered two plants upon Bellot Island, Discovery Bay.

Sea-level to 500 feet at Cape Sabine.

S. nivalis, L.

Dist. 1 2 3 - 5 6 7 - - - - 12 13. Lat. 68° 42′ to 82° 27′.
E., W., and G.

Rare, and seldom flowering in Discovery Bay; a dwarf, viviparous Saxifrage, gathered here by me, and at Shift Rudder Bay by Feilden, and referred to this species by Oliver, may possibly be a variety of *S. virginiensis*, Mich. *S. nivalis* flowered freely only at Foulke Fiord.

300 to 1400 feet at Discovery Bay.

S. stellaria, L. (var. *comosa*, J. Vahl.)

Dist. 1. Lat. 68° 42′. G.

A few stunted specimens were noticed late in the season at Egedesminde.

S. flagellaris, L.

Dist - - - - 5 6 - - - - - 12 13. Lat. 78° 18′ to 82° 27′.
E. and W.

First met with at Foulke Fiord upon the plateau above the glacier between the cliffs and the Mer de Glace, at an altitude of from 1200 to 1500 feet. Did not observe it at lower levels there. Prefers wet muddy places, and dwindles when the soil dries. In flower Discovery Bay July 7. Shift Rudder Bay (coll. Moss) and Floeberg Beach (H. W. F. and coll. Moss).

300 to 900 feet at Discovery Bay.

S. tricuspidata, Retz.

Dist. 1 - - - 5 - 7 - - - - 12 13. Lat. 69° 15′ to 82° 27′.
E., W., and G.

Flowering freely at Foulke Fiord. In Discovery Bay its rich reddish foliage, covering large patches of shingle in some places, produces a pleasing effect. Gray (Bot. Northern United States, 1872), says of this plant—"Petals obovate-oblong, yellow;" in my observation they are always pure white, sparingly and prettily dotted at the base with orange and yellow. I observed, however, that they become yellow in drying. In flower July 20 in Discovery Bay. Floeberg Beach (H. W. F.)

700 to 1400 feet at Discovery Bay.

Umbelliferæ.

Angelica Archangelica, L. (*Archangelica officinalis*, DC.)

Dist. 1. Lat. 69° 15′. G.

Englishman's Bay and along the coast from there to Laxe Bay in several glens, and by Blase Dalen Lake. The "Qvan" of the natives, much prized as an antiscorbutic; the root seems to be the part most valued; a sweetmeat is made from it in East Greenland. This well-known Disco plant is omitted from Brown's list.

(To be continued).

ON A COLLECTION OF FERNS MADE BY DR. BECCARI IN WESTERN SUMATRA.

By J. G. Baker, F.R.S.

In the months of June and July, 1878, Dr. Beccari paid a visit to the west side of Sumatra, and made a large collection of plants in the province of Padang, especially on Mount Singalan, which attains the temperate region. As he has very kindly sent me the first set of his ferns for examination and determination, and given us specimens of nearly all of them for the Kew herbarium, I propose in the present paper to give a complete list of the species which he met with. Our previous knowledge of the ferns of the island was very scanty. The collection contains about 140 species, of which twenty prove to be novelties. The numbers are the distribution-numbers of Dr. Beccari's collection. Where there is no number, only a single example was gathered. For the new species, the numbers in brackets indicate their position in the sequence followed in our 'Synopsis Filicum.'

426. *Gleichenia arachnoidea*, Mett. Mt. Singalan, above 2500 metres.

456. *G. vulcanica*, Blume. With the last.

457. *G. vestita*, Blume. With the two last.

438 (36*). Cyathea sumatrana, *Baker*, n. sp. Fronds ample, tripinnate, with the main rachis and that of the pinnæ destitute of prickles, but densely clothed with ferruginous tomentum and large linear acuminate red-brown membranous scales. Pinnæ oblong-lanceolate, 1½–2 ft. long, 5–6 in. broad; pinnules lanceolate, sessile, 8–9 lines broad, cut down to the rachis into ligulate obtuse entire tertiary lobes ⅛ in. broad. Veins moderately distinct, 8–10-jugate, all except the uppermost once or twice forked. Texture firm; both surface green. Sori crowded, filling up nearly the whole of the space between the midrib and margin of the tertiary segments, but mainly restricted to their lower half. Involucre large, very fragile, breaking up irregularly. Mount Singalan, above 1700 metres. Near *C. crenulata*, Blume, from which it differs by its entire tertiary segments, densely scaly and tomentose rachises, &c.

439 (44*). Cyathea schizochlamys, *Baker*, n. sp. Fronds ample, tripinnate, firm and subrigid in texture, green on both sides, thinly tomentose and clothed with small linear acuminate scales on the unprickly main rachis, and that of the pinnæ densely clothed with small ovate-lanceolate cuspidate scales about the midribs of the pinnæ and tertiary segments on the under surface. Pinnæ oblong-lanceolate, 1½ ft. long, 5–6 in. broad; pinnules lanceolate, sessile, ⅝–¾ in. broad, narrowed from the middle to the apex, cut down to the midrib into linear entire or rarely crenulate tertiary segments about a line broad, with a distinct space between them. Veins 9–10-jugate, distinct, forked from the base. Sori placed close to the midrib. Involucre fragile, membranous, soon slitting down to the base. Woods of Mount

Singalan. Allied to *C. arachnoidea*, Hook., in cutting and texture, but very different in sori and involucre. It is only unusually developed tertiary segments in which the veinlets are more or less pinnate that show any crenation or lobing, as occurs not unfrequently in other tripinnate tree ferns in which the tertiary segments are typically entire.

434 (39*). Alsophila modesta, *Baker*, n. sp. Stipe under a foot long, its glossy dark brown linear scales reaching $\frac{1}{2}$ in. long. Fronds $2\frac{1}{2}$–3 ft. long, rhomboid, tripinnate, moderately firm in texture, green and nearly glabrous and scaleless on both surfaces, except a few lanceolate scales of the midrib of the pinnules beneath, the rachises pubescent, but without prickles or scales. Pinnæ oblong-lanceolate, the central ones the largest, 9–12 in. long, $2\frac{1}{2}$–3 in. broad, shortly stalked, the lower smaller and more decidedly petioled; pinnules lanceolate, sessile, $\frac{3}{8}$–$\frac{1}{2}$ in. broad, cut down in the lower part to the rachis, and in the upper to a narrow wing into close ligulate entire obtuse tertiary segments under a line broad. Veins distinct, 6–7-jugate, forked or simple. Sori costular, not reaching the margin. Mount Singalan, 1800 metres. A near ally of the common Indian *A. latebrosa*.

434. *Hymenophyllum dilatatum*, Blume. Mount Singalan, 1700–2000 metres. Three varieties, the type, *H. Junghuhnii* of Vandenbosch, and a third, less compound, with a broad wing to the main rachis.

483. *H. polyanthos*, Sw. Mt. Singalan, 200 metres.

484. *H. javanicum*, Spreng. Mt. Singalan, 1700 metres.

452. *H. Reinwardtii*, Vandenbosch Hymen. Javan. tab. 42. This is evidently specifically distinct from *H. javanicum*, under which it is noticed in 'Synopsis Filicum.' It differs from the slender, much-crisped forms of that species by its toothed segments, and should be placed in section *Leptocionium*, in the neighbourhood of *H. denticulatum*. Mt. Singalan, 1700 metres.

440. *H. tunbridgense*, Sm. Mt. Singalan, 1700 metres. New to the Malay islands.

487. *H. Neesii*, Hook. Mt. Singalan, 2000 metres.

570. *H. sabinæfolium*, Baker. Ayer Mancior, 360 metres.

Trichomanes muscoides, Sw. Mt. Singalan, 1700 metres.

436. *T. digitatum*, Sw. Mt. Singalan, 2000 metres.

571, 582. *T. javanicum*, Blume. Ayer Mancior, 360 metres.

486. *T. auriculatum*, Blume. Mt. Singalan, 1700 metres.

453. *T. radicans*, Sw. Mt. Singalan, 1700–2000 metres.

589. *T. rigidum*, Sw. Mt. Singalan, 1700 metres, and Ayer Mancior, 360 metres.

590. *T. maximum*, Blume. Ayer Mancior, 360 metres.

420. *T. apiifolium*, Presl. Mt. Singalan, 1700 metres.

432. *Diacalpe aspidioides*, Blume. Mt. Singalan, 1700 metres.

436, 437. *Davallia Speluncæ*, Baker. Two varieties. Mt. Singalan, 1700 metres.

D. bullata, Wall. Mt. Singalan, 1700 metres.

442. *D. contigua*, Sw. Mt. Singalan, 1700 metres.

580. *D. decurrens*, Hook. Ayer Mancior, 360 metres.

D. tenuifolia, Sw. Mt. Singalan, 1200 metres.

451. *Lindsaya cultrata*, Sw. Mt. Singalan, 1700 metres, and Ayer Mancior.

L. lobata, Poir. Mt. Singalan, 1700 metres.

583. *Pteris longifolia*, L. Ayer Mancior, 360 metres.

P. pellucida, Presl. With the last.

591 (1*). PTERIS REDUCTA, *Baker*, n. sp. Stipes densely tufted, naked, with only a few small linear scales at the base. Fronds lanceolate, glabrous, green on both sides, rather firm in texture, about a foot long, 2–2½ in. broad, simply deeply pinnatifid or pinnate, cut down in the upper part nearly, in the lower part quite to the rachis into crowded ligulate obtuse segments ¼–⅓ in. broad, 30–40 pairs below the caudate apex. Veins close, distinct, deeply forked. Sori extending from the base to the tip of the segments. Involucre narrow, glabrous. Ayer Mancior, 360 metres. Closely resembles *P. quadriaurita* in texture and veining, but the whole frond simply pinnate.

Pteris quadriaurita, Retz. Ayer Mancior, and ascends Mt. Singalan to 1700 metres.

P. biaurita, L. Ayer Mancior, 360 metres.

416. *P. excelsa*, Gaudich. Mt. Singalan, 1700 metres.

(1*). PTERIS PLATYSORA, *Baker*, n. sp. Stipe 2–3 ft. long, naked, stramineous upwards, castaneous towards the base. Lamina 1½–2 ft. long, ½ ft. broad, oblong-lanceolate, simply pinnate, glabrous, green on both sides, moderately firm in texture. Pinnæ about 25, simple, linear, erecto-patent, the lower distinctly petioled, 5–6 in. long, ¼–⅓ in. broad, entire, the upper sessile, the end one like the others. Veins distant, simple or forked. Sorus continuous, not reaching the tips of the pinnæ, one twelfth in. broad. Involucre broad and distinct, but hidden when the fruit is fully developed. Mt. Singalan, 1700 metres. Near *P. longifolia*, from which it differs by its distant pinnæ, broad sori, distant veins, &c. Whole plant reaching a height of 5–6 feet. Lower pinnæ 2–3 in. apart on the same side.

417 (42*). PTERIS RADULA, *Baker*, n. sp. Rhizome wiry, subterranean, wide-creeping, one-twelfth in. in diameter. Stipes remote, brown, naked, 9–12 in. long, rough with minute raised points, like the flexuose rachis. Lamina lanceolate, firm in texture, green and glabrous on both sides, 8–15 in. long, 3–4 in. broad, tripinnatifid or tripinnate. Lower pinnæ deltoid, cut away on the lower side at the base, the unequal-sided deltoid pinnules cut down nearly or quite to the rachis into small oblong-cuneate tertiary segments; upper pinnæ more lanceolate, with sub-simple secondary segments. Veins free, immersed and obscure. Sori ½ line broad, reaching from the base nearly to the tip of the segments. Involucre narrow, glabrous. Mt. Singalan, 1700 metres. Closely allied to *P. scaberula* of New Zealand, but less compound, with fewer broader ultimate segments, resembling those of *P. acclivis*.

424. *P. incisa*, Thunb., var. *aurita*, Blume. Mt. Singalan, 1700 metres.

584. *P. marginata*, Bory. Ayer Mancior, 360 metres.

421. *Lomaria elongata*, Blume. Mt. Singalan, 1700 metres.
469. *L. procera*, Spreng. Mt. Singalan, 2500 metres.
411. *L.* (*Plagiogyria*) *adnata*, Blume. Mt. Singalan, 1700 metres.
L. (*Plagiogyria*) *pycnophylla*, Kunze. With the last.
593. *Blechnum orientale*, L. Ayer Mancior, 360 metres.
431. *Woodwardia radicans*, Sm. Mt. Singalan, 1400 metres.
Asplenium squamulatum, Blume. Ayer Mancior, 360 metres.
427. *A. amboinense*, Willd. Mt. Singalan, 1700 metres.
462. *A. tenerum*, Forst. With the last.
A. falcatum, Lam. With the two last.
A. resectum, Sm. Mt. Singalan and Ayer Mancior.
A. nitidum, Sw. Mt. Singalan, 1700 metres.
473. *A. laserpitiifolium*, Lam. With the last.
A. Belangeri, Kunze. Ayer Mancior, 360 metres.
A. latifolium, D. Don. With the last.
428. *A. decussatum*, Sw. Mt. Singalan, 1700 metres.
466. *Didymochlæna lunulata*, Desv. Mt. Singalan, 1700 metres, and Ayer Mancior.
418. *Aspidium aculeatum*, Sw. Mt. Singalan, 1700 metres.
A. aristatum, Sw. With the last.

471 (70*). NEPHRODIUM (LASTREA) SINGALANENSE, *Baker*, n. sp. Caudex erect. Stipes densely tufted, grey, slender, about a foot long, with a few small linear brown scales near the base. Lamina oblong-lanceolate, bipinnate, 18–21 in. long, ½ ft. broad, rather thin in texture, green on both sides, finely pubescent, scaleless, the rachis substramineous and minutely pubescent. Pinnæ lanceolate, sessile, the central ones 2½–3 in long, 8–10 lines broad, the lower a little reduced, cut down nearly to the midrib into lanceolate entire or crenate secondary segments one-twelfth to one-eighth in. broad. Veins 8–10-jugate, distinct, simple, or forked. Sori small, medial. Involucre minute, fugacious. Mt. Singalan, 1700 metres. Resembles *N. conterminum* in habit, sori, and texture: differs by the lower pinnæ being little reduced, and many of the veins forked.

586. *Nephrodium calcaratum*, Hook. Ayer Mancior, 360 metres.
429. *N. viscosum*, Baker. Mt. Singalan, 1700 metres.
568. *N. immersum*, Hook. Ayer Mancior.
435. *N. Filix-mas*, Rich., var. *elongatum*. Mt. Singalan, 1700 metres.
470. *N. sparsum*, D. Don. With the last.
470. *N. molle*, Desv. With the two last. A curious large variety, with the pinnæ of the lower 2 ft. of the frond dwarfed down to mere auricles.

433 (159*). NEPHRODIUM (EUNEPHRODIUM) DEBILE, *Baker*, n. sp. Rhizome short-creeping, hypogæous, ⅛ in. diam. Stipes contiguous, slender, grey, naked, 8–12 in. long. Lamina lanceolate, bipinnatifid, 8–12 in. long, 2–2½ in. broad, moderately firm in texture, green on both sides, strigillose all over above, finely pubescent on the ribs beneath. Pinnæ sessile, oblong-lanceolate, 1–1½ in. long, ½–⅝ in. broad, cut ⅓–¼ of the space down to the midrib into oblong

obtuse lobes, the lower pinnæ slightly dwarfed. Veins 4–6-jugate, the two lower joining at their tips. Sori small, medial. Involucre persistent. Mt. Singalan, 1700 metres. Just like the well-known West Indian *Polypodium* (*Goniopteris*) *reptans* in size, habit, and veining.

412. *N. Hænkeanum*, Presl. With the last.

455 (176*). Nephrodium eminens, *Baker*, n. sp. Caudex not seen. Stems stout, naked, 2 ft. long below the glands, 2 ft. more with glands and pinnæ dwarfed down to mere auricles. Proper lamina oblong, bipinnatifid, 2½–3 ft. long by half as broad, subcoriaceous in texture, green on both surfaces, glabrous, except on the finely pilose ribs. Pinnæ, except the dwarfed upper and lower ones, distinctly stipitate, the fully-developed central ones lanceolate, ½–1 ft. long, an inch broad, cut about halfway down to the midrib into oblong obtuse contiguous entire lobes ⅙ in. broad; the dwarfed lower pinnæ deltoid, and lowest represented only by glands 3–4 in. apart. Veins distinct, 10–12-jugate, several joining at their tips. Sori small, medial, not quite orbicular. Involucre minute, fugacious. Mt. Singalan, 1700 metres. A fine and well-marked plant, 6–7 feet high, coming nearest *N. brachyodon* of species already known.

573. *N. melanocaulon*, Baker. Ayer Mancior.

575 (202*). Nephrodium (Sagenia) nebulosum, *Baker*, n. sp. Stipes tufted, castaneous, 1½ ft. long, with only a few small brown lanceolate scales at the base. Lamina deltoid, 12–15 in. long, rather less broad, green and glabrous on both sides, moderately firm in texture, with a deeply pinnatifid large end-pinna, with short obtuse upper lobes and large lanceolate lower ones, and 2–4 lanceolate free pinnæ, the lowest unequal-sided and forked at the posterior base. Main veins of the pinnæ distinct to the edge, slender, erecto-patent, with very copious areolæ between them with free included veinlets. Sori very abundant, minute. Involucre very minute and very fugacious. Rachis dark brown, like the stipe; ribs of the lamina pale brown. Ayer Mancior, 360 metres. Comes between *N. ternatum* and *N. melanocaulon*.

N. pachyphyllum, Baker. Mt. Singalan, 1700 metres.

572. *N. glandulosum*, J. Sm., var. *asperum*, Baker. *Aspidium asperum*, Mett. Ayer Mancior, 360 metres.

422. *Oleandra neriiformis*, Cav.

595. *Polypodium difforme*, Blume. Ayer Mancior.

P. urophyllum, Wall. Ayer Mancior.

449 (99*). *Polypodium congener*, Hook. *Grammitis congener*, Blume Fil. Jav., tab. 46, fig. 3. Mt. Singalan, 1700 metres. This is not taken up in 'Synopsis Filicum,' but I now believe it to be a distinct species, differing from *P. hirtum* by its subglabrous frond, longer less pilose stipes, and more compound veining.

(100*). Polypodium (Eupolypodium) padangense, *Baker*, n. sp. Rhizome short-creeping, epigæous, one-fifth to one-sixth in diam., clothed with densely imbricated large pale brown lanceolate membranous scales. Stipe almost obsolete. Lamina ligulate, entire, ½ ft. long, 4–5 lines broad at the middle, narrowed gradually to the

base, very thick and coriaceous in texture, almost naked on both sides, but the edge ciliated with a few very minute black hairs. Veins forked, free. Sori orbicular, slightly immersed, placed in a single row near the thick midrib in the upper half of the frond a short space from one another. Mt. Singalan, 1700 metres. Near the Ceylonese *P. zeylanicum*, Mett.

448 (117*). Polypodium (Eupolypodium) sumatranum, *Baker*, n. sp. Rhizome short-creeping, epigæous, $\frac{1}{6}$ in. diam. Scales densely imbricated, pale brown, lanceolate. Stipes contiguous, very short, wiry, erect, covered with minute brown pubescence. Fronds ligulate, 6–12 in. long, $\frac{5}{8}$–$\frac{3}{4}$ in. broad at the middle, subcoriaceous, glabrous, narrowed gradually to both ends, the edge furnished with broad shallow rounded lobes. Veins in a pinnate group opposite each lobe, the veinlets about three on a side, short, erecto-patent, arranged like those of a *Goniopteris*, but not joining at the tips. Sori copious, orbicular, superficial, placed a little below the tip of the side veinlets, so that there are several irregular rows between the midrib and edge. Mt. Singalan, 1700 metres. An interesting novelty, nearly allied only to the Andine *P. trichosorum*, Hook.

481. *P. cucullatuu*, Nees. With the last.

P. fuscatum, Blume. With the last.

441 (168*). *P. nutans*, Blume Fil. Jav., t. 86A. Rhizome short-creeping, clothed with dense linear ciliated dark brown scales. Stipes nearly tufted, 2–3 in. long, minutely pubescent. Fronds lanceolate, 8–12 in. long, 1–1$\frac{1}{4}$ in. broad at the middle, narrowed gradually to both ends, moderately firm in texture, thinly pilose on both sides of the lamina, more densely so on the midrib, cut down to the rachis into very numerous adnate entire linear pinnæ $\frac{1}{2}$–$\frac{3}{4}$ lin. broad above the dilated base. Veins 8–10-jugate in the fully-developed pinnæ, simple, erecto-patent. Sori orbicular, superficial, filling up the whole space between the midrib and margin. Mt. Singalan. Distinct from *P. decorum*, under which it is noticed in 'Synopsis Filicum,' by its ciliated linear paleæ, longer stipe, pilose frond, more numerous pinnæ, and superficial sori.

P. obliquatum, Blume. *P. Schenkii*, Harrington. Mt. Singalan, 1700 metres.

443. *P. celebicum*, Blume. Mt. Singalan, 1700 metres.

P. verrucosum, Wall. Ayer Mancior.

415. *P. persicæfolium*, Desv. Mt. Singalan, 1700 metres.

P. adnascens, Sw. Ayer Mancior.

P. Lingua, Sw. Mt. Singalan, 1000 metres.

458 (290*). Polypodium (Niphobolus) asterosorum, *Baker*, n. sp. Rhizome slender, wide-trailing, epigæous, clothed with large lanceolate pale reddish brown membranous scales. Stipes distant, naked, pale brown, 2–3 in. long. Fronds lanceolate, entire, 8–12 in. long. $\frac{3}{4}$–1 in. broad above the middle, acute, narrowed gradually from the middle to the base, coriaceous, glabrous on the upper surface, whitish beneath, matted with loose soft reddish brown stellate tomentum. Main veins very obscure, erecto-patent, about

$\frac{1}{4}$ in. apart, enclosing copious minute areolæ. Sori large (about 1 lin. diam.), orbicular, superficial, densely pilose, in erecto-patent rows of 5 or 6 between the midrib and margin, filling up the whole of the upper part of the frond and mixed with copious soft brown stellate hairs. Mt. Singalan, 1700 metres. Allied to *P. albicans* and *P. distichocarpum*.

Polypodium rupestre, Blume. Mt. Singalan, 1700 metres.

P. longifolium, Mett. Ayer Mancior, 360 metres.

445 (297*). Polypodium (Phymatodes) torulosum, *Baker*, n. sp. Rhizome slender, epigæous, wide-trailing, densely clothed with linear acuminate ciliated reddish-brown paleæ. Fronds very dimorphous; sterile ones on stiffly-erect naked stipes 1–1½ in. long; lamina simple, oblong or linear-oblong, entire, obtuse, 1–2½ in. long, 6–9 lin. broad at the middle, cuneate at the base, rigidly coriaceous, quite glabrous, the veins immersed and obscure, the main ones crecto-patent, enclosing copious small irregular areolæ. Fertile fronds on much larger stipes (4–5 in. long), the lamina 4–6 in. long, reduced to a mere midrib, from which the large round-oblong sori bulge out at intervals on each side. Mt. Singalan, 1700 metres. Allied only to *P. hammatosorum*, Harrington, from the Philippine Islands.

(304*). Polypodium (Phymatodes) subsparsum, *Baker*, n. sp. Rhizome slender, wide-climbing, epigæous, firm, flexuose, thinly clothed with small adpressed bright brown lanceolate paleæ. Stipes distant, stiffly erect, naked, 1–3 in. long. Lamina linear, entire, rigidly coriaceous, quite naked on both sides, 3–6 in. long, $\frac{1}{4}$–$\frac{3}{4}$ in. broad below the middle, narrowed gradually to both ends. Veins immersed, obscure, the main ones erecto-patent, enclosing copious small irregular areolæ. Sori superficial, large, orbicular, crowded in the narrowed upper half of the frond, not in regular rows. Mt. Singalan, 1700 metres. Midway between *P. lineare* and *P. rostratum*.

461. *P. normale*, D. Don., var. *sumatranum*, Baker. Sori copious and scattered, as in var. *P. longifrons*, Wall., but the frond firmer in texture, the lamina shorter and broader (8–10 in. long, 15–18 lin. broad), the base more suddenly cuneate, and the stipe longer (4–5 in.) Mt. Singalan, 1700 metres.

446 (333*). *Polypodium (Pleuridium) costulatum*, Baker; *Acrostichum costulatum*, Cesati, Fil. Becc. Polyn., 8. Rhizome wide-creeping, slender, epigæous, densely clothed with erecto-patent linear brownish or bleached paleæ. Fronds very dimorphous, the sterile ones on slender distant naked stiffly-erect stipes 1–3 in. long. Lamina ovate-oblong, obtuse, entire, glabrous, rigidly coriaceous, 1–2½ in. long, the base deltoid. Main veins erecto-patent, distinct and straight to the edge, $\frac{1}{8}$–$\frac{1}{6}$ in. apart, enclosing copious small irregular areolæ. Fertile fronds on much longer stipes (5–6 in. long), the linear lamina 3–4 in. long, $\frac{1}{8}$–$\frac{1}{6}$ in. broad, the large crowded orbicular superficial sori occupying its whole under surface. Mt. Singalan, 1700 metres. A very distinct plant, of which Dr. Beccari previously gathered a single specimen in New Guinea in his expedition of 1875.

P. nummularifolium, Mett. Ayer Mancior.
459. *P. Dipteris*, Blume. Mt. Singalan, 2500 metres.
576. *P. nigrescens*, Blume. Ayer Mancior.
581. *P. albosquamatum*, Blume. With the two last.
577. *P. affine*, Blume. With the two last.

(355*). Polypodium (Phymatodes) quinquefidum, *Baker*, n. sp. Rhizome woody, flexuose, $\frac{1}{4}$–$\frac{1}{3}$ in. diam., clothed with bright brown linear scales. Stipes distant, naked, stiffly erect, pale brown, 5–10 in. long. Lamina deltoid, 6–8 in. long, 9–10 in. broad, exactly similar to *P. trifidum* in texture, cut down nearly or quite to the midrib into 5–7 lanceolate acuminate pinnæ, 4–6 in. long, $\frac{1}{2}$–$\frac{5}{8}$ in. broad, with an obscurely repand margin. Main veins raised, erecto-patent, distinct and straight to the edge, $\frac{1}{6}$–$\frac{1}{4}$ in. apart, enclosing copious small hexagonal areolæ. Sori large, orbicular, superficial, one between each main vein, medial in the lower part of the pinnæ, nearer the margin than the midrib in the upper part. Mt. Singalan, 1700 metres. Very near the Himalayan and Ceylonese *P. trifidum*, D. Don., from which it differs mainly in the position of the line of sori.

468 (372*). Polypodium (Phymatodes) macrochasmum, *Baker*, n. sp. Rhizome woody, epigæous, wide-creeping, $\frac{1}{4}$ in. diam., densely clothed with small linear bright brown paleæ. Stipes distant, naked, pale brown, stiffly erect, 4–8 in. long. Lamina deltoid, 8–10 in. long and broad, coriaceous, glabrous, cut down nearly to the rachis into 9–17 lanceolate acuminate pinnæ, $\frac{1}{2}$–1 in. broad, with a thickened obscurely crenulate margin. Main veins raised, erecto-patent, distinct and straight to the edge, $\frac{1}{8}$–$\frac{1}{6}$ in. apart. Sori one between each main vein, orbicular, deeply sunk in a pit, forming a single row nearer the midrib than the margin, and making the upper surface of the frond strongly verrucose. Mt. Singalan, 1700 metres. Allied to *P. longissimum* and *P. sculpturatum*.

585. *Antrophyum latifolium*, Blume. Ayer Mancior.
A. plantagineum, Kaulf. Mt. Singalan, 1700 metres.
447. *Vittaria elongata*, Sw. Mt. Singalan, 1700 metres.
423, 460. *Gymnogramme javanica*, Blume. Mt. Singalan, 1700 metres.
430. *G. Totta*, Schlecht. Mt. Singalan, 1700 metres.
454. *G. involuta*, Hook. Mt. Singalan, 1700 metres.
463. *G. macrophylla*, Hook. Mt. Singalan, 1700 metres.
596. *G. quinata*, Hook. Ayer Mancior.
592. *G. heterocarpa*, Blume. Ayer Mancior.
Acrostichum callæfolium, Blume. Mt. Singalan, 1700 metres.
587. *A. appendiculatum*, Willd. Ayer Mancior.
A. auritum, Sw.
A. flagelliferum, Wall. Ayer Mancior.
414. *A. bicuspe*, Hook. Mt. Singalan, 1700 metres.
419. *A. spicatum*, L. Ayer Mancior and Mt. Singalan.
588. *A. drynarioides*, Hook. Ayer Mancior.
465. *Osmunda javanica*, Blume. Ayer Mancior and Mt. Singalan, 1700 metres.

Kaulfussia æsculifolia, Blume. Ayer Mancior, 360 metres, and Sungei bulu, at sea-level.

Ophioglossum pendulum, L. Mt. Singalan, 1700 metres.

594. *Psilotum complanatum*, Sw. Ayer Mancior, 360 metres.

Lycopodium carinatum, Desv. Mt. Singalan, 1700 metres.

444. *L. serratum*, Thunb. Mt. Singalan, 1800 metres.

479. *L. squarrosum*, Forst. Mt. Singalan, 1700 metres.

475. *L. miniatum*, Spring. Mt. Singalan, 2000 metres.

474, 477. *L. phyllocarpum*, H. & G. Mt. Singalan, 1700–1800 metres.

467. *L. Phlegmaria*, L. Mt. Singalan, 1700 metres.

472. *L. complanatum*, L. Mt. Singalan, 2500 metres.

478. *L. clavatum*, L. Mt. Singalan, 2800 metres.

476. *L. volubile*, Forst. Mt. Singalan, 2500 metres.

574. *Selaginella caulescens*, Spring. Ayer Mancior. A large variety, like Cuming, 1998.

579. *S. flabellata*, Spring. Ayer Mancior.

569. *S. inæqualifolia*, Spring. Ayer Mancior.

578. *S. Lobbii*, Moore. Ayer Mancior.

450. *S. monospora*, Spring. Mt. Singalan, 1700 metres.

485. *S. radicata*, Spring. With the last.

S. Beccariana, *Baker*, n. sp. Stems slender, trailing, ½ ft. long, forked and copiously pinnate, rounded on the back, sulcate upwards on the face. Leaves of the lower plane spaced on the main stem, rather ascending, oblique ovate, acute, dark green, ⅛–⅙ in. long, moderately firm in texture, much more produced on the upper side of the midrib, broadly rounded, shortly ciliated and a little imbricated over the stem on the upper side at the base; leaves of the upper plane very much ovate or ovate-lanceolate, acute. Spikes platystachyoid, resupinate, ¼–½ in. long, 1 lin. diam.; bracts dimorphic, those of the upper plane ovate-navicular, erecto-patent, dark green, of the lower plane smaller, ascending, broad ovate cuspidate, strongly keeled. Mt. Singalan, 1700 metres. Habit and texture of *S. radicata*, Spring., from which it differs by its platystachyoid spike and dimorphic bracts.

SHORT NOTES.

Botanical Nomenclature. — M. Alphonse DeCandolle, in a recent letter to Mr. B. Daydon Jackson, makes the following remarks in reference to his article on Botanical Bibliography published in our last number. By the courtesy of Mr. Jackson we are enabled to place them before our readers:—

". . . . L'article Bibliographie, du 'Journal of Botany,' m'a beaucoup interessé. La publication de votre *Guide* sera bien utile, d'autant plus que, selon votre remarque, la seconde édition de Pritzel a des défauts assez nombreux. Vous poser des règles qui me semblant très bonnes sur le choix des ouvrages à citer, l'orthographie des noms, etc.

"Toute reflexion faite, je crois bien, avec vous, qu'il faut supprimer les *de*, *von*, *van*, etc., commes initiales des noms, même lorsque les auteurs ont écrit, *De*, *Von*, etc., suivant un usage qui était assez répandu autrefois et s'est conservé dans quelques localités. Je ne ferais pas non plus attention au droit que pouvaient avoir certains auteurs de se faire considérer comme gentilhommes en isolant la particule. Je sais, par exemple, que l'amiral D'Urville se nommait *Durville*, avant d'être devenu un personnage, comme la famille illustre des Jussieu provenait d'un pharmacien de Lyon, Dejussieu, qui n'avait aucune prétention à la noblesse. Dans les noms italiens comme De Notaris, ou hollandais comme Van Hall, je crois que la particule n'entraine pas, comme en France et en Allemagne, l'idée d'une distinction nobiliaire, mais on ne peut pas entrer dans des questions de ce genre. Elles donneraient lieu à trop de difficultés et de contestations.

"Quelques botanistes ont ajouté à leur nom un autre nom, de fantaisie, par exemple :—

"Brisseau s'est affublé du nom de Mirbel :

Proveniat	,,	,,	St. Hilaire :
Palisot	,,	,,	de Beauvois :
Nees	,,	,,	d'Esenbeck.

"Si je redigeais une bibliographie, je crois que je mettrais les ouvrages sous le nom primitif et réal, sauf à mentionner ailleurs un renvoi : *Mirbel*, *voyez Brisseau*.

"En français le nom de St. Hilaire est ordinairement une addition irrégulière à un nom d'apparence insignifiante, car :—

"Geoffroy St. Hilaire s'appelait légalement Geoffroy :

Jaume St. Hilaire	,,	,,	Jaume.

"Si quelque famille St. Hilaire avait eu des raisons pour reclamer, ces messieurs auraient été condamnés par les tribunaux français à ne plus s'intituler St. Hilaire. Les lois sont strictes à cet égard, seulement il faut quon réclame. . . . . ."

LEUCOBRYUM GLAUCUM IN FRUIT (ante, p. 185).—In a collection of mosses made by the late Rev. C. A. Johns, and now in my possession, there are specimens of *Leucobryum glaucum* in fruit, labelled "Criffel, Kirkcudbrightshire, July 15, 1840. W. Gardiner." I have very fine specimens in fruit, collected at Bramshill Park, Hants (which is, I presume, the locality referred to by Mr. Howse), and I am almost sure I once saw it in fruit near Bolton, in the New Forest.—F. I. WARNER.

The following is a list of the specimens of *Leucobryum glaucum*, bearing fruit, in the British Museum Herbarium :—Devonshire, Borrer, 1837. Near Exeter, Parfitt, 1855. Chailey Common, Sussex, Mitten (no date). Scotland, Dr. Taylor (no date). Clova, Robert Brown (no date). Specimen *ex* Dickson's Hort. Sicc. Brit. Ulpha Moss, Cumberland, 1867. Near Loch Kinder, Kirkcudbrightshire, Herb. Gardiner, 1840. Criffel, Kirkcudbrightshire, in Herb. Wilson, 1840, and Cruickshank, 1856. Bramshill Park, Hants, R. S. Hill, 1861, '62, '63. The last two localities

are the same as those mentioned by Mr. Warner. — George Murray.

A Fibre-yielding Curculigo.—The Kew Museum is indebted to Mr. F. W. Burbidge for a very complete series of specimens illustrating the manufacture of cloth in Borneo from a species of *Curculigo*, which has been identified by Mr. Baker with *C. latifolia*, Dryand. The Dusan in N. W. Borneo, near Kina Balu, prepare the fibre by macerating and beating the leaves. The fibre is woven into a very close cloth about ten inches wide in a loom of very simple construction, such as is used in Brittany for weaving saddle-girths. A heavy wooden sword is used for driving close the woof after it is thrown by the shuttle between the threads of the warp. The strong fibrous leaves of *Curculigo seychellensis* are employed in the Seychelles for wrapping plugs of tobacco (Baker, 'Flora of Mauritius,' &c., p. 368), and this is apparently the only other known instance of the economic use of a Hypoxidaceous plant.—W. T. Thiselton Dyer.

Extracts and Notices of Books & Memoirs.

OFFICIAL REPORT FOR 1879 *OF THE DEPARTMENT OF BOTANY IN THE BRITISH MUSEUM.*

By W. Carruthers, F.R.S.

The work of incorporating plants in the General and British Herbaria has been actively carried on during the past year. In its progress the following Natural Orders have been greatly increased, and more or less completely re-arranged:—*Leguminosæ*, *Araliaceæ*, *Dipsacaceæ*, *Styraceæ*, *Oleaceæ*, *Loganiaceæ*, *Gentianaceæ*, *Polemoniaceæ*, *Hydroleaceæ*, *Borragineæ*, *Labiatæ*, *Gesneraceæ*, *Scrophulariaceæ*, *Nyctagineæ*, *Phytolaccaceæ*, *Liliaceæ*, *Commelinaceæ*, *Filices*, *Fungi*, and *Algæ*.

The following collections have been either entirely or in part incorporated in the General Herbarium:—Plants collected in the Transvaal by the Rev. W. Greenstock; in the Malayan Archipelago, by Lobb; in Borneo, by Burbidge; in the Samoan Islands, by the Rev. S. J. Whitmee; in Australia, by the Baron Mueller; in New Zealand, by Dr. Berggren; in the Southern United States, by Rugel; in Mexico, by Botteri, Sallé, Ghiesbreght, and others; in Costa Rica, by Polakowsky; in Surinam, by Berthoud-Coulon; in Bolivia, by Bridges; and in Uruguay, by Lorentz. Numerous collections by various botanists have been incorporated belonging to the following Natural Orders:—*Rosaceæ*, *Rubiaceæ*, *Compositæ*, *Solanaceæ*, *Borragineæ*, *Piperaceæ*, *Aroideæ*, *Commelinaceæ*, *Cyperaceæ*, *Gramineæ*, *Algæ*, and *Fungi*.

The principal addition to the Department during the past year is the extensive Herbarium of the late John Miers, F.R.S., &c.,

the distinguished botanist, which he bequeathed to the Trustees. It contains the types of the species described in his numerous systematic works and memoirs, as far as they were in his own possession, together with an extensive series of South American plants from various collectors, and many valuable collections from other regions of the world. Besides the plants, Mr. John W. Miers has presented to the Department the large series of original drawings made by his father from the living plants in South America, and from dissections of plants in later years.

There have been added to the Herbarium a valuable series of Indian Plants, consisting of 951 species, presented by C. B. Clarke, Esq., and 260 species of plants from Borneo, collected by Mr. Burbidge, and presented by Messrs. H. and A. Veitch. In addition to these a valuable collection made on the Sierra Nevada, New Grenada, by Mr. F. A. A. Simons, has been acquired; also a collection from New Zealand, made by Dr. Berggren; from Syria, by Dr. Post; and from Java, by Mr. H. O. Forbes. The Fern herbarium of the late Edward Newman, consisting of 514 species of Ferns, was presented to the Trustees by his son, T. P. Newman, Esq. A collection of the Mosses of the Cape of Good Hope, made and named by Dr. Rehmann, has been purchased, and a small series of 29 species of Mosses, collected by the naturalists in the Arctic Expedition, has been received. A collection of Lichens from Central France, formed and named by Dr. Nylander, has been acquired. A small collection of unicellular Algæ, made by W. Simpson, Esq., in Afghanistan, has been presented by that gentleman. Other Algæ have been received from Dr. Rabenhorst, and from the Government Expedition to Kerguelen's Land. Collections of Fungi have been obtained from Oudemans, formed in the Netherlands; Saccardo, formed in Northern Italy; Rabenhorst, formed chiefly in Germany; and Ravenal, formed in the United States.

In the British Herbarium there have been added during the year 78 species from Mrs. Fry, and several rare and critical flowering plants from J. C. Mansel-Pleydell, Esq., Messrs. H. and J. Groves, and others, together with critical species of Fungi from C. E. Broome, Esq., and a collection of Sphæriaceæ, by Mr. Plowright. An interesting series of microscopical preparations of British Cellular Cryptogams, formed by Mr. W. Joshua, has been acquired.

To the series of woods has been added a collection from Cordoba and Tucuman, accompanied with the foliage and flowers of the trees from which the specimens were taken.

To the collection of vegetable structures in spirits have been added specimens of the flower-panicles of *Aloe dichotoma* and *Aloe Barberæ* from South Africa, presented by Roland Trimen, Esq.; and of the fruit of *Scyphochlamys revoluta*, from Rodriguez.

The collection of drawings and engravings of plants has been largely increased during the year by the further incorporation of drawings and engravings previously acquired, and by the purchase of 8772 further drawings and engravings. The number of visits

paid during the year to the Herbarium, for scientific inquiry and research, was 1008. The following foreign botanists may be specified as having used the Herbarium in connection with their investigations -—M. C. DeCandolle, of Geneva; M. Cogniaux, of Brussels; Dr. Berggren and Mr. Nathorst, of Stockholm; Dr. Hildebrandt, the African Explorer; and Baron Ettingshausen, of Gratz. Of British botanists the following may be specified:— Mr. W. P. Hiern, Mr. C. B. Clarke, Mr. J. G. Baker, Mr. A. W. Bennett, Mr. J. C. Mansel-Pleydell, Mr. A. G. More, Mr. C. P. Hobkirk, Mr. B. D. Jackson, Dr. Braithwaite, Mr. S. le M. Moore, Mr. R. V. Tellam, Mr. E. M. Holmes, Rev. W. W. Newbould, the Messrs. Groves, the Rev. J. M. Crombie, Mr. Howse, Mr. Boulger, and Mr. Joshua.

Ueber einen neuen pathogenen Bacillus. Mit 1 Taf. (Virchow's Archiv. f. pathol. Anat. u Physiol. u. f. Klin. Med. Bd. lxxvii. Heft. 1, p. 29 ff.) By C. J. Eberth.

This *Bacillus* was found in a badger, belonging to a zoological garden, which died after a few days' illness, showing no other symptoms than decrease of appetite and weakness. An examination was made half-an-hour after death, and the cause of death was attributed to a mycosis which, though general, was chiefly developed in the liver, to which also the parenchyme affections were confined. This was regarded as caused by the parasite. After the liver had been hardened in small pieces in alcohol, numerous rod bacteria were seen in sections (cleared with acetic acid) of the periphery of the small abscesses among pus-corpuscles. These were more clearly visible in hæmatoxyline preparations or in sections which had been coloured with methyl violet. Sections of the blood capillaries were completely filled with them in series parallel or slightly inclined to the axis of the capillary. In many places the walls of the vessels appeared to be destroyed. The *Bacilli* formed cylindrical rods of mostly one, seldom two, branches, which were only a little longer than the diameter of the red blood corpuscles and the contents of which were a homogeneous dull-shining substance. On treatment with a diluted solution of iodine or of Bismarck brown there appeared in many of them dirty-brown granules which after farther addition of iodine assumed a light brown colour, shading into violet. Each granule had about the same diameter as the transverse sections of the rods. Whether these granules were spores or not the author does not venture to say. This *Bacillus* is distinguished from that of the splenic fever by greater breadth and length. From a great number of measurements it was found that the average length of the *Bacilli* of *B. anthracis* (splenic fever) was five micromillimetres, while those found in the badger averaged six. The rods of the former terminate abruptly, while those of the latter are rounded off. Further, the *Bacilli* of the badger appear to actively excite inflammation, which cannot be affirmed of *B. anthracis*.

G. M.

F. von Thümen describes (Verhandl. der k. k. Zool.-bot. Ges. in Wien, xxix., p. 523–524) two new leaf-inhabiting Ascomycetes (found within the range of the Flora of Vienna); one is a new species of *Ascomyces* (*A. alutaceus*) which grow on the leaves of *Quercus susedana*, Vukot, at Kammerstein. The other is a new species of *Sphærotheca* (*S. Nieslii*), the perithecia of which appear singly (*i. e.*, never in clusters) but numerously on the leaves of *Sorbus aria* in the park of the Jesuits' College at Kalksburg and at Leopoldsberg.

Rysslands, Finlands och den Skandinaviska Halfons Hattsvampar. Part I.—*Skifsvampar* [Hymenomycetes.] By P. A. Karsten.

This first part contains the *Agaricini* of Russia, Finland, and Scandinavia. The author recognises eighty genera of *Agaricini*, which are composed chiefly of a part of Fries' subgenera of *Agaricus* elevated into genera, and of several other genera new or described elsewhere. Notably among them are:—*Amanitopsis*, Roz., *Cortinellus*, Roz., *Panellus*, Karst., *Scytinotus*, Karst., *Leptoglossum*, Karst., *Leptotus*, Karst., *Lentinellus*, Karst., *Hemicybe*, Karst., *Rozites*, Karst., *Gymnopilus*, Karst., *Gymnocybe*, Karst., *Phialocybe*, Karst., *Symocybe*, Karst., *Galerula*, Karst., *Roumegueria*, Karst., *Ryartites*, Karst., *Næmatoloma*, Karst., *Pannucia*, Karst., *Deconica*, W. G. Sm., *Anellaria*, Karst., *Chalymmota*, Karst., *Onochopus*, Karst., *Pselliotora*, Karst., and *Coprinellus*, Karst. Some good might have been done if this energy in adding new genera to the confusion in the *Agaricini* had been directed to "sinking" the numerous species of that group established on frivolous grounds. G. M.

Dr. Lange has issued the fiftieth fascicle of the 'Flora Danica.' It contains figures and descriptions of the following new species:—*Calamagrostis hyperborea*, *Potentilla Ranunculus*, *P. Friesiana*, and *Carex Drejeriana*—all of Lange.

The indefatigable Baron F. von Mueller has issued an 'Index Perfectus ad Caroli Linnæi Species Plantarum,' which is worthy of its name, and is both interesting and useful.

In the 'Sitzber. der k. k. Zool.-bot. Ges. in Wien.,' xxix., p. 52, F. von Thümen describes a prehistoric *Polyporus* from the lake-dwellings at Laibach. The structure of the pores, the form and the size, and the almost completely preserved rind, point to the high probability that it is *Polyporus fomentarius*, Fr., or some nearly-allied form.

Other New Books.—M. Willkomm & J. Lange, 'Prodromus Floræ Hispanicæ,' vol. iii., pt. 4. Stuttgard, E. Koch. — H. Rosbach, 'Flora von Trier.' Trier, E. Groppe. — F. Haslinger, 'Botanisches Excursionsbuch für den Brünner Kreis.' Brunn, Buschak. — C. Baenitz, 'Handbuch der Botanik.' Berlin, A. Stubenrauch (4 marks).— J. Lange, 'Flora Danicæ Iconum,' fasc.

50.—J. D. Hooker, 'Flora of British India,' part. vii. (*Cornaceæ—Rubiaceæ*). L. Reeves & Co. (10*s.* 6*d.*)—F. von Mueller, 'Index Perfectus ad C. Linnæi Species Plantarum.' Melbourne. — J. Britten & R. Holland, 'Dictionary of English Plant-names,' pt. ii. (G—O), English Dialect Society. Trübner. — R. Braithwaite, 'The British Moss-Flora,' Fam. I. (*Andreæaceæ*).

Articles in Journals.

May.

Flora.—J. Freyn, 'Contributions to the knowledge of some species of *Ranunculus*.'—Dr. A. Minks, 'Morphological-lichenographical studies' (contd.)—Dr. L. Just, 'An answer to Dr. Nuesch.'

Magyar Novent. Lapok.—F. L. Holuby, 'Mycological notes,' v. —V. Cesati, 'Short note on Fenzl's Biography.'

Hedwigia.—Robert Woolny, 'On the fructification of *Chætopteris plumosa*' (tt. i.–iii.).— Hansen, 'On *Saccharomyces apiculatus*.'—Warnstorff, 'Excursions in the Lower Harz' (contd.)

Botanische Zeitung.—E. Stahl, 'On the influence of direction and intensity of light on several phenomena of motion in the Vegetable Kingdom.' — A. Blytt, '*Clastoderma de Baryanum*' (nov. gen. *Myxomycetum*).

Botaniska Notiser.—E. V. Ekstrand, 'Remarks on Scandinavian *Hepaticæ*' (contd.)—A. P. Winslow, 'Gothenburg *Salix* and *Rosa* Flora.'—J. E. Areschoug, 'Description of a new Alga belonging to the *Laminarieæ*' (*Oxyglossum japonicum*).—P. W. Strandmark, 'Æstivation of *Empetrum nigrum*.' — R. Wallengren, 'New Scandinavian localities.'

Grevillea (June). — M. C. Cooke, 'British Desmids.' — Id., 'Observations on *Peziza*.' — J. B. Ellis, 'Reply to Dr. Cooke's criticism of paper on "Variability of *Sphæria quercuum*, S. Z."' (with note to above by Dr. Cooke).—M. C. Cooke, 'On *Hymenochæte* and its allies.' — C. Kalchbrenner, 'Fungi of Australia.' — W. Phillips, '*Dacrymyces succineus*, Fr., the early stage of a *Peziza*.'

Botanical News.

'Silliman's Journal' (June, 1880) contains an obituary notice of Charles Christopher Frost, the oldest cryptogamic botanist in the United States, who died at Brattleboro', Vermont, on 16th March, 1880. He was born in the same town on 11th November, 1805, and lived there throughout his life. He educated himself in Latin, French, and German, in order to pursue his scientific studies in those languages. He collected natural objects generally, but especially Fungi (of which he has published numerous species). His most important contribution to Science is a list of the Mosses, Liverworts, Charas, and Fungi in the 'Catalogue of Plants growing

within thirty miles of Amherst,' published by Prof. Ed. Tuckerman and himself in 1875.

Edward Smith Hill, a Sydney botanist, author of a 'Report on the Flora of Lord Howe Island,' died at Sydney on the 17th March, at the age of sixty-one years.

We regret to announce the death of Thomas Atthey, A.L.S., which occurred at Gosforth on the 14th April. He investigated especially the *Diatomaceæ*, of which he discovered several new species, published in the 'Annals and Magazine of Natural History.'

The well-known traveller and plant-collector, Franz Klaboch, died last February in Mexico.

Mr. W. T. T. Dyer, of Kew, has been elected a Fellow of the Royal Society.

Mr. R. A. Rolfe has been appointed Junior Assistant in the Kew Herbarium—he being the successful candidate in the public competition for that post.

Mr. John Scott, latterly head of the Herbarium Department of the Botanic Gardens, Calcutta, has recently died at Garwald, East Lothian, aged forty-two years. Mr. Scott received his early training, under the late Mr. Macnab, in the Royal Botanic Garden, Edinburgh. His contributions to the 'Transactions of the Edinburgh Botanic Society' and the 'Journal of the Linnean Society' attracted the notice of Mr. Darwin, for whom he carried out various experiments. Having received his Indian appointment, Mr. Scott, in the course of his duties, went to Darjeeling, to report on the opium poppy disease. Soon after, he contracted the disease of the spleen, of which he died. He has left a quantity of interesting MSS. Among his more recent contributions to science is a paper entitled, "Notes on the Tree Ferns of British Sikkim, with descriptions of three new species, and a few supplemental remarks on their relations to Palms and Cycads," and published in the 'Transactions of the Linnean Society,' vol. xxx., part I.

Lady Wilkinson and Mr. Carruthers are engaged in editing a series of illustrations of the 'Desert Plants of Egypt,' which will consist of reproductions of the drawings made by Sir Gardner Wilkinson during the years from 1823 to 1830, which he spent in surveying and mapping the desert regions of Upper and Lower Egypt. Lady Wilkinson is collecting all the plant-references which occur in his MSS., with the view of placing on record these valuable observations. The plants which Sir Gardner Wilkinson collected during his explorations in the Egyptian deserts, were presented by him to the British Museum, and are now in the Herbarium of that institution. From these and from the drawings, Mr. Carruthers will prepare descriptions of the plants which will give a scientific value to the publication. The plates will amount to forty, each containing several subjects accurately reproduced on stone by Mr. D. Blair, F.L.S., and coloured after the original drawings. The size of the work will be royal quarto, and the price to subscribers £3 3*s*.

Tab. 212.









1. Petalidium Welwitschii, *S. Moore.* 2. P. physaloides. *S. Moore.*

J. Nugent Fitch, del. et lith.

West, Newman & Co. imp.

Original Articles.

ENUMERATIO ACANTHACEARUM HERBARII WELWITSCHIANI ANGOLENSIS.

Auctore S. Le M. Moore.

(Continued from p. 199).

Petalidium, Nees.

P. physaloides (sp. nov.)—Erecta, caule tereti puberulo demum glabro cortice pallido cincto, foliis petiolatis ovatis leviter acuminatis junioribus flavide tomentosis adultis fere glabris, ramulis fertilibus elongatis sterilibus subsimilibus simplicibus, floribus solitariis brevissime pedunculatis, bracteis ovatis acutis cavis tomentellis viride nervosis, calycis segmentis duobus connatis, corollæ tubo recto bracteas ægre excedente sub limbo vix ampliato, filamentis ad faucem per paria unilateraliter insertis basi crassis pilosulis antheris mucronulatis, capsula ovoidea acutata 2?-sperma.

Hab. Distr. Mossamedes in dumetis montium inter Pomangala et Quitive frequens. (No. 5000.)

Folia adulta circiter 4·0 cm. long. et fere 2·5 cm. lat., petiolus 1·0 cm. long., pubescens; folia ramulorum fertilium sparsa ex axillis foliorum majorum ortis oblanceolata circiter 1·0 cm. longa; ea vero basin versus majora. Bracteæ 1·2 cm. long., elegantissimæ. Flores aurantiaco-coccinei. Corollæ limbus circiter 0·8 cm. diam., lobi ovati, obtusi, antico paullo majore, pilis longis debiliter sparsissime notati. Capsula 0·8 cm. long.

P. coccineum (sp. nov.)—Caule subtereti robusto albido glanduloso-pubescente, foliis petiolatis cordato-ovatis vel basi late truncatis cuspidulatis utrinque glanduloso-pubescentibus ramulorum fertilium iis subsimilibus sed minoribus, floribus ad apicem ramulorum simplicium fertilium in axillis foliorum majorum positorum et quam ea breviorum solitariis (an semper?) magnis, bracteis foliis ramulorum consimilibus viridibus, calycis pubescentis lobis anticis fere ad medium connatis lateralibus minoribus acuminatis lacinia postica lineari-lanceolata anticis subsimili, corollæ tubo juxta medium curvato superne gradatim ampliato ibidemque puberulo limbo perspicue bilabiato lobis magnis oblongo-ovatis obtusis, antherarum sub-exsertarum loculis elongatis basi muticis, capsula ignota.

Hab. In fruticetis ad collas mica-schistosas prope Pomangala supra flum. Maiombo distr. Mossamedes. (Nos. 5017, 5018.)

Speciei sequenti sat similis sed ob folia vere cordata, flores majores, calycem disparem necnon antheras muticas ea haud jungenda.

Fruticulus ramosus decumbenti-ascendens. Caulis 0·3 cm. crassus, demum glaber. Folia intense viridia ad 5·0 cm. long. et 4·3 cm. lat.; petiolus 1·5–2·3 cm. long. glanduloso-pubescens. Ramuli fertiles circiter 3·0 cm. long., glanduloso-pubescentes: folia eorum (petiolo excluso) vix 2·0 cm. longitudine. Bracteæ 2·2 cm. long., basi angustatæ apice acutæ. Corollæ coccineæ tubus 2·7 cm. long., sub limbo 0·8 cm. lat., lobi ejus 1·1 cm. long.

P. GLANDULOSUM (sp. nov.)—Caule ascendente tereti glanduloso-pubescente ætate cinereo glabro, ramulis fertilibus in axillis foliorum majorum positis üsque brevioribus parum ac patente ramosis glanduloso-pubescentibus, foliis ovatis obtusis glanduloso-pubescentibus e basi lata in petiolum quam lamina breviorem decurrentibus ramulorum fertilium lanceolatis obtusiusculis, floribus solitariis (an semper ?), bracteis ovato-lanceolatis viridibus pro genere parum venosis glanduloso-pubescentibus, calycis puberuli laciniis anticis alte connatis subito acuminatis, corollæ tubo paullo curvato sat angusto superne vix ampliato ibidemque puberulo bracteas circiter duplo superante limbi lobis anticis alte connatis omnibus oblongis plus minus emarginatis, antheris mucronulatis, capsula haud visa.

Hab. Distr. Benguella sine loci indicatione. (No. 5047.)

Foliorum lamina circiter 2·5 cm. long.; petioli 1·0 cm. (vel minus) longitudine, glanduloso-pubescentes. Bracteæ 1·75–2·0 cm. long. Calycis laciniæ anticæ posticæque 0·6 cm. long., laterales parum breviores. Corollæ tubus sub limbo vix 0·5 cm. lat. Stylus inferne pilosiusculus; stigmatis lobi equales.

P. RUPESTRE (sp. nov.)—Caule crasso parum flexuoso glabro, ramulis fertilibus primariis foliis subæquilongis pubescentibus, foliis firmis late cordato-ovatis acutis glanduloso-puberulis breviter petiolatis ramulorum fertilium longissime spathulatis sparsim setosis, floribus glomeratis, bracteis ovatis obtusis dorso carinulatis membranaceis glanduloso-pubescentibus ac parte inferiore præsertim setosis, calycis pubescentis lobis lanceolatis duo anticis alte connatis, corollæ tubo bracteas superante recto vix dilatato superne pubescente limbi fere æqualis lobis ovatis obtusis, antheris breviter echinatis, capsula suborbiculata longitudinaliter 2-sulcata glabra, seminibus quove in loculo solitariis.

Hab. In distr. Mossamedes non infrequens ad rupes arenaceas rubras pr. Boca do Rio Bero. (No. 5022.)

Fruticulus 2–3 pedalis. Caulis 0·3–0·4 cm. crassus, cinereus. Folia vix 2·0 cm. long., viridissima; petioli circiter a 2·0 cm. (vel minus). Ramuli fertiles sterilibus contigui; folia eorum 1·5 cm. longitudine, superiora vero minora; glomeruli 3·0 cm. long. Bracteæ 1·3–1·5 cm. long., leviter venosæ. Flores ex albido-roseoli vel albi purpureo striati. Corollæ tubus 1·5 cm. long.; limbus 0·8 cm. diam. Capsula vix 0·6 cm. long., apice subito angustata.

P. Currori, Bth. (*Pseudobarleria*, T. And.) nostræ proxima species distat foliis disparibus, bracteis floribusque multo majoribus, vestitu, notisque aliis.

P. Welwitschii (sp. nov.)—Caule procumbente leviter flexuoso obscure tetragono pubescente pallide flavido, ramulis sterilibus fertilibus oppositis eosque paullo excedentibus vel subæquantibus vel iis brevioribus quadrangularibus mox pubescentibus, foliis ovatis mucronulatis e basi leviter cordata in petiolum iis æquilongum abeuntibus albide vel subflavide tomentosis, ramulis fertilibus gracilibus piloso-hirtis folia parva linearia piloso-hirta ferentibus, glomerulis laxis, bracteis ovatis obtusiusculis villosis siccitate pallide-flavidis, calycis pubescentis laciniis anticis alte connatis, corollæ tubo fere recto bracteis paullo longiore mox ampliato, stamina 4 antheris mucronatis, capsula calyce inclusa ovoidea acutata, semine quaque in capsula unico majusculo.

Hab. Distr. Mossamedes in rupest. montosis ad sinistrum flum. Maiombo prope Páo sat frequens. (No. 5041.)

Ramuli steriles usque ad 6·5 cm. long. sed plerumque breviores, folia eorum ad 3·0 cm. et petioli fere ad 2·0 cm. long. Glomeruli ramulis erectis rigidiusculis coronati. Ramulorum fertilium folia ad 0·8 cm. long., superiora vero multoties minora. Bracteæ 1·2 cm. long. carinulatæ papyraceæ reticulato-nervosæ. Calycis laciniæ sub fructu vix 0.8 cm., long. acutatæ. Corollæ cærulæ tubus 1·2 cm. long., limbi lobi oblongi intus sed præsertim lobus anticus setis paucis reflexis minuti. Capsula 0·7 cm. long.

P. Lepidagathis (sp. nov.) — Ramulis sterilibus e rhizomate crasso cortice subereo obducto ascendentibus fertiles longe excedentibus, foliis firmis lineari-lanceolatis lanceolatisve incurvo-mucronatis glabris petiolo laminam subæquante vel ea (interdum multoties) breviore ramulorum fertilium plerumque a sterilibus distantorum perbrevium validorum linearibus obtusis piloso-hirtis, glomerulis subsphæricis vel cylindricis, bracteis ovato-oblongis acutis dorso carinatis fere glabris, calycis pubescentis segmentis duo alte connatis, corollæ tubo fere recto bracteis paullo longiore vix ampliato, staminum inclusorum antheris brevissime apiculatis vel muticis.

Hab. Frequentis. ad rupes rubro-arenaceas prope 'Boca do Rio Bero' distr. Mossamedes, et ad Serra de Montes negros. (Nos. 5007, 5020.)

Herba radice lignescente a basi ramosissima caulibus ramisque prostrato-ascendentibus apicem versus foliatis. Folia ramulorum sterilium petiolo incluso circiter 10·0 cm. long., siccitate viridia. Glomeruli ad 6·0 cm. long., sed plerumque dimidio breviores. Folia ramulorum fertilium 1·0–1·5 cm. longitudine, angustissima. Bracteæ circiter 1·1 cm. long., dorso eximie carinatæ superne planæ, parum venosæ, decolores. Corollæ puniceæ vel fulvo-rubræ tubus angustus vix omnino glaber; limbus 0·7 cm. diam. Capsula 0·5 cm. long., 2-sperma, glabra.

P. loranthifolium (sp. nov.) — Caule leviter flexuoso glabro, ramulis fertilibus a sterilibus plerumque remotis rigidis foliis subæquilongis vel brevioribus apice subspinosis, foliis petiolatis late ovatis obtusissimis basi plerumque truncatis carnosulis duris rigidis obscure venosis glabris ramulorum fertilium minimis

oblanceolatis obtusis, bracteis parvis ovatis obtusis precipue basi pubescentibus eximie reticulatis, calycis villosuli laciniis anticis omnino connatis lateralibus lineari-lanceolatis acutiusculis lacinia postica oblongo-ovata, corollæ parvæ tubo recto basi subito paulloque amplificato sub limbo parum contracto ibidemque puberulo limbo bilabiato lobis oblongis obtusis extus puberulis, staminum subexsertorum filamentis basi incrassatis antheris äristatis, capsula calyce marcescente inclusa compressa glabra 2-sperma.

Hab. Inter S. Joao de Caroca et Cazimba distr. Mossamedes. (No. 4997.)

Suffrutex multicaulis, prostratus. Ramuli fertiles crebre divaricati puberuli; folia eorum circiter 0·5 cm. long., ramorum sterilium ad circiter 3·0 cm. long. et 2·5 cm. lat.; juniora albido-tomentosa mox glabra, ex sicco brunneo-viridia ac iis *Loranthi* alicujus simillima. Florum glomeruli ramulis coronati plerumque 2–3·0 cm. long. Bracteæ 0·6 cm. long., sub fructu marcescentes. Calyx 0·5 cm. et corollæ tubus 0·8 cm. long.; flores punicei. Stigmatis lobi subæquales; stylus glaber. Capsula 0·6 cm. longitudine.

Species Dubia

No. 4998 specimen nimis imperfectum videtur esse hujus generis species nova ex affinitate *P. rupestris* ac *P. glandulosi*.

Conspectus Petalidiorum Africanorum.

1.	Flores glomerati. . . . . 5.	
	Flores solitarii. . . . . 2.	
2.	Ramuli fertiles abbreviati sterilibus dissimiles. 4.	
	Ramuli fertiles elongati sterilibus similes vel subsimiles. . . . . 3.	
3.	Folia linearia, flores pedunculati. . . .	1. *P. linifolium*, T. And.
	Folia ovata vel oblanceolata, flores subsessiles.	2. *P. physaloides*, nob.
4.	Corollæ tubus superne eximie ampliatus, antheræ elongatæ basi muticæ. . .	3. *P. coccineum*, nob.
	Corollæ tubus parum ampliatus. antheræ parvæ basi mucronulatæ.	4. *P. glandulosum*, nob.
5.	Ramuli fertiles quam maxime divaricati. . 7.	
	Ramuli fertiles simplices vel parum divaricati. 6.	
6.	Caulis hirtus, ram. fertilium folia oblanceolata, bracteæ plus quam 2 cm. longæ. . .	5. *P. Currori*, Bth.
	Caulis glaber, ram. fertilium folia spathulata, bracteæ ad 1·5 cm. longæ. . . .	6. *P. rupestre*, nob.
7.	Ramuli fertiles a sterilibus distantes vel iis contiguis. . . . . 8.	
	Ramuli fertiles sterilibus oppositis. . . .	7. *P. Welwitschii*, nob.
8.	Glomeruli folia ramulorum apices occulentia. .	8. *P. Lepidagathis*, nob.
	Glomeruli apicibus ramulorum coronati. . 9.	
9.	Folia albo-tomentosa.	9. *P. halimoides*, nob.*
	Folia ea *Loranthi* in mentem revocantia. .	10. *P. loranthifolium*, nob.

* Hæc est *Barleria halimoides*, Nees DC. Prod., vol. xi., p. 231, T. Anders. in Journ. Linn. Soc., vol. vii., p. 32,

PHAYLOPSIS, Willd.

P. ANGOLANA (sp. nov.)—Caule tetragono puberulo pallido, foliis longe petiolatis ovatis utrinque angustatis basi paullo obliquis margine vix integris secus nervos leviter appresse strigoso-pilosis ceterum glabris, spicis ovatis sat brevibus crispe pilosis, bracteis late ovatis acutiusculis siccitate pallide viridibus, calycis lacinia postica oblonga obtusa ceteris linearibus, corollæ mediocris limbo bilabiato, antheris basi acutatis, capsula ———.

Hab. Golungo Alto in dumetosis M. de Queta orient. (Catombe). (No. 5175.)

Herba, caule radicante, flexuoso. Foliorum pagina ad 9·0 cm. long. et petioli ad 4·5 cm. long., puberuli. Spicæ circiter 2·0 cm. longitudine. Calycis laciniæ pilosulæ. Corolla 0·8 cm. long., alba.

Affinis *P. longifoliæ*, T. And. et *P. Barteri*, T. And. sed foliis longius petiolatis, spicis omnino diversis, corolla minore inter alios characteres aliena.

P. OBLIQUA, T. And. MSS. in Herb. Kew. Caule quadrangulari levissime puberulo deinde glabro, ramulis piloso-pubescentibus vel puberulis, foliis ovato-lanceolatis e basi valde obliqua in petiolum puberulum laminæ æquilongum vel breviorem abeuntibus margine breviter dentatis undulatisve pagina superiore pilis paucis strigosis appressis indutis inferiore fere omnino glabris, spicis brevissimis axillaribus vel foliis subdeficientibus floribus quasi in spicas elongatas pedunculatas dispositis, bracteis ovatis obtusis vix glabris viridibus firmis, calycis lacinia postica oblongo-lanceolata ceteris linearibus acutis omnibus hirsutulis, corollæ minimæ lobis duo posticis altius connatis, antheris muticis, capsula parva in exemplariis nobis obviis 3-sperma.

Hab. In distr. Golungo Alto in dumetis secundariis ad sylv. margines prope Rio Delamboa. (No. 5115.)

Herba, caule ascendente, ramis distortis. Folia petiolo incluso ad 8·0 cm. long., plerumque vero minora. Corolla 0·4 cm. long., et capsula ei æquilonga.

Speciebus ob omnibus plerisque notis cognoscenda, quippe foliis basi obliquis, spicis brevissimis, floribus minimis.

WHITFIELDIA, Hook.

W. longiflora, T. And.

Hab. Pungo Andongo et Golungo Alto in edit. umbrosis ad cataractas Rio de Capopa non frequens; Distr. Cazengo in sylvis primit. de Muxaulo. (Nos. 5151, 5152, 5153.)

Frutex humanæ altitudinis. Flores calycesque splendide albi, speciosissimi.

BLEPHARIS, Juss.

B. edulis, Pers. *var.* foliis majus spinosis et floribus antherisque quam in typo majoribus.

Hab. Rarior in arenosis ad ostia flum. Bero distr. Mossamedes. (No. 5019.)

B. acanthorioides ? Klotzsch.

Hab. In dumetis ad sylvarum oras de Monino distr. Huilla, et sat frequens in pascuis et pratis parcius graminosis imprimis ad rivul. ripas eximie evoluta ad Rio de Catete distr. Pungo Andongo, necnon in collinis siccis ad sinistrum Riv. Caringa distr. Ambaca. (Nos. 5080, 5096, 5112, 5163, 5061, 5219.)

Herba nunc simplex 1–2 pedalis, nunc ramosissima 2–4 pedalis. Folia quaternatim verticillata, plerumque quam maxime inæqualia, minora circiter 1·0 cm. long., deltoideo-triloba, lobis apice spinuloso-pungentibus. Calycis lobi interiores integri. Flores cærulei vel fere cyanei.

In making this determination I feel most uneasy about the dimorphic leaves; these, however, seem to be absent in one of the specimens, which is not the only point of discrepancy between these latter. Whether, however, they be rightly referred to Klotzsch's species or not, they must all, I think, belong to one and the same species.

B. boerhaavifolia, Nees.

Hab. In dumetis arenosis inter Lopollo et Eme distr. Huilla; itaque in distr. Loanda sine loci indicatione. (Nos. 5054, 5129, 5199.)

B. CUANZENSIS, Welw. MSS. Caule ascendente diffuso sparsissime hirsuto-piloso, foliis subcoriaceis 4–6-natim verticillatis in verticillis inæqualibus vel subæqualibus lineari-lanceolatis vel lanceolatis acutis vel acutiusculis sparsissime hirsuto-pilosis interdum fere glabris siccitate brunneis, spicis mediocribus gracilibus, bracteis ovatis superioribus late oblanceolatis obtusissimis spinulis debilibus elongatis patentibus copiose munitis cano-villosulis, floribus solitariis læte purpureis, calycis pilosi segmento postico integro antico conspicue 2-nervio acutissime 2-dentato, corollæ limbo breviter 3-fido, filamentis incrassatis antheris 1-locularibus, capsula ———.

Hab. In sylvestribus apertis petrosis juxta ripas fl. Cuanza prope Mopopo Distr. Pungo Andongo. (No. 5101.)

Herba perennis, caule elongato, ramoso, procumbente. Folia 2·5–8·0 cm. long., sessilia. Spicæ 2·5 cm., earumque spinulæ atratæ 0·5 cm. long. Calycis segmentum posticum 0·7 cm. long., nervosum. Corolla intense flava extus puberula; limbus intus pilis numerosis brevibus decurvis notatis.

Nulli nisi *B. boerhaavifoliæ* Nees proxima, quæ ob folia membranacea siccitate viridia, spicas minores, bracteas diversas, corollæ minoris haud purpureæ limbum conspicuius lobatum nostra a planta longe distat.

Var. *leptophylla*. Humulis, foliis linearibus ad 7·0 cm. long. et 0·2 cm. lat., pungentibus, bractearum spinulis quam in typo paullo longioribus, floribus intense cæruleis.

Hab. Inter Lopollo et Catumba distr. Huilla itaque in sylvis claris montosis ex lacu Ivantala versus Quilongues. (Nos. 5053, 5056.)

No. 5030 videtur esse hujus speciei specimem valde immaturum.

B. Welwitschii (sp. nov.)—Caule tereti mox glabro ramulis hispidis, foliis sessilibus 4-natim verticillatis plerumque inæqualibus linearibus vel lineari-lanceolatis apice pungentibus integris coriaceis subtus conspicue 1-costatis glabris, spicis abbreviatis terminalibus aut axillaribus haud vel brevissime pedunculatis paucifloris, bracteis foliis haud omnino dissimilibus rigidis linearibus vel extremis brevissimis oblongis omnibus apice et margine spinulas albidas ferentibus intermediis longioribus ac calycis lobos superantibus vel subæquantibus omnibus pubescentibus, calycis lobo posteriore ovato-lanceolato pungente anteriore quam posterior breviore 2-nervio bifido, corollæ pubescentis labio breviter ac inæqualiter 3-lobo, filamentis incrassatis, staminum anticorum productione quam antheræ dimidio breviore, capsula ———.

Hab. In pascuis sylvaticis breve graminosis arenosis territorii Lopollensis distr. Huilla. (No. 5031.)

Herba perennis, suffrutescens, radice crassa, lignosa, caulibus prostratis. Folia ad 4·0 cm. long. Bracteæ longiores vix ad 3·0 cm. long. Calycis lobus posterior circiter 1·7 cm. long., lobi laterales lanceolati, usque ad 1·3 cm. long., lobi omnes puberuli. Corollæ læte cæruleæ labium 1·5 cm. lat., lobi, breves laterales rotundati, medianus ovatus, tubus 0·7 cm. long. Filamenta circiter 1·7 cm. long., glabra.

A proxima *B. pratensi* mihi distat ramulis hirsutis, foliis angustis coriaceis, bracteis majoribus spinulosis, floribus multo majoribus.

B. noli-me-tangere (sp. nov.)—Fruticosa ramosissima ramis divaricatis tortuosis elasticis virgato-ascendentibus cortice albido cinctis leviter pruinosis, foliis verticillatis dimorphis aliis oblanceolatis apice brevissime apiculatis subcoriaceis glabris aliis ad spinas sat tenues rigidissimas reductas omnibus basi articulatis, spicis ovoideis ramulos brevissimos terminantibus basi spinas paucas plus minus elongatas patulas basi latiores ferentibus, bracteis late ovatis longiuscule vel longe vel interdum longissime spinoso-acuminatis margine apicem versus sparsissime setoso-spinosis submembranaceis longitudinaliter nervosis glabris læte brunneis, bracteolis elongatis gracilibus spathulatis eleganter nervosis puberulis, calycis lacinia antica ovata obtusissima obscure 2-dentata pubescente postica pubescente quam antica multo majore 3-loba lobis lateralibus oblongis rotundatis lobo mediano oblongo-lanceolato 3-nervo emarginato laciniis lateralibus corollæ tubo æquilongis oblongis acutis puberulis dorso carinulatis, corollæ puberulæ tubo ovoideo longitudinaliter sulcato limbo 5-lobo lobis 3 anticis subæqualibus rotundatis 2 posticis ad latera labii minimis, staminum filamentis fere glabris parum incrassatis antheris stricte 1-locularibus breviter barbatis, capsula ignota.

Hab. In glareosis dumetosis inter *Tamaricis* et *Cordiæ* sylvulas ad dextrum flum. Miombo distr. Mossamedes. (No. 5045.)

Frutex 4–6 pedalis. Folia vegetativa plerumque circiter 2·0 cm. long. et 0·4–0·8 cm. lat., spinosa vix 1·5 cm. long., subteretia. Spicæ ad 2·8 cm. long. et 2·0 cm. lat., eorum ramuli vix 0·5 cm. long. vel fere obsoleti; spinæ ad basin eorum ad 2·7 cm. long.

Bracteæ 2·0 cm. long. sed minores et majores exstant, calycem paullo superantes bracteolasque æquantes, Calycis lacinia antica 1·2 cm. long., quam laterales haud duplo longior. Corolla vix 3·0 cm. long., cyanea.

Proxima videtur *B. furcatæ* T. And. (*Acanthodium*, Nees) cujus folia itaque dimorpha sed nunquam ad spinas simplices reducta; ceterum habitu diverso, internodiis multo brevioribus, spicis disparibus floribusque ob multas notas cum iis nostræ planta nequaquam comparabilibus ab ea divergens.

B. GLUMACEA (sp. nov.)—Espinosa, caule tenui diffuso ramoso pubescente, foliis verticillatis sessilibus inæqualibus linearibus vel lineari lanceolatis apice parum induratis coriaceis pilosulis vel fere glabris, floribus sessilibus vel plus minus pedunculatis solitariis (an semper) ad apicem seriei bractearum ovatarum obtusarum vel acuminatarum superne gradatim majorum glumacearum glabrarum lineis punctisque purpureis vel nigro-purpureis notatarum nitentarum, calycis lacinia postica bracteis consimili sed paullo breviore 3-nervia integra decolore lacinia antica subito longeque acuminata inconspicue 3-nervia laciniis lateralibus anticæ subsimilibus nisi minoribus omnibus oblique insertis pallide brunneis, corollæ tubo ovoideo quam limbus oblongus brevissime 3-lobus plusquam dimidio breviore, ovario ovoideo basi contracto, capsula haud visa.

Hab. In sylvis claris arenosis inter Catumba et Ohay dist. Huilla, nec alibi visa. (No. 5052.)

Internodia ad 5·0 cm. long., flexuosa. Folia majora 4·0–6·0 cm. long., basi attenuata; minora 0·9–1·3 cm. long. Pedunculi 2·5 cm. long. Bracteæ imæ 0·8 cm., mediocres 1·0 cm., superiores ad 1·7 cm. longitudine, bilateraliter compresse. Corolla 1·7 cm. long., cærulea.

Species singularis et bracteis glumaceis facile cognoscenda.

The effect of pressure on the calyx-lobes is very curious. They are all inserted obliquely, one of the lateral ones being partially concealed by one side of an outer lobe, and its fellow by the opposide side of the other outer lobe.

Dubiæ.

No. 5014 est *B.* sp. nova affinis *B. edulis*, Pers. et ab ea abhorrens habitu rigido, foliis parvis linearibus, et calyce haud sericeo. Ob florem mancum eam non descripsi.

No. 5021 eadem videtur ac 5014 sed spicis latioribus et brevioribus.

No. 5005 est planta parvula hujus generis omnino immatura.

ACANTHUS, L.

A. montanus, T. And. (*Cheilopsis*, Nees).

Hab. Dumeta formans in rupestribus de Pedra Cabondo distr. Pungo Andongo. (Nos. 5076, 5167.)

Suffrutex ramosus 3–4-pedalis.

A. (*Dilivaria*) NITIDUS (sp. nov.)—Espinosa, caule tereti glabro, foliis herbaceis petiolatis obovato-oblongis vel ovato-lanceolatis

obtusis margine obscure undulatis glabris nitentibus, spicis terminalibus cylindricis foliis brevioribus, bracteis ovatis apiculatis concavis coriaceis levissime puberulis secus dimidium superius crispe ciliatis, calycis laciniis bracteæ consimilibus, corollæ labio 5-lobo lobis oblongis, filamentis gracilibus glabris, antheris longe villosis, ovarii loculis 2-ovulatis.

Hab. Distr. Pungo Andongo in sylvaticis de Barranco de Songue. (Nos. 5100, 5087.)

Arbuscula 12–15 pedalis. Folia ad 17·0 cm. long. et 6·5 cm. lat. Spicæ fere 8·0 cm. long. Corolla albo violascens, extus appresse sericeo-pubescens.

A. Kirkii, T. Anders., cui planta nostra proxima, ab ea discedit foliis majoribus, spicis abbreviatis, bracteis longioribus minus firmis, antheris minus villosis, aliisque notis.

(To be continued).

TRIFOLIUM MARITIMUM IN IRELAND.

By A. G. More, F.L.S., M.R.I.A.

On the 18th of June last, while travelling by car from Lahinch, County Clare, towards the cliffs of Moher, I noticed a pink-flowered *Trifolium* growing in a large patch along the edge of a field bordering upon the road, near the eastern end of the village of Liscannor, and close to the sea-shore. It was growing plentifully about the border of a field reserved for hay; and at the time, I must confess, I felt some doubt as to whether it might have been introduced with agricultural seeds. But, though I had not time to search the adjoining sea-shore, I am not aware that *Trifolium maritimum* has ever been used as an agricultural clover; and I believe the balance inclines in favour of the nativity of the plant, which, upon examination, proved to be *Trifolium maritimum*, Huds.

As an Irish plant, *T. maritimum* has, long ago, been recorded by Wade ('Plantæ Rariores,' 1804) as "found in a field near Kilbarrick Church-yard, road to Howth, flowering in August." In his 'Catalogue of Rare Plants" (1806) Mackay gives two additional localities, *viz.*, "On Lambay; Mr. Underwood," and "At the lower end of the North Wall, first noticed there by Mr. R. Kennedy in 1806;" but, in his general 'Catalogue of the Plants found in Ireland" (1825) he mentions only "sandy fields and ditch-banks near Kilbarrick Church. 'The Irish Flora (1833), gives the single station of "salt marshes, in the Island of Lambay," and in 'Flora Hibernica' (1836), Mackay repeats Dr. Wade's original locality as "dry sandy fields and ditch-banks on the coast, near Kilbarrick Church, rather sparingly," adding, "said to have been found in salt marshes in the Island of Lambay."

In both localities, Kilbarrick and Lambay, the plant has often since been searched for without success. No specimen exists, and it may be observed that the sandy banks about Kilbarrick are more

likely to have produced *T. scabrum* or *T. striatum*, misnamed at a time when *T. maritimum* was imperfectly known to Irish botanists; while, in the Island of Lambay, there is no tract that can be called a salt marsh, this kind of station having probably been borrowed from one of the current 'Floras.' In the North Lots, which is the well-known locality for two of our rarest plants, *Carex divisa* and *Sclerochloa Borreri*, I have never been able to find a trace of the *Trifolium;* and I much fear that some mistake was made about the few "introduced" specimens supposed to have been once gathered there by Mr. Johnston.

In the present instance there is no doubt as to the species, but it will probably be prudent to wait for further observation before enrolling *T. maritimum* as a certain native of Ireland.

STIRPIUM DUARUM NOVARUM E *PRIMULACEARUM* FAMILIA CHARACTERES

EXCUDIT HENR. F. HANCE, PH.D.

453 1. PRIMULA (*Primulastrum*) OBCONICA, sp. nov.—Foliis rosulatis tenuibus subrotundo-ovalibus basi cordatis lobis sæpius incumbentibus apice obtusissimis margine repandis supra parce hirtis opacis subtus pallidioribus nervis pilosis petiolis iis æquilongis fulvo-villosis, scapis folia 2–3-plo superantibus pilosulis 10–20-floris, floribus umbellatis, involucri foliolis lineari-setaceis pedicellis longis divaricatis subtriplo brevioribus, calyce pubero e basi acutissima obconica ad trientem longitudinis in dentes latissime semiovatos mucronulatos diviso, corollæ hypocrateriformis roseæ tubo calycem duplo superante lobis oblongis retusis, capsula parva globosa, stylo tenuiter capillari tubum corollinum fere adæquante.

In prov. Hupeh, circa Ichang, vere 1879, coll. cl. T. Watters. (Herb. propr. n. 21,000.)

Affinis *P. sinensi*, Lindl., *P. cortusoidi*, Linn., et *P. Kauffmanniana*, Rgl.;* a cunctis tamen, foliis haud lobatis calycisque forma egregie distincta.

981 2. STIMPSONIA CRISPIDENS, sp. nov.—Annua, erecta, glaberrima, caule semipedali, foliis majoribus rosulatis sessilibus spathulatis minoribus (bractealibus) secus caulem dispositis alternis v. oppositis ovato-lanceolatis omnibus more *Pedicularium* plurimarum margine erosulis crispulo-dentatis, floribus axillaribus solitariis, pedicellis foliis bractealibus 3–4-plo longioribus patentibus, sepalis lanceolatis, corollæ calycem duplo superantis ad medium fissæ lobis margine erosis emarginatis.

In umbrosis faucium montanarum, circa Ichang, Aprili, 1880, leg. am. Watters. (Herb. propr. n. 21,012.)

Genus nullo, præter habitum, charactere ab *Androsace* sejunctum, et, specie altera nunc detecta, forte melius pro ejus sectione habendum; nam inter sectionem *Andraspidem* et *Aretiam*, *Dionysiæ* aperte accedentem, æque magna exstat differentia.

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* Fl. Turkestan 4, t. 4.

ON THE BOTANY OF THE BRITISH POLAR EXPEDITION OF 1875–6.

By Henry Chichester Hart, B.A., Naturalist to H.M.S. 'Discovery.'

(Continued from p. 208.)

Compositæ.

Artemisia borealis, Pall.
Dist. 1. Lat. 69° 15′ to 69° 42′. G.
Near Lieveley, Disco; common at the head of Svarte Vogel Bay, near Rittenbank.

Antennaria alpina, L.
Dist. 1 2 3. Lat. 68° 42′ to 72° 48′. G.
Frequent as far north as Upernavik.

Gnaphalium sylvaticum, L.
Dist. 1. Lat. 69° 15′. G.
Englishman's Bay, Disco. Specimens gathered here were identical with the British plant.

G. sylvaticum, L. (var. *norvegicum*, Gunn).
Dist. 1. Lat. 69° 15′. G.
With the last, and common elsewhere at Disco.

Arnica montana, L. (*A. augustifolia*, V.)
Dist. 1 2 - - - - - - - - - 12. Lat. 68° 42′ to 81° 40′. W. and G.
Between Lyngemarken Fjeld and the sea at Disco, scarce; much commoner at Rittenbank and Proven. Feilden gathered a plant on Bellot Island, Discovery Bay; it was not in flower, but the leaf is unmistakable.

Erigeron uniflorus, L. (*E. alpinus*, L.)
Dist. 1 - - - - - - - - - - 12. Lat. 69° 15′ to 81° 42°. W. and G.
Lyngemarken, Englishman's Bay, and Blase Dalen, Disco. Sunny slopes facing south, in three places plentifully, in Discovery Bay; abundant on Bellot Island; not in flower till August 6 in Discovery Bay, but then flowering freely.
Sea-level to 800 feet in Discovery Bay.

E. compositus, Pursh.
Dist. 1 - - - - - - - - - - 12. Lat. 69° 15′ to 81° 42′. W. and G.
Gathered at Waigattet, Disco, by the Rev. Mr. Pullen. I did not meet with it again until reaching Discovery Bay, where it was common in many places, but especially where I found the miocene coal deposits, July 18, 1876, above and around which it occurred in quantities. The flowers are large and showy, like those of our ox-eye daisy. In flower July 18 at Discovery Bay.
Sea-level to 900 feet in Discovery Bay.

Taraxacum Dens-leonis, Desf.
Dist. 1 2 - - 5 6 7 - - - 11 12 13. Lat 69° 15′ to 82° 27′.
E., W., and G.

Frequent in a stunted form in Discovery Bay. In flower July 16. Floeberg Beach (H. W. F. and coll. Moss).

Sea-level to 750 feet in Discovery Bay. The form *T. palustre*, DC., occurred in Foulke Fiord.

Campanula rotundifolia, L. (var. *linifolia*, Hænke).
Dist. 1. Lat. 69° 15′. G.
Englishman's Bay, Disco.

C. uniflora, L.
Dist. 1 2. Lat. 69° 15′ to 72° 20′. G.
Frequent at Disco, Rittenbank, and Proven, but nowhere in good flower.

Vaccineæ.

Vaccinium uliginosum, L.
Dist. 1 2 3 - 5 6 7. Lat. 68° 42′ to 78° 56′. W. and G.
Common as far north as the "Deserted Village" and "Twin Glacier," Hayes Sound.

Ericaceæ.

Cassiopeia hypnoides, L.
Dist. 1. Lat. 68° 42′ to 69° 15′. G.
In a glen at the head of Svarte Vogel Bay, near Rittenbank; on Disco; on the mainland near Disco; and at Egedesminde.

C. tetragona, L.
Dist. 1 2 3 4 5 6 7. Lat. 68° 42′ to 78° 56′. W. and G.
The most abundant of the heath family, and supplying the want of heather in low grounds in some parts of Disco, to the east of Godhavn, &c. The same range as *Vaccinium uliginosum*, but more abundant; both disappear north of Hayes Sound. In Spitzbergen this plant, the most northern of the family, reaches a latitude of 79° 56′.

Andromeda polifolia, L.
Dist. 1. Lat. 69° 15′. G.
Sparingly to the east of Godhavn, Disco.

Diapensia lapponica, L.
Dist. 1 2 3. Lat. 68° 42′ to 72° 58′. G.
I gathered this beautiful flower as far north as Kangitok.

Loiseleuria procumbens, L.
Dist. 1 2. Lat. 68° 42′ to 72° 20′. G.
Disco, Egedesminde, and Proven.

Rhododendron lapponicum, L.
Dist. 1 2. Lat. 68° 42′ to 72° 20′. G.

Ledum palustre, L.
Dist. 1. Lat. 68° 42′ to 69° 42′. G.
Common at Disco and Rittenbank.

Phyllodoce taxifolia, Sol. (*Menziesia cærulea*, Smith, *P. cærulea*, Gren. & Godr.)
Dist. 1 2. Lat. 68° 42′ to 72° 20′. G.
Egedesminde; about Lyngemarken, Disco; and Proven, common.

Pyrola rotundifolia, L. (var. *grandiflora*, Rad.)
Dist. 1. Lat. 68° 42′ to 69° 15′. G.
Especially abundant on headlands west of Englishman's Bay, where it contrasted its white flowers with the purple Saxifrage in a beautiful manner.
Sea-level to 1000 feet at Lyngemarken, Disco.

Borragineæ.

Mertensia maritima, Don.
Dist. 1. Lat. 69° 15′. G.
Sea-shore by Englishman's Bay, Laxe Bay, and Red River, Disco.

Scrophulariaceæ.

Veronica alpina, L.
Dist. 1. Lat. 69° 15′. G.
Valley at the head of Englishman's Bay and at Lyngemarken, Disco.

V. saxatilis, L.
Dist. 1. Lat. 69° 15′. G.
Sparingly near Englishman's Bay, Disco.

Bartsia alpina, L.
Dist. 1. Lat. 69° 15′. G.
With *Veronica alpina*, Disco.

Pedicularis capitata, Adams.
Dist. - - - - 5 - 7 - - - - 12. Lat. 78° 18′ to 81° 42′. E. and W.
This beautiful flower was gathered by Dr. Coppinger at Port Foulke, and again at Hayes Sound; the first locality renders it an addition to the Flora of Greenland. I found it subsequently in two places in small quantities near the ship; it spreads by means of far-creeping soboles. In flower July 20, Discovery Bay. Not previously found north of 72° at Port Kennedy.
Sea-level (at Black Hole) to 700 feet (on Mt. Carmel), Discovery Bay.

P. lapponica, L.
Dist. 1 - - - 5 - 7 8 - - - 12. Lat. 69° 15′ to 81° 52′. E. and G.
Sparingly at Disco and Rittenbank; more common at Foulke Fiord, Walrus Island, and in Hayes Sound. Scarce in Discovery Bay; always growing at low levels.

P. hirsuta, L.
Dist. 1 2 3 4 5 6 7 8 - 10 - 12. Lat. 68° 42′ to 81° 45′.
E., W., and G.
Occurring frequently to Discovery Bay, where it was a very poor and stunted representative of the gaudy Disco plant. In flower July 6 at Discovery Bay. Not north of Shift Rudder Bay (H. W. F.)
Up to 1000 feet between Discovery Bay and Musk Ox Fiord.

P. sudetica (*Langsdorfii* var.), L.
Dist. 1 - - - - - 7 - - - - 12. Lat. 69° 15′ to 81° 42′. W. and G.
Sea-level to 900 feet at Disco.

P. flammea, L.
Dist. 1 2 · - - - 7. Lat. 69° 15′ to 78° 50′. W. and G.
Disco, Proven, and at "Edward's Grief," Hayes Sound.
As a rule this genus is confined to low levels.

Primulaceæ.

Androsace septentrionalis, L.
Dist. - - - - - - - - - - - - 12. Lat. 81° 42′. W.
In two places near the harbourage in Discovery Bay and on Bellot Island; in each case in company with *Erigeron uniflorus*. Not hitherto found north of 72° in the Polar American Islands.
Sea-level to 900 feet on Mt. Cartmel, Discovery Bay.

Plumbagineæ.

Armeria vulgaris, Willd. (*A. labradorica*, Wallr.)
Dist. 1. Lat. 69° 15′. G.
Headlands west of Englishman's Bay, Disco.

Plantagineæ.

Plantago maritima, L.
Dist. 1. Lat. 69° 15′. G.
Rocky coast near sea-level west of Englishman's Bay; a different looking plant from the British one, with lax flowering scapes, not erect and larger flowers; the leaves also limp, and scarcely fleshy.

Polygonaceæ.

Polygonum aviculare, L.
Dist. 1. Lat. 68° 42′. G.
Sparingly near the landing-place at Egedesminde; a colonist?

P. viviparum, L.
Dist. 1 2 3 - - 6 7 - - - - 12 13. Lat. 68° 42′ to 82° 27′.
W. and G.

Generally common; abundant and in flower at Englishman's Bay, Disco, and at Upernavik. Farther north it was rarely seen in blossom. Floeberg Beach (H. W. F.)
Sea-level to 1000 feet at Cape Sabine.

Rumex Acetosella, L.
Dist. 1. Lat. 69° 15′. G.
Near Godhavn, Disco.

Kœnigia islandica, L.
Dist. 1. Lat. 69° 15′. G.
On partially thawed slushy ground near sea-level at Disco, especially about the governor's house. The only annual observed.

Oxyria reniformis, Hk.
Dist. 1 2 3 4 5 6 7 8 9 10 11 12 13. Lat. 68° 42′ to 82° 27′.
E., W., and G.
Common everywhere; seldom at very low levels. Floeberg Beach (H. W. F.)
300 to 2000 feet at Discovery Bay.

Empetraceæ.

Empetrum nigrum, L.
Dist. 1 2 3 - 5 6. Lat. 68° 42′ to 78° 45′. E., W., and G.
Common, but soon diminishing in quantity. Not seen north of Cape Sabine.
Sea-level to 800 feet at Cape Sabine.

Betulaceæ.

Betula nana, L.
Dist. 1. Lat. 69° 15′. G.
Common at Disco; not seen farther north. J. Taylor (Arctic Manual) mentions that he did not see it north of Disco. Lange gives 72° 48′ for its range. *Salix herbacea* is sometimes mistaken for it.

Salicineæ.

Salix glauca, L.
Dist. 1. Lat. 69° 15′. G.
Not uncommon at Disco.

S. arctica, Br.
Common everywhere, and under this name a variety of forms are included, varying especially with regard to size, width, and downiness of the leaves. Lieut. Beaumont showed me a stem an inch in diameter from Wood Pt., North Greenland, lat. 82° 25′; and Lieut. Aldrich picked up willow leaves at Cape Fanshawe Martin, lat. 82° 50′, upon the north coast of Grinnell Land. Of great value in holding the soil, by means of its strong stems, from being washed away by the floods from melting snow, and is often the first plant to make the ground tenable for others. A large series which I sent to the Rev. J. Leefe are all referred by him to *S. arctica*. In flower (female) in Discovery Bay, June 21.
Sea-level to 900 feet, Discovery Bay.

S. herbacea, L.
Dist. 1 2 3. G.
Disco, Proven, and Upernavik, abundant. A willow without inflorescence which I gathered in Disco may be *S. polaris*, though it may be an entire-leaved form of *S. herbacea*.

MONOCOTYLEDONES.

Melanthaceæ.

Tofieldia borealis, Wahlenb. (*T. palustris*, L.)
Dist. 1 2. Lat. 69° 15′ to 72° 20′. G.
Common at Disco, Rittenbank, and Proven. On clayey slopes, where the melting snow has an almost irresistible power to carry away the soil, this plant is of great service in binding it together and saving it, by means of its fibrous roots.
Sea-level to 1000 feet at Disco.

Orchidaceæ.

Habenaria albida, R. Br.
Dist. 1. Lat. 69° 15′. G.

Abundant with the following two Orchids at Englishman's Bay, Disco. Remarkably sweet-scented.

Listera cordata, Br.
Dist. 1. Lat. 69° 15′. G.

With the last, in flower at Disco, July 13. Lange, in 'Rink's Gronland,' gives 64° 10′ as the northern limit of this plant; its discovery here is therefore an addition to the Flora of Arctic Greenland.

Platanthera hyperborea, Linde.
Dist. 1. Lat. 69° 15′. G.

Luxuriant with the last two, at sea-level and close to the sea, forming dense beds of rich foliage. No Orchis is included in R. Brown's 'Florula Discoana.'

Juncaceæ.

Luzula spadicea, DC. (var. *parviflora*, Desv.)
Dist. 1 2. Lat. 69° 15′ to 72° 20′. G.

A very handsome plant at Englishman's Bay, Disco; Proven. Not recorded north of Disco by Lange.

L. campestris, Sm. (var. *congesta*), *L. multiflora*, Lej.
Dist. 1 2 3 - - - - - - - - 11 12. Lat. 69° 15′ to 81° 42′.
E., W., and G.

Frequent at the earlier stations; again at Polaris Bay and Discovery Bay. Lange gives 70° its north limit in Greenland.

L. arcuata, Sw. (*L. hyperborea*, Br.)
Dist. - - 3 - 5 6 7 - - - - 12. Lat. 72° 48′ to 81° 49′.
E., W., and G.

This form occurred more commonly northward, and became more glabrous. Between St. Patrick's Bay and Shift Rudder Bay at 800 feet.

Juncus triglumis, L.
Dist. 1. Lat. 69° 15′. G.
Near Lievely, Disco.

J. biglumis, L.
Dist. 1 - - - - - 7 8 - - - 12 13. Lat. 69° 15′ to 82° 27.
W. and G.

Muddy soil near the sea. Common at Discovery Bay, St. Patrick's Bay, and near Shift Rudder Bay. Appearing late in the season. Floeberg Beach (H. W. F.)

Cyperaceæ.

Carex rupestris, All.
Dist. 1. Lat. 69° 15′. G.
Disco, frequent.

C. nardina, Fr.
Dist. 1 2 3 - 5 6 7 8 9 10 12 13. Lat. 69° 14′ to 82° 27′.
E., W., and G.

Common everywhere; especially at Foulke Fiord and at Norman Lockyer Island, where it formed nearly the whole vegetation. Floeberg Beach (H. W. F.).

C. scirpoidea, Mx. (*C. Wormskioldiana*, Horn.).
Dist. 1 2. Lat. 69° 15′ to 72° 20′. G.
Frequent at Disco; gathered two plants at Proven.

C. alpina, Sw. (*C. holostoma*, Drej.)
Dist. - 2 - - - - 7. Lat. 72° 20′ to 78° 50′. W. and G.
Proven; Hayes Sound (H. W. F.)

C. fuliginosa, St. & Hoppe.
Dist. 1 2 3 - - 6 7 8 - - - 12 13. Lat. 69° 42′ to 82° 27′. E., W., and G.

Rittenbank, Proven, and Upernavik; "Deserted Village," Hayes Sound, covering the drier sod about the iglus; but a stunted form, and not luxuriant, as on inorganic soil at Discovery Bay. Franklin Pearce Bay, east side (coll. Moss); Floeberg Beach (H. W. F.) Except for occasional patches of moss, this is the only plant forming a bright green sward in Discovery Bay. In Musk Ox Fiord, seven or eight miles inland, amongst a chain of trout lakes, there are several small oval plains, three to five hundred yards in length, and having a fresh green surface entirely due to this sedge. I saw nothing so refreshing for the eyes as these oases in tbe Arctic Regions. These had been small glacially-formed lakes, now silted full with mud, and such sedge-meadows were rich pasturage for the musk-oxen. Floeberg Beach (H. W. F.)

Sea-level to 650 feet in Discovery Bay.

C. rariflora, Sm.
Dist. 1. Lat. 69° 15′. G.
Near Lievely, Disco.

C. capillaris, L.
Dist. - 2. Lat. 72° 20′. G.

C. rigida, Good. (et vars.)
Dist. 1 2 3 - 5 6 7 - - - - 12. Lat. 69° 15′ to 81° 52′. E., W., & G.

Lievely Island, Disco, &c.; Discovery Bay and Musk Ox Bay; near Shift Rudder Bay.

Sea-level to 500 feet in Musk Ox Fiord.

C. stans, Drej. (*C. aquatilis*, Wahl.)
Dist. - 2 - - - - 7 - - - - 12. Lat. 72° 20′ to 81° 42′. W. and G.

Proven; Deserted Village to Ptarmigan Hill, Hayes Sound; Discovery Bay to the north of the harbourage, by the sea. This sedge was always near the sea-shore, usually amongst shingle at the water's edge, or just inside the ice-foot. At the Deserted Village, lat. 78° 50′, it attained a height of close on two feet, by far a greater growth than that of any other herbaceous plant seen north of Disco.

Scirpus cæspitosus, L.
Dist. 1. Lat. 69° 15′. G.
Common in patches about Godhavn, Disco.

Eriophorum capitatum, Host.
Dist. 1 2 - 4 5 4 - - - - - 12. Lat. 69° 15′ to 81° 42′. E., W., & G.
Disco, common, appearing through the snow at 2500 feet.

Not common at Discovery Bay, and only on a high plain between it and Musk Ox Bay. Considering the time of the season (early in June, which was long before the snow had begun to melt on the higher plains), and the exposed and elevated situations which this plant seemed to prefer, I consider it has a greater power of defying the cold than any other species.

At 1000 feet in Discovery Bay, forcing itself through the frozen snow.

E capitatum, var. *Scheuchzeri*, Hoppe.

Dist. 1 - - - - - 7 - - - - 12. Lat. 69° 15′ to 81° 52′. W. & G.

Disco. Common at the Deserted Village and Ptarmigan Hill with *E. polystachium*, L. Shift Rudder Bay (H. W. F.)

E. vaginatum, L.

Dist. - 2 - - 5. Lat. 72° 20′ to 78° 18′. E. and G.

Proven and Foulke Fiord.

(To be continued).

SHORT NOTES.

Cardamine impatiens, L., in Kent.—This plant occurs abundantly in hedge-banks near Edenbridge, West Kent, where I observed it this spring by the side of the road, south of the railway, leading from the above place to Penshurst. It is not recorded for either division of the county in 'Topographical Botany.'—W. H. Beeby.

Ranunculus vulgatus, Jord., in Herts.—I am not aware that this plant has been hitherto on record for the county, although it has been noticed in at least one of those immediately adjacent. I have quite recently met with it in this neighbourhood, not far from the borders of Cambridgeshire, growing on a balk by the roadside in an exposed situation on a chalky soil. The rhizomes, some of which, broken, were two inches or more in length, appeared to have spread from common centres. The stems have a distinct facies from those of *R. tomophyllus*, and seem to be of a much tougher constitution. It is curious that Professor Babington, in the last edition of his 'Manual,' should have ascribed an oblique or horizontal rhizome to *R. tomophyllus*.—R. A. Pryor.

Leucobryum glaucum in Fruit (*ante*, pp. 185, 218).—In addition to the habitats already given in the 'Journal,' the following may be given :— Fowlshaw Moss, Westmoreland, gathered by Mr. J. M. Barnes, in the autumn of 1866, where I have since several times collected it; Wardon Park, Dorset, by the Rev. O. P. Cambridge, in April, 1880. — George Stabler. [Mr. C. P. Hobkirk adds the locality of Dartmoor, 1870, Dr. de Crespigny. It does not seem necessary to publish further localities for what proves to be a not uncommon occurrence.—Ed. Journ. Bot.]

Two New British Hepaticæ.—So far as I am aware, *Cesia obtusa*, Lindberg, and *Radula Lindenbergii*, Gottsche, have not hitherto been recorded as British plants; I first found both about five years ago. *Cesia obtusa* I have only found in a single place, *viz.*, on a boulder by the highway side in the valley of Kentmere, Westmoreland. Dr. Lindberg, the author of the species, detected it amongst a number of plants I sent him. *Radula Lindenbergii*, Gottsche, is more plentiful than the latter. It grows on the northern face of Harter Fell, Westmoreland. I have not succeeded in finding fruiting specimens; probably the fruit is rare, as the species is dioicous. The Westmoreland plant closely agrees with a Scandinavian specimen which I have received from Professor Lindberg.—George Stabler.

Norfolk Plants.—On June 5th I gathered *Festuca ambigua*, LeGall, in West Norfolk (additional to vice-county 28). It was almost certain to occur, as the district is similar to the adjoining part of Suffolk, where I found it last year. I traced it for some three or four miles, from about three miles from Thetford (on the Mundford road) across Santon Warren nearly to Brandon. In places its position was well marked by the quantity it occurred in and by its brownish yellow spikes. It was growing with *Scleranthus perennis*, *Veronica verna*, *Silene conica*, &c. *V. verna* has not been gathered recently, I think, in this part of Norfolk; the Rev. Kirby Trimmer had not found it when his 'Flora of Norfolk' was published; and Mr. Geldart, of Norwich, speaks of it (Lubbock's 'Fauna of Norfolk,' 2nd ed.) as "not found lately." I also found on Santon Warren *Carex ericetorum*, Poll. (additional to vice-county 28), but in small quantity, and was only able to identify it by one spike; it is an earlier flowerer than *C. præcox*, and I was too late for it; however, I secured living specimens. It occurred in one place only (so far as I saw), close by a "drift-way." These "drift-ways" are found in this part of Norfolk and adjacent parts of Suffolk; they are public ways over the sandy heaths and warrens, and only to be noticed sometimes by a faint wheel-mark or the exposure of the sandy soil; they are used for cattle, but not as roads in the ordinary sense. *Carex paludosa*, var. *Kochiana*, I found by the Brandon river between Thetford and Brandon on the Norfolk side. I think it has not been recorded for the county. *Botrychium Lunaria*, Sw., is not recorded for West Norfolk by Mr. Watson; I gathered it on Santon Warren. *Sagina apetala*, Santon Warren (additional to vice-county 28, West Norfolk). One noticeable feature of this part of Norfolk is the scarcity of *Medicago minima*; I only saw it in one spot: within a few miles in Suffolk, on exactly similar ground, it occurs in profusion; I have walked seven miles without losing sight of it for more than a few yards, and on some banks its yellow flowers arrest attention by their quantity. I have collected *Tolypella intricata* at Harston, near Cambridge,—an additional station for the county. I am glad the Messrs. Groves have called attention to the discrepancy between specimens and numbers in Braun's R. & S. Exsiccata,

as some authors may be charged with deceptive references. I give another instance, from my own set, and there are others: the Messrs. Groves, under *Tolypella glomerata*, give Braun, No. 17; my specimen (No. 17) is *Nitella mucronata*, var. *tenuior*. Wahlstedt also gives No. 17 for *Tolypella glomerata* in his 'Monografi öfver Swerges och Norges Characeer.'—A. Bennett.

Ningpo Hats.—In a report on the foreign trade of Ningpo for the year 1877, Mr. W. M. Cooper, consul at Ningpo, referred to these hats as follows:—"The export of hats woven by hand from a small species of *Carex* (sedge) has grown within three years to great proportions, no less than 15,000,000 having this year been exported. The plant is indigenous, and is to be found in damp spots among the hills, but that employed for the manufacture is cultivated in rice grounds. The hats are made by the women and children at their homes, and sold by them at ½d. to 2d. each. They are strong and serviceable, and are bought wholesale by the foreign merchants, who send them to London, whence, I believe, they are shipped principally to the Southern States of America."* These hats were very abundant in London last year,† and we thought that specimens obtained for the Kew Museum were made of some kind of rush. Mr. Cooper has, however, obligingly sent me a specimen of the plant actually used for the purpose, which proves to be identical with that from which China matting is made, and which Dr. Hance has determined to be *Cyperus tegetiformis*, Roxb. The only difference is that in making the hats the culms are used whole, while for matting they are split into two.—W. T. Thiselton Dyer.

Asplenium lanceolatum, Huds., *var.* Sinelii.—Under this name Mr. J. F. Robinson describes (in Hardwicke's 'Science Gossip' for July) "a new and very distinct variety" of *Asplenium lanceolatum*, of which "several roots have been found by Mr. Sinel on old walls near to Bagot, Jersey." Its characters are stated to be as follow:—"Fronds but few, from the crown of the root, scaly below, free above, lanceolate in outline in the young fronds, evidently broadly linear; rachis round, without the least appearance of raised marginal wings; bipinnate throughout, lower pinnæ of three to fiive pinnules, central of three distinctly stalked pinnæ in the old fronds. Pinnules rounded or obtuse at the apex, evenly serrated, terminal cordate, lower for those nearest the rachis, orbicular, the teeth of lower pinnules slightly mucronate. Sori oblong, springing from midrib, numerous, white in early fronds, dark brown when ripe." Mr. Robinson adds, "Fronds have been submitted to our best authorities on British pteridology; all declare it to be a new and very distinct variety." We cannot express any opinion as to its distinctness, as neither Mr. Moore

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* 'Commercial Reports,' China, No. 7 (1878), pp. 113, 114.

† See 'Gard. Chron.,' 1879, vol. xii., n. s., pp. 210, 211.

nor Mr. Baker have seen specimens, nor have we been able to obtain any.

CEPHALANTHERA RUBRA.— We are indebted to the Rev. H. P. Reader for a fresh specimen of this beautiful orchid, collected in a Gloucestershire locality (which he does not wish to specify more closely), distinct though not very far removed from that in which he found it last year (Journ. Bot., 1879, p. 277).

Notices of Books and Memoirs.

An Elementary Text book of Botany. Translated from the German of Dr. K. PRANTL; the translation revised by S. H. VINES, M.A., D.Sc., F.L.S. London: Sonnenchein and Allen, 1880.

THE number of good text-books of Botany is rapidly becoming so large that the student is likely to suffer, in the choice of one, under an *embarras de richesses*. That the one now under our hands is entitled to be included under the above category is implied in the statement that it is founded on Sachs's 'Lehrbuch,' being in fact almost a condensed epitome of it. In fact, the failings of Sachs's great work as a handbook for the English student are but too faithfully reproduced. It seems to us a serious defect in a work of this kind that just one-third of it should be devoted to the classification of flowering plants on a system which renders it almost valueless to students in this country; a system which places *Pittosporeæ* in the same natural order as *Staphyleaceæ* and *Ilicineæ*, and *Laurineæ* in the same order as *Ranunculaceæ*. Has not the English editor presumed too much on the neglect of systematic botany now prevalent in this country?

Here and there we find statements which are not abreast of the state of knowledge in the year which appears on the title-page, as in the assertion that "in angiosperms the pollen-grain is unicellular," notwithstanding the now well-known observations of Elfving, which show that the statement can only be accepted with very great modification. It seems inevitable that even the best and most careful writers will stumble when attempting to elucidate the chaotic terminology of cryptogams. The student will be sorely tried in attempting to reconcile the statements that "the reproductive cells [of Fungi] which are produced asexually are spoken of as *gonidia* or *conidia* (stylogonidia, endogonida, zoogonidia), whereas those which are produced sexually are spoken of as *spores* (zygospore, oospore, ascospore, (*sic*);" "fungi as reproduced in two ways, asexually by means of conidia, and sexually by means of spores;" "true reproduction may be affected in two ways: (*a*) asexually by cells termed *gonidia*, *conidia*, or *spores*."

But we are mindful of the adage about glass houses. If every text-book were to be judged by its defects, what would be the fate of even the best? It may seem but small praise to say that in the present instance they are greatly outweighed by its merits. Setting aside the portion devoted to the ulterior classification of flowering plants, the book is one with which the student may feel himself safe, and which will no doubt obtain the wide circulation which will be greatly helped by the easy and "English" style of translation. A. W. B.

A Monograph of the genus Lilium. By H. J. Elwes, F.L.S., F.Z.S. Illustrated by W. H. Fitch, A.L.S. Seven parts folio, with forty-eight coloured plates. London, 1880. R. H. Porter. 6, Tenterden Street, Hanover Square.

This is a very fine work, both from a botanical and artistic point of view. It contains a coloured plate, folio size, drawn by Fitch, of every known species and the principal varieties of Lily, with a Latin description and popular account of the plant, and a sketch of its history, geographical distribution, and cultural and climatic requirements. As every one knows, a great impulse has lately been given to the cultivation of Lilies, and we now know far more about them than we did twenty, or even ten years ago. Nearly all the plates of Lilies that have previously appeared have been very incomplete and unsatisfactory, partly because it requires folio size to do a Lily justice. But here we have the whole series, about fifty in number, drawn upon a uniform scale, upon a large enough size, by the man best fitted to deal with them, and the result is one of the most sumptuous botanical monographs that has ever appeared. The leaves and flowers have been carefully coloured from nature, and pains has been taken to make the plates as complete as possible by including the bulbs and capsules, which are very needful for a full understanding of the species, but have previously been almost altogether neglected. The author, Mr. Elwes, is an ornithologist of great experience, who has seen service in India, and since his retirement from the army has devoted himself specially to the cultivation of petaloid monocotyledons, of which he has now, in his garden at Preston, near Cirencester, one of the finest collections in existence. For several years he has been a member of the Council of the Royal Horticultural Society, and a leading contributor to their shows, so that a considerable proportion of the plates have been drawn from specimens grown in his own garden, and he has been brought into constant contact and correspondence with the principal cultivators at home and abroad, he having been helped ungrudgingly by such men as Wilson and Leichtlin in Europe, and Horey, Pringle, Hanson, and Sarjeant in America. He has tested under cultivation the validity of the critical forms, and has visited frequently the principal establishments in England and on the Continent where Lilies are grown on a grand scale, with the result of reducing some of those which were considered as species to the rank of varieties. Botanists are not at all likely to quarrel with

what he says about the impossibility of reaching satisfactory conclusions on matters of this kind without appealing to the aid of the cultivator. In every way great pains has been taken to make the work as complete as possible, and we are pleased to see from the notice distributed with the last part that, although it is necessarily an expensive one, but few copies still remain for disposal. There are altogether seven parts, six devoted to the species and varieties taken *seriatim*, and the last to a classified list of species, and to general remarks on their history, culture, and geographical distribution, this last point illustrated by a map. The genus belongs essentially to the north temperate zone, and is dispersed throughout its area, the concentration of forms being in Japan and China in the Old World, and California in the New. By this work, Mr. Elwes has not only connected his name inseparably with this beautiful genus, but has set an excellent example to the many gentlemen of means and leisure who are interested in plant-cultivation. If they want to work so as to help Botany, by far the best way to accomplish this is to make a speciality of some particular, or one particular set of plants, such as hybridising or fertilisation, or Agaves, or Crocuses, or Pelargoniums, or Begonias, or Irises, and work out the details with thoroughness and patience.

J. G. B.

The British Moss-Flora. By R. Braithwaite, M.D., F.L.S., &c. Parts 1 and 2. London: published by the Author at 303, Clapham Road.

Two parts of this work, containing the three Orders, *Andræaceæ*, *Buxbaumiaceæ*, and *Georgiaceæ*, have been issued, uniform in size and style with the author's excellent monograph of the *Sphagnaceæ*, and we can highly commend them to the notice of our bryological readers. The text is ample, and leaves nothing to be desired, containing full and clear descriptions, with copious synonymy and references chronologically arranged; the plates are all that plates should be, affording all necessary structural details, without the unnecessary redundance which renders the magnificence of some modern bryological works almost oppressive and embarrassing; and the whole work shows the care and thoroughness with which the author has laboured. At the same time the engraver and printer have done all that could be done to give the reader a handsome as well as valuable book.

Of late years an increased amount of attention has been bestowed by students of mosses upon the areolation or cell structure of the leaves, wherein are found ready and trustworthy means of discrimination in the absence of the fruit so rarely produced in many species. This principle receives full attention from the author, and will doubtless be readily welcomed by students from the facility with which it will enable them to determine many a barren and doubtful specimen. The reproductive system or inflorescence, on the other hand, is in nowise neglected, but its division is carried out more fully and completely than hitherto,

with the adoption of Lindberg's arrangement, whereby instead of the three now familiar terms, monoicous, dioicous, and synoicous, we now have six, namely :—

1. Synoicous, which retains its old signification.

2. Paroicous, having the antheridia naked and axillary, as in *Bryum nutans*.

3. Autoicous, equivalent for monoicous as usually understood, having the fertile and barren flowers distinct, but upon the same stem, as *B. uliginosum*.

4. Heteroicous, with both synoicous and autoicous flowers on the plant, as *B. pendulum*.

5. Dioicous, having the fertile and barren flowers on distinct individuals, as in *B. capillare* and so many other mosses which are but seldom found bearing fruit.

6. Poloicous, having both barren and fertile flowers, both on the same and on different plants—and this 6th section is again divided into three subsections. Whether this change and multiplication of terms will be looked upon as anything but a doubtful blessing by students remains to be seen.

In regard to nomenclature the author, following Dr. Lindberg's lead, adopts fully the principle of the right of priority, as already he had done in various articles in this Journal and in his 'Sphagnaceæ.' This method has the sanction of authority, and it is difficult to say anything in its depreciation : a principle is worth nothing unless carried out regardless of convenience or consequence; but there will probably be regrets at the trouble involved in the abolition or superseding of names grown familiar by many years use, for the sake of others which have fallen altogether out of recollection. It will be long a matter of difficulty and trouble to unlearn what has taken years to learn, and *Georgia* will sound unwelcome in the place of the long-accustomed *Tetraphis*.

These, however, are moot points, and in the presence of so many excellencies as the work presents it is more agreeable to leave them. The familiar names are given as synonyms, and collectors may use their own discretion as to whether they will at once adopt the new-old nomenclature, or wait till time shall have given it sanction, bearing the inconvenience which reformations must involve as patiently as they may. Apart from these questions the work will be found to furnish them with the fullest and readiest means of studying and identifying the genera and species, the habits and structure of mosses; and we hope nothing will delay the rapid progress and completion of a work of so much promise, for which so much, and in whose depreciation so little, is to be said. The large increase in the number of British species of mosses since the publication of Wilson's 'Bryologia,' five-and-twenty years ago, and the scarcity of that work now, have created a want which the 'British Moss-Flora' is exactly and thoroughly adapted to supply.

O.

Plants Indigenous in the Neighbourhood of Sydney, arranged according to the system of Baron F. von Mueller. By W. Woolls, Ph.D., F.L.S. Sydney: T. Richards. 1880.

This small *brochure* of sixty pages is of more interest than might be suspected from its title, inasmuch as it contains the skeleton of an arrangement of the vegetable kingdom, differing in some particulars from those usually accepted, and partially elaborated in Baron von Mueller's 'Native Plants of Victoria,'* of which the first part only has yet appeared. It may be interesting to systematists to compare this with other systems, and we have therefore extracted the diagnoses of the main groups, under which the Natural Orders are arranged in a somewhat unusual sequence, the apetalous groups being placed near those orders to which they bear the closest alliance, and the Amyliferæ (or Curvembryonatæ) being brought closely together.

The enumeration of species consists simply of a list of names; the numerical result of Dr. Woolls' investigations is summed up thus:—

	Orders.	Genera.	Species.
Dicotyledoneæ	83	327	804
Monocotyledoneæ	21	137	334
Acotyledoneæ	4	29	70
	108	423	1208
Naturalised species			127
Total number of species			1335

The number of cryptogams recorded is comparatively small, and will doubtless be greatly extended; we believe that the untiring Baron von Mueller has brought together much material for a Flora of the Australian Continent. The list of plants which have become naturalised in the county of Cumberland is very extensive and varied, amounting to about one-twelfth of the entire flora as here enumerated.

The following is the arrangement referred to:—

I. Dicotyledonous Plants.

i. *Choripetaleæ Hypogynæ.*

Orders of dicotyledonous plants, which, with some exceptions, have disunited petals or no petals, stamens inserted on the bottom of the calyx and at the base of the ovary, and the fruit free from the calyx.

1. Ranunculaceæ. 2. Nymphæaceæ. 3. Dilleniaceæ. 4. Magnoliaceæ. 5. Anonaceæ. 6. Monimiaceæ. 7. Lauraceæ. 8. Menispermeæ. 9. Papaveraceæ. 10. Cruciferæ. 11. Violaceæ. 12. Pittosporeæ. 13. Droseraceæ. 14. Hypericineæ. 15. Polygaleæ. 16. Tremandreæ. 17. Meliaceæ. 18. Rutaceæ. 19. Lineæ.

* See Journ. Bot., 1879, p. 317.

20. Geraniaceæ. 21. Malvaceæ. 22. Sterculiaceæ. 23. Tiliaceæ. 24. Euphorbiaceæ. 25. Urticeæ. 26. Casuarineæ. 27. Viniferæ. 28. Sapindaceæ. 29. Celastrineæ. 30. Stackhousiaceæ. 31. Portulaceæ. 32. Caryophylleæ. 33. Salsolaceæ. 34. Amaraniaceæ. 35. Ficoideæ. 36. Polygonaceæ.

ii. *Choripetaleæ Perigynæ.*

Orders of dicotyledonous plants with disconnected petals, rarely absent, or in the *Leguminosæ* partly connected, the petals, as well as the stamens, inserted on the tube of the calyx, and mostly at a distance from the base of the ovary, fruit laterally adnate to the calyx, or, chiefly in the *Leguminosæ*, free from it; exceptions rare.

1. Leguminosæ. 2. Saxifrageæ. 3. Rosaceæ. 4. Crassulaceæ. 5. Onagreæ. 6. Lythraceæ. 7. Halorageæ. 8. Myrtaceæ. 9. Rhamnaceæ. 10. Araliaceæ. 11. Umbelliferæ.

iii. *Synpetaleæ Perigynæ.*

Orders of dicotyledonous plants with connected (or rarely absent) petals; these as well as the stamens are inserted on the tube of the calyx, and at a distance from the base of the ovary, or the stamens are affixed to the petals, fruit literally adnate to the calyx, exceptions rare.

1. Santalaceæ. 2. Olacineæ. 3. Loranthaceæ. 4. Proteaceæ. 5. Thymeleæ. 6. Rubiaceæ. 7. Caprifoliaceæ. 8. Passifloreæ. 9. Cucurbitaceæ. 10. Compositæ. 11. Campanulaceæ. 12. Stylideæ. 13. Goodeniaceæ.

iv. *Synpetaleæ Hypogynæ.*

Orders of dicotyledonous plants with connected (rarely absent) petals; these inserted at the bottom of the calyx, stamens affixed to the petals, fruit laterally free from the calyx, exceptions rare.

1. Gentianeæ. 2. Loganiaceæ. 3. Plantagineæ. 4. Primulaceæ. 5. Myrsinaceæ. 6. Sapotaceæ. 7. Ebenaceæ. 8. Jasmineæ. 9. Apocyneæ. 10. Asclepiadeæ. 11. Convolvulaceæ. 12. Solanaceæ. 13. Scrophularinæ. 14. Lentibularinæ. 15. Bignoniaceæ. 16. Acanthaceæ. 17. Asperifoliæ. 18. Labiatæ. 19. Verbenaceæ. 20. Myoporinæ. 21. Epacrideæ.

v. *Apetaleæ Gymnospermeæ.*

Orders of dicotyledonous plants, without calyx and petals, with stamens inserted in the bract-like receptacles, and with rudimentary style and stigma.

1. Coniferæ. 2. Cycadeæ.

II. Monocotyledonous Plants.

i. *Calyceæ Perigynæ.*

Orders of monocotyledonous plants, with stamens inserted on the tube of the calyx, and at a distance from the base of the ovaries; fruit laterally adnate to the tube of the calyx, exceptions rare.

1. Orchideæ. 2. Irideæ. 3. Hydrocharideæ. 4. Amaryllideæ.

ii. *Calyceæ Hypogynæ.*

Orders of monocotyledonous plants, with stamens inserted on the bottom of the calyx, and near the base of the ovary; fruit laterally free from the calyx, exceptions rare.

1. Liliaceæ. 2. Philydreæ. 3. Xyrideæ. 4. Commelineæ. 5. Typhaceæ. 6. Lemnaceæ. 7. Alismaceæ. 8. Naiadeæ. 9. Xerotideæ. 10. Palmæ. 11. Aroideæ. 12. Junceæ. 13. Restiaceæ. 14. Eriocauleæ. 15. Centrolepideæ.

iii. *Acalyceæ Hypognæ.*

Orders of monocotyledonous plants without a calyx, with stamens (in bisexual flowers) inserted at the base of the ovary, and with fruit adnate to or free from its glumaceous bract, exceptions rare.

1. Cyperaceæ. 2. Graminaceæ.

III. Acotyledonous Plants.

(Species only partially known).

1. Characeæ. 2. Marsileaceæ. 3. Lycopodiaceæ. 4. Filices. 5. Musci. 6. Lichenes. 7. Fungi. 8. Algæ.

J. B.

English Plant-Names from the Tenth to the Fifteenth Century. By John Earle, M.A. Oxford, at the Clarendon Press. 1880. 12mo, pp. cxii., 122.

A Dictionary of English Plant-Names. By James Britten, F.L.S., and Robert Holland. Part ii. London, English Dialect Society (Trübner). 1880. 8vo, pp. 197–364 (G—O).

The first book on our list is a welcome addition to our literature, by no means too ample, of the Saxon names applied to various plants, native and foreign, of the period mentioned. As might be supposed, from the author being Professor of Anglo-Saxon at Oxford, the philological rather than the botanical element is preponderant; but a real appreciation of the charm of plant-lore for its own sake is throughout very plainly to be seen. After a long introduction of more than a hundred pages we find the following vocabularies:—I. Liber Medicinalis, a Translation of Apuleius Medaurensis de Virtutibus Herbarum. II. From Ælfric's Vocabulary. III. An anonymous list, of the Tenth or Eleventh Century. IV. From the Royal Library, Brussels. V. From Ælfric's Grammar. VI. Trilingual Vocabulary of the Thirteenth Century. VII. Fifteenth Century. VIII. From a Nominale about the same date. IX. From a Pictorial Vocabulary, Fifteenth Century. An Appendix follows, containing extracts from Cockayne's Leechdoms, certain Notes, and three Indexes, which the author, preserving the form now usually confined to Mathematics, calls Indices: these consist of Latin, Saxon and English, and French Plant-names.

It seems strange that the author should not have made more use of the material ready to hand. From a single reference to

Dr. Prior's "Popular Names of British Plants" we infer that that work was known to the author, but he seems not to be aware of Britten and Holland's 'Plant-Names'; but as the main object of the work is to print the vocabularies, and not to determine the species, it might seem hypercritical to insist on this item.

There are a few things we may indicate, as not being quite as we should like them. We find the spelling of certain authors' names varied, thus, Cæsalpinus and Cæsalpin, for Cesalpini; Gerarde and Gerard, the latter correct; *Gaspar* Bauhin rather shocks our ideas,—as a Zürich man, he was either Caspar or Kaspar, translated as Casparus, and Gaspard. The English *olive* is closer to the Latin *oliva* than *ele beam*, which the author adduces as the bridge from one to the other.

"Obstrutium; Saponaria officinalis? Imperatoria ostrutium?" (*sic*) is the sort of error sure to creep in when the author is more of a philologist than a botanist. But these slight demerits do not greatly mar the value of the work as a whole. Every person who cares for the early familiar names of plants in this country would do well to possess this little volume.

We are glad to see Part ii. of Britten and Holland's 'English Plant-Names.' The first part was noticed in the Journal soon after it appeared (1879, pp. 92–3), and due recognition was given of the special qualifications both authors possess over most of their predecessors. The copious cross-references will move many readers to thank the compilers for their care in this particular. We are very pleased to find that the third and final part will not be long delayed, and with it an introduction and a complete index, which will supersede the temporary indexes hitherto issued with each part. B. D. J.

Although rather after date, it is well to put on record that a very useful catalogue of works on Tropical Products and Economic Botany, classified and alphabetically arranged, was issued as a Supplement to 'The Colonies and India' for the 22nd of last November. The titles are arranged under the following headings:—Applied Botany and Economic Products (Cinchona, Cochineal, Cocoa, Coffee, Cotton, and other fibres); Forestry and Forest Products (Eucalyptus, Gutta-percha, India-rubber and other Gums, Indigo, Mahogany, Oak, Olives, Oranges, Palms, Pines, Silk, Sugar, Tea, Tobacco, Vine Culture, and Vines). These subjects are followed by a catalogue of the books arranged alphabetically under the authors' names.

The ninth Annual Report (1880) of the South London Microscopical and Natural History Club contains a list of the Phanerogamia, Filicales, and Characeæ of the district, by Messrs. Henry and James Groves. The authors say that it "is not put forward as an all-complete list of the flowering plants of the district, but merely a collection of casual notes, and it therefore gives no negative evidence. Many common plants have escaped noting in some or all of the districts where they undoubtedly

occur; but we have thought it necessary to confine the list strictly to actual notes taken by members until a detailed account of the Flora shall be published, when authorities for the records can be cited." The list shows the distribution of each species through the five sub-districts, three being in Surrey and two in Kent, into which the S. London district has been divided for the purpose of field work; a good map, showing these divisions, is also issued by the Club.

We would direct attention to an interesting series of papers on the early history of the *Diatomaceæ*, by Mr. F. Kitton, which is now appearing in 'Hardwicke's Science-Gossip.'

We have received from Messrs. Cassell 'The Field Naturalist's Handbook,' by the Rev. J. G. Wood and Theodore Wood. It contains lists of the plants in flower in each month, with their respective habitats. It would be well, however, that this portion of the work should be revised by some botanist practically acquainted with British plants: we are not accustomed to see *Achillea serrata* and *A. tomentosa* classed as such, although they were at one time reported as occurring in England; the spelling of the Latin names, too, might be more accurate.

M. Willkomm, who has just completed the 'Prodromus Floræ Hispanicæ,' announces the publication of a series of figures of new or rare plants described in that work or recently discovered in Spain and the Balearic Islands, under the title, "Illustrationes Floræ Hispanicæ insularumque Balearium." Each part will contain ten quarto plates with accompanying letterpress, and will be published at 12s.; the first part will appear during the present autumn.

We have received a specimen-page and plate of Sir Gardner Wilkinson's 'Desert Plants of Egypt' to which reference was made in our last number. It bids fair to be a very interesting work. We omitted to mention that it will be published by Messrs. Dulau & Co., Soho Square.

Other New Books.—F. de Thuemen, 'Contributiones ad Floram Mycologicam Lusitanicani,' Series 2 (Coimbra).—E. Haeckel, 'Catalogue raisonnée de Graminées du Portugal '(Coimbra).—H. van Heurck, 'Synopsis des Diatomées de Belgique,' Fasc. i. Raphidées (pt. 1). (Anvers). 7 *fr.* — J. Earle, 'English Plant-Names from the Tenth to the Fifteenth Century' (Oxford, Clarendon Press).—A. DeCandolle, 'La Phytographie' (Paris, Masson). 10 *fr.* —N. L. Marchand, 'Botanique Cryptogamique Pharmaco-Médicale' (Paris, O. Doin), fasc. 1, 4 *fr.*—A. Prazmowski, 'Untersuchungen über die Entwickelungsgeschichte und Fermentwirkung einiger Bacterien-Arten' (Leipzig, Voigt.) — W. Woolls, 'Plants Indigenous in the neighbourhood of Sydney' (Sydney). — Saint-lager, 'Réforme de la Nomenclature Botanique' (Lyon). — A. Gremli, 'Neue Beiträge zur Flora der Schweiz.' Heft. i. (Aarau). — L. V. Baltzer, 'Das Kyffheäuser Gebirge, in mineralogischer, geognostischer und botanischer Beziehung' (Nordhausen, Eigendorf).—A. Hausen, 'Die Quebracho-Rinde,' tt. 3 (Berlin, Springer).—P. Petit, 'Spirogyra des Environs de Paris,' tt. 12 (Paris, Lechevalier), 8 *fr.*

Articles in Journals.

May.

Œsterr. Bot. Zeitschrift.—R. v. Uechtritz, 'A form of the genus *Roripa*.'—S. Schulzer, 'Mycological Notes' (concluded) (*Dædalea polymorpha*, Schulzer, olim *Ceriomyces terrestris*. 1 tab.)—H. Wawra, 'On Bromeliaceæ' (continued) (*Quesnelia lateralis*, *Q. strobilospica*, *Q. centralis*, *Q. Augustocoburgi*, spp. nn.)—L. de Vukotinovic, 'New forms of Croatian Oaks.'—F. Antoine, 'South Australian Weeds.'—C. J. v. Klinggräff, 'Palestine and its vegetation' (contd.)

Annales des Sciences Naturelles (Botany).—Sér. 6, tom. ix., No. 4. Ch. Flahault, 'On the modifications of Vegetables' (concluded).

June.

Œsterr. Bot. Zeitschrift.—E. de Halácsy, '*Thlaspi Goesingense*,' n. sp.—F. Krasan, 'On plant-distribution in the districts of Görz and Gradisca.' — H. Wawra, 'On Bromeliaceæ' (contd.) — V. v. Aichinger, 'Ascent of the Hohe Kugel.' — J. Wiesbaur, 'The Violets of the Bisamberg, near Vienna.' — F. Antoine, 'South Australian Weeds' (contd.) — C. J. v. Klinggräff, 'Palestine and its vegetation' (contd.)

Flora.—H. von Löne, 'On the development of the endogenous organs.' — J. Müller, 'Lichenological Contributions,' no. xi. (numerous new species and forms).

Naturalist (Huddersfield).—J. E. Griffith, 'Flora of Carnarvonshire and Anglesea' (contd.)

Hardwicke's Science-Gossip. — F. Kitton, 'The early history of the Diatomaceæ' (contd.)—M. H. Robson, 'The salmon disease' (*Saprolegnia ferax*).

Botanische Zeitung. — E. Stahl, 'On the influence of direction and intensity of light on several phenomena of motion in the Vegetable Kingdom' (concluded). — W. Woronin, '*Vaucheria Debaryana*,' sp. n. (1 tab.). — E. Haeckel, 'On the flowering of Grasses.'—H. Bauke, 'Drawings of prothallia of Ferns,' with note by J. Sachs.—A. de Bary, 'W. P. Schimper.'

Hedwigia.—C. Warnstorf, 'Excursions in the Lower Harz' (concluded).

American Naturalist.—C. E. Bessey, 'The supposed dimorphism of *Lithospermum longiflorum*.'

Magyar Novenytani Lapok.—'On the foundation of a central Botanical Institution.'—Ch. Mika, 'On the vegetation of the baths of Hercules near Mehadia.' — (Supplement) A. Kanitz, 'Plantæ Romaniæ hucusque cognitæ' (contd.)

Bulletin of Torrey Botanical Club.—D. C. Eaton, 'New or little-known Ferns of the United States' (*Northolæna Lemmoni*, sp. n.)—J. D. Smith, '*Wolffia gladiata*, var. *floridana*.'

Journ. Royal Microscopical Soc. — M. C. Cooke, 'The genus *Ravenelia*' (1 tab.)—A. Grunow, 'New Species of *Nitzschia*' (2 tabs.)

Proceedings of Societies.

Linnean Society of London.

June 3, 1880.—Prof. Allman, F.R.S., President, in the chair. —The only botanical paper read at this meeting was by Mr. George Murray, "On the application of the results of Pringsheim's Recent Researches on Chlorophyll to the life of the Lichen." Summarising the results of Pringsheim's labours, Mr. Murray considered the suggestion of Dr. Vines that by the aid of an artificial chlorophyll screen the protoplasm of fungi might be excited to the decomposition of carbonic acid, and contended that this experiment is proceeding naturally in Lichens. He pointed out that in these organisms we have the fungal tissues in the body of the thallus, and the chlorophyll screen in the gonidia; and that light traversing the chlorophyll containing gonidia—often occurring as a dense layer—excites in the fungal tissues the decomposition of carbonic acid. In evidence he adduced the plentiful occurrence of starch, or rather lichenin—a substance of the same chemical composition as starch (C_{12} H_{10} O_{10}) and formed from it by the action of the free acids of the plant. In conclusion he submitted that this process tended to explain the nature of the consortism of the fungal and algal elements in the Lichen, and thus to support the views of Schwendener. In the discussion following, Messrs. Bennett, Carruthers, and Stewart, and Professors Duncan and Greene took part.

June 17, 1880.—Prof. Allman, F.R.S., President, in the chair. —The following gentlemen were elected Fellows of the Society:—the Rev. H. G. Bonavia Hunt (Trinity Coll., Lond.), H. N. Moseley, F.R.S., the Rev. A. Merle Norman (Durham), and E. A. Webb (of Turnham Green). — Dr. R. C. A. Prior read a letter from a correspondent concerning the rare case of a Mistletoe found parasitic on a Mistletoe. — Mr. E. M. Holmes exhibited microscopical slides of *Polysiphonia fastigiata* showing the trichogyne still remaining attached to the young cystocarp and antheridia on the same branches. The occurrence of both antheridia and cystocarps on the same plant is rare in this species, which is usually dioicous.—Mr. Charles Stewart showed, and made remarks on, some microscopic sections of the growing point of *Chara* and of the common ash. — No botanical papers were read at this meeting. The President in a few parting remarks closed the session.

Botanical News.

Baron H. F. A. von Eggers, to whose 'Flora of St. Croix' we referred at p. 93, is contemplating an organised exploration of the West Indian Islands, with the view of thoroughly investigating their natural history. He hopes to secure the subscriptions of botanists to sets of dried plants which it is intended to prepare at

the rate of twelve dollars and a half per century for Phanerogams, and ten dollars for Cryptogams. His address is—St. Thomas, West Indies.

Dr. M. C. Cooke has entered upon his duties as Cryptogamist attached to the Kew Herbarium; he will take charge of the non-vascular Cryptogams.

The Herbarium of Dr. Samuel Goodenough, sometime Bishop of Carlisle, has been presented by the Corporation of that town to the Kew Herbarium. It consists mainly of garden specimens, many obtained from Kew at the time of his residence at Ealing between 1780 and 1800, but contains also some interesting types—among them those of the plants figured in Shaw's 'Travels' in Barbary and the Levant, and of his own papers on British *Carices* and *Fuci*, published in vols. ii. and iii. of the Linnean Society's 'Transactions' (1794–97).

We are glad to announce the formation of a Natural History Society for Oxfordshire, the object of which is the thorough investigation of the flora and fauna of the county. Prof. M. A. Lawson and Mr. H. Boswell are Presidents of the botanical section, the former undertaking the Phanerogams and the latter the Cryptogams; Mr. G. C. Druce being the Hon. Secretary. Mr. Druce asks us to state that he is collecting material with a view to the publication of a Flora of Oxfordshire, into which the MS. material brought together by the late Alfred French will be incorporated; and he will be glad to receive notes relating to the plants of the county; his address is 118, High Street, Oxford. This Flora will be the more interesting, inasmuch as we have at present no complete enumeration of the plants of either of the counties—Bucks, Berks, and Oxon—included in Mr. Watson's sub-province of West Thames.

Mr. William Andrews, of Dublin, died on the 11th of last month, at the age of seventy-eight, having been born at Chichester in 1802. Although his labours, especially of late years, were mainly devoted to marine zoology, he published several papers upon Irish plants; and his name is commemorated in the variety *Andrewsii* of *Trichomanes radicans* (of which he was the discoverer), as well as in the somewhat obscure *Saxifraga Andrewsii* of Harvey. He was one of the original founders of the Natural History Society of Dublin, of which he was for six years President.

We understand that Mr. Richard Kippist, after half-a-century of devoted service as Librarian to the Linnean Society, has retired from that office. The appointment to the vacancy thus caused will be made by the Council in October next; written applications should be addressed to Mr. B. Daydon Jackson, at Burlington House, Piccadilly.

We shall be grateful to the Secretaries of local Natural History Societies if they will forward us any notes of botanical work done by their respective bodies, or published reports containing anything relative to local British Botany.

Original Articles.

SPICILEGIA FLORÆ SINENSIS: DIAGNOSES OF NEW, AND HABITATS OF RARE OR HITHERTO UNRECORDED CHINESE PLANTS.

By H. F. Hance, Ph.D., Memb. Acad. Nat. Cur., &c., &c.

V.

1. Clematis (*Viticella*) leptomera, *sp. nov.* Caule scandente, ramis gracilibus tomentellis sulcatis, foliis v. simpliciter ternatisectis v. petiolo medio pari segmentorum adauctis petiolo sæpe volubili segmentis tenuiter membranaceis glabris lineari-lanceolatis obtusiusculis mucronulatis basi rotundatis v. obliquis integerrimis luci obversis tenuiter triplinerviis ac reticulatis nervis anastomosantibus 6–18 lin. longis 2–3 lin. latis petiolo 1–2¼ lin. petiolulisque 1½–3½ lin. longis fultis, pedunculis axillaribus unifloris folio circ. æquilongis rigidis erectis infra medium bracteas binas sessiles ovatas obtusiusculas 5–6 lin. longas gerentibus, sepalis 6 oblongis acutis extus minute sericeis tenuiter trinerviis nervis extrorsum ramulosis 8–9 lin. longis 4–6 lin. latis stamina 4-plo superantibus, filamentis complanatis antherisque iis triplo brevioribus glaberrimis, ovariis plurimis villosissimis stigmate apiculatis staminibus 3–4-plo brevioribus.

In convalle ad ripam occidentalem fl. Fuh-ho, juxta urbem Wu-chau-fu, prov. Kwangsi, exeunte Martio 1879 coll. W. Mesny. (Herb. propr. n. 20799.)

Allied to the Indian *C. cadmia*, Ham., which has more compound leaves, with wider segments nearly resembling the bracts, and very short filaments.

Note.—In the character of *C. Stronachii*, in the 3rd fasciculus of these 'Spicilegia,' the anthers were, by a slip of the pen, erroneously described as "filamento triplo brevioribus." ('Journ. Bot.,' n. s., vii., 104.) For the latter word, "longioribus" should be substituted.

2. *Clematis patens*, Morr. & Dcne.? In prov. Hu-peh, circa oppidum Ichang, vere 1879 coll. T. Watters.

I suppose this is a wild form of the above species, hitherto, I believe, only found in Japan, as it agrees very well in character. The leaves are dry and membranaceous, the petals less than an inch in length, and the peduncles are bractless.

3. *Isopyrum adoxoides*, DC. In collibus Feng-wang-shan, prov. Kiang-su, d. 22 Aprilis 1877 leg. F. B. Forbes. I am not aware that this has been met with before out of Japan.

Pæonia albiflora, Pall. In monte Siao Wu-tai-shan, Chinæ bor., m. Jul., 1876, coll. W. Hancock. Though Bunge's variety

trichocarpa, with hairy fruit, more or less pubescent foliage, and rose-coloured or purplish flowers, of which I have a Jehol specimen from the Abbé David, is apparently not uncommon in Northern China, I do not think the typical Siberian form, with white blossoms and perfectly smooth leaves and fruit, has been before recorded from China.

5. *Schizandra* (*Sphærostema*) *japonica*, A. Gr.—In collibus Feng-wang-shan, juxta Shanghai, Maio 1877 detexit am. Forbes. I have never previously seen specimens gathered south of Peking.

6. *Jeffersonia manchuriensis*, mihi (= *Plagiorhegma dubium*, Maxim.) In Manchuria australiori, juxta Portam Coreanam, m. Aprili 1876 florentem legit Rev. J. Ross. Folia juniora basi cordata, auriculis sæpe incumbentibus apice e lata emarginatura mucronulata, marginibus irregulariter angulatis; petala oblonga, obtusissima, basi in unguem brevem angustata.

The genus *Plagiorhegma* was founded by Maximowicz on young fruiting specimens of this plant, with which, as he subsequently discovered, he had inadvertently mixed up flowers of something quite different. Though still without flowers, the writers of the 'Genera Plantarum' confidently reduced the genus to *Jeffersonia*, and in this they were followed by Baillon (Hist. des Plantes, iii. 59); and this decision is now fully confirmed by Mr. Ross's rediscovery. The young leaves differ a good deal from the full-grown ones on the authentic specimen I received from M. Maximowicz; but this, judging only from Prof. Gray's plate (Gen. N. Amer. Pl., i. t. 34),—for I have only an old fruiting specimen in my herbarium,—is in a less degree the case in the American species. I have been compelled to alter the specific name, as there is nothing at all doubtful about the affinity.

7. Corydalis (*Capnoides*) suaveolens, *sp. nov.* E rhizomate cylindrico fibras undique emettente erecta, ramosa, glaberrima, foliis radicalibus longe petiolatis ternatim bipinnatisectis superioribus brevius petiolatis bipinnatisectis petiolis basi stipulaceo-auriculatis laciniis ovali-oblongis acutis basi cuneatis supra læte viridibus subtus glaucescentibus dentatis v. subintegris 2–10 lin. longis, racemis laxiusculis 5–12 floris demum elongatis, bracteis cuneato-oblongis inferioribus dentatis summis integris pedicellos subduplo superantibus, floribus horizontaliter nutantibus, sepalis minutis transverse oblongis denticulatis, corollæ calcare incluso pollicaris petalo superiore galeato violaceo in calcar ipso æquilongum apicis uncinatum acutiusculum attenuato lateralibus brevioribus apice cohærentibus albis apice intense purpureis cum inferiore concavo deflexo staminibus connatis, siliquis immaturis anguste linearibus polyspermis erectis pedicellum paulo excedentibus, stigmate complanato-dilatato basi auriculato.

In prov. Cantonensi, secus fl. North River, m., Jan. 1879 legit Dr. C. Gerlach. (Herb. propr. n. 20775.) Flores *Heliotropium* vel *Vanillam* fragrant.

A well-characterized species, perfectly distinct from all the East-Asiatic ones with which I am acquainted, or can find described, and equally so from those of the Himalaya; worthy of

cultivation, as well for its tender green foliage and pretty variegated flowers, as for the delicate scent they exhale.

8. *Moricandia sonchifolia*, Hook. f., *β. homæophylla*, var. nov. Tota planta quam in typo gracilior et humilior, pilis brevibus passim puberula, foliis omnibus conformibus basi auriculatis medio ad costam usque sectis utrinque lobis 1–2 linearibus integris basi adnatis patentissimis auctis lobo terminali triangulari dentato basi truncato.

In collibus Feng-wang-shan, Apr. 1879, F. B. Forbes. (Herb. propr. n. 20736.) This is the plant noticed by Mr. Hemsley ('Journ. Bot.' xiv. 207.) It has so very different an aspect from the typical form, which also occurs in Kiang-su, owing to its much smaller size, puberulous stem, leaves, and calyx, and the curiously-shaped leaves, that at first I thought it must be distinct.

9. *Hypericum Ascyron*, Linn. Ad ripas fl. Siang, reg. sept. prov. Hu-nan, in humidis, æst. 1878 coll. Bullock. The most southerly station known to me for this species.

10. Euonymus Forbesii, *sp. nov.* Glaberrimus, ramis subtetragonis cortice fusco obductis, foliis late ovatis basi rotundatis apice caudato-acuminatis calloso-mucronatis margine incumbenti-glanduloso-serrulatis tenuiter membranaceis in sicco flaventibus utrinque opacis concoloribus tenuiter penniveniis ac luci obversis reticulatis 2–2½ poll. longis 15–16 lin. latis petiolo 5–6 lineali, cymis pedunculo communi 5–6 lin. longo rigido fultis 7-floris flore centrali solitario lateralibus ternis pedunculo 3-lineali divaricato omnibus pedicellis 2 lin. longis impositis tetrameris 4 lin. diametro, sepalis suborbiculatis, petalis in sicco flavidulis oblongis integerrimis calycem duplo excedentibus intus basi minute papillosis, staminibus disco duplo longioribus antheris fusco-purpureis, stylo conico staminibus breviore.

In collibus Feng-wang-shan, ditionis Shanghaiensis, d. 13 Maii 1877 florentem invenit am. F. B. Forbes. (Herb. propr. n. 20762.)

Though its fruit is unknown, this appears certainly quite distinct from any of the East-Asiatic or Japanese species hitherto described. It seems in some respects near *E. oxyphyllus*, Miq., which, however, has slender elongated cymes, pentamerous flowers, shorter stamens, and different coloured foliage. It is also allied to the Peking *E. Bungeanus*, Maxim.

11. Tripterygium Bullockii, *sp. nov.* Frutescens, ramulis tetragonis verrucosis ferrugineo-tomentellis, foliis alternis breviter petiolatis ellipticis obtuse acuminatis serrulatis præter nervos tenuissime strigillosos utrinque glaberrimis, panicula terminali, petalis oblongis denticulatis, stigmatibus 6, fructibus immaturis 3-alatis basi obtusiusculis apice acutiusculis.

In collibus demissis secus fl. Siang, reg. bor. prov. Hunan, æst. 1878 legit am. Bullock. (Herb. propr. n. 20692.)

A very interesting plant. The only other known species, found both in Formosa and Japan, has somewhat differently-shaped leaves, and only three stigmas; and the fruit is deeply emarginate both at the base and apex, as in *Dodonæa viscosa*, Linn.

12. *Dodonæa viscosa*, Linn. Circa Amoy, ipse legi, m. Oct. 1857; juxta Swa-tow invenit Sampson. A small-fruited, nearly oblong obtuse-leaved form.

13. *Euscaphis staphyleoides*, Sieb. & Zucc. In collibus Feng-wang-shan, ditionis Shanghaiensis, m. Aprili 1877 coll. am. Forbes. I do not think this has been recorded before from China. Baillon refers this to Loureiro's hitherto unrecognised genus *Triceros*, to which he also reduces *Turpinia*.

14. *Indigofera atropurpurea*. Ham. In provincia Cantonensi, juxta pagum Fuk-wing, m. Junio 1855 coll. Rev. R. Krone. Now, I believe, first recorded from China.

15. Millettia (*Eumillettia*) cognata, *sp. nov.* Frutescens, ramulis glaberrimis, foliolis 5 ovato-oblongis obtusis v. obtuse acuminatis creberrime reticulatis præter costam nervosque subtus strigillosos glaberrimis, paniculæ laxæ velutinæ ramis divaricatis, floribus semipollicaribus dilute purpureis, calyce sericeo-tomentosa breviter dentato pedicello vix longiore, ovario petalisque glabris, alis dimidiato oblongis obtusis carinæ cymbiformi æquilongis, disco conspicuo.

In collibus demissis ad fl. Siang, regione septentrionali prov. Hu-nan, æst. 1878 coll. T. L. Bullock. (Herb. propr. n. 20708.)

Very closely allied to *M. reticulata*, Benth., and *M. Championi*, Benth. It differs from the former in the much paler flowers, and in the fewer leaflets, which dry of a bright green, not a blackish hue; from the latter by the colour of its flowers, which are nearly half as large again; from both by its sericeo-tomentose calyx.

16. *Desmodium* (*Dendrilobium*) *cephalotes*, Wall. In ripis devexis fluvii West River, provinciæ Cantonensis, primus legit Sampson, Julio 1870.

17. *Desmodium* (*Nicolsonia*) *retroflexum*, DC. In collinis circa Cantonem et Whampoam haud rara. Exhales, when dry, a powerful odour of liquorice.

18. *Desmodium* (*Nicolsonia*) *trichocaulon*, DC. Circa Amoy, ipse legi Octobri 1857; ad Sai-chu-shan, prov. Cantonensis, m. Augusto 1862 coll. F. Parry.

19. *Potentilla Wallichiana*, Del. In alluviis fl. West River, prov. Cantonensis, inter Kun-hü et Tsz-tung, d. 27 Febr. 1869 leg. Sampson. This is the typical plant, with pedate leaves, as figured by Lehmann (Rev. Potent., t. 34); not *P. Kleiniana*, Wt., which occurs in Japan, and with which this is united by Sir Joseph Hooker (Fl. Brit. Ind., ii., 359).

20. *Rosa macrophylla*, Lindl. In monte Po-hua-shan, Chinæ bor., alt. 5000 ped., d. 19 Jan. 1875 coll. Dr. O. a Moellendorff. For the determination of this I am indebted to Prof. Crépin. Found previously in Kan-su by Przevalsky, and North China by Père David. (Crépin, Prim. monogr. Ros., fasc. 3, 371.)

21. *Rosa acicularis*, Lindl. In m. Siao Wu-tai-shan, Chinæ bor., m. Julio 1876 coll. W. Hancock. An addition to the Peking flora.

22. *Sportella atalantioides*, Hance. Copiose prope Kwei-yang, metropolin prov. Kwei-chau, m. Jan. 1880 coll. W. Mesny.

"Berries edible. It is said an army was once saved from starvation by living on them for some days." I now make the *amende honorable* to Prof. Oliver, for having ventured to dispute his opinion as to the position of this genus. I am at present satisfied he and M. Maximowicz (in his recent most interesting revision of *Spiræaceæ*), are correct; and I think it stands close to *Cotoneaster*, *Photinia*, and *Rhaphiolepis*.

23. PHOTINIA CRENATO-SERRATA, *sp. nov.* Ramis cortice griseo obductis, ramulis innovationibusque tomentosis, foliis membranaceis spathulato-oblongis obtusissimis retusis glaberrimis supra lucidulis subtus pallidioribus opacis et inconspicue venoso-reticulatis venis primariis ad utrumque latus circ. 15 a triente inferiore ad apicem crenato-serratis serraturis nempe rotundatis apice incumbenti (quasi ex sinubus) minute calloso-apiculatis ¾ ad 1¾ poll. longis 4–7 lin. latis in petiolum subbilinealem angustatis, corymbis compositis literalibus et terminalibus multifloris basi foliatis, bracteolis linearibus deciduis, floribus longiuscule pedicellatis, calycis glaberrimi lobis late semiovatis acutiusculis margine glandulis 5–7 minutis præditis, petalis rotundato-ellipticis sæpe emarginatis, staminibus circ. 20 alternis brevioribus, ovario omnino infero apice extus loculisque biovulatis intus albo-villosissimo, stylis 5 liberis apice paulo incrassatis stigmatibus simplicibus.

In prov. Hu-peh, juxta oppidum Ichang vere 1879 coll. T. Watters. (Herb. propr. n. 20988.)

This appears very distinct from any species hitherto described, and is perhaps nearest to *P. Fortuneana*, Maxim. (= *Cotoneaster Fortunei*, Wennig = *Osteomeles Pyracantha*, Dcne.

24. *Drosera* (*Rorella*) *indica*, Linn. Circa Amoy, ipse legi m. Octobri 1857.

25. *Drosera* (*Ergaleium*) *lunata*, Ham. Ad cacumina montium Pak-wan, supra Cantonem, Martio 1868 invenerunt Sampson et Hance. A most beautiful plant when seen growing, as it often does, in dense carpet-like masses, its glandular-fringed leaves sparkling like jewels in the sun. I consider it quite distinct as a species from *D. peltata*, Sm.

26. *Jussiæa repens*, Linn. In stagnis agri Cantonensis sæpe occurrit.

27. *Acanthopanax spinosa*, Miq. In coll. Feng-wang-shan, prov. Kiang-su, d. 20 Maii 1877 coll. F. B. Forbes. Now, I believe, first recorded out of Japan.

28. *Abelia Hanceana*, Mart. Secus fl. North River, prov. Cantonensis, m. Jan. 1879, frf. coll. Dr. Gerlach. It is to be regretted that this species should only be known in fruit.

29. *Serissa fœtida*, Comm. In collibus demissis ad fl. Siang, reg. sept. prov. Hu-nan, æst. 1878 coll. T. L. Bullock.

The branchlets in these specimens are clothed with lines of dense short crisp hairs, on alternate sides, running down from the base of the stipules. The leaves, too, are much larger than in any cultivated plants I have seen or in the wild ones I formerly gathered at Amoy, some of them measuring two inches in length by nine lines broad.

30. Aster (*Orthomeris*) Gerlachii, *sp. nov.* Caule simplici angulato scabro, foliis (radicalia desunt) subflaccidis lineari-lanceolatis acutis margine remotissime calloso-serrulatis in petiolum marginatum sensim cuneato-attenuatis griseo-pallidis supra opacis glabriusculis subtus lucidulis subtrinerviis nervis lateralibus juxta medium anastomosantibus cum costa iis validiore subtus prominulis ac setulis scabris, corymbo fastigiato subsimplici 10–12 cephalo ramis basi et saepe medio bracteatis, involucri squamis triseriatis inæqualibus (seriebus scilicet gradatim minoribus) oblongis obtusiusculis præter carinam totis membranaceis ciliatis, radiis albis, corollarum disci tubo limbum dilatatum æquante, pappi setis scabridis parum inæqualibus sordide albis apice haud clavellatis corollæ limbo æquilongis, receptaculi alveolis margine lacerodentatis, achænis angusto compresso $1\frac{1}{2}$ lin. longo pilis albidis nitentibus obsito.

In prov. Cantonensi, secus fl. North River, m. Jan. 1879 collegit Dr. C. Gerlach. (Herb. propr. n. 20793).

This interesting plant has so strong a resemblance to *A. rugulosus*, Maxim., and the sister species *A. acuminatus*, Michx., that any botanist would at first sight feel sure of their being immediate allies. But both those species belong to a group of *Orthomeris* which may be called *albæ* (cfr. Torr. and Gray, Fl. N. Amer. ii. 160), in which the sockets of the receptacle are entire, the achænia perfectly smooth, and the pappus-bristles clavellate. The present plant falls into another group of the same section, *acuminatæ*, which has the alveoli conspicuously toothed, the setæ of the pappus filiform, and hairy achenes. Its nearest ally I take to be the somewhat variable *A. tataricus*, Linn. f., from which it may be at once distinguished by its habit, the peculiar colour of its far smoother leaves, their very conspicuous attenuation into the stalk, the simpler corymb, smoother and less herbaceous involucre-scales, the longer narrower achene, and the non-rufescent pappus. I have compared it with a considerable suite of allied species, and have no doubt of its autonomy.

31. *Gnaphalium japonicum*, Thunb. In collibus Feng-wang-shan, prov. Kiang-su, d. 13 Maii 1877 coll. F. B. Forbes. I cannot find any prior record of the existence of this species in China, though its distribution would of course have led us to expect its discovery in the country.

32. *Senecio argunensis*, Turcz. Ad ripas lacus Tung-ting, reg. centr. prov. Hu-peh, æst. 1878 coll. Bullock. The most southerly station known to me for this species. The capitula are smaller than in any Peking or Manchurian specimens I have seen.

33. *Primula sinensis*, Lindl. In umbrosis juxta I-chang, prov. Hu-peh, sub fine m. Jan. 1879 coll. am. T. Watters.

In this, the only wild specimen of this favourite plant I have seen, the flowers are smaller and the leaves much less toothed (resembling indeed rather those of *P. cortusoides*, Linn.), than in cultivated ones.

(To be continued).

BOTANICAL BIBLIOGRAPHY.

By W. P. Hiern, M.A., F.L.S.

The benefit conferred upon botanical science by the publication of the two editions of the 'Thesaurus literaturæ botanicæ' of Pritzel strengthens the appetite for further information of the same kind. It may be too much to expect, but it is by no means too much to desire, that in addition to what can be obtained from the title-page and the numbers of pages and of plates (if any) of a book, certain explanatory or corrective particulars should, where necessary, have been supplied in the 'Thesaurus.' It is true that occasionally such particulars have been added, but there is a craving for more. When a book has been issued in parts, the dates and quantities of the parts should, if possible, be given; and when two or more authors divide between or amongst them portions of a book, it would be useful to indicate what portions are authoritatively due to each, especially in those cases where there occurs an incidental author whose name does not appear on the title-page. Consider, for example, the 'Floræ Senegambiæ tentamen' of Guillemin, Perrottet, and A. Richard, volume i., a work of which the date on the title-page gives the range of years 1830—1833. This is the only volume of the book ever published, and all the authors have been dead for several years; the details of authorship for all the natural orders comprised therein, except one, are indicated by names given at the end of each order; of the forty-five orders, thirty-five and part of another are due conjointly to Perrottet and Guillemin, the arrangement of these names being sometimes reversed; eight and a part are due to A. Richard; and one order is without signature. From internal evidence it appears that the work was issued in parts, but the sizes of the parts and the several dates of their publication cannot be ascertained from the book itself. Why cannot these particulars be obtained from other sources, and given for the information of botanists?

In like manner, the three published volumes of the 'Flora Capensis' of Harvey and Sonder are severally dated on the title-pages 1859–1860, 1861–1862, 1864–1865: the separate authorship of each natural order is plainly stated at the head of each order. The preface at the commencement of each volume is dated in the later year of the two included on the title-page; so far as I can learn on enquiry in Dublin (the place of publication), the volumes were not published in parts: thus the ranges of years given on the title-pages appear to be delusive; it may perhaps turn out that the volumes were passing through the press in the course of those years. It would be important to remove doubts of this kind and to place on record a clear statement of fact about them. Another class of inaccuracies or omissions ought to be exposed or supplied, relating to the false dates printed upon the parts of the journals or transactions of learned societies, or to the absence of any precise dates. Not unfrequently the date on a part is given as the end of

a month or year (a favourite time with the editors), whereas the part was not ready till the early portion of the following month or year; an excuse has been pleaded that from the nature of the case it has been necessary some days in advance of the time of actual publication to fix the date to be printed on the part, and that the unforeseen delay of some days will occasionally occur. This excuse fails and becomes untenable when, on the completion of the volume, the same errors are repeated and reprinted, for at that time it is positively known that some of the dates given are false; it is defensible only on the unprincipled ground that consistency and firmness are more important and more desirable than truth and accuracy.

Mr. B. Daydon Jackson has already in the 'Journal of Botany' alluded to a common trick that publishers have of post-dating books: a case of this occurred with the first part of Peters' Mozambique Botany, the date on the title-page of which is 1862; but on consulting the preface of the second part it is learnt that the former part really appeared at the close of the year 1861. Mr. Jackson's researches, relating to the dates of Sir J. E. Smith's articles in 'Rees's Cyclopædia,' supplied a want previously much felt, and for them the thanks of botanists are due to Mr. Jackson and to the 'Journal of Botany.'

The 'Botanical Magazine' is usually quoted by the number of the plate without reference to the volume; the numbers of plates contained in a volume and the intervals of time between the completion of the volumes are not constant. A scheme, showing the numbers of the plates published during each year since their commencement in 1787, would be useful; I have prepared one for my private use, and could print it if thought necessary.

In the case of those serial publications which have appeared with some regularity throughout a long course of years, an algebraical formula may be constructed, and would be useful to those botanists who have not ready access to the complete work and are not too much prejudiced against the employment of anything like a mathematical expression. For example, take the 'Annales des Sciences Naturelles,' which consists of five series, commencing in the year 1824. For the first series, the volumes, whose number is expressed by $3n+1$, $3n+2$, $3n+3$, bear the date expressed by the formula $1824+n$; for the subsequent series, the number of the series being expressed by $r+1$, the volumes whose number is expressed by $2n+1$, $2n+2$, bear the date expressed by the formula $1824+10r+n$; this holds good up to the tenth volume of the fifth series, the date of which is 1869; one volume annually has been since published.

In the case of the 'Journal of Botany,' the formula would give for the nth volume of the original series the date of the year expressed by $1862+n$, and for the second series $1871+n$.

ENUMERATIO ACANTHACEARUM HERBARII WELWITSCHIANI ANGOLENSIS.

Auctore S. Le M. Moore.

(Continued from p. 233.)

Barleria, L.

B. Prionitis, L., *var.*—Calycis segmentis parvis ovato-lanceolatis breviter acuminatis.

Hab. Circa Loanda sine loci indicatione. (Nos. 5067, 5090) itaque circa Loanda.

B. cyanea (sp. nov.) — Caule ramoso tenui obsolete quadrangulari puberulo mox glabro albido striato, foliis parvis lineari oblanceolatis obtusis brevissime petiolatis scabriusculis subcoriaceis, floribus solitariis breviter pedunculatis, bracteis minimis linearibus juxta medium pedunculum insertis puberulis, calycis laciniis exterioribus fere æqualibus ovato-lanceolatis obtusiusculis integris decoloribus eximie nervosis appresse strigoso-pilosulis basi pubescentibus interioribus comparate magnis lanceolatis acutis nervosis appresse strigoso-pilosulis, corollæ tubo limbum subæquante tenui basi parum ampliato extus et intus basin versus pubescente limbi patentis lobis subæqualibus obovatis crebre nervosis extus puberulis, staminibus 4, 2 minimis et filamenta subulata basi pubescentia coronantibus staminodio filamenta staminum minorum æquante ac iis consimili, capsula ———.

Hab. In dumetosis arenosis rupestribusque prope Quitibe de Cima prope Bumbo distr. Mossamedes. (No. 5002.)

Species nulli affinis forsan cum *B. acanthoidi*, Vahl comparari debet, ab ea vero multis de notis abhorret.

Fruticulus decumbenti-ascendens rigide elasticus. Folia vix usque ad 2·5 cm. long., plerumque circiter 2·0 cm. Bracteæ 0·3 cm. longitudine, rigidiusculæ. Calycis laciniæ exteriores 1·2 cm. et interiores circiter 0·8 cm. long. Flores intense cærulei.

B. Kirkii, T. And.

Hab. In dumetis sylvaticis inter Lopollo et Catumba. (No. 5048.)

The bracts of our specimen are smaller and less deeply incised than those of the type, but I think the plant must be referred here.

B. violascens (sp. nov.)—Caule subtereti præter secus duas lineas oppositas glabro, foliis vix sessilibus lanceolatis acutis coriaceis crebre reticulato-nervosis glabris, floribus in axillis superioribus solitariis necnon in glomerulam brevem terminalem dispositis sessilibus, bracteis linearibus quam calyx brevioribus, calycis laciniis exterioribus subæqualibus ovato-lanceolatis glabris et precipue apicem versus nigro-punctatis lacinia antica breviter 2-loba lobis ovatis minute cuspidulatis laciniis lateralibus lineari-

lanceolatis acuminatis exterioribus plus quam duplo brevioribus haud induratis glabris, corollæ tubo fere uniformi limbi lobis ovatis microscopice crenulatis, staminibus 2 staminodiis 3 subæqualibus minimis subulatis exantheriferis, capsula ignota.

Hab. Prope Eme distr. Huilla necnon in dumetis editis de 5000 ad 5300 ped. in Morro de Lopolo. (Nos. 5015, 5016, 5028.)

Caules patentes, leviter flexuosi. Folia ad 5 cm. long. et 1 cm. lat. Bracteæ 1·5 cm. longitudine. Calycis lacinia postica 2·5 cm. et laciniæ laterales 1·1 cm. long. Corollæ albidæ in violaceo-cæruleam tendentis limbus 2·5 cm. diam.

Species *B. polyneuræ*, nob. arcte affinis sed præcipue ob folia lanceolata et calycis laciniam anticam 2-lobam lateralesque haud induratas aliena.

B. POLYNEURA (sp. nov.)—Caule obsolete tetragono præter lineas duas oppositas pubescentes glabro, foliis integerrimis subsessilibus lanceolato-ovatis superioribus oblanceolatis obtusiusculis utrinque eleganter reticulatis subcoriaceis glabris nigro-punctatis, floribus in axillis superioribus positis vel ramulos terminantibus, bracteis parvis oblanceolatis vel lineari-oblanceolatis induratis, calycis lacinia antica membranacea ovata minutissime ac inæquilateraliter 2-dentata quam postica etiam membranacea paullo majore laciniis lateralibus lineari-lanceolatis decoloribus induratis, corollæ tubo leviter ac gradatim ampliato calycem paullo excedente limbi lobis subæqualibus ovatis obtusis, staminibus perfectis 2, staminodiis mihi obviis nullis, capsula oblongo-ovoidea subcarnosa rugosula glabra superne in rostrum obtusum ipsi æquilongum contracta 2-sperma.

Hab. In sylv. locis apricis petrosis inter lacum Ivantala et Quilongues. (No. 5029.)

B. Mackenii, Hook. f. ab hac abhorret foliis angustioribus haud coriaceis minus eximie reticulatis secus nervos appresse hirsutulis nequaquam punctatis, bracteis minus rigidis, calycis paullo majoris lacinia antica firmiore ac inconspicuis dentata ac secus nervos appresse hirsutula laciniisque lateralibus pubescentibus vix induratis, corolla majore, necnon staminodiis nisi fallor dicens hæc plantæ nostræ deesse. *B. Mackenii* capsula itaque 1·5 cm. longitudine, longius rostrata, pubescens, coriacea, plana.

Herba radice lignescente polycephala perennis, pluricaulis caulibus prostrato ascendentibus. Caulis passim pallide rufus vel violascens, internodiis quam ii *B. Mackenii* multo brevioribus (4·0 cm. in exemplariis nostris nunquam excedentibus). Folia ad 6·0 cm. long. et 3·5 cm. lat., exstant vero minora: petioli brevissimi, lati. Bracteæ ad 1·5 cm. long., persistentes. Flores albi, tubo purpurescente. Calycis lacinia antica 2·0 cm. long., 1·3 cm. lat., basi 3 apice 2-nervia, minute reticulata, sub fructu ampliata. Corolla vix 3·0 cm. long. Capsula 1·2 cm. longitudine, nitida.

B. ALATA (sp. nov.)—Caule ramoso subtetragono crebre ac molliter puberulo, foliis ovatis acuminatis integris in petiolum late

alatum desinentibus pagina superiore obscure scabriusculis nitidis inferiore ad nervos appresse hispidulis, floribus axillaribus solitariis breviter pedunculatis, bracteis parvis linearibus viridibus, calycis lacinia antica quam postica vix majore oblongo-ovata apice integerrima obtusa viridi laciniis lateralibus lanceolatis pallidis omnibus (sed precipue exterioribus) una cum bracteis pedunculoque glanduloso-pubescentibus, corollæ tubo sub fauce parum ampliato limbi subæqualis lobis oblongo-ovatis, staminibus perfectis 2 staminodiis 3 minimis altero more *B. Mackenii* altius connato, capsula brevi eximie rostrata 2-sperma, seminibus subquadrangularibus magnis.

Hab. In dumetis rupestribus circa Barrancos de Catete distr. Pungo Andongo et in sylvis umbrosis de Queta distr. Golungo Alto. (Nos. 5147, 5148, 5169, 5194, 5195.)

B. lancifoliæ, T. And., proxima et diversa præsertim caule ægre pruinoso, foliis majoribus alato-petiolatis, corollæque minoris limbo omnino dispari. Videtur itaque cum *B. Mackenii* et *B. polyneura* comparanda, sed ob folia magna alato-petiolata, bracteas calycisque lacinias multo minores et glanduloso-pubescentes, necnon flores minores primo intuitu dignoscenda.

Herba suffruticosa basi lignescens digit crassa ramosa caule ramisque supra rupes decumbento-ascendentes. Folia usque ad 8·0 cm. long. et fere 5·0 cm. lat., petioli circiter ad 4·0 cm. long. Bracteæ 1·0 cm. longitudine. Calycis laciniæ exteriores 1·2 cm. long., radiatim nervosæ, interiores carinatas acuminatas fere duplo superantes. Corolla vix 2·5 cm. long., extrorsum puberula, lobi subæquales circiter 1·5 cm. long. Capsula 1·8 cm. long. superne dorso pubescens. Semina circa 0·5 cm. long., albido-brunnea. Huic affinis exstat species sequens.

B. Welwitschii (sp. nov.)—Caule subtereti obscure nodoso pubescente, foliis oblanceolatis obtusis basi longe attenuatis membranaceis fere glabris, floribus breviter pedunculatis, bracteis juxta medium pedunculum insertis linearibus obtusis puberulis quam calyx brevioribus, calycis laciniis exterioribus fere omnino æqualibus obovato-oblongis obtusis integris puberulis interioribus parvis linearibus acutis decoloribus, corollæ tubo lato a basi sensim ac leviter amplificato limbo tubo fere æquilongo lobis rotundatis, staminibus 2 staminodiis 3 subæqualibus (mediano minore) subulatis distantibus basi puberulis, capsula.

Hab. In petrosis dumetosis inter Lombe et Quibinde distr. Pungo Andongo. (No. 5091.)

Herba pedalis vel ultra. Radices rigidæ, simplices. Folia ad 10·0 cm. long. et 2·5 cm. lat. parum nervosa. Pedunculus 0·3 cm. long., puberula. Calycis laciniæ exteriores 1·7 cm. long. Corolla lactea, 3·0 cm. long., limbus ejus ultra 2·0 cm. diametro, tubus 0·4 cm. diametro.

B. villosa (sp. nov.)—Caule ad 4-pedali tetragono geniculato villoso-pubescente, foliis longe petiolatis ovatis acuminatis basi parum obliquis supra appresse pilosis subtus villosis, floribus in axillis superioribus plerumque 2–3-nis vel terminalibus,

bracteis linearibus obtusiusculis, calycis lacinia antica oblonga biloba lobis linearibus acuminatis laminæ fere æquilongis laciniis lateralibus angustissimis quam exteriores circiter duplo brevioribus omnibus una cum bracteis villosis intus glabris, corollæ tubo basi uniformi superne gradatim ampliato limbi lobis ovatis, staminibus perfectis 4, duobus minimis filamento sterili basi ampliato superne filiformi, capsula ignota.

Hab. In dumetosis siccioribus edit. Sobati de Quilombo distr. Golungo Alto. (Nos. 5070, 5071.)

Folia 5–8 cm. long., superiora lanceolata fere sessilia; petiolus ad 3·0 cm. long., villosus. Spica terminalis circiter 4·0 cm. long. Bracteæ 1·7 cm. long., 1-nerviæ. Calycis lacinia antica ad 1·5 cm. long., lobi ejus 0·7 cm. long. Corolla lacteo cærulea vel cyanescens tubo pallide flavescente extus pubescente.

Ex affinitate *B. opacæ*, Nees, quæ forsan eadem ac *B. ventricosa*, Hochst.: ceterum ob vestitum, foliorum formam, bracteas longiores ac angustiores, calycis laciniam anticam longius ac diverse bilobam, staminum antheras minores vix cum ea conspecifica.

B. STELLATO-TOMENTOSA (sp. nov.)—Caule erecto robusto sparsim ramoso subtereti ad nodos tumido dense stellato-tomentoso ætate glabro, foliis subsessilibus ovato-oblongis vel oblongis vel lanceolatis obtusis vel stellatim pubescentibus necnon interdum supra fere glabris subcoriaceis patentibus, fasciculis omnibus terminalibus subsphæroideis multifloris, bracteis firmis amplis extremis cordato-ovatis interioribus angustioribus obtusis eleganter reticulatis extus ad nervos et marginem stellatim ac simpliciter hirsutis demum fere glabris intus omnino glabris, calycis lacinia antica breviter æquilateraliter 2-loba lobis deltoideis obtusis laciniis lateralibus ea paullo brevioribus lineari-subulatis acuminatis omnibus pilis simplicibus ac stellatis hirsutis, corollæ tubo satis tenui ad staminum insertionem pilorum annulo cincto limbi lobis ovatis obtusis, staminibus perfectis 4, 2 antheris minimis staminodio filiformi, reliquis partibus ignotis.

Hab. Non frequens in dumetis apertis argillaceis prope Lombe distr. Pungo Andongo. (Nos. 5165, 5095.)

Herba suffrutescens, e radice lignosa 3–4-caulis, caulibus erectis. Pili omnes flavidi. Ramuli pilis simplicibus ac stellatis tomentosi. Folia 3·5–7·0 cm. long., juvenalia tomentosula, pilos fere omnes stellatos ferentia. Bracteæ extremæ 2·0 cm. long., 1·3 c.m. lat., ex sicco ad dimidium superius purpurascentæ. Calycis lacinia antica 1·6 cm. long., laciniæ laterales haud induratæ. Corollæ limbo circiter 2·0 cm. diam. Flores violaceo-cærulescentes.

Una cum *B. Hildebrandtii* nob. caule robusto, foliis stellatim tomentosis, fasciculis terminalibus pilisque dimorphis gaudet, sed ejus caulis crebre ramosus mox glaber cortice cinereo (in nostra pallide flavido) obtectus, folia multo minora, capitula parva pauciflora, bracteæ omnino diversæ, corollæ minoris lobi rotundati retusi, staminodia 2 filiformia.

B. SALICIFOLIA (sp. nov.)—Erecta, heterophylla, caule robusto

superne ramoso subtereti pallide fulvo-stellato-tomentoso demum fere glabro, foliis firmis elongatis inferioribus breviter petiolatis lanceolatis superioribus subsessilibus lineari lanceolatis omnibus acutis margine undulatis pagina superiore appresse pilosis mox omnino glabris pagina inferiore albide stellato-tomentosis deinde pubescentibus, floribus ad apicem caulis vel ramulorum brevium fasciculatis, bracteis exterioribus oblongo-ovatis interioribus lanceolatis extus hirsuto-pubescentibus intus minute puberulis reticulato-nervosis, calycis lacinia antica late oblonga breviter lateque biloba lacinia postica oblongo-ovata breviter acuminata quam antica paullo breviore laciniis lateralibus inclusis linearibus carinatis laciniis omnibus (sed præsertim antica et postica) extus præcipue ad marginem hirsutis, corollæ tubo inferne tenui mox gradatim amplificato calycem paullo excedente limbi lobis rotundatis, staminibus perfectis 2 staminodiis 2 perbrevibus anthera biloba minima fortasse haud pollinifera coronatis.

Hab. In distr. Pungo Andongo ad Lombe, Candumba, Quibinda et Condo. (Nos. 5102, 5103.)

Caulis ad nodos obscure tumidus. Folia 12·0 cm. long. vel minus, inferiora 3·5–5·0 cm. superiora 2·0 cm. lat., subtus aperte reticulata, petioli foliorum inf. ad 1·5 cm. long., basi dilatati. Bracteæ exteriores 2·5 cm. long., circa 1·3 cm. lat., firmæ. Calycis lobi obtusissimi.

Præcedenti affinis sed multis de notis dispar.

B. pungens, L., var. *macrophylla*, Nees (*B. elegans*, mihi in schedis). —Caule subtetragono ramoso glabro vel appresse minuteque papuloso ad nodos pilis paucis strigosis induto, foliis ovato-lanceolatis lanceolatisve basi in petiolum brevem gradatim abeuntibus apice breviter spinulosis margine vix integris subtus secus nervos sparsim appresse hirsutulis, fasciculis axillaribus sessilibus elongatis strobiliformibus multifloris, bracteis sterilibus lineari-lanceolatis sparsim spinosis fertilibus ventralibus lanceolatis recurvis obscure carinatis dorsalibus majoribus ovatis omnibus apice et margine spinosis pubescentibus vel fere glabris, calycis laciniis exterioribus bracteis subsimilibus extus puberulis interioribus linearibus acuminatis integris pubescentibus, corollæ tubo juxta medium contracto superne ampliato puberulo limbi subregularis lobis rotundatis, staminibus perfectis 2 filamentis basi pubescentibus staminodiis 2 antheris minimis coronatis tertio ea æquante filiformi, capsula oblonga nitida 4-sperma.

Hab. In distrr. Bumbo ac Loanda. (Nos. 5034, 5068, 5122, 5114, 5187.)

Itaque mihi sunt obvia specimina ex Ambriz a Monteiro missa, Loando a Soyaux (No. 26), et Natal a Gerrard (No. 1681).

Suffrutex 2–4-pedalis. Folia ad 8·0 cm. long. et 3·0 cm. lat., plerumque vero minora. Fasciculi 3·0–4·0 cm. long. Bracteæ circiter 2·0 cm. long., dorsalium spinæ marginales 0·7 cm. long. adjectis minimis. Calycis lacinia antica vix 1·5 cm. long.; laciniis interioribus circiter 1·0 cm. long. Corolla 3·0 cm. long., pallide cærulea. Capsula 1·6 cm. long., apice acutata.

B. Carruthersiana (sp. nov.)—Hirsuta, caule ascendente quadrangulari 0·1 cm. crasso, foliis distantibus ovato-lanceolatis in petiolum brevem attenuatis mucronulatis in sicco pallide viridibus, spicis terminalibus vel axillaribus subsessilibus ovatis foliis brevioribus, bracteis sterilibus obsoletis fertilibus secundis ovatis acuminatis argute spinuloso-dentatis eleganter reticulatis membranaceis, calycis segmentis exterioribus bracteis consimilibus sed majoribus interioribus linearibus acuminatis, corollæ tubo calycem vix excedente sat tenui gradatim ampliato limbi lobis ovatis æqualibus, staminum 2 filamentis inter se liberis, staminodiis subulatis basi hirsutis, capsula ignota.

Hab. In dumetis ad sylv. oras prope Quitibe de Cima. (No. 5040.)

Caulis pilos albidos breves ferens adjectis præcipue in nodorum vicinitate paucis strigosis patenti-erectis : internodia ad 9·0 cm. long. Folia 4–9 cm. long., 2–3·5 cm. lat., maxima pro parte secus nervos hirsuta. Spicæ 3–4 cm. long. circiter 2·5 cm. lat. Bracteæ 2·0 cm. long., vix 1·5 cm. lat., ex sicco pallide virides. Flores cærulei. Calycis segmenta exteriora fere subæqualia circiter 2·0 cm. long., extus appresse pilosa intus puberula : segmenta interiora 1·4 cm. long., glanduloso-pubescentia. Corollæ limbus circiter 1·4 cm. diam. Staminodia vix 0·2 cm. long.

A *B. capitata*, Klotzsch, species revera mihi descriptione tantum obvia, abhorret caule quadrangulari, internodiis longioribus, foliis majoribus supra in sicco haud atratis, bractearum sterilium absentia, bractearum fertilium fere æquimagnitudine; a *B. Lichtensteiniana*, Nees cui proxima, caule ascendente, foliis diversis, bracteis, &c.

Species dubiæ.

B. sp. nov.? aff. *B. acanthoidi*, Vahl.—Foliis oblanceolatis acutis pubescentibus 2·5–3·5 cm. long., floribus solitariis breviter pedunculatis, bracteis parvis lanceolatis rigidis ad medium pedunculum insertis, calycis laciniis exterioribus ovato-lanceolatis acutis decoloribus margine spinuloso-dentatis vel fere integris vix 1·5 cm. longis quam interiores lineari-lanceolatæ paullo brevioribus, floribus ignotis, capsula acutata haud rostrata quam calyx paullo breviore. (Nos. 5024, 5013.)

B. sp. nov. aff. *B. salicifoliæ* nob.—Glabra, caule elato, foliis oblanceolatis usque ad 10·0 cm. long., floribus in axillis superioribus fere sessilibus, bracteis calycisque laciniis exterioribus subæqualibus lanceolatis apiculatis circa 1·7 cm. long., flore uniço haud examinato capsula immatura breviter rostrata circa 0·8 cm. long. (No. 5162.)

No. 5119. Specimen mancum.

(To be continued.)

ON THE FLORA OF NORTH-WESTERN DONEGAL.

By Henry Chichester Hart, B.A.

In continuation of my former papers on this subject (see 'Journ. Bot.' for 1879), I now beg to offer the results of my explorations carried on during the year 1879; from which it will appear that this remote and mountainous district is not without its fair proportion of rarities. I feel especial pleasure in being able to add to the list three alpine plants so rare in Ireland as *Saussurea alpina*, *Saxifraga hirta*, and *Polygonum viviparum*.

The following are also important additions to the flora of the county:— *Potamogeton filiformis*, *Festuca sylvatica*, and *Zostera nana* (?); while, although not indigenous, the occurrence of *Allium Babingtonii* extends considerably the known range of this nearly disused pot-herb.

Altogether, since I commenced the careful investigation of the Botany of Donegal, I have succeeded in adding nearly 100 species of flowering plants and ferns to the list of the county as it stood in 1866, the date of the publication of the 'Cybele Hibernica.' Of these, the five or six alpine species considerably increase the interest of the flora, and place Donegal in its proper botanical position as the most northern in Ireland. In my previous list I enumerated 525 species; in the present paper there are 72 additions, making a total of 597 species. By the addition of a few plants which I have omitted from the above total as being varieties, or sub-species, the flora of North-West Donegal may be set down at 600 plants at the lowest. So little was the flora of the county known in 1866 that the whole number was then reckoned at 550 species, and of these 40 have not been observed in my district. By adding this last number to the 600 above given, we shall have a present total of 640 species, so that the entire list for the county may be expected to reach a total of at least 650 species.

The following plants are additions to District 11 of Moore and More's 'Cybele Hibernica':—

‡Thalictrum minus.
*Corydalis lutea.
Lepidium Smithii.
Sagina apetala.
†Acer campestre.
*A. Pseudo-platanus.
†Prunus Cerasus.
Pyrus Malus.
Rosa arvensis.
*Ribes Grossularia.
Saxifraga hirta.
[S. Cymbalaria].
†Apium graveolens.
Æthusa Cynapium.
*Petroselium sativum.
†Valerianella dentata.
*Petasites fragrans.
[Antennaria margaritacea].
Saussurea alpina.
‡Cichorium Intybus.
Lamium incisum.
‡Lysimachia Nummularia.
Polygonum viviparum.
Callitriche hamulata.
†Salix Smithiana.
*Iris fœtidissima.
‡Allium Babingtonii.
Zostera nana (?).
Potamogeton filiformis.
Festuca sylvatica.

‡*Thalictrum minus*, L.—Has appeared at Glenalla in cultivated ground in 1878, 1879. Perhaps introduced as an ornamental plant.

Ranunculus sceleratus, L.—This plant seems to be local and rare; it occurs between Aughnish Island and Whale Head, and at Carn Mill, near Ramelton, on the shores of Lough Swilly; near Burton Port on the roadside to Kadew Strand.

R. heterophyllus, Sibth., var. *Baudotii*, Godron.—Tory Island, R. W. Barrington; Drimnacraig, F.

Trollius europæus, L.—The range in my district of this most interesting Donegal plant appears to be as follows:—In several places upon the shores of Lough Gartan, and along the River Lennan from that lake to Lough Fern; upon the shores of Lough Fern, especially below Moyle, and on an island in Lough Fern; along the river again towards Ramelton, but no farther than Bally Arr. For this information I am chiefly indebted to my friend, the Very Rev. Dean Gwynn.

Papaver dubium, L.—Very local. Between Whale Head and Ball Green; shores of Kimylough, F.

**Corydalis lutea*, DC.—Naturalised and thoroughly established for many years on old walls, &c., at Greenfort, in Fanet.

Arabis hirsuta, R. Br.—Near Macamish on the point next north of the Fort in small quantities; by Sheephaven, near Rosepenna, Carrigart.

**Cheiranthus Cheiri*, L.—Well established and abundant on Doagh Castle.

Cardamine sylvatica, Link.—Glen Alla, Ballymacoole, Rathmullen, &c.

Draba verna, L.—Flowering April and August at Rathmullen, 1879, and as late as Sept. 5 in the same year at Rosepenna, near Carrigart. Lighthouse at Aranmore.

†*Lepidium Smithii*, Br.—Extremely rare, roadside near Manorvaughan, where it may have been introduced.

Capsella Bursa-pastoris, DC.—Local, and in some places abundant; diminishing westward, where it is rare, and probably not native.

Sabularia aquatica, L.—In Lough Carban, north-west of the Gap of Barnesmore, Prof. E. Murphy; accidentally omitted in my former list.

Viola arvensis, Murr. (*V. tricolor*, L., var.)—Whale Head; Fanet; Lough Fern; F.

V. Curtisii, Forst.—Kadew Strand, near Burton Port. Marble Hill Strand, in company with the variety *V. Mackaii*.

Drosera anglica, Huds.—Between Bulbein Mount and Mamore Gap, this species is very local, and becomes rarer to the east.

Parnassia palustris, L.—Very local. Sand hills about a mile to the south-east of Kincashla Tower, and along the northern shores of Mullaghderg Lake. On Carrick Finn Island to the west of Bunbeg.

Elatine hexandra, DC.—Very rare. In the River Clady at the Gweedore Hotel.

Silene maritima, With.—Sandy sea-shore between Aughnish

Island and Ball Green; Carraleena, and between Ray and Ramelton.

Sagina apetala, L.—Aranmore and Hornhead.

‡*Lychnis Githago*, Lam.—Carrablagh and Hornhead. This plant always appears most plentifully amongst the vetches, and appears to be introduced with them, afterwards springing up occasionally with other crops.

Stellaria graminea, L.—Shore of Lough Fern, near Moyle; Whale Head to the east of Ramelton; at Ards; abundant in hedges by the side of an old road at Ardromin, between Ramelton and Letterkenny.

Cerastium tetrandrum, Curt.—Macamish Point, Lough Swilly; Aranmore.

†*Althæa officinalis*, L.—Plentiful in a marshy pool on Carrick-Finn Island to the west of Bunbeg. There are a couple of cabins close by, and an old woman of one of them told me "it had always grown there." It looks native, but is open to reasonable suspicion.

‡*Acer campestre*, L.—On an island in Lough Fern.

**A. Pseudo-platanus*, L.—In many places; and sowing itself freely, especially upon peat.

**Erodium moschatum*, Sm.—Very rare, but established at Rathmullen in a few places.

Trifolium medium, L.—Very local; Aranmore, by the sea-shore, near Mrs. Charley's residence, both north and south of it.

Trifolium procumbens, L.—Frequent. F. Accidentally omitted from my former list.

‡*Vicia hirsuta*, Koch.—Rare. Near Ramelton, by the side of the upper road to Fort Stewart; Drumalla; between Carn and Ramelton by the shores of Lough Swilly.

Lathyrus macrorrhizus, Wimm. Frequent. F. Accidentally omitted previously.

†*Prunus Cerasus*, L.—On an island in Lough Fern; roadside near Marble Hill, Dunfanaghy; frequent about Lough Gartan; in Fanet, near Croaghross; in many places about Lough Fern and Kilmacrennan, where it bears all the appearance of a native. F.

Pyrus Malus, L.—In several places about Aughnagaddy and native; in the neighbourhood of Kilmacrennan, and between that and Lough Fern.

[*P. communis*, L.—Roadside near Rathmullan, well established, but probably remnants of an old orchard.]

Agrimonia Eupatorium, L.—Rather rare and local. Macamish Point, Whale Head, and near Ramelton, upon the shores of Lough Swilly; near Clontallagh on Rossgull; Burton Port.

Rubus saxatilis, L.—Local and rather rare. Only at the northern extremity of Lough Keel; sparingly upon Bulbein Mount; at Ards, near the sea, upon the northern part of the east shore of the "Back Strand."

R. fruticosus, L.—Under this name I may mention that the prevailing forms in my district appear to be *R. discolor*, W. and N., *R. carpinifolius*, W. and N., *R. suberectus*, Anders., and *R. plicatus*,

W. and N., so far as I can identify them from Babington's Manual.

Geum rivale, L.—Rare; by Ballyconnelly Bridge, Glen Alla.

Rosa arvensis, Huds. Very rare. Banks by the roadside near Croaghross abundantly. F.

R. tomentosa, Sm.—Common throughout the district; but, as far as my observation goes, less so than *R. canina*, L.

Epilobium hirsutum, L.—Very rare. By a small stream running to the Bottom shore below the bailiff's cottage. F.

E. parviflorum, L.—Scarce. With the last. F.

Circæa alpina, L.—Hills behind Sesiagh Lake, Dunfanaghy. Woods by Lough Gartan, near Churchill.

Myriophyllum spicatum, L.—Lough Conny, near Milford; near Loughkeel Village.

Lepigonum marinum, Wathb.—Local. Muddy salt marshes between Ramelton and Whale Head, and between Ramelton and Ray.

L. salinum, Presl.—Local. Burton Port.

Spergula arvensis, L.—This corn-field weed is perhaps indigenous; it often appears in the greatest abundance upon the first breaking up and reclamation of a turf bog.

Sedum Rhodiola, DC.—This plant increases in abundance to the westward; it is profusely common on Aranmore. The leaves in the autumn pass through all shades of purple rose and red, and in many places, as upon Breaghy Head, on the western face of Aranmore and upon Sheephaven below Ganiamore Mount, they lend a conspicuous glow to the cliffs.

[*Ribes Grossularia*, L.—Thickets along the shore of Lough Swilly between Drumalla and Fort Royal, with hazel and oak; quite apart from existing cultivation.]

Saxifraga hirta, Sm.—Extremely rare. I found one small colony of this Saxifrage in Polldoo, about two hundred feet above sea-level, at the south-western corner of Aranmore. Hitherto known only on Brandon and Galtymore. The Donegal plant is more hirsute than any others I have seen.

[*S. Cymbalaria*, L.—Established for many years on old moss-grown walls near the steward's house, Glenalla.]

S. oppositifolia, L.—Very rare and local. Abundant upon Bulbein Mount in Innishowen from 1300 to 1580 feet above sea-level.

†*Apium graveolens*, L.—Very rare, and a doubtful native. Sea-shore between Ray and Carraleena; marshy ground near the sea at Port-na-blagh, near Dunfanaghy.

Helosciadium ochreatum, DC.—This form of *H. nodiflorum*, Koch, grows with it by the sea-shore of Lough Swilly at Ramelton, both maintaining their respective characteristics.

Pimpinella Saxifraga, L.—Very rare and local. Could not in 1878 or 1879 find this plant in the Fanet locality already given. It grows, however, plentifully upon sandy pastures between Burton Port and Kadew Strand, near to the latter.

Œnanthe crocata, L.—Local and rare. In several places along

Lough Swilly by the edge of high water mark between Rathmullen and Ray, between Ray and Ramelton, between Ramelton and Augnish Island, and on to Whale Head and Fort Stewart, in company with *Aster Tripolium* and other maritime plants. Shore at Burton Port in small quantities. I have not seen it inland in Donegal.

Œ. Phellandrium, Lam.—Very rare. The locality given previously for this species belongs to the last-mentioned plant. *Œ. Phellandrium* grows in a ditch by the roadside between Milford and Glentidaly, close to Glentidaly.

†*Æthusa Cynapium*, L.—Abundant about the abbey ruins at Rathmullen.

Crithmum maritimum, L.—Local and rare. Hornhead, near the gap of Doon, Rev. Alex. Stuart; near Tramore Strand, and at Pollaquill Bay, Hornhead; Rossgull upon Sheephaven from Rinnafaghla Point southwards.

Angelica sylvestris, L.—Common. This is the most ubiquitous umbellifer in Donegal, occurring as it does on sea-side cliffs or on sea-shores, low-lying or elevated bogs, mountain streams, alpine gullies, or in rich pasture land.

[*Petroselinum sativum*, Hoffm.—Thoroughly established and in profusion at Rathmullan Abbey.]

Torilis Anthriscus, Gaert.—Though local, occurs as far west as Carrigart.

**Myrrhis odorata*, Scop.—Very rare. Ramelton Churchyard, the Very Rev. Dean Gwynn. Tully Churchyard; by the stream near Ray, remnant of an old garden.

‡*Smyrnium Olusatrum*, L.—Very local. About Ray; Doagh Castle.

**Sambucus Ebulus*, L.—Very rare.—Roadside banks near Losset, between Kilmacrennan and Churchill.

Viburnum Opulus, L.—Local and rare. Glenalla, near the milldam; by the stream at the head of Auchterlinn; banks of the Lennan near Ramelton, Dean Gwynn; south-eastern end of Lough Fern; by the side of an old road near Ardromin; Claragh.

†*Galium Aparine*, L.—In an unusually wild locality on the western shores of the Bloody Foreland; as a rule a weed of cultivation.

Valerianella olitoria, Mœnch.—Very rare. Roadside at Ray; on sandy pastures at Macamish Point, an undoubted native in the last-named station.

‡*V. dentata*, DC.—Extremely rare. Banks near the sea by corn-fields between Whale Head and Ball Green.

(To be continued.)

SHORT NOTES.

West Sussex Plants.—*Carex stricta*, Good. This plant is recorded for Sussex in 'Topographical Botany,' on the authority of Mr. Borrer, but with a mark of doubt as to which division of

the county it belongs. In June last I found it growing rather plentifully in one spot by the River Adur, near Partridge Green (West Sussex), and this is very probably the locality in which Mr. Borrer observed it, as it is within a few miles of his house.—*Carex elongata*, L. This is not recorded for Sussex in 'Top. Botany.' Though not very common, large tufts of it occur at intervals along the banks of the Wey and Arun canal between Billingshurst and Loxwood. This canal, which is now disused, is rich in *Carices*, and I collected along its banks *C. Bœninghauseniana*, *C. axillaris*, and a subcæspitose form of *C. acuta* with some leafless sheaths at the base of the stem. Without offering any opinion as to whether *Carex Bœninghauseniana* is a cross between *C. remota* and *C. paniculata*, as has been supposed, I may remark that the latter plant does not occur along the eight or nine miles of the canal which I traversed.—*Chara mucronata*, Br. I fear this plant will not again be seen in its old station. Mr. Borrer found it in a ditch near the lock, West Grinstead. Since the railway has been built, the coal-traffic on the River Adur has ceased, and the lock alluded to has long been permanently open. The consequence is that the river now merely runs along its bed some eight feet below the level of the adjoining meadows, nearly all the ditches in which have accordingly become dry, and many, no doubt, filled up. — *Chara prolifera*. I looked for this for a day and a half in the marshes about Brookside, Henfield, the only English station for which it is recorded, but without success. These marshes are, however, of considerable extent, and are intersected by such numerous dykes that it is quite possible that this species may still be found here, but it can only occur very locally. Lower down the river-valley, near Bramber, *Chara fœtida* var. *papillata* occurs. This is already recorded for *East* Sussex (among other counties) by the Messrs. Groves. In order to prevent future misunderstanding as to their nativity, I may add that *Euphorbia pseudo-cyparissias* and *Equisetum sylvaticum* occur as escapes from Mr. Borrer's garden.—W. H. Beeby.

Potamogeton lanceolatus, *Smith*, in Cambridgeshire. — I gathered specimens of this plant from a ditch on Burwell Fen, Cambridgeshire, on August 4th. It was growing in one place only, so far as I saw, and with *P. plantagineus*, Ducr. It matches the Kew Herbarium specimens exactly.—Arthur Bennett.

Cesia obtusa, *Lindb.* (p. 243).—In addition to the station mentioned by Mr. George Stabler for this new species, may be mentioned Glen Finnan, Inverness, Dr. Carrington, July, 1876; Cader Idris, Merionethshire, W. H. Pearson, July, 1876; Loch-nagar, Aberdeenshire, J. and T. Sim, August, 1876; Cader Idris, Merionethshire, E. M. Holmes, August, 1878; Llanberis, Carnarvonshire, E. M. Holmes, August, 1878; top of Snowdon, Carnarvonshire, J. R. Byrom, J. Neild, and W. H. Pearson, June, 1880.—W. H. Pearson.

Centunculus minimus, *L.*, in Warwickshire.—The first record I find of the occurrence of this plant in Warwickshire is a manuscript note in a copy I have of the 'Botanist's Guide,' 1805, which is as follows:—"*Centunculus minimus*, Bull's field and near Moor Hall, Sutton Coldfield. J. P. Cottage, Atherstone." My copy of the 'Botanists' Guide' formerly belonged to a Mr. Power, who, I am informed, was one of the Professors of Cambridge University. The next record is from Oversley Wood, near Alcester, where it was found by Mr. T. J. Slater during a visit he and I made to that place in August, 1878. During the present month (August) I have had the pleasure of finding the plant in a third Warwickshire habitat, in damp sandy drives in a wood near Combe Abbey. In both the above localities I find it associated with *Peplis Portula* and *Sagina apetala*. This is an additional county record to those given in Mr. H. C. Watson's 'Topographical Botany.—James E. Bagnall.

Potentilla Sibbaldi, *Haller* fil.—It appears that this is the correct name of the plant which British botanists usually call *Sibbaldia procumbens*, L. Mr. J. T. Boswell Syme (now J. T. Boswell), in 'English Botany,' vol. iii., pp. 142–3, reduced *Sibbaldia* to a subgenus of *Potentilla*, styling our plant *P. Sibbaldia*, ascribing more than enough credit to William Wilson for pointing out the insufficient characters by which the present species had been made the type of a new genus and separated from *Potentilla*. Wilson's remark was published in Hooker's 'British Flora,' ed. i. (1830), p. 148, and remained unaltered through all the successive editions —a period of thirty years. Grisselich, however, had previously made the same reduction in his comparatively unknown work, 'Kleine botanische Ochriften' (1836). Sir J. D. Hooker was the first to revive the name at the head of this note in the 'Flora of British India,' part v., p. 345 (recently issued, but not dated), and he is followed by Dr. Aitchison in his paper on the 'Flora of the Kuram Valley,' in the last number of the 'Journal of the Linnean Society.' The name *Potentilla procumbens*, Clairv., given in the 'Students' Flora,' ed. ii., p. 120 (1878), is untenable, because already appropriated by Sibthorp, 'Fl. Oxon,' p. 162 (1794). I take the following to be a correct statement so far as it goes:—

Potentilla Sibbaldi, Haller fil. (1820).
Syn. *P. procumbens*, Clairv. (1811), non Sibth.
P. Sibbaldia, Grisselich (1836), Syme (1864).
Sibbaldia procumbens, Linn. (1753).

—B. Daydon Jackson.

Polygonum maritimum, *L.*, in West Cornwall.—While botanising with Mr. Ralfs for a day in Falmouth neighbourhood, I found a specimen of *Polygonum maritimum* on one of the sandy beaches near there. This is interesting, as extending the western distribution of this plant in Britain. No doubt, had there been more time to enable us to search other similar situations around, other specimens might have been found.—James Groves.

Notices of Books and Memoirs.

La Phytographie, ou l'art de décrire les végétaux considérés sous différents points de vue. Par Alph. de Candolle. Paris : Masson, 1880. 8vo, pp. xxiv., 484.

Réforme de la Nomenclature Botanique. Par le Dr. Saint-Lager. Lyon : Ristor, 1880. 8vo, pp. 155.

Proserpina. Studies of wayside Flowers, while the air was yet pure among the Alps, and in the Scotland and England which my father knew. By John Ruskin. Orpington. Vol. i. [1874–] 1879. 8vo, pp. 287.

We have here grouped under one heading three works of very different aim and character, whose claim to be considered together is that each is concerned with the names given to plants by botanical writers.

M. De Candolle's book is very pleasant reading. In going with the author through his various subjects, we are conscious of being conducted by a guide whose long experience, exceptional training, and philosophical method of looking at things, signally qualify him to point out the best way for future botanists to take when working at some branch of descriptive Botany. The author does not attempt to lay down any rules for investigating vital phenomena, the growth of particular organs, and general physiological problems; his experience having been chiefly gathered in other channels, he was perfectly right to confine his remarks to ground so familiar to him, and about which his observations would tell with greatest effect.

After some general preliminary remarks, the relative amount of publicity to be attained by publication in journals, transactions, or separate treatises is discussed; next, the use of Latin for descriptions is urged, not at all too strongly; then we find hints as to methods of working and recording, passing on to the treatment of natural groups of plants, and how they should be described. Nearly thirty monographs are cited by name, and separately criticised or praised, and local floras afterwards receive their share of praise and blame. Next in order we find rules submitted to regulate our choice of terms in drawing up the descriptions themselves, which rules we would commend to the thoughtful consideration of many botanists of the present day who appear more careful to coin their own special names than to simplify nomenclature and reduce it to its lowest terms.

The terms *glaucus* and *pruinosus*, *lanceolatus* in its sundry different shades of signification, and the much debated *sinistrosum* vel *dextrosum volubilis*, are next brought into the arena. The conclusions arrived at are consistent with Linnæus's definition, "Sinistrosum hoc est, quod respicit sinistrum, si ponas te ipsum in centro constitutum, meridiem adspicere, dextrorsum itaque contrarium." Phil. bot., p. 103 (1751). Mathematicians may object to some of

the arguments, but will assent to the results, although many botanists have adopted the contrary method; the whole gist of the matter is the direction of looking either up, or down the axis. The last is that practically advocated by M. De Candolle, although the plan adopted in Bentham and Hooker's 'Genera Plantarum' is the contrary.

Next in order, microscopical observations, style in descriptions, abbreviations, orthography, and so on, are handled, bringing us to the chronological account of plant description, only sixteen pages in length, but very suggestive.

The second part consists of "Preuves des descriptions," and is certainly the most important part of the book; the main portion is devoted to an alphabetical list of botanical writers, with a record of the present situation of their types of species. Here we must close our brief recapitulation of the contents of a volume which offers on every page temptation for extended digression.

The second volume in our list is the production of a different stamp. It is the work of a classical purist who would unhesitatingly alter every botanical name, generic and specific alike, which does not square with the canons laid down by the author. In our opinion Linnæus exercised great discretion in not dealing too harshly with many of the names which had been consecrated by long usage; but Dr. Saint-Lager laughs such temporising latitudinarians to scorn; he would entertain no pity for the names he includes in his black list, such pity as the Congress of 1867 so weakly showed. Here is a sample of the names recommended in lieu of those still in common use:—

Æsculus Hippocastanum	.	to be Æ. castanea.
Antirrhinon (*sic*) Asarina	.	,, A. quinquelobatum.
Asplenon (*sic*) Nidus	. .	,, A. neottium.
Cactos (*sic*) Opuntia	. .	,, C. opuntius.
Carex dioica	. . . .	,, C. dioiscostrongyla.
Clypeola Jonthlaspi	. .	,, Jonthlaspi clypeatum.
Datura Metel	. . . .	,, D. metelia.
Glechoma hederacea	. .	,, Glechonion hederaceum.
Kleinia Anteuphorbium	. .	,, K. anteuphorbia.
Lamium Orvala	. . . .	,, L. phalacranthera.
Lathyros (*sic*) Aphaca	. .	,, L. filipetiolatus.
L. Nissolia	. . . .	,, L. foliaceopetiolatus.
Melaleuca Leucadendron	.	,, Meladendron leucocladum.
Narcissos (*sic*) Pseudo-narcissus		,, N. grandiflorus. [non *Salisb.*]
Orobanche Rapum	. . .	,, O. sarothamnophyta.
O. Scabiosæ	. . . .	,, O. scabioshærens.
Ranunculus Flammula	. .	,, R. lanceolatus, *C. Bauh.*
Viburnum Lantana	. .	,, V. lentum.
Zizyphon (*sic*) Jujuba	. .	,, Z. jujubum.
Zygophyllon (*sic*) Fabago	.	,, Z. fabagineum.

Some of the names here proposed for adoption recall those proposed by C. R. W. Watkins, "Late Captain in the Bombay Army," in his 'Principles and Rudiments of Botany' (1858).

Examples:—

Adenikona instead of Adenanthera.
Afallanthus ,, Aphyllanthus.
Dirythmæ for the Sweetwilliam.
Zygofallæ instead of Zygophyllum—(p. 13).

The airy manner in which Dr. Saint-Lager proposes to constitute new generic names, as *Glechonion* and *Meladendron*, as well as to set aside names like *Anteuphorbium* and *Aphaca*, which were perfectly well known as single names long before Linnæus came into existence, shows his eminent unfitness for universal censorship. The comparison between such names as "Sulphate d'Epsom" and "Arsenite de Scheele' with modern botanical nomenclature is singularly unapt; the names given by the herbalists of the Middle Ages indeed might be adduced as their phytological equivalents. More than enough has been said on this head; the book is worth reading by those who are careless in name-making, but it is fortunately powerless to set aside accepted nomenclature; what Salisbury could not do, seventy years ago, will not be accomplished now by Dr. Saint-Lager.

Some apology may be expected for introducing here the singular production of Mr. Ruskin; nevertheless the step from our last book to this is not so great as might be thought. But whereas Dr. Saint-Lager mostly kept within limits respected by botanists, Mr. Ruskin at once breaks out of bounds. With his accustomed fluency he runs on, heaping abuse upon "unscholarly botanists" who call a plant this or that, and then passing on to praise Linnæus's language, all the while unknowing that the latter was responsible for nearly everything that rouses his indignation. A few excerpts will display the author's peculiarities better than a long description:—

"I do not care much to assert or debate my reason for the changes of nomenclature made. . . . . The most gratuitous is that of 'Lucy' for 'Gentian,' because the King of Macedon, from whom the flower has been so long named, was by no means a person deserving of so consecrated memory."—(p. 161.)

"Names with the feminine termination 'a,' if they are real names of girls, will always mean flowers that are perfectly pretty and perfectly good (Lucia, Viola,* Margarita, Clarissa). Names terminating in 'a,' which are also accepted names of girls, may sometimes be none the less honourable (Primula, Campanula), but for the most part will signify either plants that are only good and worthy in a nursy sort of way (Salvia), or that are good without being pretty (Lavandula), or pretty without being good (Kalmia). But no name terminating in 'a' will be attached to a plant that is neither good nor pretty."—(pp. 204–5.)

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* [It seems hardly right to include *Viola* in this category. "Boullay discovered in the root, leaves, flowers, and seeds [of *Viola odorata*] an alkaloid, resembling the *emetia* of ipecacuanha, which he termed *violine*. This alkaline principle was found by Orfila to be an energetic poison. It may probably prove to be identical with emetia." Bentley and Trimen's 'Medicinal Plants,' t. 25.—Ed. Journ. Bot.]

And before writing the foregoing Mr. Ruskin actually took the perfectly needless trouble of begging that his names might be quoted as "Art. Schol. Oxon." The illustrations are fragmentary, but charming, and the only part to which we can allot ungrudging praise.

B. D. J.

Flora of Plymouth: an account of the Flowering Plants and Ferns within twelve miles of the town; with brief sketches of the topography, geology, and climate of the area, and history of local botanical investigation. By T. R. Archer Briggs, F.L.S. With map. London, Van Voorst. 1880. pp. xxxv., 432.

This latest addition to our list of local floras—the result of the diligent and accurate work of the last twenty years—is in every sense worthy of the high anticipations which had been formed regarding it. British botanists have long known Mr. Briggs as occupying a foremost place in the rank of critical investigators of local botany; and it is not too much to say that they will find in the 'Flora of Plymouth' the fullest justification for their opinion. Since the commencement of this Journal in 1863, Mr. Briggs has from time to time published in its pages contributions to our knowledge of the plants of Devon and Cornwall, with especial reference to those of the neighbourhood of Plymouth; he has been bringing together patiently and unobtrusively every scrap of information which could be brought to bear upon the subject; and the result is a volume which will long remain a model for the writers of local floras.

It may be well to draw attention to a few of the points which seem to us especially noteworthy. Prominent among these is the fact that the author himself is personally responsible for the great bulk of the information as to local distribution. This was of course rendered possible by the small area embraced by the flora—an area even smaller than appears from the title, inasmuch as a large portion of the southern half of the radius is occupied by the sea—but it adds materially to the value of the work. Small as the area is, however, it affords scope for division into six districts, each being the basin, or a portion ot the basin, of a separate river: two of these districts are in the sub-province of East Cornwall, the remainder in South Devon. The introduction contains a sketch of these districts, with lists of the plants peculiar to each, and a summary of the number of species, types of distribution, &c., which we extract:—

"Of the 1680 species named in the 'London Catalogue of British Plants' 873 belong to Plymouth. Four additional to these will be found numbered and given in the Flora. They are, *Rubus ramosus*, *R. hirtifolius*, *R. mutabilis*, and *Rumex rupestris*. The last is a recent addition to the British list, and the *Rubi* are inserted for reasons that will appear on referring to the respective notices of them. These four plants bring up the number of Plymouth species to 877. Two species of the 'London Catalogue,' *Polygala oxyptera* and *P. depressa*, are united with *P. vulgaris*.

Taking this into consideration, the actual number of plants common to the Plymouth and British list is 875. Three firmly-established introductions, *Geranium striatum*, *Petasites fragrans*, and *Linaria supina*, appear in the Flora with full particulars; but as they are among the "Excluded Species" of the 'London Catalogue' they are not numbered, and of course do not enter into this summary. For a like reason *Valerianella eriocarpa* is excluded in the calculations, though admitted into the work in the same way as the three others. Of the 877 Plymouth species the five following are probably extinct, as they have not been seen for many years past:—*Nasturtium palustre*, *Vicia bithynica*, *Comarum palustre*, *Veronica Anagallis*, and *Euphorbia platyphylla*. The 877 species are divided as follows, with reference strictly to the area:—

Natives	728	Aliens	37
Denizens	48	Casuals	16
Colonists	48		877

"As regards relative frequency they stand as follows, but of course there are some species which might be placed almost indifferently in one or the other of the lists:—

Very common	248	Rare	98
Common	159	Very rare	153
Rather common	114	Probably extinct	5
Locally common	41		877
Rather rare	59		

"They come thus under Watson's 'Types of Distribution':—

British	484	Germanic	16
English	220	Atlantic	36
Intermediate	3		764
Scottish	5		

"The 113 remaining plants are segregates, introductions, &c., not classified by Watson."

A sketch of the progress of botanical investigation relating to Plymouth (the first notice of a Plymouth plant being found in Johnson's edition of 'Gerard's Herball,' published in 1633) and a list of the books quoted follow; and then we come to the Flora proper. In general style of printing and "get-up" the book reminds us of the 'Flora of Middlesex,' possessing all the excellencies which marked that great advance upon all previous local floras, and adding to them others which we do not find in any similar work. Such small details as the local names, where these exist, and the times of flowering are attended to with a care which makes one feel secure that the "weightier matters" have received equal attention.

If we want to find a good illustration of Mr. Briggs's minute examination and critical acumen, we shall discover it in his treatment of the Roses and Rubi. In no local flora hitherto published shall we find anything even approaching the completeness with which Mr. Briggs has investigated the bewildering forms of these troublesome genera. He has evidently taken great care in

comparing his plants with the types of continental botanists; many of the Roses, for example, have been named by Déséglise, while the opinions of Genevier and Focke are quoted with regard to many of the Brambles, not to mention authorities more familiar to English botanists, such as Babington and Baker. Mr. Briggs is no slavish follower of any of the eminent botanists we have named: he differs from most of them on some point or other, taking care to explain with characteristic modesty his reasons for doing so, which seem sufficiently ample. To the readers of this Journal from its commencement, the notes on the Roses and Rubi will be of especial interest, as they refer in many instances to plants which have been described or commented upon in its pages.

It is not only on critical plants, however, that Mr. Briggs has made useful notes: we find these scattered throughout the book. The following note upon *Rosa micrantha* may be taken as a type of these:—

"*Rosa micrantha* is one of our commonest roses, its abundance being quite a noticeable feature in the local flora. The petals vary in colour from very light pink to rose, but seem never to have the full deep rose of those of *rubiginosa*. The odour of the plant is generally stated to be faint; but it can only be said to be so in comparison with that of the 'Sweetbriar.' The fruit varies from ovate or urceolate to globose, and sometimes is sparingly setose, though usually naked, except close to the peduncle. I am not aware that the naked peduncled variety has been found anywhere else in Britain, though Dr. Christ has recorded it from Vallée de Clanzo, near Santa Anna, on the Maritime Alps. Our plant has the sepals eglandular at the back. It does not seem to be dependent either on soil or situation for its peculiarities; for it and the type often grow in the same hedgerow, and it occurs on soils differently constituted. A luxuriant form of it is the var. *Briggsii* of Baker's 'Monograph.' The late Rev. A. Bloxam sowed seeds I sent him, and found it come true. M. Déséglise places it under *R. tomentella*, Leman, an arrangement that I cannot follow. In the neighbourhood of Plymouth *R. micrantha*, not *R. rubiginosa*, sometimes constitutes the 'Sweetbriar' of cottage gardens."

In comparatively small matters, as we have already said, Mr. Briggs's careful observation is conspicuous. If he is dealing with an alien, or a plant whose nativity in the district is doubtful, he takes pains to put us in possession of the facts of its occurrence by a full description of the circumstances under which it was found and the names of the plants associated with it, mindful, apparently, of the old adage that you may judge of a man by the company he keeps. The habitats and times of flowering receive similar careful treatment: we may note, as confirmatory of his observations, that in Cheshire and Buckinghamshire *Viola Reichenbachiana* flowers earlier than *V. Riviniana*, as it does at Plymouth. While on the subject of Violets we may note that the Plymouth *Viola permixta* (which here receives full specific rank) has been identified by M. Jordan, the founder of the species; Mr. Briggs adds, "The distribution of this plant in the neighbourhood

of Plymouth somewhat favours the view of its being a hybrid between *V. odorata* and *V. hirta*. Its scentless flowers are of a bright slaty blue, and make a fine show at the end of March and early in April."

To his enumeration of the *Epilobia* Mr. Briggs appends the following note:—"I believe hybrids are frequently produced among the *Epilobia*, as is known to be the case in *Carduus*, *Verbascum*, and some other genera. I have frequently met with specimens looking like hybrids between *E. montanum* and *E. lanceolatum* growing with these two; also with others apparently between *E. lanceolatum* and *E. obscurum*; and less frequently with specimens having characters between *E. parviflorum* and *E. lanceolatum*; and *E. parviflorum* and *E. tetragonum*. I have several apparent hybrids preserved in my herbarium."

As bearing out this suggestion, it may be noted that Prof. Haussknecht, who has lately been visiting the herbaria of this country in connection with his study of the genus *Epilobium*, has named specimens collected at Plymouth by Mr. Briggs and presented by him to the British Museum herbarium *E. lanceolatum* × *obscurum*, *E. lanceolatum* × *parviflorum*, and *E. obscurum* × *parviflorum*. Among other hybrids in the same herbarium are curious cultivated specimens from Mr. Watson's garden, named by the same authority *E. palustre* × *obscurum*; and one from the Cheviots, on which N. J. Winch notes, "proved by three years' cultivation to be very distinct from *E. montanum*," and which is named by Haussknecht *E. palustre* × *alsinifolium*. This is the plant from which the figure in 'Eng. Bot.' (t. 2000) was principally made; two of Sowerby's specimens of "*alsinifolium*" are named by Haussknecht *E. anagallidifolium* and *E. alsinifolium* × *palustre*, the third being the true plant.

The points which seem to us to suggest criticism are very few. We observe that *Polygonum maculatum* has attached to it, as an authority, the name "Dyer" in inverted commas; in this Mr. Briggs has (as usual) exactly followed the 'London Catalogue.' But a reference to this Journal for 1871 (p. 36), where this was first published, shows that the authority should be "Dyer and Trimen," the name occurring in a paper which was the joint production of the authors named. Although retaining it as a species, Mr. Briggs says, "I believe this graduates into *lapathifolium*, as plants with characters more or less intermediate occur. I would regard it as a variety only." It is only fair to point out that, although numbered as a species in the 'London Catalogue,' its authors claimed for it only subspecific rank.

In one particular only we have to complain of incompleteness; the two Indexes are not so full as they should be. We have never been able to understand why an index of genera should be considered all that is needed in a local flora; but in such a book as the present, where *Rubus* extends over twenty-two pages and *Rosa* occupies sixteen, and there is in each case a good deal of synonymy, a more detailed index is certainly required. Still more unfortunate, as it seems to us, is the omission from the Index

of Genera of all the plants which from one cause or another are not admitted as belonging to the flora of the district, although mentioned in the body of the work; so that we do not find in the index *Pyrola*, *Asarum*, *Onobrychis*, *Polemonium*, and many more. The Index of English names contains none of the genuine local ones which, as it seems to us, should alone have been included in the book, with possibly the addition of those in general use; it is certain that "Fries's small-flowered Pearlwort" is no more an English name for *Sagina ciliata* than is "Bönninghausen's Sedge" for *Carex Bœninghauseniana*. Mr. Briggs quotes these, and many equally as bad, from the third edition of 'English Botany'; but they are, as it seems to us, worse than useless, and we regret their presence in the book as much as we regret the absence of the local ones from the index.

These minor points, however, are comparatively trifling, and in no way seriously interfere with the value of the book, albeit the deficiencies of the index make the information contained in the volume less easily accessible than we could wish to have been the case. We cannot too strongly recommend the 'Flora of Plymouth' to our readers, especially to those who may be engaged upon a work of a similar character. J. B.

Three pamphlets on local Botany have recently been announced as if they were just issued, their titles being:—1. The Study of Mosses; with a list of the Mosses of the Wrekin and its environs, intended as a contribution to the Bryology of Shropshire. By Robert Anslow. Wellington. 1871. 8vo, pp. 22.—2. Notes on Sutton Park; its Flowering Plants, Ferns, and Mosses; to which is added the Roses and Brambles of Warwickshire. By James E. Bagnall. Birmingham. 1877. 8vo, pp. 27.—3. A Guide to the Botany, Ornithology, and Geology of Shrewsbury and its vicinity. By William Phillips and others. Shrewsbury. 1878. 8vo, pp. 65. — The 'Journal of Botany' cannot be accused of discouraging local catalogues, and our complaint is merely levelled at the manner of announcement, which gives the erroneous notion of their being recently issued. The plan adopted by such booksellers as Fischer, of Cassel, of giving the *date* of publication in each advertisement, is worthy of universal imitation. The second paper on the list was duly noticed in this Journal for 1877 (p. 224).

The first part has just been issued of the 'Arboretum Segrezianum: Icones selectæ Arborum et Fruticum in hortis Segrezianis collectorum.' It contains six beautiful copperplates by Riocreux and other artists, with descriptive text by M. Alphonse Lavallée. The work will form two large quarto volumes, each containing sixty plates; a fasciculus will be published every three months, with descriptive text, each costing ten francs.

We are glad to see that the 'Athenæum' of August 14 directs attention to a new "departure" in the way of printing scientific names, in the last number (205) of the 'Proceedings of the Royal Society.' The following sentence from p. 562 is a sample:—"If

we compare the plants from the Mackenzie River with the Tertiary Flora of the United States, which has been very thoroughly worked up by Professor L. Lesquereux, we find eight species in common, viz., *Tax. dist.*, *Sequ. Langsd.*, *Glypt. Ung.*, *Cor. M'Quar.*, *Pop. Richards*, *Populus Arctica*, *Betula macrophylla*, and *Platanus aceroides* (?)" We trust that this most objectionable method of abbreviation will find no followers, although it has the sanction of our leading scientific society.

The very cheap and handy 'Aids to Bible Students,' issued by Messrs. Eyre and Spottiswoode, contains "An attempt to summarise such information as is attainable relative to the plants of the Bible," by Sir Joseph Hooker.

Referring to a paragraph on p. 256 of our last issue, reprinted in the 'Garden,' the Rev. H. H. Dombrain writes as follows in that journal for August 14:—"In the obituary notice of my former associate, Mr. W. Andrews, it is stated that he was one of the original founders of the Dublin Natural History Society. This is incorrect; he was not even a member of it until after it had existed two years. I have now the first two annual reports: in the first his name does not appear at all; in the second only as a subscriber, not even a member of the council. He joined the society early, and gave it his hearty and generous support. Its history is simply this: two university students were, in the year 1838, out entomologising in the neighbourhood of Dublin, and, while discoursing on various matters, the idea was started of a society for the investigation of the Natural History of Ireland, where less advanced naturalists might obtain information, and become better acquainted with one another. Of these students I was one, and my late friend, the Rev. B. S. Clarke, the other. The idea was taken up with a good deal of spirit. We commenced in a very quiet way. Our apartments were at first at a rope and twine shop on D'Olier Quay, although our first gatherings, when the society could hardly be said to be formed, were at Glenan's, the birdstuffer in Suffolk Street. Our first year's income was £37 10s. In the following year our borders were greatly enlarged; we migrated to commodious rooms in Great Brunswick Street. Some of the most eminent men of science in Ireland joined us. Archbishop Whately took us by the hand; Mr. (afterwards Sir William) Wilde, Professor Allman, Robert Ball, David Moore of Glasnevin, the Lord Lieutenant, the Provost of Trinity College, became members, and we left off at the end of the second year with a balance of £80. In 1841 I resigned my secretaryship, to which, if I remember rightly, Mr. Andrews succeeded; at any rate he became aad continued a very active member; but it will be seen from this that he was not one of the original founders of the society." By a printer's error we gave "last *month*" instead of "last *March*" as the date of Mr. Andrews's death.

Other New Books.—E. A. Rau & A. B. Hervey, 'Catalogue of North-American Musci.'—Malinvand, 'Matériaux pour l'histoire

des Menthes,' fasc. 1 (Paris, Lechevalier, 2 *fr.*)—G. Genevier, 'Monographie des espèces du Genre *Rubus* croissant dans le Bassin de la Loire' (7 *fr.*)—E. Bucquoy, 'Herbier du jeune Botaniste' (fasc. 1–4, 1 *fr.* 25 *c.* each, Perpignan). — W. Detmer, 'Vergleichende Physiologie der Keimungsprocesses der Samen' (Jena, Fischer).

Articles in Journals.

July.

Popular Science Review.—F. Darwin, 'Climbing Plants.'

Scottish Naturalist.—J. Cameron, 'The Gaelic Names of Plants' (contd.)— F. B. White, 'Preliminary List of Fungi of Perthshire' (contd.)

Bulletin of the Torrey Bot. Club. — J. S. Newberry, 'Geological History of the North American Flora.'—J. Williamson, '*Adiantum Capillus-Veneris* in Kentucky.'—N. L. Britton, 'Northward extension of the New Jersey Pine Barren Flora.'

Annales des Sciences Nat. (Botany, vol. ix., Nos. 5 and 6). — E. Fournier, 'On the Geographical Distribution of Mexican Grasses.' — E. Bescherelle, 'Moss-Flora of Reunion and other South African Islands' (contains many new species). — P. van Tieghem, '*Bacillus amylobacter.*'

American Naturalist.—J. F. James, 'A Botanist in Southern California.'

Naturalist (Huddersfield).—F. A. Lees, 'Mosses of the Wetherby District.'—J. E. Griffith, 'Flora of Carnarvonshire and Anglesea' (contd.)

Œsterr. Bot. Zeitschrift. — F. Krasan, 'On Plant-distribution in the Districts of Görz and Gradisca' (contd.)—H. Wawra, 'On *Bromeliaceæ*' (*Vriesia Phillopocoburgi*, *V. Morreni*, *V. Itatiatiæ*, *Tillandsia incana*, *T. globosa*, spp. nn.) (concluded). — E. Ráthay, 'On the "Witches'-broom" of the Cherry-tree and *Exoascus Weisneri*' (n. sp.) — C. Polák, 'On the forms of *Roripa* of the Bohemian Flora.'—C. J. Klinggräff, 'Palestine and its Vegetation' (contd.)

Hedwigia. — G. Winter, 'On *Uredineæ* and *Ustilagineæ*.' — P. A. Karsten, 'Symbolæ ad Mycologiam Fennicam' (many new species) (concluded).—Id., 'Pyrenomycetes aliquot novi.'

Botanische Zeitung.—H. Hoffmann, 'On the Doctrine of Thermal Constants of Vegetation.'—C. J. Salomonsen, 'On a simple method for the pure cultivation of putrefactive Bacteria.' — F. Hegelmaier, 'On Dicotyledonous Suspensors composed of several Nucleate Cells.' — C. Mereschkowsky, 'Observations of the movements of *Diatomaceæ* and their cause.'

Magyar Novenytani Lapok. — J. Schaarschmidt & A. Tanás, 'Additamenta ad Algologicam Dacicam, No. I.' (Supplement).—A. Kanitz, 'Plantæ Romaniæ hucusque cognitæ' (contd.)

Nuov. Giorn. Bot. Ital.—L. Caldesi, 'Floræ Faventinæ tentamen' (contd.)—E. de Thuemen, 'Fungi aliquot novi in terra Kirghisorum lecti.'—A. Jatta, 'Lichenum Italiæ meridionalis, manipulus tertius.' — L. Macchiati, 'Movements in stamens of *Ruta bracteosa* and *Smyrnium rotundifolium*.'

Flora.—Diagnoses of Thümen's 'Mycotheca Universalis.'— J. E. Duby, 'New or imperfectly-known Foreign Mosses.' — G. Strobl, 'Flora of the Nebrodes.'

Botanical News.

The Report for the Botanical Exchange Club upon the plants collected by its members during 1879 is nearly ready for the printer, and now that the last notes have been received respecting some or the referred plants, the members of the Club may shortly expect their return parcels. Notwithstanding the unfavourable state of the weather last season, there is a fair supply of plants to distribute, and we hope to give the readers of this Journal extracts from the report as soon as it is published.

We also understand that the 1879 Report of the Botanical Record Club, Phanerogamic and Cryptogamic, is in a forward state. It was at one time feared that the work of this useful Club might come to an end, but an appeal to the existing membership has reconstituted it, and very shortly the revised rules and list of officers will be issued to its members.

We are glad to hear that the Catalogue of Vegetable Technology (mentioned in our last number, p. 252) is being edited by Mr. B. Daydon Jackson for the Index Society. It will be issued at as early a date as possible consistent with the extensive revision and additions absolutely required.

The sixth annual conference of the Cryptogamic Society of Scotland is to be held at Glasgow in the third or fourth week of this month; and the usual meeting of English mycologists will be held at Hereford in the week beginning October 4th.

Mr. W. Fawcett, B.Sc., has been appointed an Assistant in the Department of Botany, British Museum. The removal of this Department to the new Natural History Museum is now in active progress. The official title and address of the new building is, "British Museum (Natural History), South Kensington, S.W."

A complete 'Catalogue of the Diatomaceæ' is announced for publication, by Mr. Frederick Habirshaw, F.R.L.S. It will appear in four parts, large octavo, and will be published in New York; the price, to English subscribers, is 5*s*. 4*d*. per part.

THE

BOTANICAL RECORD CLUB:

PHANEROGAMIC AND CRYPTOGAMIC.

ASHFIELD, COLLEGE ROAD, WHALLEY RANGE,
MANCHESTER, *23rd August, 1880.*

SIR,

In handing you a copy of the Rules of "The Botanical Record Club," I venture to solicit your help in the important work of extending the tabulation of the geographical and altitudinal distribution of the native flora of Great Britain and Ireland. Thanks to the life-long labours of Mr. H. C. WATSON in this comparatively neglected department of botany, no country of the like extent can claim to have determined the distribution of its phanerogamic vegetation with such fulness or exactitude as Great Britain, nevertheless the annual additions to the county records continue to be considerable; while for our cryptogamic vegetation so little has been attempted in this direction that an inexhaustible field lies open for investigation.

The scope of the Club will be more fully understood by a perusal of the accompanying Rules, and its previous work is exhibited in the six Annual Reports which it has already issued. It is intended to publish, from time to time, maps which will show, in a graphic form, the area of distribution occupied by selected species of plants in Great Britain and Ireland; but the realization of this idea is dependent upon the degree of support the Club may receive from botanists and other scientific gentlemen interested in Phytogeography.

Should the work of the Record Club commend itself to your judgment, I beg the favour of your becoming one of its members, and of your filling up and forwarding to me at your early convenience the fly-leaf of this circular.

I remain, Sir,

Yours faithfully,

CHARLES BAILEY.

THE

BOTANICAL RECORD CLUB:

PHANEROGAMIC AND CRYPTOGAMIC.

LIST OF OFFICERS.

Referees:

CHARLES CARDALE BABINGTON, M.A., F.R.S., F.L.S., &c. (For Rubi, Characeæ and Flowering Plants generally.)

JOHN GILBERT BAKER, F.R.S., F.L.S. (For Rosidæ and Hieracia).

HENRY BOSWELL (For Musci).

B. CARRINGTON, M.D., F.L.S., F.R.S., Edin. (For Hepaticæ).

Editor of Reports:

F. ARNOLD LEES, M.R.C.S., L.R.C.P., Lond., F.L.S.,
Wetherby, Yorkshire.

Secretary and Treasurer:

CHARLES BAILEY, F.L.S., Ashfield, College Road, Whalley Range,
Manchester.

REVISED

RULES AND REGULATIONS.

Sanctioned by the Members, 1880.

I. The Botanical Record Club shall be an association of persons desirous of forwarding the purposes for which the Club was (in 1873) formed, the condition of membership being a subscription to the funds.

II. The objects of the association shall be to verify, register, and publish annually such facts (relating to the horizontal or vertical distribution of British Plants) as may be furnished for the purpose by the members, and as seem to merit publication either as (1) hitherto unpublished (for example, a *fresh station* for a plant, with a comital census at least under sixty, occurring in a county for which it may be already on record); or (2) as additional to the items tabulated in Mr. H. C. Watson's works: *Compendium Cybele Britannica*, its *Supplement*, and *Topographical Botany;* and Moore & More's *Cybele Hibernica;* or (3) as interesting and worthy of repetition by reason of previous confusion, uncertainty, or reported extinction.

III. Since there is for the Mosses and Hepaticæ no existing compendium of published data analogous to those above mentioned for Phanerogamia and the Vascular Cryptogams, it shall be an aim of the Club to work out and tabulate the distribution throughout Britain of such lower Cryptogams, effecting this, first, by the successive compilation and printing of moss and hepatica florulas for each county; and, second, by subsequent addenda to such comital lists as may have been previously issued.

IV. A third object of the Club shall be the exemplification of geographic plant-distribution (first phanero-, then crypto-gamic) by means of outline county maps, so displayed as to indicate the various 'types' of distribution, best discernible in such way, for selected representative species.

V. It shall be an essential characteristic of the work of the Club that every record must be qualified for a place in the annual Report by a Voucher for its accuracy and bona-fide nature—in the shape of a well-selected specimen (from the locality specified on its label) of a size and character sufficient for its safe identification. These vouchers shall alone form the material for the Report, save and except such manuscript notices of extinctions of species, or of errors requiring correction, as it may be found necessary to publish.

VI. The plant contributions of each season, after usage for the Report, shall become Government property, and with that intention shall each year be forwarded direct to the Royal Herbarium of Kew; and, being thus disposed of, shall be no longer the property of the Club in any sense, although the collections shall be open to the inspection of any member giving sufficient notice, and complying with such regulations as may govern like portions of the National Herbaria.*

VII. The management of the affairs of the Club shall devolve, in their several capacities, upon the following officers:—Editor of Records, Secretary and Treasurer, and such Botanical Referees as may be appointed from time to time by the Editor to assist in the determination of species.

On all matters in dispute, concerning the polity or well-being of the Club, these Officers and Referees shall form an Executive Committee, to whose counsels shall be left such elections of

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* Note.—Director Sir J. D. Hooker has given his consent to this annual acceptance of the Club's plants by the Kew authorities; and it is a suggestion of Mr. Baker's that they should ultimately be incorporated with the Watsonian Herbarium when that is received, supplementing it as they do.

officers in place of resignations, such adjustments, decisions, or general appeals to the members. as it may be thought wise and necessary to make.

VIII. The Botanists able and willing to act as Botanical Referees must be members of this Club; and shall be chosen, each one upon the ground of his special study of, and acquaintance with, some difficult class or genus, or critical group of British Plants.* All contributed specimens in regard to which the Editor of Records is unable to satisfy himself, or feels any doubt about, shall be submitted to a Referee, who shall settle finally whether it appear in the Report of that year, or whether the record be deferred for fuller information or ampler material.

IX. The duties of the Editor of Records shall include the safe keeping, verification, and arrangement of the plants confided yearly to his care for the time being, for the special purpose of enabling him to compile the Report. Having, with the assistance of the several Referees, duly scrutinised, verified, and decided (under Rule II.) upon the eligibility or unfitness of each separate record for a place in the Report, the Report shall then be prepared in such form as seems to him best; and, when finished, the manuscript shall be forwarded to the Secretary for his order as to its printing. When in type, every specimen voucher which represents a record in the Report shall be forthwith sent to Kew by the Editor. It shall not be necessary to mount or forward to Kew those contributed specimens notices of which are not eligible (under Rule II.) for the Report, or the records of which are to be deferred for any reason, such plants being superfluities for the purposes of the Club.

X. The duties of the Secretary and Treasurer shall be to collect the subscriptions; to keep the funds of the Club, its expenditure vouchers, and other accounts; and to authorise all

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* NOTE.—Referees will thus, whilst not without power of direction, &c., in crises of the Club's history, hold the honourable position of Experts or Consultants, and so contribute not a little to the trustworthiness of the general Record.

printing. He shall also attend to the publication, sale, or distribution of all Reports, Maps, Circulars, Catalogues, Moss-envelopes, &c., issued by the association; and pay all accounts against the Club for work done, or expense incurred, with and by his sanction and with the knowledge of the Editor of Records.

XI. Membership in this Club shall be of two kinds:—Honorary (or non-contributing) and Ordinary (or working) members.

Honorary members need not contribute any specimens, but shall subscribe annually a sum of not less than ten shillings.

Ordinary members shall subscribe not less than five shillings annually, and shall also send annually plants as defined in Rules II. and III.*

XII. All plants contributed shall be in good condition, and shall as far as possible represent unmistakeably the species they are sent to illustrate; but a specimen need not necessarily be in flower or have a root, &c., if the safe determination of the species is not thereby endangered. Specimens in such a bad or fragmentary state as to be nameable only with difficulty or doubt shall be inadmissible. Only one example of any plant need be sent where the necessary requirement as to its condition is fulfilled. Where the intention is to show some variation or peculiarity, a range of specimens may be desirable; but a number of typical specimens from one and the same station, accompanied by only one label, tends to favour admixture and confusion.

XIII. With each plant—if a Phanerogam or Fern—must be sent a Label of fair size, $4\frac{1}{2}$ inches across by $3\frac{1}{2}$ inches deep; upon which, leaving a space of 1 inch at the top for the official Stamp of the Club to be impressed, must be written the name (where known), but at least the locality and *kind* of station

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*Note.—It is hoped, however, that all 'working' or ordinary members who can afford it will contribute the larger sum—entitling them to two copies of all Reports—seeing that the expenses of the Club for printing and lithographing are proportionately heavy, owing to the somewhat limited issue of its publications.

(*i.e.*, natural wood or thicket, plantation or osier holt, waste sandy or grassy ground, warren, heath, bog, marsh, wall top, hedge or lane, pasture or meadow; discriminating between clayey, sandy, and peaty soil), where gathered, the date when and the county or vice-county area in which it grew, together with the name of the collector. The special printed label hitherto in use shall be abandoned; and, in place of it, to prevent possibility of appropriation, each label shall, as received by the Editor, be impressed with the official stamp of the Club.

Mosses or Hepaticæ shall not be sent loose, but each one be enclosed in a special Envelope-Label, designed to keep each species secure and separate, and easily accessible, whilst at the same time facilitating arrangement on sheets of herbarium paper, to which they may be readily affixed. Particulars of the locality, &c., to be written upon the face of the envelope-label, below the down-turned overlap. A sufficient supply of these envelopes shall be made to each member desirous of contributing county series, by the Secretary or Editor, free of charge.

XIV. This association shall, from time to time, as need arises, issue revised editions of 'The London Catalogue of British Mosses' already published by the Club. With the second edition shall be included a Catalogue of the British Hepaticæ, drawn up or revised by competent authority. Should it at any time become desirable, this Club shall publish similar Catalogues of Lichens, Fresh-water Algæ, Fungi, &c.

XV. Subscriptions must be forwarded to the Treasurer prior to the 31st December of each year.

XVI. Parcels of plants shall be forwarded, carriage or post paid, to the Editor of Records, in no case later than the 31st of December in each year, and as much earlier (after the close of the collecting season) as possible.

XVII. All members of the Club shall receive from the Secretary, post paid, a copy of the yearly Report, together with such sets of Maps or Catalogues as may be published; always provided that the subscription for the previous year be not in arrear.

Further, it shall be an instruction to the Referees, Editor, and Secretary, to distribute at their discretion copies of the Club's publications to such persons and institutions as they may deem desirable, in addition to the following Libraries and Journals :—The Royal Herbarium, Kew; the British Museum Botanical Department; The British Museum General Library; the Linnean Society; the Library of the Edinburgh Botanical Society; and the Editors of 'Nature', 'The Journal of Botany', 'Grevillea', &c.

Duplicates of back Reports may be purchased by members at half price of the Secretary; and by non-members on payment of a sum equal to the subscription for the year in which they were issued. Extra copies of all General Catalogues will be published for general sale at sixpence each, and these, together with Reports (5/- each,) for 1879 and onwards, may be obtained from David Bogue, 3, St. Martin's Place, Trafalgar Square, W.C.; but such maps illustrating plant distribution as the Club may publish will only be issued in consecutive sets or series to continuing members, as the officers of the Club may determine.

James Collins and Co., Printers, 76, King Street, Manchester.

THE BOTANICAL RECORD CLUB:

PHANEROGAMIC AND CRYPTOGAMIC.

Sir,

In reply to your circular of the 23rd August, 1880, I shall be glad to become a Member of the above Club, and to subscribe *shillings annually.*

Name:—

Address:—

To MR. CHARLES BAILEY, F.L.S.,

Secretary and Treasurer, Botanical Record Club,

Ashfield, College Road, Whalley Range, Manchester.

Original Articles.

MUSCI PRÆTERITI;

SIVE DE MUSCIS NONNULLIS ADHUC NEGLECTIS, PRÆTERVISIS VEL CONFUSIS, NUNC RECOGNITIS.

AUCTORE RICARDO SPRUCE.

1. PLAGIOTHECIUM ELEGANS.

Hypnum elegans, Hook. Musc. Exot., t. 9 (1818).

Dioicum humile depresso cæspitosum, in sicco e viridi rufo-badium. Caules 1–1½-pollicares procumbentes laxe pinnatim ramosi, ad ramorum et florum insertionem radicelliferi, cæterum fere arhizi. Folia complanata bifariam imbricata, basi obliqua inserta, angulo 45°–60° patentia, ovato-lanceolata sensim longe acutata—vix subacuminata—ab apice ad ¼ longitudinis usque serrulata, concavula, altero margine haud raro implicata, costis binis brevibus obscuris, raro nullis; cellulæ perangustæ lineari-rhomboideæ subrectæ (vix flexuosæ) subpellucidæ, basales perpaucæ subbreviores magisque rectangulares, alares propriæ nullæ. Rarissime advenit folium exacte vel anticum vel posticum, basi recta transversa inserta caulique adpressa. Flores ♀ e caule et ramis orti. Bracteæ plurimæ, arcte imbricatæ suberectæ, extimæ minutæ, interiores sensim majores, intimæ foliis sat longiores ovales, a medio acuminatæ cuspidatæve, apice subserrulatæ, subenerves, cellulis laxioribus. Pedicellus plus quam semipollicaris rufus validiusculus lævissimus, siccando dextrorsum—sub apice incurvo sinistrorsum—laxe contortus. Capsula brevi-cylindrica symmetrica (nec gibba), collo longiusculo, rufa pachydermis, hurmectate horizontalis, siccando semper fere exacte pendula sub ore rubro valde constricta estriata. Operculum (ex icone Hookeri, breve, conicum subacuminatum obtusum). Annulus angustus, duplici cellularum serie constans, vix revolubilis. Peristomium rufo-flavidum siccando incurvum; dentes tenui-acuminati trabeculati scaberuli, sutura media inconspicua. Endostomium pallidum ad ½ fissum; processus scaberuli remote articulati in carina integri, ciliolis æquilongis solitariis binisve. *Folia* 1·5 × ·5, 1·3 × ·6, 1·25 × ·5, 1·0 × ·35; *cellulæ mediæ* $\frac{1}{10} \times \frac{1}{90}$; *bracteæ* ♀ 2·0 × ·5, 1·6 × ·4; *pedicellus* 15·0; *capsula* 1·25 × ·5mm.

Hab. Nootka Sound, in plaga occidentali Americæ borealis (Menzies! anno 1787).

Syn. *Hypnum elegans*, Schwgr. Suppl. iii., t. 282 (nec Spruce, Musc. Pyren.; nec Wils. Bryol. Brit.; nec Schimp. Syn. Musc. Eur.; &c.

Plagiothecium deplanatum, Schimp. MSS., apud Sulliv. Musc. Allegh. no. 50, *Pl. eleganti* certe proximum, robustius est, densifolium, radicellis crebris rubris repens. Folia distincte acuminata,

toto margine serrulata, basi bicostata (altera costa interdum obsoleta); cellulæ subbreviores subserpentinæ, apicales perpaucæ breves rhombeæ, alares distinctæ quadratæ utrinque sub 12. Bracteæ ♀ internæ omnes cuspidatæ, cuspide denticulata basi sæpe incisa. Capsula in pedicello duplo fere breviore oblongo-cylindrica inclinata subcernua (nunquam horizontalis), siccando arcuata sub ore valde constricta. Operculum brevirostre. Annulus angustus simplex. Peristomium majus, pallidum sublævissimum.

Pl. depressum, Bruch., magis ramosum est, densifolium, pro more viridissimum nitidulum. Rami medium versus dilatati. Folia apice brevi raro subacuminata, plerumque abrupte acuta, margine supero subdenticulato; cellulæ breviores, apicis triangularis totius subrhombeæ, alares distinctæ quadratæ. Bracteæ acuminatæ. Pedicellus brevis apice leniter incurvus. Capsula oblonga vel brevi cylindracea gibba cernuo-inclinata, siccando sub ore constricta, directione immutata. Operculum brevirostre. Peristomium pallidum.

Pl. Borrerianum, Spruce, a *Pl. elegante* magis remotum est; de suis differentiis confer descriptionem *Pl. Borreriani* ad pedem.

Hooker's figure and description accord sufficiently with Menzies' original specimens, except that — probably from not having thoroughly moistened the pedicel—he has not noticed that the direction of the capsule when fresh is horizontal, although in the dry state it becomes as completely pendulous as that of *Bryum cæspiticium*, in which position his figure represents it. In the only perfect peristome I was able to examine the processes were imperforate, but Hooker's figure shows them somewhat cloven at the keel, which may have been caused by the pressure of a covering-glass; or the species is really variable in that particular.

Schwaegrichen's figure is correct enough as to the foliage, but his account of the fruit must have been drawn up, in part, from that of some intermixed *Hypnum* of the subgenus *Brachythecium*, for he says "pedicellus imprimis sicco statu *scaber*" and "perist. internum *ciliis tribus longissimis capillaceis*," neither of which characters exists in *Pl. elegans*.

2. Plagiothecium Borrerianum.

Hypnum Borrerianum, Spruce MSS. (1846).

Dioicum, dense depresso-cæspitosum, pallide vel amœne viride nitidissimum, in sicco sæpe argenteum raro rutilans. Caules 1–2-pollicares procumbentes laxe pinnatim ramosi, hic illic—e ramorum basi colorata præcipue—radicellas longas flexuosas nigro-purpureas edentes, ramis ascendentibus imbricatis. (E plantæ sterilis foliorum axillis persæpe proferuntur ramuli gracillimi parvifolii fasciculato-5–10ni. decidui). Folia laxiuscule imbricata complanata, lateralia bifaria angulo 45°–80° patentia subobliqua, antica posticaque (pauca) appressa symmetrica, omnia sub triplo longiora quam lata, ovato-lanceolata, sensim vel subabrupte tenui-acuminata cuspidatave, acumine subserrulato stricto vel decurvulo, concavula, margine inferne leviter reflexo, costulis, binis brevibus, raro ¼ folii longitudinem attingentibus, interdum obsoletis cellulæ

angustissime lineares prosenchymaticæ subflexuosæ pellucidæ, alares (perpaucæ) subquadratæ obscuriores. (Folia caulina haud raro striata, prope basin latissima; ramea autem versus ¼ altitudinis latitudinem suam majorem monstrant). Flores ♀ e caule et ramis orti. Bracteæ inferne erectæ convolutivæ superne recurvo-squarrosulæ (in fl. sterili sæpe omnino erectæ) ovato-lanceolatæ sensim capillari-acuminatæ, acumine obsolete serrulato ad basin interdum incisulo. Pistillidia sub 10; paraphyses longiores—in flore sterili sæpe pauci, in fertili numerosi—alii pro more plus minus foliiformes: ad *Paraphysanthi*, *Neckeræ* subgenus, instar. i.e. inferne cellulas 2–4 lati, nec omnino capillacei. Pedicellus ⅔ pollicis longus stramineus, solum basin versus rufescens, apice subincurvus, in sicco dextrorsum, sub apice sinistrorsum, laxe tortus. Capsula e pedicelli incurvatione inclinata, vel fere horizontalis—in sicco plus minus inclinata (nunquam pendula)—breviuscula ovalis symmetrica, nec cernua, brevicolla leptodermis, recens flavo-viridis, sicca flava *turgida* (neque sub ore constricta). Calyptra albida apice purpurascens. Operculum exacte conicum, brevissime mammillatum vel non, in sicco subconforme. Annulus perangustus, cellulis biseriatis conflatus. Peristomium majusculum pallidum; dentes externi subulati, a medio acuminati, alte trabeculati minute scaberuli; internum ultra medium fissum, processus acuminati alte carinati, in carina integri vel hic illic pertusi, parum scaberuli, ciliola bina, superne capillacea, appendiculata. Sporæ minutæ læves. *Folia* 1·6 × ·6, 1·4 × ·5, 1·25 × ·4; *cell. mediæ* ¼ ad $\frac{1}{10} \times \frac{1}{8}$; *bracteæ* ♀ 1·6 × ·5; *pedicellus* 15·0; *capsula* 1·8 × ·8; *operculum* ·55 × ·5mm.

Hypnum Borrerianum, Spruce in schedis (1846); C. Müller Syn. Musc. ii., 279 (1851); Sulliv. Musc. et Hep. Un. Stat. (edit. poster.)

Hypnum elegans, Spruce in Ann. & Mag. Nat. Hist. 2, 1849, pro parte (nec Hook.); Wils. Bryol. Brit. (1855); Schimp. Bryol. Eur. et Syn. Musc. Europ.

Plagiothecium Schimperi, Jur. et Milde (1862), fide Schimp.

Var. *longinerve*, foliis pro more magis decurvo-secundis, costis longioribus validioribus, altera saltem medium folium attingente.

Hab. per omnem Europam in sylvis umbrosis ad terram, truncos putrescentes et saxa, arenacea præcipue, in montes altiores tamen haud ascendens; etiam in America boreali haud infrequens. Rarissime fertile, primum cum capsulis a cl. domina Hutchins prope *Bantry* Hiberniæ inventum est; nuperius ad *Ardingley Rocks* Sussexiæ (W. Mitten); in sylvis prope *Barmouth*, *N. Wales* (Whitehead et Ashton, 1876); et in valle fl. *Esk* prope *Whitby* (Slater et Stabler, 1879). Var. *longinerve* in sylvis arenosis prope *Castle-Howard*, et in pinetis turfosis ad *Stockton Forest* prope Eboracum (R. S.)

Plagiothecium Borrerianum a *Pl. elegante* distat nitore insigni; foliis constanter tenui-acuminatis, cellulis alaribus (paucis quidem) semper præsentibus; bracteis capillari-acuminatis, intimis in paraphyses transeuntibus; pedicello stramineo; capsula brevi pallida leptodermi, in sicco turgida inclinata—neque (ad *Pl. elegantis*

instar), pendula, sub ore valde constricta; operculo exacte conico; peristomio sublævi.

Pl. Müllerianum, Schimp., a. *Pl. Borreriano* differre videtur colore flavido; caule tenui bipollicari fastigiatim ramoso; foliis angulo acutiore patentibus, dein deflexo-subsecundis, peranguste ovato-lanceolatis, 4-plo longioribus quam latis, sensim tenui-acuminatis integerrimis enerviis; cellulis iis *Pl. Borreriani* conformibus, alaribus autem nullis; (capsula inclinata tenui, sicca sub ore constricta; operculo rostellato).

Pl. piliferum, Sw., pro foliis *Pl. Borreriano* interdum haud absimile, monoicum est, semper copiose fertile; foliis in cuspidem piliformem flexuosam abrupte attenuatis, subenerviis; capsula brevipedicellata suberecta tenera in sicco corrugata vel substriata; operculo brevi-conico; peristomio interno basi ad $\frac{1}{3}$ alt. solum integro, ciliolis subnullis.

Pl. depressum, Bruch, et *Pl. deplanatum*, Sch., facile distincta sunt foliis apice latioribus, reti minus denso; capsula inæquali sicca sub ore constricta; operculo rostrato.

This moss first attracted my notice in the winter of 1845–6, when residing in the Pyrenees at Bagnères-de Bigorre, near which town it grew on the borders of shady walks on the little hill called Mont Olivet. On my return to England in April, 1846, I visited Tunbridge Wells, in company with Messrs. Borrer and Jenner; and, whilst herborising at Eridge Rocks, Mr. Borrer brought to me a silvery-green patch of moss he had just torn from the horizontal face of a crumbling sand-rock, and asked me to name it. "Why," said I, "this is exactly the *Hypnum* that has been puzzling me at Bagnères—it is neither *denticulatum* nor *cupressiforme*—it must be new, and we will call it *Hypnum Borrerianum*." "That," he replied, "will be an unfortunate name to give it, for nothing named after me has ever proved permanent—not even either of the two genera, *Borrera* and *Borreria*." However, having carefully studied it, and satisfied myself it was distinct from everything else I possessed, or could find described, I gave it under that name to my botanical correspondents, and especially to Messrs. Taylor, Wilson, and Montagne. To Dr. Montagne I gave also a specimen of the Pyrenean plant, and when, not long afterwards, he lent his moss-herbarium to Carl Müller (then occupied in elaborating his 'Synopsis Muscorum'), my specimens of *H. Borrerianum*, but especially those gathered at Tunbridge Wells, were the materials on which Mr. Müller founded his description of the species—the first ever published (Syn. Musc. ii., Sept., 1851).

In the succeeding months of the year 1846 I found the same moss growing abundantly in the Castle-Howard woods, especially on sandy declivities, and even on old stools of *Carex paniculata* in Terrington Carr; and in December, 1847, I gathered very luxuriant specimens, but still sterile, in Arncliffe Wood and Cronkley Gill, Eskdale, growing on decayed vegetable matter about tree-roots and in clefts of rocks. I received it also from Congleton Clough, Cheshire, and from Wales (Wilson, 1846); from Stansfield Moor,

Eagle Crag, and other places in W. Yorkshire (Nowell, 1847); and from near Killarney (Taylor and Wilson). Taylor said he had long known it, and should call it *Leskea prostrata* n. sp., feeling confident it would prove a near ally of *L. polyantha* (*Pylaisia*); but he did not find me an Irish specimen of it until August, 1847, when he gathered it at Turk Waterfall. I told him it was exactly my *H. Borrerianum;* but as English bryologists were at that period still guided chiefly by the Hedwigian canons, founded on the pre-eminence of characters derived from the peristome, I said I was not unwilling to adopt his name for it, especially if the peristome should prove to be that of a *Leskea*, *i. e.*, with the inner membrane destitute of cilia. So, for some time, it passed among us as "*Leskea prostrata*, Tayl."

About the same time Wilson picked a moss out of Taylor's gatherings at Turk Waterfall, which he called *H. lapidinum*, MSS. This proved a mixture of *H. Borrerianum* and *H. depressum*, Bruch, and was afterwards quoted in 'Bryologia Britannica' (1855) as a variety of the latter. I had already, in May, 1846, by the help of specimens in Schimper's 'Stirpes Normales,' made out *H. depressum* in our Yorkshire woods, growing quite as abundantly on a calcareous, as *H. Borrerianum* on a siliceous base.

In 1847, when I was working up my Exsiccata of Pyrenean Mosses, I found, intermixed with other species gathered near Bagnères-de-Luchon (Bois de Sajust and Cascade des Parisiens) a moss without fruit, which I could only consider a slender form of *H. Borrerianum;* and I afterwards described the male inflorescence, under "*Hypnum elegans*," in my paper on the Mosses of the Pyrenees (Annals of Nat. Hist., &c., 1849). In 1851 the same moss was found in fruit by J. Müller (of Geneva), in southern Tyrol, and the much longer, subcylindrical capsule, constricted under the mouth when dry, with the rostellate lid, proved it to be a distinct species—since published by Schimper under the name of *Plagiothecium Müllerianum* (Synops., ed, i.; ed. ii., p. 698). I do not remember giving specimens of this moss to Montagne, but if I did so they were probably seen also by C. Müller, and mistaken by him (as they had been by me) for a slender form of *H. Borrerianum*. The true type of the latter was, however, both for C. Müller and myself, the moss gathered at Tunbridge Wells, as I have already stated.

Of the true *H. Borrerianum* I gathered too little in the Pyrenees to include it in my sets, but I had drawn up a full description of it for my paper on Pyrenean Mosses, to be read to the Botanical Society of Edinburgh, when, towards the close of 1848, Mr. Wilson informed me he had found, in Turner's herbarium, fertile specimens of our moss, gathered near Bantry long years since by Miss Hutchins; that he had compared them with the original specimen of *H. elegans* in Hooker's herbarium, and that they were undoubtedly the same species. I was then preparing for my journey to South America, and had little leisure for reconsidering the matter; but I possessed a small scrap of *H. elegans*, gathered by Menzies at Nootka Sound, and given me by Dr. Taylor in 1842.

which was one of the first things I had compared with *H. Borrerianum* in 1846; and my original note on it is still in its proper place. The two seemed so plainly distinct that I had dismissed all thought of their possible identity. Wilson, however, assured me that Miss Hutchins's specimens were exactly intermediate between mine and those of Menzies; and, bowing to his decision (though unconvinced), I quashed my description and diagnostic notes and published the moss as "*H. elegans*, Hook.," ignoring even any mention of *H. Borrerianum*. But when, many years afterwards, I came to see Wilson's figure and description of his "*H. elegans*" in 'Bryol. Brit.," it was plain to me that if they correctly represented Miss Hutchins's plant (as was to be supposed), they also agreed exactly enough with my *H. Borrerianum*, but by no means with the true *H. elegans* of Hooker. The recent acquisition, through the liberality of Messrs. Whitehead, Ashton, and Pearson, of Welsh specimens in good fruit of *H. Borrerianum*, has enabled me to institute a more rigorous comparison between the two, and to prove them specifically distinct.

Plagiothecium elegans is, in fact, as may be seen from Hooker's figure, more closely related to *Pl. depressum* and *Pl. deplanatum* than to *Pl. Borrerianum*; its diagnosis from those two species I have given pretty fully above. When in fruit they are readily distinguished from both *Pl. elegans* and *Pl. Borrerianum* by the short pedicel; the cernuous, asymmetrical capsule; and the rostrate lid.

Plagiothecium Borrerianum has constantly more lustrous foliage than *Pl. elegans*. The leaves have a slender point (*cuspis*) quite wanting in the other, where they are merely acute or very slightly subacuminate; the cells, equally close and slender in both, are nearly straight in *Pl. elegans*, distinctly flexuose in *Pl. Borrerianum*, and in the latter there are at the base a few quadrate alar cells, quite wanting in *Pl. elegans*. The female bracts, or perichætial leaves, run out to a long hair-like point. The pedicel is straw-coloured, and about the same length as the red pedicel of *Pl. elegans*. The capsule is wider, thinner, and paler, merely inclined at a greater or less angle, and when dry unchanged in form and direction; but the dried capsule of *Pl. elegans* is pendulous and much constricted below the orifice. The lid, annulus, and peristome differ very slightly in the two species, as is apparent from the foregoing descriptions.

Since it was first brought into notice *Plagiothecium Borrerianum* has been found to be quite a common plant, not only in the British Isles, but in almost every country in Europe, and on the eastern side of North America. Like many dioicous mosses that are mostly sterile, it maintains and even enlarges its area by throwing out propagula, in the shape of slender deciduous ramuli that spring in fascicles of five to ten from the axils of the leaves, and are liable to be washed away by heavy rains, or broken off and blown about by parching winds, and thus transferred to other sites, where, under favourable circumstances, they take root, and enter on a separate existence. The same apparatus exists also in *Pl. depressum*,

Pl. Müllerianum, and probably in other dioicous *Plagiothecia*. *Pl. Borrerianum* is further interesting as furnishing another proof that the so-called *paraphyses* are in reality imperfectly-developed—or, if you will, *degenerated*—leaves, or bracts; for the outer paraphyses, instead of being capillary throughout their length, like the inner ones, are often two or more cells wide below, and thus indicate a transition to the subjacent leafy bracts. The transition from capillary paraphyses to broad leafy bracts is much more gradual and unmistakable in certain tropical *Neckeræ* of the subgenus *Paraphysanthus* (Spruce), *e. g.*, in *N. disticha*, *N. undulata*, &c.

Lindberg has removed *Pl. Borrerianum* and its nearest relatives to *Isopterygium*, Mitt., which, to me, is scarcely even a subgenus of *Plagiothecium*; for I cannot make out where the one ends and the other begins. Moreover, about half the species, both European and Tropical-American, do not answer to Mitten's character of the genus, especially as to the "operculum longirostre," seeing that the lid is very short and conical in *leucophyllum*, Hpe., *Borrerianum*, Spruce, *elegans*, Hook., &c.; and even in *tenerum*, Sw., which, from its wide distribution, may be regarded the type of the group, the lid is only shortly beaked. Besides, he calls the leaves "æqualia," meaning, I suppose, "symmetrical," which is true only of the few leaves that spring from the upper and under faces of the stem, the lateral leaves (constituting the mass of the foliage) being unequal-sided at the base in every species. Nor are the leaves (as he asserts) "enervia," except in very rare cases, but often very distinctly (and in a few cases strongly) 2-nerved; and instead of being, as he says, "laxissime areolata," in a great majority of the species they would be more correctly termed "densissime et angustissime areolata."

(To be continued.)

UNRECORDED STATIONS FOR SOME PLANTS NEAR BODMIN, E. CORNWALL.

By T. R. Archer Briggs, F.L.S.

Whilst spending recently a few days with a friend in the parish of Blisland, situated about five miles to the north-east of the town of Bodmin, an opportunity was afforded me to note some of the plants growing in that and the contiguous parishes of St. Breward, St. Tudy, St. Mabyn, Cardinham, St. Neots, &c. The tract has been but little explored by botanists, if we may judge by the few records to be found concerning its plants. As a small contribution towards a list of the rarer and critical species of this part of Cornwall, I give the following notes. The tract forms part of vice-county 2 (E. Cornwall) of Watson's 'Topographical Botany.'

Ranunculus Lenormandi, F. Schultz. Moor near St. Breward.

Aquilegia vulgaris, L. Hedge-bank near Tresarrat Bridge, on the Camel River.

Chelidonium majus, L. Near houses at Kea Bridge; St. Mabyn.

Maintaining the "denizen" character in which it seems always to appear in Cornwall and Devon.

Fumaria confusa, Jord. Near Pawlis Bridge; St. Tudy. The common *Fumaria* of the *capreolata* segregates in Cornwall and Devon.

Brassica Rapa, L., *c. Briggsii*, Lond. Cat., ed. 7. In damp earthy places by the road from Blisland to Cardinham; St. Tudy.

Viola lactea, Sm. Bodmin Race-course; on a common between Cardinham and Panter Bridge.

Polygala depressa, Wender. Near Bodmin, &c. There is little doubt but that this is general on the unenclosed lands throughout Cornwall and Devon.

Sagina subulata, Wimm. Gravelly spot between Blisland village and the moors on the north. On a common near St. Neots. These stations are at a considerable distance from all previously recorded ones.

Scleranthus annuus, L. On a common near St. Breward, growing in peaty spots partially bare of vegetation; in great abundance as a weed in a neighbouring field with a crop of oats. In a road at Millpool between Blisland and Cardinham. So rare in some parts of Cornwall and Devon as to make it desirable to note its occurrence.

Hypericum dubium, Leers. In plenty on hedge-banks near Glynn Bridge, on the river Fowey, by the road thence to Bodmin. Sparingly by a road to St. Neots from the Liskeard and Bodmin turnpike-road. Hedge-bank in a lane near Lavethan, Blisland, between Tregenna hamlet and Tresarrat Bridge, on the Camel. This species has but few stations recorded for it in Cornwall.

Radiola millegrana, Sm. Roadside between Glynn Bridge and Bodmin, with *Centunculus*. On a common near St. Neots. Where this occurs *Centunculus* is usually to be seen also; but in Cornwall and Devon I have found the *Radiola* the less common of the two.

Ulex Gallii, Planchon. Near Bodmin, St. Neots, &c. A common shrub of the open wastes, apparently to the exclusion of *U. nanus*, Forst.

Prunus insititia, L. St. Tudy.

P. Cerasus, L. Hedges between Blisland and St. Tudy.

Agrimonia odorata, Mill. Near Glynn Bridge. A single plant near Tresarrat Bridge, by the road to St. Mabyn. Between Doublebois and Moorswater.

Rubus Idæus, L. Roadside between Glynn Bridge and Bodmin, growing with other Rubi; hedge between the Bodmin and Launceston Road and Trewardale.

R. discolor, W. & N. Near Bodmin; Blisland; St. Mabyn.

R. leucostachys, Sm. Between Glynn Bridge and Bodmin. Between Blisland village and the hamlet of Tregenna; Cardinham.

R. hirtifolius, Müll. & Wirtz., Fl. Plym., 116. Between Glynn Bridge and Bodmin, as well as elsewhere near the latter place, occurring in open waste spots by roadsides, intermixed with other Rubi. On the side of a bank at Millpool, between Blisland and Cardinham. In one spot in a hedge between St. Neots and

Liskeard. The Bramble at the above stations is precisely the same as the Plymouth *hirtifolius*, recently described in its 'Flora.'

R. calvatus, Blox. In one or two places between Glynn Bridge and Bodmin.

R. adscitus, Genev. Very common and generally diffused. Blisland; St. Tudy; Cardinham; St. Neots; Liskeard. As about Plymouth and elsewhere in the two counties, an abundant plant.

R. umbrosus, Arrh. Common and widely diffused. Two forms noticed. Blisland; near St. Mabyn; between Glynn Bridge and Bodmin; between St. Neots and Liskeard.

R. Hystrix, Weihe. Glynn Bridge.

R. Radula, Weihe. Glynn, close to the lodge by the road from the bridge to Bodmin. Well marked here.

R. Koehleri, Weihe. A Bramble, which I consider to belong to the aggregate *Koehleri*, occurs in the vale below Lavellant House, and also helps to form roadside thickets near Bodmin.

R. diversifolius, Lindl. St. Tudy; St. Mabyn.

R. Lejeunii, Weihe. Between Glynn Bridge and Bodmin.

R. pyramidalis, Bab. Lavethan, Blisland, under shrubs close to the house. By the road to Liskeard from St. Neots, in the valley on the left bank of the Fowey River. Well marked at both places.

Rosa spinosissima, L. Hedges between Lavethan and Millpool, near Cardinham. A form with the peduncles aciculate; this also occurs near Plymouth, but is said by Baker to be "quite rare."

R. tomentosa, Sm. Apparently scattered over all the country, as probably is the case throughout Cornwall and Devon.

R. micrantha, Sm. Near Glynn. Between Tregenna and Tresarrat; Blisland; St. Tudy. Between Cardinham and Panter Bridge, St. Neots.

R. systyla, Bast. Near Tresarrat Bridge, by the road to St. Mabyn.

R. leucochroa, Desv. Between Blisland village and Tregenna; St. Mabyn. Noticed also at Moorswater, near Liskeard.

Epilobium lanceolatum, S. & M. Sparingly on a dry bank between Kea and Pawlis Bridges, and in considerable quantity by the lane thence to St. Tudy village. Seen also at Moorswater, near Liskeard. The first station is considerably to the north of any previously recorded Cornwall ones. This is a species which should have its distribution in Cornwall and Devon carefully noted.

E. palustre, L. Near St. Breward. Between Panter Bridge and St. Neots. Quite rare in the portion of E. Cornwall near Plymouth.

Arctium minus, Schkuhr. Near Blisland village, by the road to Bodmin; strongly marked *minus*. Cardinham; Fowey Valley, by the road from St. Neots to Liskeard.

Senecio aquaticus, Huds. Two plants with the anthodes wholly or partially rayless, with others by a road near Bodmin. A similar form of *S. Jacobæa* is sometimes, though rarely, met with.

Hieracium umbellatum, L. Near Tresarrat, St. Tudy. Between

Cardinham and Panter Bridge. May be said to be dotted over Cornwall and Devon.

Specularia hybrida, A. DC. Barley-field near St. Tudy.

Wahlenbergia hederacea, Reich. Near St. Breward; Millpool. Between Cardinham and Panter Bridge.

Ligustrum vulgare, L. Certainly indigenous. Blisland; St. Mabyn; St. Tudy; Cardinham. Between St. Neots and Liskeard.

Sibthorpia europæa, L. Common. Blisland; St. Tudy, &c.

Bartsia Odontites, Huds., b. *serotina*. St. Tudy; St. Mabyn.

Mentha rotundifolia, L. Damp spot on the right bank of the Camel at Tresarrat, opposite a farmhouse, and there is little doubt derived from ancient cultivation.

M. sativa, L., var. *subglabra*, Baker. Near Bodmin, by a roadside nearly opposite a farmhouse. Like the last probably an escape, as it seems mostly to be about Plymouth.

Thymus Serpyllum, Fries. A patch with white flowers near Bodmin. The only Thyme seen in this part of Cornwall.

Stachys ambigua, Sm. Near a cottage between Blisland and the moor; St. Tudy.

Lamium album, L. Blisland village; also at Liskeard. It would be interesting to carefully trace out the distribution of this in Cornwall and Devon. Its paucity would, I suspect, strikingly contrast with its frequency in some other parts of England, as about London.

Myosotis repens, Don. In the moory tract near St. Breward; near Pawlis Bridge; Camel Valley, near Lavethan, Blisland; vale between Cardinham and Panter Bridge; and between the latter place and St. Neots. The allied *M. palustris*, With., not found anywhere.

Anchusa sempervirens, L. Blisland, close to the village. Millpool, very near houses.

Centunculus minimus, L. Between Glynn Bridge and Bodmin; Blisland, near Pawlis Bridge; vale between Cardinham and Panter Bridge; St. Neots.

Plantago maritima, L. On commons and in open gravelly places by roadsides near Bodmin; quite general, notwithstanding the inland character of the county. Also seen between Cardinham and Panter Bridge, and on a common near St. Neots village. In Devon never noticed at anything like such a distance from the sea.

Rumex pratensis, M. & K. By the road to St. Neots from the Liskeard and Bodmin turnpike-road.

Scirpus fluitans, L. Near St. Breward.

Avena strigosa, Schreb. In an oat-field near Bodmin.

Asplenium lanceolatum, Huds. In considerable quantity on walls at Blisland, in and near the village; also at Lavethan; near Kea Bridge.

Aspidium angulare, Willd. A few small plants near Pawlis Bridge. St. Mabyn, in one place on a hedge-bank near the village. In another between Panter Bridge and St. Neots. Seemingly uncommon and sparse in this part of Cornwall.

Nephrodium æmulum, Baker. Blisland; near St. Mabyn; Cardinham; St. Neots.

N. Oreopteris, Desv. Blisland, in profusion, and very fine on a bank in a lane near the village. Near St. Breward; near Tresarrat Bridge; between Cardinham and Panter Bridge; St. Neots.

Osmunda regalis, L. Near Kea Bridge.

SPICILEGIA FLORÆ SINENSIS: DIAGNOSES OF NEW, AND HABITATS OF RARE OR HITHERTO UNRECORDED CHINESE PLANTS.

By H. F. Hance, Ph.D., Memb. Acad. Nat. Cur., &c., &c.

(Concluded from p. 262.)

34. *Lysimachia ferruginea*, Edgew. Prope I-chang, in prov. Hu-peh, vere 1879 leg. T. Watters. Erroneously stated by Klatt to grow in Ceylon. Edgeworth's original specimens were Himalayan.

35. *Diospyros Morrisiana*, Hance. In devexis boream spectantibus montium Pak-wan, supra Cantonem, specimina pauca fœminea, d. 26 Maii 1878 carpsit cl. Sampson. These specimens enable me to describe the female flowers, which have hitherto remained unknown. Floribus fœmineis solitariis brevissime pedicellatis, calyce cyathiformi breviter acute 4-dentato 1¼ lin. longo cum pedicello adpresse sericeo, corolla glabra suburceolata 3 lin. longa ad trientem longitudinis in lobos 4 ovatos basi auriculatos acutiusculos divisa, staminodiis 6 uniseriatis sericeis juxta corollæ basin insertis, ovario globoso glabro, stylis 4 tomentosis ad medium usque coalitis.

3143 36. Ehretia (*Bourrerioides*) resinosa, *sp. nov.* Ramis angulatis cortice griseo lenticelloso, foliis (junioribus tantum visis) hysteranthеis sæpe fasciculatis breviter petiolatis oblongo-lanceolatis acutis costato-nervosis costulis subtus elevatis supra glaberrimis lucidis subtus dense fulventi-pilosis opacis resinam exsudantibus, cymis terminalibus pilosulis in corymbum multiflorum coacervatis floribus brevissime pedicellatis, calycis laciniis linearibus obtusiusculis adpressis margine ciliatis, corollæ glabræ tubo calycem triente superante fauce æquali lobis linearibus obtusis tubo æquilongis patentibus, genitalibus exsertis, antheris oblongis, ovario glabro ovoideo parvo, stylo staminibus paulo breviore breviter bifido stigmatibus sub ipsius apiculo obtuso in anulum coalitis.

Ad oram austro-occidentalem insulæ Formosæ, juxta Ta-kan, æstate 1865 collegit defunctus amicus, ornithologus præstans, omniumque Naturæ regnorum indefessus pervestigator Rob. Swinhoe. (Herb. propr. n. 12333.)

37. *Brandisia discolor*, Hook. f. & Th. Inter rupes, ad ripas fl. Pu-tu, juxta urbem Kwei-yang, prov. Kwei-chau, alt. 6500–7000 ped., d. 23 Jan. 1880 coll. W. Mesny. A highly interesting addition to the Chinese flora, hitherto only found in Martaban.

The late Mr. Kurz placed this plant, which has a curious resemblance to the genus *Eremophila*, in *Myoporaceæ*, unhesitatingly amongst *Pedaliaceæ*. (Journ. As. Soc. Beng. xlii. 236.)

38. *Rehmannia glutinosa*, Libosch. In prov. Hu-peh, prope I-chang, vere 1879 leg. T. Watters. The wild specimen before me differs so remarkably from all the Peking ones I have seen, by its well-developed long stem, its much more laciniate leaves, the lower ones with petioles exceeding the limb, its longer curved peduncles, flowers attaining a length of $2\frac{1}{2}$ inches, loose acuminate more unequal calyx-teeth, and much wider-mouthed corolla, that it is difficult to believe it conspecific, nor have I been able to dissect a flower; but it appears from the remarks of Bentham (Gen. Plant. ii. 960) and Maximowicz (Mél. biol. ix. 371) that the plant is subject to great variation.

39. *Tecoma grandiflora*, Delaun. In collinis juxta fluvium Siang, regione septentrionaria prov. Hu-nan, æst. 1878 coll. T. L. Bullock. This is the first occasion I am aware of on which this plant, commonly cultivated, has been gathered wild.

40. *Origanum vulgare*, Linn. Ad ripas fl. Yang-tze, reg. centr. prov. Hu-peh, æst. 1878 coll. Bullock. An interesting addition to the Chinese flora. Occurs in the mountains of Northern India, and in various parts of Siberia; but has not, I believe, yet been met with either in Manchuria, Mongolia, or Japan. Mr. Bullock notes that the flowers in his specimens were pure white, as is sometimes though rarely the case in the European plant.

41. *Nepeta Cataria*, Linn. Circa Chi-fu, a. 1873, coll. b. Rob. Swinhoe. Fine specimens of a plant now, I believe, first recorded as a native of China.

42. *Scutellaria rivularis*, Wall. In graminosis circa Tam-sui ins. Formosæ, Martio 1864 coll. b. Oldham; juxta Swa-tow et Amoy, necnon ad Sai-chü-shan aliisque prov. Cantonensis locis invenit Sampson.

43. *Stachys aspera*, Michx., β. *glabrata*, Benth. In humidis montium Pei-shan, prov. Shan-si, necnon in campis circa Jehol, mensibus Maio Junioque florentem, legit Rev. Abbas David, miss. apost.; Shanghai, in fossis hippodromi, medio Maii 1877 coll. F. B. Forbes. Père David's specimens have the angles of the stem with retrorse bristles, whilst those of Mr. Forbes are perfectly smooth, as are the leaves of both: they are, however, certainly identical, and I think with equal certainty referable to Michaux's species, American examples of which have rather smaller flowers. I should, judging only from the description, have supposed Bunge's *S. chinensis* also to be the same, but Maximowicz (Prim. fl. Amur. 220) refers it to *S. baicalensis*, Fisch., a quite different-looking, much lower, hispid plant, with a very dense abbreviated raceme, of which I have specimens gathered in East Siberia, near the Lena, by Stubendorff, and others quite identical collected at Vladi Vostok by the late Mr. R. Conolly. This latter is considered a mere variety of *S. palustris*, Linn., by Turczaninow, Ledebour, and Regel; which, however, it is much more unlike than the Shanghai plant is to typical *S. aspera*.

44. *Boerhaavia diffusa*, Linn. In collibus graminosis agri Amoyensis, Oct. 1857; in ruderatis circa Cantonem, necnon in mœnibus urbis ipse legi.

45. *B. repens*, Linn. In herbidis juxta Amoy, ipse legi m. Oct. 1857.

46. *Lindera sericea*, Bl. In collibus Feng-wang-shan, prope Shanghai, exeunte Aprili 1877 leg. F. B. Forbes. Not to my knowledge previously recorded from China. *L. glauca*, Bl., grows in the same locality.

47. *Aristolochia recurvilabra*, Hance. Ad ripas fluvii Siang, reg. sept. prov. Hu-nan, æst. 1878 leg. Bullock. The only truly wild specimen of this plant I have seen.

1886 48. LORANTHUS BIBRACTEOLATUS, *sp. nov.* Glaberrimus, ramis ramulisque subteretibus cortice ruguloso griseo obductis, foliis oppositis brevissime petiolatis coriaceis oblongo-lanceolatis nunc subfalcatis obtusiusculis supra nitidulis subtus opacis creberrime reticulatis venis venulisque utrinque satis conspicuis 2½–4 poll. longis, 11–14 lin. latis, pedunculis axillaribus 2–8 aggregatis crassiusculis 1–2 lin. longis bifloris, pedicellis basi articulatis filiformibus 3 lin. longis, calycis tubo pedicello æquilongo subclavato basi bracteolis 2 oppositis semiorbiculatis basi leviter connatis stipato limbo integerrimo truncato semilineali, corollæ (ex sicco forte rubræ) 15 lin. longæ curvulæ inferne ancipitis medio paulo ampliatæ et subquadrialatæ superne tetragonæ petalis 6 ad medium coalitis loriformibus æqualibus, genitalibus corollæ æquilongis, filamentis ad medium usque tubo corollino adnatis antheris linearibus adnatis, stigmate subgloboso.

In prov. Cantonensi, secus fl. North River, m. Januario 1879 legit Dr. C. Gerlach. (Herb. propr. n. 20792.)

This seems to me most nearly allied to the Australian *L. dictyophlebus*, F. von Muell. Amongst all the species I am acquainted with I know no other with similar opposite bractlets, nor do I find such alluded to in the arrangement sketched out a few years since by Prof. Oliver. (Journ. Linn. Soc. vii. 97 sqq.)

49. *Salix pentandra*, Linn.? Ad Ping-wu, juxta Ka-shing (prov. Kiang-su ?) d. 15 Apr. 1877 coll. F. B. Forbes.

The serratures of the leaves are incumbent and more conspicuous than in the English plant; but as far as the specimens—female and in flower—enable me to judge, it must be referred here. If I am correct in my determination the Upper Amur is the nearest recorded locality.

541 50. ZINGIBER (*Lampuium*) CORALLINUM, *sp. nov.* Bi-tripedale, foliis lineari lanceolatis pedalibus supra glaberrimis subtus vaginisque pilosis, scapo 5–6 pollicari flavido vaginis pubescentibus e flavo rubentibus obtecto, spica oblonga 7-pollicari, bracteis ovatis glabris vivide coccineis 1½ poll. longis summis vacuis, floribus . . . . . ?, seminibus piceis nitidissimis arillo albo lacero-fimbriato obvolutis.

In alveis umbrosis ins. Hai-nan, ad lavas, m. Dec. 1878 coll. cl. W. Hancock. (Herb. propr. n. 20747.)

Closely allied to *Z. Cassumunar*, Roxb.

51. *Arisæma curvatum*, Kth. In montibus Fen-wang-shan, prope Shanghai, d. 13 Maii 1877 coll. am. F. B. Forbes. Only found hitherto, I believe, in the mountains of Upper India.

52. *Carex aristata*, R. Br. In collibus Feng-wang-shan, prov. Kiang-su, d. 30 Apr. 1877 coll. F. B. Forbes. The female spikes are rather longer and less compact than in Dr. Boott's figure (Illust. Car., t. 59), or than in a specimen from Shan-si, certainly referable here, which I received unnamed from the Abbé David, but I do not think they can be specifically distinguished. Dr. Boott (*l. c.*, p. 22), seems to lay stress on the hairy sheaths and leaves. They are quite or almost smooth in my specimens from both the above localities, and Treviranus had already pointed out (in Ledeb. Fl. Ross. iv. 317) that *C. drymophila*, Turcz., is merely a smooth form.

53. *C. Sampsoni*, Hance. Cum priore, sed multo rarius occurrebat cl. Forbes, d, 22 Aprilis 1877. This, though a much finer better developed specimen than Mr. Sampson's Amoy plant, on which I founded the species, is certainly the same. The Ta-hu Lake plant referred to by Mr. Hemsley as different from any he had seen at Kew (Journ. Bot. xiv. 210) is also identical, as I know from an examination of the example submitted to him.

54. *C. gracilis*, R. Br. E montosis circa Ning-po, a. 1871 misit b. Swinhoe. Now, I believe, first recorded from China.

55. *C. heterolepis*, Bge. In udis ad radices montium Pak-wan extra Cantonem, Maio 1879 leg. Sampson. The specimens agree in every respect with Peking and Jehol ones gathered by Dr. Wells Williams and Père David. Heretofore only known from the neighbourhood of Peking.

56. *Pollinia articulata*, Trin. In collinis juxta Amoy, Oct., 1857; circa Whampoa copiose occurrit, m. Octobri florens.

4375? 57. Eragrostis Nevinii, *sp. nov.* Radice valide fibrosa, culmis $1\frac{1}{4}$ pedalibus teretibus glaberrimis erectis, foliis culmo brevioribus nervosis acuminatis margine involutis cum vaginis pilis longis tuberculo insidentibus obsitis, paniculæ angustæ contractæ racemoso-compositæ $2\frac{1}{2}$–5 pollicaris ramis alternis breviter pedicellatis simplicibus a basi divisis 2–6 stachyis, axillis nudis, spiculis 12–20 floris imbricatis lineari-lanceolatis pallide purpurascenti-æneis, valvula inferiore mucronata dorso minute serrulata nervo laterali recto, superiore triente breviore dense breviciliata.

Secus fl. North River, ad angiportum Tsing-yün, m. Octobri 1876 leg. Rev. J. C. Nevin, alibique in prov. Cantonensi non rara occurrit. (Herb. propr. n. 20602.)

This, which is probably the grass referred to in my Supplement to the Hong-Kong Flora as a form of *E. geniculata*, N. ab E., connecting that species with *E. zeylanica*, N. ab E., is undoubtedly very close to both species. Mr. Nevin, however, to whom I have dedicated it, has always insisted on its distinctness from both, and I am now persuaded that he is right. He indeed, after comparing it carefully with all the species in my herbarium, considered it nearest the South African *E. chalcantha*, Trin.; but, though it greatly resembles the latter in habit and inflorescence, I do not

doubt that its true position is between *E. geniculata* and *E. zeylanica*, to the former of which it is most closely allied. It seems constant, and can easily be distinguished by habit from both.

59. *Poa nemoralis*, Linn., var. Versus cacumen montis Pohua-shan, Chinæ bor., alt. 6-7000 ped., m. Junio 1875 coll. Dr. O. a Moellendorff. For the determination I am indebted to the kindness of General Munro and Sir Joseph Hooker. The panicle is linear, simple and much contracted, and this gives it a look very unlike the usual form of the species in Europe. General Munro says that it resembles Hakodadi specimens in the elongated glumes and the 2-flowered spikelets. An addition to the Chinese flora.

60. *Cheilanthes argentea*, Kze. Secus fl. North River, prov. Cantonensis, m. Jan. 1879 coll. Dr. Gerlach. The first record of this fern from Southern China.

*** A few of the plants mentioned in the foregoing fasciculus as new to China have been already recorded in M. Maximowicz's 'Fragmenta ad floræ Asiæ orientalis cognitionem meliorem,' Messrs. Baker and Spencer Moore's 'Contributions to the Flora of Northern China,' and perhaps elsewhere. With this explanation I leave my manuscript just as it was written, most of it having been drawn up long ago, and a press of other avocations having alone prevented its being arranged in order and sent to press earlier.

ON THE BOTANY OF THE BRITISH POLAR EXPEDITION OF 1875–6.

By Henry Chichester Hart, B.A., Naturalist to H.M.S. 'Discovery.'

(Concluded from p 242.)

Eriophorum polystachyum, L., var. *elatior*, Koch.
Dist. 1 2 3 - - - 7 - - - - 12 13. Lat. 69° 15′ to 82° 27′. W. & G.
Disco, &c., very plentiful along the southern shore of Hayes Sound. Common in Discovery Bay and appearing at low levels with the thaw in all wettest places. Floeberg Beach (H. W. F. and coll. Moss).

E. polystachyum, L., var. *angustifolia*, Roth.
Dist. 1. Lat. 69° 15′. G.
Common at Disco.

Gramineæ.

Alopecurus alpinus, L.
Dist. 1 2 3 4 5 6 7 8 9 10 11 12 13. Lat. 68° 42′ to 83° 4′.
Perhaps the most widely spread plant in the latitudes visited, and in all probability grows in the extreme habitats given for the yellow Poppy, Arctic Willow, and purple Saxifrage; "tufts of grass" at Ward Hunt Island, lat. 83° 4′, noticed by Lieut. Aldrich, most likely belonged to this species. Very luxuriant and handsome

at Disco, where it was from a foot to eighteen inches in height. The chief vegetation about the settlements, and very rank upon organic matter, as guano at Foulke Fiord and Cape York. In Discovery Bay, though common, this grass is seldom more than four inches in height, always growing singly and never forming a sward; nor does it scatter its purple pollen—its chief beauty at more southerly stations. Floeberg Beach and Cape Joseph Henry (H. W. F.)

Sea-level to 1400 feet in Discovery Bay.

Phleum alpinum, L.

Dist. - 2. Lat. 72° 20′. G.

Only met with at Proven. Lange gives 69° 14′ as northern range of this plant in Greenland.

Hierochloe alpina, L.

Dist. 1 2 3 - - - 7. Lat. 69° 14′ to 78° 50′. W. and G.

Disco; especially luxuriant and handsome at Proven; Deserted Village, Hayes Sound.

Deschampsia cæspitosa, Beauv.

Dist. - - - - - - - - - - - 12. Lat. 81° 42′. W.

Discovery Bay; not known from the west coast of Greenland.

Trisetum subspicatum, Beauv.

Dist. 1 2 - - - - - - - - - 12. Lat. 69° 14′ to 81° 42′. W. and G.

Disco and Proven; not again seen till Discovery Bay, where it grows on Mount Cartmel and on Bellot Island; very luxuriant at Proven.

Sea-level to 700 feet at Discovery Bay.

Colpodium latifolium, Br.

Dist. 1 2 3 - - - - - - - - 12. Lat. 69° 14′ to 81° 50′. W. & G.

Not unfrequent in Discovery Bay, usually on wet places near the sea—as far north as Shift Rudder Bay.

Phippsia algida, Br.

Dist. - - - - - - - - 8 9 - - 12. Lat. 79° 30′ to 81° 42′. W.

Walrus (Norman Lockyer) Island; Radmore Harbour; common in Discovery Bay, growing in mud by the sea-edge on ground which is flooded by spring-tides.

Sea-level to 100 feet on Walrus Island.

Glyceria angustata, Br. (*G. festucæformis*, Host., *Poa angustata*, Br.)

Dist. 1 - - - - 6 - 8 - - - 12. Lat. 69° 14′ to 81° 42′. W. & G.

Confined to the sea coast; Englishman's Bay, Disco; Cape Sabine and Walrus Island (coll. Moss); Gould Bay (coll. Copp.); frequent in Discovery Bay and Watercourse Bay to the north east.

Poa pratensis, L. (and vars.)

Dist. - 2 - - 5. Lat. 72° 20′ to 78° 18′. E. and G.

Proven and Foulke Fiord.

P. nemoralis, L. (*P. cæsia*, Sm.)

Dist. 1 - - - - - 7 - - - - 12. Lat 68° 42′ to 81° 42′. W. and G.

Disco; Twin Glacier, Hayes Sound; common in Discovery Bay.

P. flexuosa, Wahl.

Dist. 1 2 3 4 5 6 7 8 9 10 11 12 13. Lat. 68° 42′ to 82° 50′. E., W., and G.

The forms *P. cenisia*, All., *P. arctica*, Br., *P. laxa*, Haenke, and *P. abbreviata*, Br., occurred, but it is impossible often to separate them. *P. abbreviata* appeared to be the commonest form to the north. Polaris Bay (coll. Copp.); Floeberg Beach and Cape Joseph Henry (H. W. F.)

Sea-level to 1500 feet in Discovery Bay.

P. alpina, L.

Dist. 1 - - - - 6 - 8 - 10 - 12. Lat. 69° 15′ to 81° 42′. E., W., & G.

Disco; Cape Sabine; Walrus Island; Bessels Bay (coll. Moss) and Discovery Bay. Rare to the north and nowhere plentiful. Lange gives 70° as northern limit in Greenland.

Festuca ovina, L.

Dist. 1 2. Lat. 69° 15′ to 72° 20′.

Disco and Proven.

F. ovina, L., var. *brevifolia*, R. Br.

Dist. 1 2 3 - 5 6 - 8 - - 11 12 13. Lat. 69° 15′ to 82° 27′. E., W., and G.

Not so common as *Poa flexuosa* in Discovery Bay; flowering late and rarely. Floeberg Beach (H. W. F.)

Elymus arenarius, L.

Dist. 1. Lat. 69° 15′. G.

Shore on both sides of Godhavn, Disco.

Acotyledones.

Filices.

Polypodium Dryopteris, L.

Dist. 1. Lat. 69° 15′. G.

Growing profusely with holly fern close to the shore at Englishman's Bay, Disco. The oak fern has not been previously discovered in Arctic Greenland; Lange gives its northern limit at 64° 10′.

Woodsia ilvensis, R. Br.

Dist. 1. Lat. 69° 15′ to 69° 42′. G.

Disco, at Lyngemarken; Englishman's Bay, &c., Rittenbank (coll. Copp.)

W. hyperborea, R. Br.

Dist. - - - - - - 7. Lat. 78° 50′. W.

"Edward's Grief," Hayes Sound, August 4, 1875. Very abundant. Not known in North America except Canada; and arctic elsewhere only in Europe and Greenland.

W. glabella, Br.

Dist. - - - - - - 7. Lat. 78° 50′. W.

With the last, common; also at Twin Glacier Valley, close by (coll. Moss). This fern, though arctic in East America, does not appear in Greenland; the occurrence of these two together is therefore very remarkable.

Cystopteris fragilis, Bernh.
Dist. 1 - - - - 6 7 - - - - 12. Lat. 69° 15′ to 81° 44′. W. & G.
Common at Disco. Plentiful with the last two at Hayes Sound. Bellot Island and Cape Murchison, Discovery Bay. Cape Murchison, lat. 81° 43′ N., is the highest latitude at which a fern has been gathered, near Cape Sabine (H. W. F.)

C. fragilis, Bernh., var. *dentata*, Sm.
Dist. 1. Lat. 69° 15′. G.
In exposed situations near Godhavn. Having the confluent sori, and fronds barely twice pinnate of this variety; also with the young pinnæ reflexed.

Polystichum Lonchitis, L.
Dist. 1. Lat. 69° 15′. G.
In great profusion at sea-level in Englishman's Bay, Disco. Neither the Holly Fern nor the Oak Fern are recorded from Disco by Brown ('Florula Discoana').

Equisetaceæ.

Equisetum variegatum, L.
Dist. 1 - - - - - - - - - - - 12. Lat. 69° 15′ to 81° 42′. W. and G.
Englishman's Bay and Lyngemarken, Disco; did not again meet with it except sparingly in these places at Discovery Bay, near the harbourage.
800 feet on Mount Cartmel.

E. arvense, L.
Dist. 1 - - - - - 7 - - - - 12. Lat. 69° 15′ to 81° 42′. W. & G.
With the last in Englishman's Bay, Disco, and at Hayes Sound; Bellot Island, Discovery Bay, and on low ground near the ship. Always preferring low levels.

Lycopodiaceæ.

Lycopodium Selago, L.
Dist. 1 2 - - - 7. Lat. 69° 14′ to 72° 20′. G.
Disco, Rittenbank, and Proven; Hayes Sound.

L. annotinum, L.
Dist. 1. Lat. 69° 14′. G.
Disco.

Note.—In support of the theory which I have put forward in my introductory remarks, namely, that in the higher latitudes visited by our expedition the duration of the sun's power is too brief to enable flowering plants to ripen their seeds, and that in fact no annuals occur, I may mention that a large series of apparently ripe seeds, taken from almost all the species occurring at the stations visited, has been submitted to Messrs. Moore and Burbidge, of the Glasnevin and College Botanic Gardens, Dublin, and that their efforts to obtain even a single seedling were unsuccessful.

ENUMERATIO ACANTHACEARUM HERBARII WELWITSCHIANI ANGOLENSIS.

Auctore S. Le M. Moore.

(Continued from p. 270.)

Neuracanthus, Nees.

N. decorus (sp. nov.)— Herba perennis radice crassiuscula pluricaulis, caulibus pedalibus erectis pubescentibus demum fere glabris, foliis subsessilibus rigidulis oblanceolato-obovatis minutissime denticulatis subtus conspicue reticulatis vix glabris, spicis subsessilibus vel foliis deficientibus pedunculatis elegantibus ad 5 cm. longis, bracteis ovatis breviter acuminatis flavido-villosulis, calycis villosuli labiis fere æqualibus lobis ultra medium connatis lanceolatis acutis, corollæ labio postico breviter 2-lobo lobis ovatis obtusis antico vix integro limbo extus pilos longos strigosos ferente tubo basi dilatato, capsula ignota.

Hab. In collinis rupestribus dumetosis inter lacum magnum de Ivantala et Quilongues rarior. (No. 5057.)

Folia usque ad 9·0 cm. long. et 2·5 cm. lat., supra obscure subtus flavescente viridia. Pedunculi ad 5·0 cm. long. Bractea circiter 1·0 cm. long. et 0·6 cm. lat. Corolla albido-purpurascens, 1·0 cm. longitudine.

Species insignis cum nulla comparabilis.

N. scaber (sp. nov.)—Caule valido ramoso interdum ad nodos tumido fere omnino glabro, foliis firmis breviter petiolatis ovatis vel ovato-lanceolatis brevissime apiculatis utrinque strigose hirsuto-pilosis nonnunquam fere glabris obscure scabris, spicis axillaribus vel terminalibus abbreviatis subglobosis, bracteis herbaceis ovatis vel ovato-lanceolatis apice acuminatis ac revera induratis conspicue nervosis extus pilosis vel vix glabris ciliatis, calycis villosi labiis fere æqualiter lobatis lobis lineari-lanceolatis acuminatis, corollæ labio postico 2-dentato antico breviter 3-lobo, capsula ovoideo-oblonga apice breviter rostrata nitida 2-sperma.

Hab. In collinis edit. agri Loandensis prope Boa Vista. (Nos. 5064, 5125, 5128, 5171.)

Herba suffrutescens radice lignosa polycephala. Folia usque ad 6·5 cm. long. et 3·5 cm. lat., plerumque vero minora; petioli 0·5 cm. long., validi. Spicæ circiter 2·0 cm. long., et 2·5 cm. lat. Bracteæ ad 1·5 cm. long., plerumque 6–7-nerviæ interdum paullo inæquilaterales. Flores ex albo-lacteo pallidissime cærulescentes. Calyx sub flore 1·3 cm. long., lobi 0·3 cm. long., labii postici lobis lateralibus paullo brevioribus. Capsula 0·8 cm. long.

N. Lawii, Wight proxima, sed foliis, bracteis ac floribus toto cœlo diversa.

At the time of the publication of Anderson's and Klotzsch's papers no *Neuracanthus* was known from Africa. Four species from this continent have now been described.

Asystasia, Bl.

A. gangetica, T. And.

Hab. In distrr. Huilla, Golungo Alto et Geha do Principe. (Nos. 5170, 5160, 5196, 5206, 5131, 5050.)

All the specimens with numbers here quoted belong to the species as understood by Anderson, although they differ considerably among themselves.

A. Welwitschii (sp. nov.)—Caule erecto ramoso eximie quadrangulari scabro superne pubescente, foliis sparsis subsessilibus lanceolatis acutis vel acuminatis margine undulatis utrinque scabris, spica erecta elongata folia multoties excedente, floribus formosis in axillis foliorum floralium parvorum pubescentum solitariis vel oppositis, bracteis lanceolatis quam calyx brevioribus, calycis 5-partiti lobis elongatis linearibus subulatis pubescentibus, corollæ majusculæ puberulæ tubo leviter incurvo mox in faucem latam campanulatam expanso limbi lobis late ovatis obtusis, staminibus 4 perfectis per paria lateralia insertis et breviter connatis loculis subæqualibus uno loculo altius affixo breviter biappendiculatis connectivo lato, stylo glabriusculo bilobo, ovario-glabro, capsula ———.

Hab. Frequentiss. ubique in dumetis circa Presidium et ad dumeta prope Cazellas distr. Pungo Andongo necnon rarior in pascius dumetosis pr. Lopollo distr. Huilla. (Nos. 5188, 5105, 5039).

Herba 2·4 pedalis, e radice lignescente multicaulis erecta vel ascendens. Folia 4·0—7·0 em. long., 1·2–3·0 cm. lat. Spicæ nondum absolute evolutæ ad 16·0 cm. long. Calycis lobi 1·3 cm. long. Corolla albo-rosea, vix 3·5 cm. long., limbus ejus 2·0 cm. diam.

A. Charmian, nob. huic proxima punctis multis ea discrepat.

Species dubia.

No. 5159. Specimen maxime imperfectum. An hujus generis ?

Eranthemum, L.

E. nigritianum, T. And.

Hab. In sylvis primitivis umbrosis humidis ipsius Præsidii Mata de Pungo distr. Pungo Andongo. (Nos. 5177, 5192.)

Suffrutex gracilis basi lignescens 1–2-pedalis, foliis tenuiter coriaceis lucidulis. Flores cærulei vel intense violaceo-cærulescentes.

Lepidagathis, Willd.

L. pallescens (sp. nov.)—Caule stricto obscure quadrangulari pubescenti-hirsutulo, foliis subsessilibus firmis lanceolatis obtusiusculis basi attenuatis subtus præsertim ad nervos pilis strigosis appressis notatis, spicis breviter subcylindricis in axillis superioribus positis vix sessilibus, bracteis ovatis acuminatis vel acutis subrigidis crebre eleganterque nervosis basi pubescentibus, calycis laciniis ovato-lanceolatis acuminatis (lateralibus lineari-lanceolatis) ciliolatis scariosis anticis liberis, corollæ tubo sub fauce arcte constricto limbi puberuli labio postico ovato-oblongo brevissime 2-lobo antico

Tab. 213.



J. Nugent Fitch del et lith.

West, Newman & Co. imp.

Asystasia Welwitschii. *S. Moore.*

3-partito lobis late ovatis omnibus obtusissimis, antheris glabris, disco breviter cupulari ovula quoque in loculo 2, capsula ignota.

Hab. Sparsim ad latera sylvarum in arenosis prope Quitage distr. Pungo Andongo. (No. 5084.)

Herba ut videter perennis. Folia ad 6·0 cm. long. et 1·0 cm. lat. Spicæ circiter 2·0 cm. long. et 1·0 cm. lat., haud interruptæ. Bracteæ circiter 1·0 cm. longitudine, minores vero ad basin exstant. Calycis laciniæ anticæ 1·3 cm. longæ prope ad apicem 3-nerviæ lateralibus paullo brevioribus 1-nerviis. Corollæ albida-roseæ tubus 0·7 cm. long., superne pubescens.

Species insignis ab omnibus africanis quam maxime aliena.

Species dubia.

No. 5104 videtur *L. sp.* sed specimen valde mancum.

Isochoriste, Miq.

I. africana (sp. nov.)—Caule tenui angulato ad nodos tumido ibique puberulo, foliis membranaceis ovato-lanceolatis acuminatis glabris basi in petiolum gracilem perlongum gradatim desinentibus, inflorescentia foliis subæquilonga, floribus geminis, bracteis bracteolisque minimis linearibus, calycis lobis lineari-lanceolatis glabris, corollæ tubo pro genere brevi ac lato limbi labio postico 2-lobo lobis oblongis antico æstivatione extimo 3-lobo lobis ovatis lobo mediano majore, staminibus subexsertis antherarum loculis parum inæqualibus basi brevissime aristulatis, disco prominente, ovario oblongo 2-ovulato, stylo capitellato, capsula ———.

Hab. Distr. Pungo Andongo in sylvestribus dumetosis prope Quilange. (No. 5073.)

Herba 2–3-pedalis. Folia ad 7·0 cm. et petioli ad 3·0 cm. long. Bracteæ 1·5 cm. long., quam bracteolæ majores. Calyx circiter 2·5 cm. long., pedicellos paullo excedens, ex sicco ater. Corollæ tubus vix 0·6 cm. long., labium superius tubo longius; flores rosei, nervosi, intus levissime puberuli. Stamina ad faucem tubi affixa; filamenta parum arcuata; antheræ 0·1 cm. long., glabræ, ad marginem membranaceæ.

A genere a Miquelio proposito discedit corollæ tubo brevi necnon antherarum loculis parum inæqualibus ac basi aristulatis.

No. 5078 forma parvifolia videtur hujus speciei. Flores ejus non vidi, sed capsula longe stipitata acutiuscula fere 3·0 cm. long., cinerea. Semina 0·5 cm. diam., cinerea, sicca rugosula.

Monothecium, Hochst.

M. aristatum, T. And. (*Anthocometes*, Nees).

Hab. In sylvaticis M. de Queta occident. supra Ndelle distr. Golungo Alto necnon in distr. Pungo Andongo sine loci indicatione. (Nos. 5134, 5155, 5197, 5198.)

Justicia, L.

§ *Betonica.*

J. Betonica, L.

Hab. In distrr. Pungo Andongo et Huilla. (Nos. 5043, 5111.)

Hujus exstant formas duas, viz. :—
i. Forma normalis bracteis decoloribus viride reticulatis.
ii. Forma foliis majoribus bracteis amplioribus viridibus.

§ Rostellaria.

J. lolioides (sp. nov.) — Bipollicaris, caule obsolete quadrangulari scabriusculo, foliis rigidis sessilibus linearibus obtusis, spicis elongatis interruptis, bractea bracteolisque lanceolato-oblongis obscure ciliolatis uninerviis carinatis subhyalinis, calycis laciniis bracteolis æquilongis inter se subæqualibus lanceolatis vel linearilanceolatis acuminatis vel acutis ad medium saltem longitudinaliter trinerviis superne binerviis apice uninerviis subhyalinis obscure ciliolatis, corollæ pubescentis tubo quam limbus paullo longiore a basi gradatim parumque ampliato, capsula oblongo-ovata in stipitem brevem contracta apice acuta nitida, semine quove in loculo solitario lævi retinaculo truncato fulto.

Hab. In apricis sylvaticis subhumidis de Mata de Mentollo distr. Pungo Andongo. (Nos. 5090, 5178.)

Folia 4·0–6·5 cm. long. et circiter 0·2 cm. lat., glabra, ex sicco ascendentia. Florum rhachis bilateraliter compressa. Bracteolæ 0·8 cm. long. et 0·1 cm. lat., fere omnino glabræ, siccitate pallide lutescentes atrateque nervosæ. Corollæ tubus 0·5 cm. long. Capsula 0·8 cm. long. Semina compressa.

J. procumbenti, L. affinis sed de foliis comparate longioribus ac rigidis et bracteis majoribus obscure ciliolatis ex sicco flavescentibus primo intuitu diversa; præbet itaque varietatem sequentem speciei Linnæanæ majus affinem.

Var. *latifolia* foliis lineari-lanceolatis apice induratis 3–4 cm. long. 0·6 cm. lat. rigidiusculis, inflorescentia typi.

Hab. In pascuis parce graminosis subsiccis sylvestribus inter Quisonde et Condo distr. Pungo Andongo. (No. 5099.)

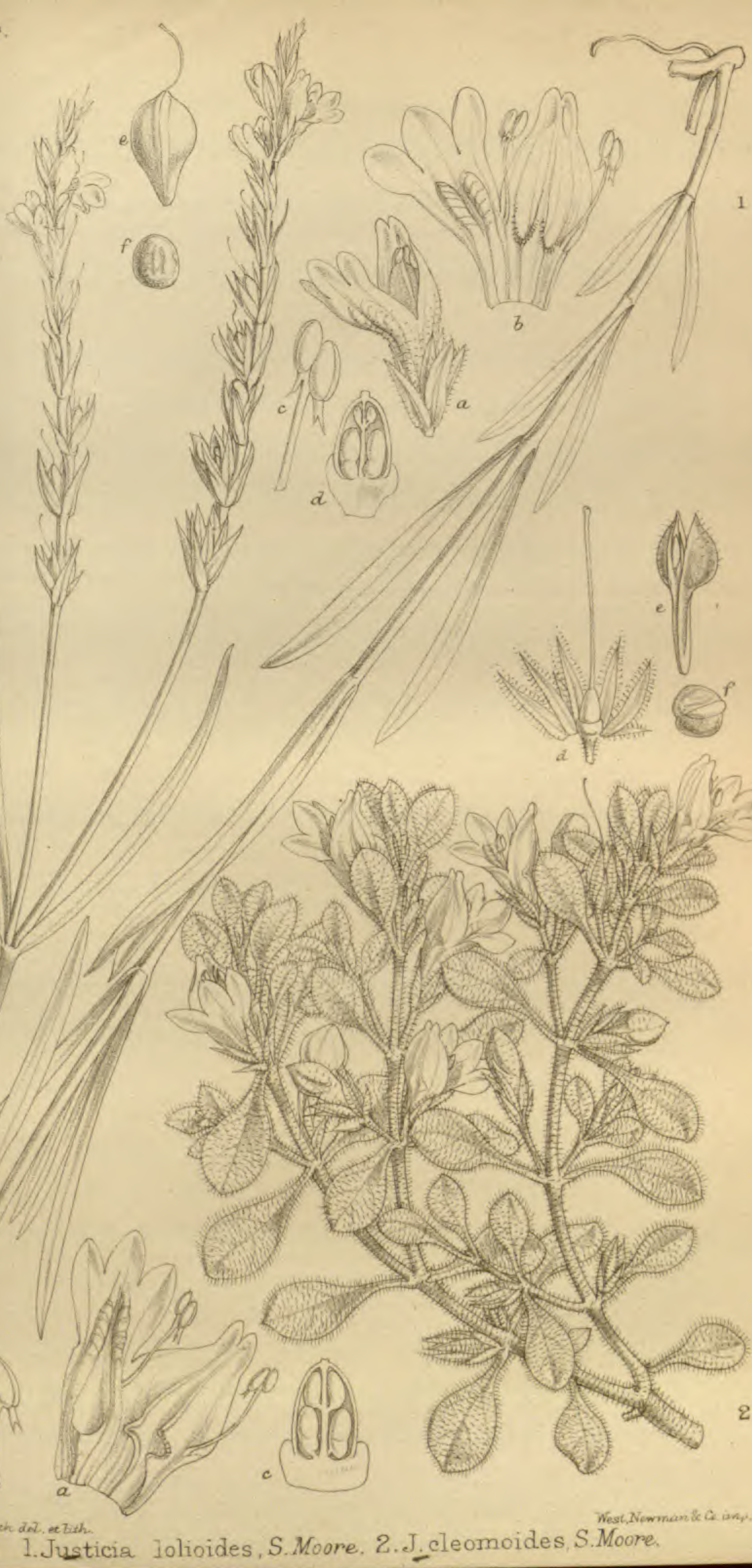
J. plicatæ, Vahl var. foliis oblongo-ovalibus obtusiusculis, bracteis elongatis attenuatis siccitate atris. Flores lutei.

Hab. In pascuis sylvaticis pr. Mumpulla distr. Huilla, necnon in distrr. Golungo Alto, Pungo Andongo et Huilla. (Nos. 5035, 5036, 5074, 5097, 5135, 5183.)

There is considerable diversity in the size and number of seeds on the same specimen in this species.

J. scabrida (sp. nov.)—Caule robusto paullo nodoso subquadrangulari longitudinaliter canaliculato crebre pubescenti-villoso, foliis firmis subsessilibus lanceolatis obtusis margine levissime undulatis pagina inferiore pallidiore appresse strigoso-pubescentibus superiore scabridis, spicis pedunculatis attenuatis foliis brevioribus vel subæqualibus, bracteis quam flores maturos paullo brevioribus lineari-lanceolatis obtusiusculis puberulis ciliolatis, calycis laciniis 5 fere æqualibus lineari-lanceolatis acuminatis quam bracteæ multo minoribus, corollæ tubo basi ampliato limbum ac calycem æquante labio postico breviter 2-fido, filamentis crassiusculis leviter tortis basi laxe pubescentibus antherarum loculo inferiore quam superior

Tab. 214.



J. Nugent Fitch del. et lith.

West, Newman & Co. imp.

1. Justicia lolioides, *S. Moore.* 2. J. cleomoides, *S. Moore.*

majore ac calcar bene evolutum apice bicrurum gerente, stylo obtuso, capsula ignota.

Hab. Rarior ad dumeta prope Condo, Nbille et Bumba distr. Pungo Andongo. (Nos. 5085, 5092.)

Ex affinitate *J. palustris* (*Adhatoda*, Nees) sed caule pubescenti-villoso, et foliis majus coriaceis ac scabridis, et floribus multo majoribus ab ea distincta: itaque ob notas citatas a *J. plicata*, Vahl et *J. minore*, Anders. haud longe distare videtur.

Herba 2–3 pedalis erecta scoparie ramosa. Caulis 2–4 cm. crassus. Folia 4–8·5 cm. long. et 1–2·5 cm. lat.: petioli 0·2–0·3 cm. long., pubescenti-villosi. Bracteæ circiter 1·0 cm. long., 0·15–0·22 cm. lat., firmiusculæ, siccæ haud atratæ. Calyx 0·7 cm. long., lobi ejus divaricati, puberuli. Corollæ labii antici lobi ovato-rotundati, postici ovati, obtusi.

J. MONECHMOIDES (sp. nov.)—Caule subtetragono crebre strigoseque puberulo longitudinaliter canaliculato, foliis membranaceis brevipetiolatis lanceolatis vel ovato-lanceolatis scabriusculis, spicis sessilibus terminalibus vel axillaribus folia equantibus vel iis revera longioribus vel abbreviatis, bracteis amplis ovatis vel oblongo-ovatis acutis viscoso-hirsutis calycem occulentibus, calycis lobis 5 subæqualibus linearibus hirsutulis, corollæ tubo quam calyx breviore e basi levissime dilatato labio postico brevissime 2-lobo fere integro, antheris valide calcaratis, disco integro, ovario oblongo-ovoideo brevissime stipitato, stigmate obtuso, capsula obovoidea levissime rostrata sericeo-pubescente, seminibus quave in capsula 2 lævibus retinaculis truncatis suffultis.

Hab. In dumetosis humidiusculis ad Imbondeiro dos Lobos distr. Loando. (Nos. 5065, 5123, 5140, 5184.)

Herba $1\frac{1}{2}$–2-pedalis, læte viridis, erecta, basi pauce ramosa. Foliorum lamina ad 5·0 cm. long. et 2·5 cm. lat.; petioli usque ad 0·7 cm. long., crebre puberuli. Spicæ 0·6–4·0 cm. long. et 1·0 cm. lat., alternæ (an rarissime oppositæ?). Bracteæ 0·7–0·8 cm. longitudine, siccæ virides. Flores albi, indecores. Calycis lobi et corolla 0·5 cm. et capsula 0·7 cm. long. Semina ægre 0·3 cm. diam., obscure reniformia, nitida.

This very distinct species, as its name imports, has a great resemblance to the section *Monechma*. The essential character of that section, unfortunately overlooked by Bentham in the 'Genera,' is that the spikes are in opposite axils, a character which is not possessed by the spikes of *J. monechmoides*, unless perhaps near the point where they change from axillary to terminal.

J. LÆTA (sp. nov.) — Caule erecto tetragono cinereo patenti-pubescente, foliis amplis membranaceis ovato lanceolatis cuspidatis e basi attenuata in petiolum brevem abeuntibus utrinque precipue vero subtus piloso-pubescentibus, spicis axillaribus pedunculatis ac thrysoideo-terminalibus, bracteis bracteolisque subæqualibus ovato-lanceolatis subhyalino-membranaceis trinerviis extus puberulis margine ciliolatis, calycis lobis quam corollæ tubus paullo brevioribus lanceolatis bracteis bracteolisque consimilibus lobo quinto deficiente, corollæ tubo satis elongato a basi ipsa gradatim

amplificato labio postico integro quam anticum breviore, filamentis filiformibus antheris graciliter calcaratis, disco integro, stylo obtuso.

Hab. In distr. Pungo Andongo in collinis dumetosis inter Condo et Quisonde necnon in rupestribus de Fonte de Casambe. (Nos. 5081, 5108.)

Herba perennis, 2–3-pedalis, rhizomate lignescente multicaulis. Caulis 0·3 cm., crassus. Folia ad 10·0 cm. long. et fere 4·0 cm. lat.; petioli circiter 1·5 cm. long., tenues. Pedunculi spicarum axillarum ad 2·5 cm. long., pubescentes. Bracteæ 0·8 cm. long. Calycis laciniæ vix 1·0 cm. longitudine. Corollæ amœnissime violaceæ tubo ægre 0·9 cm. et labium anticum 1·0 cm. long. Capsula ignota.

Mihi videtur ad *J. petiolarem*, E. Mey. proxime accedere ab illa vero multis de notis discedit.

J. MOSSAMEDEA (sp. nov.) — Caule ramoso lignescente parum geniculato pilis patentibus glanduloso-villoso dein villosulo, foliis sat sparsis breviter petiolatis oblanceolatis vel lineari-oblanceolatis mucronulatis seu brevissime cuspidulatis pubescentibus, floribus axillaribus solitariis fere omnino sessilibus, bracteis calycem æquantibus linearibus glanduloso-villosulis, calycis lobis lobo quinto omnino deficiente 4 æqualibus linearibus obtusiusculis prominenter 1-nerviis glanduloso-villosulis, corollæ tubo calyci subæquilongo sat lato vix ampliato extus superne pubescente labio postico 2-lobo antico amplo ad faucem angustato, filamentis crassiusculis basi glabris antherarum loculis subæqualibus loculo superiore incurvo-calcarato, disco cyathiformi, capsula compressa ovoideo-oblonga acuminata superne puberula 2-sperma, seminibus maturis plano-convexis circularibus nigropunctulatis glabris nitidis.

Hab. In distr. Mossamedes ad Arimo de Sr. Viana; itaque ad latus mont. calcar. inter Mossamedes et Cavalheiros. (Nos. 5003, 5004.)

Herba a basi ramosa. Caulis circiter 0·2 cm. crassus; internodia plerumque 3–4 cm. long. Folia 2·0–3·5 cm. long., membranacea. Calyx 0·5 cm., corolla vix 1·0 cm. et capsula 0·5 cm. longitudine. Flores violaceo-purpurei. Semina 0·22 cm. diam.

Species inter affines pilis glandulosis primo intuitu cognoscenda. Huic proxima exstat ———.

J. NEPETA (sp. nov.)—Ramosa foliosa pubescenti-villosa caulibus tenuibus subteretibus ad nodos incrassatis internodiis brevibus, foliis fere omnino sessilibus lineari-oblanceolatis obtusis vel acutiusculis, floribus in axillis solitariis sessilibus, bracteis foliis similibus quam ea vero minoribus calycem amplectantibus, calycis laciniis 4 subæqualibus linearibus pubescenti-villosis in partem superiorem læte viridibus, corollæ parvulæ puberulæ tubo quam calyx paullo breviore superne gradatim ac leviter amplificato labio postico ovato-oblongo breviter bilobo labii antici lobis subæqualibus ovatis, filamentis dilatatis antherarum loculo inferiore majore calcari incurvo appendiculato, ovario conico glabro, stylo firmo leviter incurvo præsertim inferne villoso-pubescente apice obtuso, ovulo

unico, capsula ovoideo-oblonga breviter et valide stipitata apice rostellato superne pubescente, seminibus lævibus cinereis retinaculis incurvis fultis.

Hab. Rarior in dumetis arenosis vel argillaceis ferrugineis prope Boa Vista agri Loandensis. (No. 5185.)

Herba erecta vel ascendens. Folia 1·0–2·5 cm. long., medio 0·4–0·5 cm. lat., secus lineam medianam conspicue 1-nervata. Bracteæ 0·7 cm. long., 0·1 cm. lat., erectæ. Calycis laciniæ 0·4 cm., erectæ. Corolla 0·6 cm. long., violaceo-purpurea. Ovarium 0·1 cm. long. Capsula fere 0·6 cm. long., pallide brunnea. Semina 0·15 cm. diam.

J. CLEOMOIDES (sp. nov.)—Tota planta pilis patentibus hirsuta, caule folioso ramoso lignescente subquadrangulari, foliis membranaceis brevipetiolatis late spathulatis obtusissimis, floribus in axillis solitariis pedunculatis, bracteis linearibus acutis, calycis laciniis 5 æqualibus bracteolis consimilibus iis vero longioribus, corollæ majusculæ fere 2·0 cm. longæ tubo lato e basi leviter ampliato curvato glabro labio postico integro antici ampli lobis ovatis acutiusculis, filamentis filiformibus basi glabris antherarum loculis subæqualibus loculo inferiore (paullo minore) breviter calcarato, disco cupulari, stylo obtuso, capsula oblonga acutata longiuscule stipitata superne sericeo-pilosa, capsula 2-sperma, seminibus (immaturis) lævibus.

Hab. In arenosis submaritimis inter Mossamedes et Cavalheiros. (No. 5006.)

Frutex humilis 1–2 pedalis densissime ramosus cæspites hemisphericas formans. Folia (petiolo incluso) ad 1·5 cm. long. et 1·0 cm. lat. Pedunculus 0·4 cm. long. Bracteolæ 1·7 cm. Calycis laciniæ vix 1·9 cm. et corollæ tubus 1·1 cm. long. Flores albidi labio inferiore violaceo disco flavescente. Capsula 1·4 cm. long.

J. mossamedeæ affinis multis de notis vero maxime aliena.

J. LAZARUS (sp. nov.) — Caule gracili ramoso longitudinaliter sulcato puberulo, foliis sparsis lineari-lanceolatis fere linearibus obtusis vel acutis vix integris basi in petiolum brevem attenuatis glabris læte viridibus, floribus parvulis in axillis sessilibus, bracteis oblanceolatis obtusis calyci æquilongis puberulis, calycis laciniis 5 subæqualibus anguste lineari-lanceolatis acutis fere glabris dorso eximie carinatis, corollæ tubo calycem paullo excedente a basi sensim ampliato labio postico ovato integro, filamentis parum flexuosis, antherarum loculo inferiore majore calcari recto appendiculato, disco cupuliformi, ovario oblongo-ovoideo glabro 2-ovulato, stylo obtuso.

Hab. In sylvaticis umbrosiusculis prope Catumba sed sparsissime. (Nos. 5051, 5058.)

Folia ad 4·0 cm. long., plerumque vero minora. Bracteæ et calyx 0·35 cm. long., hujus tubus et laciniarum basis decolores. Corolla 0·6 cm. long., albida vel albido-rosea. Capsula haud visa.

Ex affinitate *J. rotundifoliæ*, E. Mey., cujus folia diversiformia, flores multo majores, &c.

In the absence of fruit it is impossible to say whether the place of this plant is in the present section or in § *Harniera*.

No. 5093 (distr. Pungo Andongo) may perhaps be a larger form of this with leaves hairy on the underside.

(To be continued.)

THE COFFEE-LEAF DISEASE.

[Mr. Marshall Ward's Preliminary Report on the Ceylon Coffee-leaf disease presents several new and important phenomena in the life-history of *Hemileia vastatrix*. Of even greater interest, we venture to think, at this stage of the investigation than these facts are the evidences given by the Report of the thoroughness of the methods which Mr. Ward is employing. The difficulties to be met with in any research of this kind cannot easily be over-estimated: one of the most troublesome and misleading is the presence of foreign fungi. In Europe such at least as commonly occur have become more or less familiar, and their connection with the subject of investigation is easily determined; but Mr. Ward has to contend with unfamiliar forms (both, apparently, special parasites of the coffee-plant and more generally-distributed fungi), all of which must be thoroughly traced, as they may possibly be phases of the *Hemileia*. Mr. Ward recognises this difficulty, and is actively meeting it; and we may now hope in due course for details of the life-history of this highly interesting fungus. That part of Mr. Ward's Report which describes his examination of the *Hemileia* is appended.—G. M.]

Specimens of disease-patches in all stages were selected. Some were very small, hardly yellow "pin-spots," only seen when held up to the light; others older, larger, and more oily-looking; still older ones were covered below with the yellow or orange "rust"; while yet further advanced irregular patches presented brown or black blotches in the central part, the yellow powder being at the edges.

The microscope establishes the following facts, and I have confirmed the observations since by examination of specimens from all parts of the coffee-districts, at various elevations and seasons.

Thin slices of the "pin-spots" and pale yellow patches, taken in all directions, and examined fresh or treated with chemical reagents, show that this part of the leaf has the passages between its cells which lead to the exterior blocked up with a much-branched, tubular, coral-like mycelium; the short, stumpy branches applying themselves here and there in their course to the outside walls of the cells. The contents of the tubes are very granular and oily, usually coloured by a pigment varying from yellow to deep orange-red.

The older patches present similar features exaggerated, but the branched tubes of the mycelium have sent peculiar groups of processes outwards through the outlets (stomata) of the epidermis;

on reaching the exterior, the ends of these branches form swellings which soon become filled with deep orange-coloured pigment and granules, and the groups of bodies seen from above present the appearance of rosettes. Since these bodies are easily rubbed off, they form a powdery mass on the outside—the so-called "rust."

Similar examination of the brown or black central blotches shows that the leaf-cells have lost most of their contents, turned brown, and collapsed; thus the upper and lower surfaces come closer together, and such parts are thinner than the rest of the leaf. Usually, a number of black dots are seen on the upper and lower surfaces.

There can be no doubt that the tubular branched mycelium has been feeding upon the contents of the leaf-cells, turning the green colouring-matter and other substances into the granular and oily masses found within it, and finally passing forth into the bodies forming the "rust"-powder; and when we reflect upon the immense quantities of matter thus derived and thrown off from the leaves, we may understand in some measure the terrible effect produced upon the coffee plant.

Some of the yellow "rust" was placed in water on a glass slide, and examined under the microscope. Each "grain" of the powder is a hollow case, somewhat kidney-shaped in longitudinal section, and triangular, with one angle downwards, in transverse section; it is narrower at the end attached to the mycelium. The upper curved side is studded with papillæ or wart-like projections of its outer, colourless coat; the two smooth sides converge below to a rounded longitudinal ridge. Such a figure exhibits various forms if projected in different positions. As said, this papillate body has granular orange-coloured contents.

Many of them soon swell in water, and become filled with globules of clear fluid (vacuoles) from the equal and rapid imbibition of water; the papillate body now appears as if filled with spherical clearer bodies embedded in the coloured mass. These globules are not always equal in size, but generally are nearly so, and average one-tenth to one-eighth the diameter of the whole mass; not only by their appearance, refusal to absorb staining reagents, and general behaviour, but by the fact that they can be made to disappear and reappear I am convinced of their fluid nature.

Others of the papillate bodies, however, do not fill with globules, but swell, and soon lose their reddish colour; and the contents become very granular and grey-looking. After a time, varying from a few hours to a much longer period, the granules, which are very minute and numerous, pass into a state of violent motion to and fro in the fluid contents of the papillate body. This motion is too active to be merely physical, and has been observed too often to be accidental. After remaining in this state for some hours, the granules pass out into the surrounding water, and become widely distributed, leaving the empty papillate case behind; their ultimate fate is not yet satisfactorily established.

A piece of leaf, with "rust" on it, was exposed to sunlight, and was found to become paler. Examination showed that the majority

of the papillate bodies had lost their contents, and remained as empty colourless cases; the further history of the contents has not been yet ascertained.

On February 22nd, during an observation on the moist papillate bodies, several of them were found to have emitted tubular processes from one to four points of the circumference: these tubes are continuations of the inner coat, and the coloured contents pass into them. Further observations have shown that one tube usually grows to a great length, its cavity is continuous, and no partitions form across it; it takes a curved and even coiled course, and sends out many short branches at frequent intervals; the diameter of the tube is about one-fifth the breadth of the papillate body. A streaming of the contents is often seen, and the coloured matter passes gradually into the ends of the branches. From the above facts it is inferred that the papillate bodies are *spores*, which in certain circumstances germinate and produce a tubular mycelium; further facts are mentioned hereafter.

The minute black dots on the dark parts of old patches are found to contain multitudes of very small hyaline spores, budded off from the ends of delicate filaments which are matted together into a hollow case beneath the epidermis: the cavity becomes filled with the spores. These facts are here mentioned because the black points are so universal; they are not yet known to have anything in common with the above phenomena beyond what has been now stated.

On March 22nd, the peculiar appearance presented by certain patches of "rust" obtained from "Inverness" estate, was shown to be due to a different kind of body from the papillate spores. The "rust" spots appeared pink rather than orange-coloured, and were of a pasty rather than powdery character. Among the clusters of papillate spores, their microscope showed certain bodies of little more than half the size, quite smooth, crowded with red granular matter, and of a shape somewhat like a turnip or peg-top; each was on a narrow stalk, and many had a central boss on the top. These are not to be confounded with immature papillate spores.

Associated with the same external features, I have since rediscovered these bodies at various places and times, *e.g.*, Maturata (March 25th), Ambagamuwa (April 5th), Peradeniya (May and June), and extended observations have elicited the following information:—

From the top, opposite the stalked end, a stiff tubular prolongation of the turnip-shaped body is sent up; the coloured contents pass in, and when it has reached a length equal to six or eight times that of the original body four partitions have cut the tube into as many chambers. From each chamber a delicate lateral branch is sent forth, which at once buds off a small globule at its tip; this globule receives the coloured contents, falls off, and persists, while the rest dies. Here, again, I think we are justified in concluding that the turnip-shaped body is a spore; that on germination it produces a short tubular, septate mycelium, whence small spores

of another kind (*conidia*) are budded off: such cases of different kinds of reproductive bodies are well known to all mycologists.

The small globular spores have been made to germinate, but died at an early age in all cases from the attacks of introduced organisms (*Bacteria*, *Torulæ*), &c., which are so troublesome in these experiments.

The question what becomes of the long and curled tubes emitted by the papillate spores has been followed up with more success lately. The following facts have been obtained by growing the spores on the under side of thin glass squares, so arranged as to form the roof of a small cell kept moist by wet blotting-paper; various contrivances to avoid the introduction of foreign fungi need not here be detailed.

Having attained a considerable length, all the colouring-matter, &c., passes along a branch, and a pear-shaped swelling is formed at its end; this receives all the contents, a septum forms for the first time, and we have a swollen reddish body separated off from the empty tube and spore, which shortly die off.

This coloured body has been seen to send out branches. A number of rather large hyaline motile bodies (zoospores) generally make their appearance, and two of these have been seen to fuse. The connection between these various facts demands further enquiry.

* * * * * * *

Numerous attempts to directly infect coffee-plants with "leaf-disease" have as yet failed. I may select the following from a multitude of examples as to methods adopted:—

1. Papillate spores were sown on the under side of a young leaf, covered with a glass cell, and placed in various positions, temperatures, and dry or moist atmospheres.
2. Similar sowings were made on thin slices of coffee-leaf kept moist in glass cells; some in water, others in various solutions.
3. Sections of "disease-spots" were treated as above to try and induce the mycelium to spread from the leaf-passages, either on to other slices or on to the coffee-leaf.
4. Several of the spores found on the coffee-leaf have been sown as above. The chief cause of failure here has been the unavoidable introduction of other forms which increase so rapidly as to destroy the selected ones before their normal fate has become indicated.

SHORT NOTES.

Potamogeton trichoides, *Cham.*, in East Suffolk. — On August 3rd I gathered *Potamogeton trichoides* at Framlingham Earl, Norfolk, guided by directions kindly given me by Rev. Kirby Trimmer, its discoverer in England. It occurred but sparingly.

On the 6th I found it in a ditch and adjacent pond on Wrotham Long Green, between Melliss and Redgrave, in East Suffolk. Here it occurred in great abundance, almost filling the ditch to the exclusion of other plants. It was very sparingly found in fruit.—Arthur Bennett.

Cesia obtusa, *Lindberg*.—In the notice, inserted in the 'Journal of Botany' for August (p. 243), of the discovery of *Cesia obtusa* as a British plant, there is a mistake which I take the first opportunity of correcting. Being away from home, I trusted entirely to my memory, and hence the mistake. On referring to my herbarium, I find the specimen labelled by Professor Lindberg as follows:—"*Cesia obtusa*, Lindb., n. sp. ♀, Westmoreland, Hill Bell, June, 1870. J. A. Martindale." On the same date (June 7th), in company with my friend Mr. Martindale, I gathered finely-fruited specimens at the same place. In addition to the above station I may add:—Head of Mardale, Westmoreland (G. S.), May, 1869; Rach-na-gain (G. E. Hunt), July, 1869; Bow Fell (G. S.), July, 1875. The specimen found on the boulder (see p. 243), I find, is correctly marked *Cesia crenulata*, Gottsche, a species not uncommon in some parts of the English lake districts.—G. Stabler.

A new use for Gum Euphorbium.—For the past three or four years a good deal of interest has been attached to the species of *Euphorbia* growing in South Africa, on account of the milky juice, with which it is well known they all abound, being used in the preparation of a marine paint. It is to a similar juice, hardening on exposure to the air after incisions made in the fleshy branches of *Euphorbia resinifera*, that Gum Euphorbium of commerce owes its origin. This brittle acid resin was at one time used in medicine as an emetic and purgative. It is now, however, nearly obsolete so far as its medicinal uses are concerned. In Flückiger and Hanbury's 'Pharmacographia,' p. 504, 1st edition, 1874, under the article "Euphorbium," which refers more particularly to *Euphorbia resinifera* just alluded to, it is stated that the demand for the so-called Gum Euphorbium for medicinal purposes in this country is extremely small, twelve hundredweight only being imported into London in 1870; but the authors further say:—"We have been told that it is now in some demand as an ingredient of a paint for the preservation of ships' bottoms." This seems indeed to be the use to which Gum Euphorbium is now put, a company having been formed under the name of the Protector Fluid Company, for the purpose of making and supplying this new paint. The value of the juice of the Euphorbias, whether in its fresh and milky, or its dry and resinous state, for covering ironwork in exposed situations, lies in its acid nature. Experiments were made so long ago as 1873 by painting a large sheet of iron with a solution of Euphorbium and spirits of wine, and lowering the iron into one of the basins of Chatham Dockyard. At the end of two years, when the iron was taken out, it was found to be quite clean, and free from fouling and

corrosion. The preparation is also said to be efficacious in coating woodwork in tropical countries, for protection against the attacks of white ants. This paint is now in actual use by some of the largest shipowners.—John R. Jackson.

Chara stelligera, *Bauer* (C. obtusa, *Desv.*), in Britain.—I gathered specimens of this Chara in Filby Broad, eight miles from Great Yarmouth, E. Norfolk, on September 23rd. It was growing in from four to eight feet of water with *Potamogeton crispus*, L., *Myriophyllum spicatum*, L., and *Ceratophyllum*, and spread over many yards of the bottom of the Broad. It is a somewhat interesting addition, as it belongs to a section of the genus *Astephanæ*, new to our Flora. The pretty star-like nucules at once characterise this species, which occurs in Europe from Sweden southwards to France.—Arthur Bennett.

Notices of Books and Memoirs.

New Books.—F. A. Messer, 'British Wild Flowers by Natural Analysis' (D. Bogue, 10s. 6d.).—W. M. Fontaine and J. C. White, 'The Permian or Upper Carboniferous Flora of West Virginia and S. W. Pennsylvania.' Harrisburg.—F. von Mueller, 'Eucalyptographia' (6th decade). London: Trübner (5s.)

Articles in Journals.

August.

Transactions of the Linnean Society of London (2nd ser., vol. i., pt. ix.)—C. B. Clarke, 'Review of Ferns of Northern India' (concluded, 11 tab.)—G. Henslow, 'On the Origin of the so-called Scorpioid Cyme' (1 tab.)

Journal of Linnean Society (London), vol. xviii., Nos. 106, 107.—J. E. T. Aitchison, 'On the Flora of the Kuram Valley, &c., Afghanistan.'—C. B. Clarke, 'On Indian Begonias' (3 plates).

Science Gossip.—L. Castle, 'Heteromorphic Orchids.'

Proceedings of the Royal Society (vol. xxx., No, 205).—G. Thin, 'On *Bacterium fœtidum* (sp. nov.), an organism associated with profuse sweating from the soles of the feet' (1 tab.)—W. C. Williamson, 'On the Organisation of the Fossil Plants of the Coal-measures.'—O. Heer, 'On Miocene Plants discovered on the Mackenzie River.'

Hedwigia.—P. A. Karsten, 'Quædam ad Mycologiam Addenda.'

Silliman's Journal.—Asa Gray, 'DeCandolle's Phytography.'

Œsterr. Bot. Zeitschrift.—E. Ráthay, 'Alternation of Generation of Gymnosporangia.'—F. Krasan, 'On Plant-distribution in the

Districts of Görz and Gradica' (contd.)—S. Schulzer von Muggenburg, 'Mycological Notes' (*Neopkofitzia*, gen. nov.)—C. J. v. Klinggräff, 'Palestine and its Vegetation' (concluded).—V. v. Aichinger, 'On the Flora of Vorarlberg.'

Naturalist (Huddersfield).—J. E. Griffith, 'Flora of Carnarvonshire and Anglesea' (contd.)

Bulletin of Torrey Botanical Club.—L. M. Underwood, 'Artificial Synopses.'—J. B. Ellis, 'A new *Sphæria* on Grapes' (*S. Bidwellii*). —F. Wolle, 'New American Desmids' (1 tab.)

Flora.—A. Winkler, 'On the Seedling of *Mercurialis perennis*, L.' —R. G. Stobl, 'Flora of the Nebrodes' (contd.)—L. Celakovsky, 'On the Development of the Flowers of *Boraginaceæ*.'

Bot. Zeit.—K. Goebel, 'Contributions to the Comparative "Development History" of Sporangia.'

Botanical News.

Among the illustrious foreign botanists who have visited the National Herbaria during the past month, M. Alph. DeCandolle and Prof. Asa Gray demand special mention. M. A. Cogniaux, of Brussels, and the Rev. L. Menyhárth, S.J., of Buda-Pesth, have also been working in London; the former at the *Melastomaceæ*, which he is elaborating for the 'Flora Brasiliensis'; the latter at a critical revision of the genus *Melilotus*.

The death is announced of Dr. W. Imray, of Dominica, which took place upon the 22nd of August. For the last forty-three years Dr. Imray has worked at the flora of the island in which he lived, of which indeed our knowledge has mainly been gathered from his observations; his name is commemorated in *Vaccinium Imrayi* and many other species.

We have also to announce the death of Mr. Abraham Stansfield, of Todmorden, Yorkshire, on August 22nd, at the age of seventy-seven. Mr. Stansfield had been for many years president of the Todmorden Botanical Society.

The removal of the British Museum Herbarium to the new Natural History Museum at South Kensington has been completed, and the collections are available for reference. The British Herbarium here has just been enriched with a large and critically-named series of Plymouth Rubi, presented by Mr. T. R. Archer Briggs, and carefully selected by him to represent the forms described in his 'Flora of Plymouth.'

Original Articles.

ON THE PLANT AFFORDING CEARÀ INDIA-RUBBER.

(*MANIHOT GLAZIOVII*, Müll. Arg.)

By Henry Trimen, M.B., F.L.S.

(Tab. 215.)

When I arrived in Ceylon in February last, I found that a good deal of interest had been excited by the fruiting of some of the Ceará Rubber-plants in the Royal Botanic Garden at Peradeniya. Seeds from them had been distributed to several public establishments in India and Burmah, and elsewhere in the tropics; and were also being liberally disposed of to those planters in Ceylon who, in the alarm produced by the large decrease in the yield of coffee, were desirous of trying other plants of a profitable character.

As the number of seeds sent out from this establishment has been over twenty-five thousand, and the plant has also been propagated by very numerous cuttings, and as it is of rapid growth and early productiveness, it will no doubt soon become common in tropical countries, I have thought that a figure and description would be likely to prove acceptable to the readers of this journal, especially since I believe the plant has not been previously illustrated. The present figure is from a drawing by Mr. W. De Alwis, the draughtsman attached to the Peradeniya Gardens and the worthy successor of his father, Harmanis De Alwis (mentioned by Dr. Thwaites in the preface to his 'Enumeratio'), to whom Lindley dedicated a genus of Orchids, and who is still living, at an advanced age and in the enjoyment of the native rank of Moodliar, in the close neighbourhood of the gardens.

I believe that the determination of the plant as *Manihot Glaziovii* was made at Kew. I have here no opportunity of referring to the original description of J. Müller's in 'Fl. Brasiliensis,' but the Editor of this Journal has been good enough to send me the extract, which, so far as it goes, agrees fairly well with our plant, though the habit of the latter cannot be well said to be the same as that of the semi-herbaceous Cassava (*M. utilissima* and *M. Aipi*). Many species of *Manihot* are stated by Bentham ('Gen. Plant.' iii., p. 306) to be imperfectly described, and it is by no means certain that *M. Glaziovii*, Müll. Arg., may not be found reducible to one previously described. Dr. Glaziou (after whom the species is named) collected his specimens near Rio, so that the species must have a considerably extensive range in Brazil.

The full description now given is of course wholly drawn up from the cultivated plant at Peradeniya.

Manihot Glaziovii, *Müll. Arg.*—A tree of moderate size (the largest now 35 ft. high), the erect stem dividing di- or trichotomously, with the branches ascending and frequently branched in a similar manner, forming a dense rounded crown; bark purplish grey, the thin silvery outer layers readily peeling off transversely in narrow strips. *Leaves* numerous on smooth cylindrical spreading or deflexed pruinose petioles as long as the blade, peltate, the petiole inserted at no great distance from the truncate or concave base, ordinarily about 6–8 ins. long by 8–10 ins. wide (but often reaching 14 by 18 ins.), palmately cut four-fifths to petiole into 3, 5, or 7 oblong-ovate, acute, drooping segments rarely undivided or with 2 or 4 segments) which are entire (rarely deeply sinuate), glabrous on both surfaces save for a tuft of woolly hair on the centre of the summit of the insertion of the petiole, texture thin, veins prominent especially beneath, the lateral ones numerous, parallel but uniting within the margin to form a continuous nerve, deep bluish green, much paler beneath; stipules very quickly deciduous, small, lanceolate-linear, very acute, with a few fine spine-like denticulations at upper part of the margin, sub-membranaceous. *Flowers* rather large, completely unisexual, monœcious, arranged in rather few-flowered racemes or panicles from the forks of the young branches, the male (more numerous) above, the female below and expanding several days before the male, all stalked, the pedicels spreading, glabrous, glaucous, in the male suddenly bent downwards at a right angle, in the female thicker, curved downward and expanded beneath the flower into a turbinate receptacle suggesting externally an inferior ovary. *Male fl.*:—Calyx campanulate, about $\frac{3}{4}$ inch long by $\frac{1}{2}$ inch wide, somewhat truncate at the base (angular in the bud), divided about half-way down into 5 triangular acute lobes, each with a broad prominent vein down the centre, with incurved margins, smooth, externally greenish white with a purplish tinge, internally pale dull purple, especially at the base, and sticky with nectar. *Stamens* 10, arising from beneath a large smooth bright yellow disk and passing between its spreading lobes which are arranged in 5 pairs, filaments unequal, 5 longer (coming off from between the pairs of lobes), erect-spreading, as long as the calyx, 5 shorter (coming off between the lobes in each pair), not more than half the length of the others, inflexed towards centre of flower. *Female fl.*:—Sepals 5, distinct, inserted on the edge of the receptacle, $\frac{7}{8}$ inch long, curved outwards but not widely spreading, oblong-lanceolate, acute, with a strongly-marked midrib and lateral intra-marginal vein, pale greenish yellow. *Ovary* surrounded at the base with a small smooth pale yellow disk, oblong-ovoid, blunt, shining, pale green capped by the large cream-coloured style which is divided very nearly to the base into 3 spreading tufted coral-like stigmas, each bifid, and the flabellate divisions cut into numerous blunt lobes. *Capsule* pendulous on the thickened peduncle, about an inch in diameter, nearly globular, with 6 shallow grooves, testa dry and hard, smooth, greenish brown, at length splitting elastically and separating into 3 hard cocci (each of which also partially splits

down the back) containing a single seed. *Seed* ten-sixteenths in. long by seven-sixteenths in. wide, broadly oval in face, somewhat compressed with biconvex surfaces and a blunt edge, ventral raphe well marked and a (caruncle) prominent and bilobed, surface smooth and polished greyish yellow or brownish variously mottled and splashed with purplish black, testa very hard and thick with a radiated structure; cotyledons very thin, foliaceous, slightly cordate at base, endosperm oily but solid.

In drying for the herbarium the leaves and flowers quickly separate at the articulations and fall away from the axis.

Many enquiries were addressed to me with reference to the requirements and best method of cultivation of the tree; and the following extracts are from 'Notes on some Trees yielding India-Rubber,' which I prepared and had printed in March last for distribution to the planters and others, along with the seed from the Royal Botanic Gardens:—

"1. *Locality, Soil, and Climate.*—Ceará is a coast town of Brazil in lat. 4° S., and the flat country which runs back to the hills is described by Mr. Cross as manifestly possessing 'a very dry arid climate for a considerable part of the year. This is evident from the fact that mandiocca and other crops require to be irrigated. The rainy season is said to begin in November and end in May or June; torrents of rain are then reported to fall for several days in succession, after which the weather moderates for a brief space. According to some statements there are occasional years in which hardly any rain falls. This assertion concurs with the aspect presented by the country in general. The daily temperature on board the ship ranged from 82° to 85° F., but inland it is often probably 90°. The localities traversed by me nowhere seemed to be elevated more than 200 feet above the sea.' At Pacatuba, about forty miles from Ceará, the actual place where the specimens were obtained, 'the general forest was tolerably high, but the sparse small foliage did not afford much shade from the fierce rays of the sun. The soil was in places a sort of soft sandstone or gravel which was bound up in the most extraordinary manner. Neither grass nor weeds grew among this underwood, and there was an entire absence of ferns, mosses, and other plants.' In another place somewhat farther from the coast, the traveller, shortly after entering the bush-like forest, 'came on a large tract of land covered by immense masses of grey granite, some of which might be fifty tons or more in weight. These had been broken where they lay, and were the result of a volcanic explosion. Rounded masses of the same rock also cropped out in many places. . . . Many good-sized rubber trees were growing in the spaces between these granite masses. . . . . The situation was very dry, but no doubt some seedlings had sprung up, which, owing to numerous thickets of shrubs, were not perceived.'

"2. *Propagation and Planting.*—Mr. Cross's directions are as follows:—'Seeds are early produced, if the tree is not shaded. They should be buried in brown sand, kept pretty moist until there are indications of growth, when they may be planted out perma-

nently. In some situations where the ground is rough and strong they might be sown broadcast. Meantime I would suggest the formation of plantations by cuttings, which will take root as easily as a willow. These should be taken from the points of strong shoots, and may be one foot in length. In planting, each cutting may be put down in the soil to a depth of six inches. If scarce, the entire shoot may be cut into pieces, each possessing a bud, all of which will grow if covered with half-an-inch or so of soil. On loose sandy soils or exhausted coffee land, plantations may be formed at little expense. Hard dry gravelly wastes, if found to support any kind of bush, are also suitable sites. Holes might be made in strong land with an iron jumper, and a stout cutting put into each, and filled with pebbles. On bare or thinly-covered portions of rock, the cuttings might be laid down flat, and a little heap of stones or any kind of *débris*, about the size of a molehill, piled over each, care being taken that the extreme point of each cutting with a bud is left uncovered. I do not advocate planting in an entirely barren desert, but wherever there is any sort of stunted tree or scrub vegetation, with an occasional sprinkling from a monsoon shower, the tree is likely to prosper.'

"Experience of the plant in the botanic garden here has proved the general accuracy of the above remarks. There can be no doubt of the hardiness of the species, its readiness of culture, and adaptability to circumstances. It grows equally readily from seed or from cuttings, and, though a native of a tropical sea-level, thrives well here in Ceylon up to at least a level of 3000 feet, and on the most barren soils. It has succeeded equally in Calcutta and Madras, but the wet season appears to have killed it at Singapore. It would seem especially adapted for the dry and barren districts of our Eastern and Northern Provinces, or in the higher districts; but it would not be wise to risk it in localities where the temperature is liable to fall below 60° F.

"*Germination of Seed.*—The seed-coat is of remarkable thickness and very hard, and the natural process of germination occupies a long period—it is said more than a year. All that is necessary to hasten this, if desired, is to assist the seed-coat in splitting. This is best effected by holding the seed firmly, and rasping off with a file both edges at the radicular end.* It is best not to file off the actual end, as it may thus easily happen that the radicle of the embryo may be injured. After this treatment, properly performed, the young plant appears above ground in two or three weeks. The seedlings require no particular attention. They grow rapidly, and may be finally planted out at distances of twenty feet. A peculiarity which they share with their close relative the mandioc is the possession of large tubers on the spreading roots. The trees at Peradeniya, from which seed has been distributed to Burmah, India, Jamaica, &c., flowered at the age of eighteen months; and at the present time (at $2\frac{1}{2}$ years) the larger ones form branching trees about 25 feet or 30 feet high, with a stem 1 foot 9 inches in

* This end is to be recognized externally by possessing at its side a flat two-lobed appendage technically known as the caruncle.







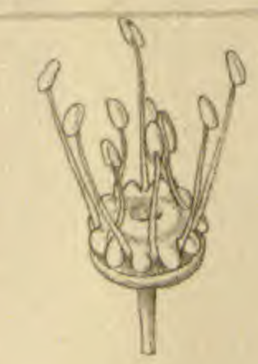












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De Alwis del. J.N. Fitch lith.

West, Newman & Co. imp.

Manihot glaziovii, *Mull. Arg.*

circumference at a yard from the base, and a smooth, silvery birch-like bark readily peeling off; being about half the size of those which Mr. Cross describes, and which may be assumed to have been fully grown.

"3.—*System of collecting the Rubber*.—I quote again from Mr. Cross's report:—'This is an operation of a very simple description. On commencing to work, the collector takes with him a stout knife and a handful of twigs to serve as a broom. Arriving at a tree, any loose stones or dust are swept from the ground, around the base, and some large leaves are laid down to receive the droppings of milk which trickle down. Some do not go to the trouble of sweeping the ground or laying down leaves, for which reason the milk adheres to sand, dust, decayed leaves, and other impurities. The outer surface of the bark of the trunk is pared or sliced off to a height of four or five feet. The milk then exudes and runs down in many tortuous courses, some of it ultimately falling on the ground. After several days the juice becomes dry and solid, and is then pulled off in strings and rolled up in balls or put into bags in loose masses. Only a thin paring should be taken off, just deep enough to reach the milk vessels; but this is not always attended to. Nearly every tree has been cut through the bark, and a slice taken off the wood. Decay then proceeds rapidly, and many of the trunks are hollow. In this condition the trees must yield far less milk, and many no doubt are broken over by the wind, or wither away. Collecting is carried on during the dry season only, when rain seldom falls.'

"Mr. Cross says nothing as to the age of the trees so operated upon; probably the collectors treat all indiscriminately. In the sequel of his report, however, he incidentally remarks that Ceará rubber may be tapped on attaining 'a diameter of four to five inches,' which is the case here in Ceylon after about two years' growth. But unless there were a very large number of trees in an extensive plantation, this would certainly be labour thrown away. The tree, however, comes so early to maturity, as shown by the production of seed*, that it is improbable that it attains any very great size. The process above described must be, if thoroughly done, almost exhaustive of the milk; but in the case of a small stem it would be a work of some care and time to so conduct it as to avoid cutting into the wood, and probably some of the methods afterwards described will be preferred. But these are practical difficulties which it may be safely assumed the ingenuity of our planters will quickly master."

DESCRIPTION OF TAB. 215.—*Manihot Glaziovii*, Müll. Arg., drawn from specimens in the R. Bot. Garden, Peradeniya, Ceylon, April, 1880. 1. Extremity of a young branch with inflorescence. 2. Male fls. 3. A male fl. with perianth removed (not fully expanded). 4. Vertical section of female flower. 5. Transverse section of ovary. 6. A half-ripe capsule. 7. One fully ripe. 8. A separate coccus with contained seed. 9. Dorsal, and 10, Ventral aspect of seed. 11. Ventral, and 12, Transverse section of the same. 13. Sketch of tree 2½ years old, on scale of about an inch to 6 ft.

Peradeniya, Ceylon, Aug., 1880.

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* [Certainly when less than twelve months old.—H. T.]

ON A COLLECTION OF FERNS MADE BY LANGLEY KITCHING, ESQ., IN MADAGASCAR.

By J. G. Baker, F.R.S.

This is the third considerable collection of Ferns from Central Madagascar which has reached this country within the last few years. An account of that of Mr. W. Pool will be found in vol. 15 of the 'Journal of the Linnean Society,' p. 411, and of that of Miss Helen Gilpin in vol. 16, page 197. The present collection covers a considerably wider area, and adds about twenty-five species to the two former ones, of which about half prove to be new. Of the stations in which the plants were gathered the route between Tamatave and the capital is now well-trodden ground. Andrangaloaka is about a day's journey from the capital in the heart of the Great Forest, and was one of the chief hunting-grounds of Mr. Kitching's predecessors. The mountains of Ankaratra lie about thirty miles south-west of the capital; they attain an elevation of 9000 or 10,000 feet, and are supposed to be the highest mountains in the island.

The Betsileo country is one of the central provinces of Madagascar, lying between latitude 21° and 22°. Fianarantsoa, its chief town, is about 200 miles south of Antananarivo, the capital of the island, the palanquin journey between the two places occupying a week. It is 4000 feet above the sea. The Tanala country, lying between latitude 21° and 23°, is a two days' journey to the east, and is a dense forest and mountainous country ranging from 4000 to 5000 feet above the sea; a continuation of the "Great Forest," which, at a distance of about forty miles from the coast, encircles the whole island. The portion of the Ibara country reached was one hundred odd miles farther south,—a low-lying though broken country mostly surrounded by high mountains, and situated between latitude 22° and 23°,—is ground previously unexplored botanically, and in some instances had only been trodden by two or three other white men. Mr. Kitching has also brought home an interesting collection of flowering plants, which includes three new genera and a considerable number of new species.

Gleichenia dichotoma, Hook. Between Tamatave and Antananarivo.

Cyathea appendiculata, Baker. Forest of Andrangaloaka.

C. discolor, Baker. Forest of Andrangaloaka.

Alsophila vestita, Baker. Forest of Andrangaloaka.

Hymenophyllum ciliatum, Sw. Tanala.

H. polyanthos, Sw. Tanala.

Trichomanes muscoides. Sw. Tanala.

T. flabellatum, Bory. Tanala, and between Tamatave and Antananarivo.

T. pyxidiferum, L. Tanala.

T. radicans, Sw. Tanala.

T. radicans, var. *T. giganteum*, Bory. Between Tamatave and Antananarivo.

Dicksonia Henriettæ, Baker. Tanala.

D. hypolepidoides, Baker. Tanala, and forest of Andrangaloaka.

Davallia ferruginea, Desv. Tanala, and between Tamatave and Antananarivo.

D. Speluncæ, Baker. Tanala.

D. elegans, Sw.

D. thecifera, H. B. K. Tanala.

D. tenuifolia, Sw. Tanala, &c.

Lindsaya cultrata, Sw. Between Tamatave and Antananarivo; the same form gathered by Dr. Meller.

Adiantum æthiopicum, L. Ambositra (Betsileo), and Ankaratra Mountains.

A. caudatum, L. Ibara country.

Hypolepis tenuifolia, Bernh. Tanala. I cannot distinguish this from the well-known Australian and Tropical Asian plant.

Lonchitis madagascariensis, Hook. Tanala.

Cheilanthes (*Adiantopsis*) *Streetiæ*, Baker; *Notochlæna Streetiæ*, Baker olim. Mr. Kitching's better specimen shows that this is really a *Cheilanthes* of the *Adiantopsis* section.

22*. Pellæa (Allosorus) Kitchingii, *Baker* n. sp. Caudex not seen. Stipe wiry, naked, bright brown, 9–10 in. long, with a few small lanceolate brown scales at the very base. Frond oblong-deltoid, tripinnate, 3–4 in. long, very thick and rigid in texture, naked on both surfaces, the rachis light brown and quite naked, like the stipe. Lower pinnæ the largest, deltoid, unequal-sided, the segments of the upper side simple, of the lower produced and again pinnate; all the pinnæ above the lowest only simply pinnate; ultimate segments contiguous, lanceolate, ascending, entire, $\frac{1}{3}$–$\frac{1}{2}$ in. long, adnate to the rachis by a dilated base. Midrib of the ultimate segments bright brown, the other veins quite hidden. Sori continuous from the base to the very tip of the segments; involucre moderately broad, persistent, brown, glabrous, firm in texture, entire at the margin. Betsileo country. Most like the Himalayan *P. nitidula*, Baker, but much thicker in texture, with a long brown stipe and an entire involucre.

P. dura, Baker (*P. Burkeana*, Baker olim.) Betsileo country, and between Tamatare and Antananarivo.

P. consobrina, Hook. Tanala, and between Tamatare and Antananarivo.

P. calomelanos, Link. Ibara country.

P. hastata, Link. Tanala, Betsileo and Ibara land, and between Tamatare and Antananarivo.

P. angulosa, Baker. Tanala, and between Tamatare and Antananarivo.

Pteris cretica, L. Tanala.

P. quadriaurita, Retz. Forest of Andrangaloaka, and between Tamatare and Antananarivo.

P. madagascarica, Ag. Tanala, and between Tamatave and Antananarivo.

P. remotifolia, Baker. Tanala, and Forest of Andrangaloaka.

P. pedata, L. Ambohidratrimo.

P. incisa, Thunb. Between Tamatave and Antananarivo.

P. triplicata, Ag. Between Tamatave and Antananarivo.

50*. Pteris (Campteria) oligodictyon, *Baker*, n. sp. Frond ample, tripinnate, green on both sides, naked on the upper surface, furnished on the lower with minute brown hairs and dots. Stipe about half as long as the lamina, naked, stramineous, like the rachises. Lower pinnæ much the largest, deltoid, above a foot long, more produced on the lower side, copiously bipinnate, with caudate lanceolate pinnules and linear adnate decurrent tertiary segments not extending quite down to the rachis, reaching an inch in length, $\frac{1}{6}$ in. broad, the barren ones rather broader and minutely inciso-crenate. Veins distant, distinct, ascending, forked at or near the base and sometimes again higher up, anastomosing in costal arches only along the penultimate rachises. Sori extending from the base nearly to the tip of the segments; involucre narrow, glabrous. Forest of Andrangaloaka. Habit of *P. flabellata*, Thunb., but the ultimate segments of the barren frond less distinctly toothed and the veining Camptericoid.

Lomaria biformis, Baker. Forest of Andrangaloaka. I find that we have incomplete specimens of this curious species, received long ago from Dr. Meller.

L. Boryana, Willd.

L. procera, Spreng. Forest of Andrangaloaka.

24*. Lomaria microbasis, *Baker*, n. sp. Caudex erect, densely clothed at the top with linear-subulate or linear-acuminate glossy paleæ $\frac{1}{4}$–$\frac{1}{3}$ in. long, with a pale brown edge and a nearly black centre. Stipe of barren frond only 1–1$\frac{1}{2}$ in. long to the auricles which represent the lowest pinnæ. Lamina of the barren frond oblanceolate-oblong, rigidly coriaceous, 1–1$\frac{1}{2}$ ft. long, 4–5 in. broad at the middle, narrow gradually downwards, the three or four lower pairs of pinnæ dwarfed down to minute auricles. Pinnæ 20–30-jugate, linear, entire, the largest 2–2$\frac{1}{2}$ in. long, $\frac{1}{3}$ in. broad, all except the uppermost distinctly separated at the base, the upper adnate, the lower attached by the midrib only. Rachis slender, naked, grooved down the face. Veins obscure, simple or forked at the base. Fertile lamina with a longer stipe, its remote pinnæ 2–3 in. long, $\frac{3}{4}$–1 lin. broad. Between Tamatave and Antananarivo. Nearest *Boryana*, from which it differs in texture, and by its slender rachis, small basal paleæ, and much dwarfed lower pinnæ of the sterile frond.

Asplenium Nidus, L. Tanala, and between Tamatave and Antananarivo.

A. normale, D. Don. Tanala. The plant called *A. Trichomanes*, gathered by Mr. Pool, must also evidently be referred here, as Mr. C. B. Clarke has suggested. The species has previously been known only as Indian.

A. hirtum, Kaulf. Between Tamatare and Antananarivo.

A. lunulatum, Sw. Tanala.

A. Sandersoni, Hook. Tanala, and between Tamatare and Antananarivo.

A. brachypteron, Kunze. Tanala.

A. Poolii, Baker. Tanala, and forest of Andrangaloaka.

A. anisophyllum, Kunze. Tanala.

A. lætum, Sw. Tanala, and between Tamatave and Antananarivo.

A. Serra, L. & F. Between Tamatave and Antananarivo.

A. dimidiatum, Sw. Forest of Andrangaloaka, and between Tamatave and Antananarivo.

A. affine, Sw. (var. *tanalense*, Baker). Tanala, a dareoid variety and a curious form receding from the type in an opposite direction with pinnæ like those of *A. lucidum*, acuminate and only inciso-serrate in the upper half, shallowly lobed lower down, with the lobes of the very base only reaching down nearly to the midrib, so that the cutting is similar to that of the Polynesian *A. lobulatum*, Mett.

A. herpetopteris, Baker. Tanala; two varieties.

A. protensum, Schrad. Tanala and Betsileo-land.

A. cuneatum, Lam. Between Tamatave and Antananarivo.

A. auritum, Sw. Tanala.

A. furcatum, Thunb. Tanala and Betsileo-land.

A. nigripes, Blume. Forest of Andrangaloaka.

A. nemoralis, Baker. Forest of Andrangaloaka.

Aspidium aculeatum, Sw. Tanala.

A. capense, Willd. Tanala, and between Tamatave and Antananarivo.

A. falcatum, Sw. Tanala and forest of Andrangaloaka.

Didymochlæna lunulata, Desv. Forest of Andrangaloaka.

Nephrolepis cordifolia, Presl. Between Tamatave and Antananarivo.

N. acuta, Presl. Between Tamatave and Antananarivo.

Oleandra articulata, Car.

Nephrodium parallelum, Baker. Tanala. Complete specimens showing that the species has a wide-creeping slender hypogœous rhizome like that of *Neprolepis ramosa*.

N. albo-punctatum, Desv. Forest of Andrangaloaka.

N. prolixum, Baker. Between Tamatave and Antananarivo.

N. patens, var. *madagascariense*, Baker. Between Tamatave and Antananarivo.

N. Filix-mas, Rich. Tanala, forest of Andrangaloaka, and between Tamatave and Antananarivo; both the type and the var. *elongatum*.

N. unitum, R. Br. Between Tamatave and Antananarivo.

N. molle, Desv. Ibara country.

183*. Nephrodium (Eunephrodium) eurostotrichum, *Baker*, n. sp. Caudex not seen. Stipe reaching a foot in length, square, with a few short broad paleæ. Lamina oblong-lanceolate, simply pinnate, 1–2 ft. long, 6–9 in. broad, densely pilose, especially on the lower surface, the rachis densely clothed with short brown deflexed bristly hairs. Pinnæ distant, lanceolate, sessile, 10–12-jugate, acuminate, 3–5 in. long, 9–10 lines broad, cut about ¼ down to the midrib into orbicular lobes, truncate at the base; the lowest pair of pinnæ shorter, broader, deflexed, auricled on the upper side at the

base. Veins obscure, 6–8-jugate, nearly all uniting at the tip. Sori copious, nearly costular. Involucre reniform, persistent, densely setose. Tanala. Allied to *N. pennigerum*, but densely pilose, like *molle*, and the position of the sori different.

Polypodium obtusilobum, Desv. Forest of Andrangaloaka, and between Tamatave and Antananarivo.

(To be continued).

ON THE FLORA OF NORTH-WESTERN DONEGAL.

By Henry Chichester Hart, B.A.

(Concluded from p. 275.)

Knautia arvensis, Coult.—Very rare. Brownknowe, near Ramelton, where it was found by the Very Rev. Dean Gwynn, July, 1880. I have not seen this plant elsewhere in Denegal, except in the neighbourhood of Lough Esk. See 'Recent Additions to tho Flora of Ireland,' by A. G. More, 1872.

**Petasites fragrans*, Presl.—Thoroughly established at Fort Stewart and Augh-na-gaddy, Dean Gwynn. Near Rathmullan House.

Bidens tripartita, L.—Rare. Lough Fern at the Kilmacrennan end; boggy ground at Carn Mill, near Ramelton; Glenlough, near the village.

Artemisia Absinthium, L.—Near Ray and Kindrum, established from gardens.

Gnaphalium sylvaticum, L.—Local and rather rare. Between Loughs Doo and Conny, near Milford; Burton Port; near Glen.

[*Antennaria margaritacea*, R. Br.—A colony by the side of the disused road between Kilmacrennan and Churchill, about two miles from the latter.]

Senecio sylvaticus, L.—Local. Near Croaghross; Auchterlinn; Carrowkeel; Moyle Hill; near Glen.

Saussurea alpina, DC.—Extremely rare. I found two or three small scattered colonies of this alpine plant upon the north-western face of Bulbein Mount, near the summit. It has hitherto been only recorded from Kerry. But I am informed by my friend A. G. More that there is a record of this plant in Templeton's MS. "Innishowen, Co. Donegal, Mr. Brown." This is the same mountain on which Robert Brown found *Saxifraga oppositifolia*, so that my observation corroborates his two discoveries. Growing with them, however, is also *Polygonum viviparum*, which I am grateful to him for leaving me to add to the Donegal flora.

[*Cichorium Intybus*, L.—Very rare and hardly established. Between Ramelton and Fort Stewart, Dean Gwynn. I have not seen specimens.]

Sonchus asper, Hoffm. Local. Aranmore.

S. arvensis, L.—I believe this plant, which is very common

in corn-fields throughout the county, to be native; it grows frequently along remote shores, in gravelly and stony places, as at Ards, on the Bloody Foreland, &c.

Crepis virens, L.—Not uncommon in the eastern part of my district, gradually disappearing to the west. F.

C. paludosa, Mœnch.—Local and rather rare. Moyle, Lough Fern, by the water's edge; Carrablagh, below the house, at sea-level; Bulbein Mount.

Hieracium vulgatum, Fries.—Lough Conny, near Milford; Breaghy Head and Ards; Bulbein Mount.

Lobelia Dortmanna, L.—Aranmore, in a lake at the southern end of the island, local in the district.

Arctostaphyllos Uva-ursi, Spr.—Local. This plant grows more abundantly at Aranmore, about some of the small lakes, than anywhere else I have seen it. *Sedum Rhodiola*, *Juniperus nana*, and the present species seem to find their head-quarters upon this western island.

Vaccinium Vitis-idæa, L.—Rare and very local. By Derrybeg Stream into Lough Veagh from Dooish Mountain; Bulbein Mount; Loughsalt, near the summit on the north-eastern side; and by a small lake about two miles eastward.

Gentiana campestris, L.—Increasing westward, and especially abundant about Burton Port.

Convolvulus arvensis, L.—Rare and very local. Banks near the sea at Rathmullan House in plenty, where it appeared native.

C. Soldanella, L.—Extremely rare. Tramore Strand, where it meets Hornhead by the sea. I have an old record of finding this plant at Carrigart, but have failed to rediscover it there.

Lycopsis arvensis, L.—By Magherdromin Lough.

Mertensia maritima, Don.—Very rare. In a small gravelly bog in Rossgull upon the shores of Sheephaven, south of Rinnafaghla Point, about two miles north-west of Ganiamore, in profusion.

**Symphytum officinale*, L.—Near Lough Fullarton.

Myosotis cæspitosa, Schulz.—Frequent. About Ray and Ramelton; Lough Fern; noticed on Tory Island by my friend, Mr. R. M. Barrington.

Orobanche Hederæ, Duby.—Brown Knowe Island, about half-way between Ray and Ramelton, and upon the shore close by upon ivy.

Verbascum Thapsus, L.—Near the Fanan Railway Station, Dean Gwynne.

**Linaria Cymbalaria*, Mill.—Rathmullan Abbey; old walls about Rathmullan House; Killydonnelly Abbey.

[*L. vulgaris*, L.—Well established at Leckbeg, the residence of Mr. Hammond, near Burton Port, where I was informed it had escaped from the garden. I suspect that the plants observed by Mr. Barrington in Tory Island may have originated from this locality.]

Scrophularia nodosa, L.—Local. Between Ray and Ramelton by the roadside; Whale Head; March Burn, Ray; &c.

S. aquatica, L.—About Ramullen, and near Ray Bridge, &c. Commoner than the last in Donegal.

Veronica agrestis, L.—Local. Roadsides and ditches about Ramelton, &c. I believe it to be a native.

V. montana, L.—Rare. Bulbein Mount.

V. hederifolia, L.—Frequent; previously omitted by accident. F.

**Nepeta Cataria*, L.—Waste ground about ruined cottages near Port-na-blagh, a mile from Dunfanaghy.

Lamium amplexicaule, L.—Rare. Near Magherdromin in Fanet.

L. intermedium, Fries.—Local. Ball Green, by Lough Swilly, east of Ramelton; Port-na-blagh, near Dunfanaghy.

L. incisum, Willd.—About Kindrum, and near Magherdromin by Kinnylough; at Port na-blagh with the last. My friend, Mr. R. M. Barrington, has also gathered these three *Lamia* in Tory Island; the latter two appear to me to be hardly worthy of specific rank.

Galeopsis versicolor, Curt.—Local. About Lough Keel; Leenane, and between that and Bulbein Mount.

Utricularia vulgaris, L.—Very rare. Kincashla Point, and near Burton Port.

U. intermedia, Hayne.—Very rare. In the lake at Kincashla Point, in "The Rosses," with the last.

U. minor, L.—Glenlough, near the village; lakes in "The Rosses."

Anagallis arvensis, L.—I believe this plant to be native along sandy sea-coasts, as at Ards, and about Ray and Aughnish Island in Lough Swilly, &c.

‡*Lysimachia Nummularia*, L.—Plentiful on hedge-banks at Augh-na-gaddy, and about a mile from there on a bank by the roadside to Ramelton. It is difficult to believe that it is not native in these stations where it has been observed for many years by my friend, Dean Gwynn. It was, however, formerly much in vogue as a cottage-garden plant.

**Plantago media*, L.—Maintains its position at Glenalla, 1879.

**Chenopodium Bonus-Henricus*, L.—In a lane leading to the Iodine Works at Ramelton, where it was pointed out to me by Dean Gwynn.

Suæda maritima, Dum.—Local. Ray to Ramelton and Aughnish Island; Lough Swilly; Carrigart; Burton Port; Kadew Strand, east of Burton Port.

Salsola Kali, L.—Local. Kadew Strand, near Burton Port; especially common along Tramore Strand, between Glen and Carrigart.

Beta maritima, L.—Frequent. Common on shores in Fanet; Hornhead; Tory; Sheephaven; Breaghy Head; Aranmore; Bloody Foreland, at the north-western extremity, &c. F.

Salicornia herbacea, L.—This and the last-mentioned species were omitted from my previous list by mistake. Local. Upon Mulroy Lake, near Rossnakill in Fanet; between Ramelton and Aughnish Island, and between Ray and Ramelton upon Lough Swilly; Kadew Strand, near Burton Port. F.

Atriplex deltoidea, Bab. (*A. hastata*, var., Auct.)—Aranmore, on the east shore, abundant.

A. erecta, Huds.; *A. angustifolia*, Sm.; *A. Babingtonii*, Woods.—Aranmore, with the last. Sea-shores, common.

Polygonum viviparum, L.—Extremely rare. I found two small colonies of this alpine plant with *Saussurea alpina* at one hundred to fifty feet from the summit of Bulbein Mount, in Innishowen. It has hitherto been recorded in Ireland only from the Benbulben and Glenade Mountains, in Sligo and Leitrim.

Polygonum Raii, Bab.—Very rare. Sands between Carrigart and Sheephaven, a couple of plants; and one plant between Port-na-blagh and Dunfanaghy.

Euphorbia portlandica, L.—Rare. Near Marble Hill; Horn Head, near the house, and near Tramore Strand; on Tramore sand hills.

‡*E. Helioscopia*, L.—Increasing to the westward.

‡*E. exigua*, L.—Very rare. Waste ground near the sea between Aughnish Island and Ramelton; fields between the Milford end of Lough Fern and Lough Keel.

Callitriche verna, L., var. *platycarpa*, Kutz.—Aranmore; road-side ditch between Bunbeg and Gweedore. This form was noticed by Mr. Barrington on Tory Island; it is probably common.

C. hamulata, Kutz.—Gweedore, in the river below the hotel.

[*Parietaria diffusa*, Koch.—I have been unable to rediscover this plant upon Rathmullan Castle, the locality given in my former list, and I fear there has been some mistake.]

**Salix fragilis*, L.—Thoroughly established and looking wild by the shores of Glen Lough, near Glen.

**S. viminalis*, L.—Kindrum and many places in Fanet, where it often appears quite wild; by the Lennan, &c. F.

‡*S. Smithiana*, Willd.—Frequent in Fanet, looking more like a native than the last. F.

**S. alba*, L.—Not unfrequent, but not native. F.

S. herbacea, L.—Rare. 1200 to 1620 feet on Bulbein Mount. 1800 to 2200 feet on Nunekirk (Errigal?).

Salix Grahami, Borr.—"Among moss on the top of Muckish Mountain," 1868; D. Moore, 'Recent Additions,' page 29. This willow, which is probably a hybrid, has not come under my notice. On the mountains I have met with no other small willows except *S. herbacea* and *S. repens*.

[*Populus nigra*, L.—Streamside between Bunlinn and Milford; naturalised, but no doubt introduced.]

Taxus baccata, L.—Rare as a native. Indigenous at Glenveagh, where thick trunks have often been dug out of the soil.

Orchis pyramidalis, L.—Rare and very local. Marble Hill.

Gymnadenia conopsea, R. Br.—Rare and local. Macamish: Marble Hill.

Habenaria viridis, R. Br.—Local. Old road between Fort Stewart and Ramelton.

H. chlorantha, Bab.—Near Ramelton; by the lower road to Fort Stewart.

Listera ovata, R. Br.—Fort Royal; near Ramelton; Macamish; Ards.

L. cordata, R. Br.—Local and rare. Up to 1900 feet above sea-level on Muckish.

Epipactis latifolia, All.—Very rare. Woods in the north-western part of Ards.

**Iris fœtidissima*, L.—Well established in thickets by the sea at Rathmullan House.

**Allium Babingtonii*, Borr.—Occasionally to be met with in old cottage gardens, whence it has sometimes spread to wild-looking stations, as at Doaghbeg, where it covers a ditch-bank; between Ray and Ramullan, and between Kilmacrennan and Paddy Murray's inn. This appears to be the ancient garlick of the Irish, now almost entirely disused in consequence of the introduction of better kinds.

Eriocaulon septangulare, With.—Very rare. In a small lake on Kincashla Point; in The Rosses, about a quarter of a mile to the north-west of the Signal Tower.

Juncus maritimus, Sm.—Local. Near Milford; shores of Mulroy Lake at Glinsk, and elsewhere; between Ray and Ramelton; between Ramelton and Whale Head, and on to Fort Stewart; Ramullan; Lackagh Bridge; Doagh Castle; Burton Port; Aranmore; Horn Head, &c.

J. acutiflorus, Ehrh.—Common. Omitted by accident from my last list.

J. Gerardi, Lois., Jacq.—Frequent. Aranmore and Burton Port; Rathmullan; Tory Island, R. W. Barrington.

Triglochin palustre, L.—Ascends to 1000 feet on Bulbein Mountain.

Sparganium affine, Schn. (*S. natans*, Huds.)—Rare. Small lake in Mamore Gap.

S. minimum, Fries.—Very common on Aranmore.

[*Arum maculatum*, L.—The two localities given in my previous list for this plant are doubtful. I have not met with it of late years in my district, and I fear there may have been some error.]

Potamogeton heterophyllus (Schreb.)—Very local. Abundant in Mullaghderg Lake, to the west of Bunbeg.

P. lucens, L.—Local. Lough Fern; abundant in Long Lake near Drumalla, where it almost covers the surface of the water. The long thick peduncles make me think the plant in the latter locality to be *P. Zizii*, but I was unable to secure satisfactory specimens.

P. perfoliatus, L.—Rare. Lough Fern.

P. crispus, L.—Previously omitted by accident. Ballymagahy Lake, and stream into it; Lough Fern; Kinnylough; Magherdromin Lake. F.

P. pectinatus, L.—Kinnylough. L.

P. pusillus, L.—Glenalla Pond.

P. filiformis, L.—South side of Kinnylough. My specimens have been carefully examined and identified by my friend Mr. A. G. More, who discovered the first Irish locality.

Zostera nana, Roth.—I gathered specimens, which I believe

belonged to this species, on a strand at Ards, just below high-water mark; but as there was no fruit I could not be quite certain of its identity.

Cladium mariscus, Br. — Local, and rather rare. Glenlough; very luxuriant in a pond at Ards, where it reaches a height of over six feet above the water.

Rhynchospora alba, Vahl.—Local. Campbell's Bog, Fauct. F.

Eleocharis multicaulis, Sm.—Very local. Aranmore and Burton Port.

Scirpus maritimus, L.—Very local. In small quantities upon the shores of Lough Swilly, below Carralsena; between Ray and Ramelton, and between Ramelton and Aughuish Island; shore of Mulroy Lake on Rossgull; at Clontallagh, near Carrigart.

S. Tabernæmontani, Gm.—Rare. By the side of Lough Swilly, near Ramelton.

S. fluitans, Hook. Local. Very plentiful in a pond at Ards.

Blysmus rufus, Panz.—Very rare. Salt marsh by Lough Swilly, close to Ramelton.

Carex pulicaris, L.—Local. Carradoan; Bulbein Mountain, from 1000 feet to the summit; shores of Lough Keel.

C. vulpina, L. Rare and local. Shores of Lough Swilly at Carralsena; Ramelton and Ramullan in small quantities.

C. remota, L.—Rare. "Backwood," Carradoan.

C. ovalis, Good.—Local. Lough Conny, near Milford, at the head of the stream.

C. rigida, Good.—Rare and local. Common on Bulbein Mountain near the top; 700 to 2000 feet on Muckish.

C. pallescens, Lam. Rare. Thicket at side of Lough Columbkill, near Milford.

C. pilulifera, L.—Rare. With *C. rigida* on Bulbein Mountain, and Muckish.

Carex limosa, L.—Very rare. "Gap of Urris, Mr. C. Moore." This reference, quoted from the 'Cybele Hibernica,' is probably meant for Mamore Gap, in Erris Mountains, Innishowen.

C. extensa, Good. — Local. Lough Swilly shores between Ramelton and Aughuish Island; Ards; Horn Head, near the House; Aranmore, to the north of the harbour at Leabgarrow.

C. distans, L.—Local. Ramelton, by the shore; Ards; Breaghy Head; Port-na-blagh; in several places upon Horn Head; Burton Port; Aranmore.

C. sylvatica, Huds.—Local. "Backwood," Carradoan.

Phleum arenarium, L.—Local. Macamish; near Rosepenna; Carrigart; Tramote Strand, Carrigart.

Melica uniflora, Retz.—Rare. Woods by the shore of Lough Swilly at Daisyknowe Island, half-way between Ray and Ramelton; at Ards.

Sclerochloa loliacea, Woods.—Local. Macamish, Lough Swilly; Carrigart; Bloody Foreland.

S. maritima, Lindl.—Local. Between Ray and Ramelton, and along shore to Fort Stewart; Bloody Foreland.

Briza media, L. — Rare and local. Fort Royal, and near Ramelton.

Catabrosa aquatica, Presl.—Local. Frequent on Aranmore, and on the Bloody Foreland. Increasing westwards.

Festuca sylvatica, Vill.—Very rare. Glenalla Woods, in two or three places.

F. gigantea, Vill.—Rather local. Carradoan ; Killydonnelly.

F. arundinacea, Schreb.—Very local. Glenalla ; Ray Woods.

Bromus asper, L.—Local. Drumalla.

Elymus arenarius, L.—Rare and very local. In small quantities and stunted upon the eastern shore of Aranmore in two places; near Leabgarrow and a couple of miles south of it. Abundant and luxuriant upon the western side of Carrick Finn Island, to the west of Bunbeg ; along a strand facing north a little north of Bunbeg ; about three miles north of Bunbeg upon the shore towards the Bloody Foreland, on the north side of Calheen River.

Equisetum maximum, Lam.—Very rare. In two small glens between Macamish and Glenvor, near Glenvor ; near Whale Head, to the east of Ramelton. In each case in company with *Polystichum angulare*.

Polypodium Phegopteris, L.—Local and scarce. From Drumalla to Auchterlinn ; in one place with *Hymenophyllum Wilsoni* on cliffs facing north upon Muchish Mountain, at 1750 feet above sea-level.

Lastræa Oreopteris, Presl.—Very local. Common in Auchterlinn, and down the valley to Carradoan ; roadside near Carrowkeel, between Glenalla and Carrablagh; between Muckish Gap and Caleabber Bridge.

Polystichum aculeatum, Roth.—Rare and very local. Glenalla, in two or three places ; Drimnacraig ; Bunlinn. F. (These localities were accidentally given under *P. angulare* in my former paper). The variety *P. lobatum* occurs near Fort Stewart ; Very Rev. Dean Gwynn.

P. angulare, Presl. Very local. In a small glen by the sea between Glenvor and Macamish ; Whale Head, between Ramelton and Fort Stewart ; on Daisyknowe Island, half-way between Ray and Ramelton ; woods about Long Lough, near Rathmullan ; at Ards.

Cystopteris fragilis, Bernh., var. *β dentata*.—Extremely rare. I found a single plant on Bulbein Mountain, August, 1879.

Athyrium Filix-fœmina, Roth.—I gathered a remarkable "sport" of this fern amongst cliffs behind Lough Sesiagh, near Dunfanaghy. It bore spores upon the upper as well as the lower surface of the pinnules, frequently upon both faces of the same pinnule, while the fronds were remarkably dissected. Mr. Moore, of Chelsea, to whom I sent specimens, considered it quite a new variety.

Asplenium Ruta-muraria, L.—Rare. Cliffs facing north, about a mile and a half inland in a south-easterly direction from the mill near Milford, at about 600 feet above sea-level. This is the only indisputably native locality I have seen. Killydonnelly Abbey, Dean Gwynn ; old wall near Rathmullan Church, Mr. Batt.

Hymenophyllum Wilsoni, Hook.—Local. Muckish Mountain, with *Polypodium Phegopteris;* Drummonaghan Wood near Ramelton, Dean Gwynn.

Botrychium Lunaria, Sw.—Local. Between Ramelton and Fort Stewart, by the side of the old road. Here, as in Fanet, in company with *Habenaria viridis*.

Ophioglossum lusitanicum, L.—I gathered this plant again on Horn Head, fruiting in September, 1879. Specimens sent to Sir J. Hooker and to Mr. H. C. Watson were pronounced distinct from *O. ambiguum* of Orkney.

Isoetes lacustris, L.—Rare. Aranmore, in Lough Shore.

Lycopodium alpinum, L.—Quite rare. Dooish Mountain, near the summit to the westward.

ON *GYMNOMITRIUM OBTUSUM*.

By W. H. Pearson.

Gymnomitrium obtusum.

Dioicous. When tufts crowded, stems erect, with branches few, assurgent, ascending to height of chief stem; when tufts loose, stems prostrate, creeping; leaves closely clasping stem on both sides; fertile stems increasing in size to apex, which is blunt and swollen; barren shoots catenulate; leaves ovate, roundish ovate, bidentate; segments round and obtuse, *finely crenulate*.

Cesia obtusa, Lindberg in 'Meddelanden af Societas Pro Fauna et Flora Fennica' (Helsingsfors), Feb. 3rd, 1877.

Jungermannia gymnomitrioides, Nees?

Exsiccatæ. Gottsche & Raben., Hep. Eur. no. 567, as *Gymnomitrium concinnatum*, Corda. Carrington & Pearson, Hep. Brit. Ex., Fasc. I., no. 1, with *Gymnomitrium concinnatum*, Corda.

Growing in the crevices of rocks, or on the bare exposed or shaded rock, at an elevation of from a few hundred feet (Glen Finnan, Inverness) to 3570 feet (summit of Snowdon).

Mardale, Westmoreland, 1869, Geo. Stabler; Glen Finnan, Inverness, July, 1876, Dr. Carrington; Loch-na-gar, Aberdeenshire, Aug., 1876, J. & T. Sim; Cader Idris, Merionethshire, July, 1876, W. H. P.; Aug., 1878, E. M. Holmes; Llanberis, Carnarvonshire, Aug., 1878, E. M. Holmes; Summit of Snowdon, June, 1880, J. R. Byrom, J. Neild, & W. H. P.*

Plants growing in tufts of a few inches diameter or often less, of a silvery polished appearance; where exposed, dark coloured; where much shaded, with a greenish tinge.

Stems intricately entangled, ¼ to ½ inch long, almost round, the outer layer of cells of a darker colour and stronger texture than the inner ones.

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* [Mr. Pearson has presented specimens from most of these localities to the British Museum Herbarium. Other localities will be found in our last number (p. 318).—Ed. Journ. Bot.]

·3 × ·25, ·25 × ·25, ·25 × ·24, ·26 × ·23, ·23 × ·21, ·22 × ·21 diameter.

Rootlets few, hyaline, arising from the under side of stem where the two series of leaves join, ascending to about the middle of stem; the leaves have to be carefully separated from stem before the origin of the rootlets can be seen.

Leaves ovate, roundish ovate, obovate, sometimes broader at the lower half of leaf, some broader at the upper, concave, bidentate, margin entire (not speaking of segments) except occasionally at the outside of leaf opposite where the segments end, or a little lower, is a shallow hollowing out; in one leaf this was so marked that the basal margin appeared toothed; upon being magnified $\frac{8}{1}^{5}$ slight irregularities may be noted by the marginal cells not running regularly round the side of leaf, but where the leaf increases in breadth rows of four, five, and six cells are as it were added to the leaf; sinus shallow, extending to a depth of from one-fifth to one-fourth of the leaf; at the base of sinus sharp, with the segments frequently slightly overlapping, widening out broadly, with the segments broad, obtuse, nearly of equal size; each segment of leaf very concave, forming at the top of each leaf two spoon-shaped hollows; segments finely, roundly crenulate on both the inner and outer sides; cells on each side of sinus from ten to fourteen in number; the leaves have a hyaline border of irregular depth which is distinctly reticulated to the edge, sometimes the whole leaf hyaline, others (young terminal leaves) green to the very margin; these terminal leaves are also often in the middle reddish brown coloured, pale green at the base which gradually changes into reddish brown and increases in intensity, then suddenly hyaline.

Size of leaf, ·9mm. × ·7mm., ·9 × ·65, ·9 × ·6, ·875 × ·6, ·85 × ·7, ·825 × ·6, ·8 × ·7, ·7 × ·85 (male), ·775 × ·6, ·75 × ·65, ·75 × ·6, ·725 × ·55, ·7 × ·5, ·65 × ·5, ·6 × ·525.

Segments, ·4 and ·225, ·325 and ·3, ·3 and ·25, ·175 and ·15 broad.

Segments about ·25 deep.

Structure.—Marginal cells quadrate small (*parvæ*) cells of the centre between *mediocres* and *parvulæ* (see Spruce, 'Journal of Botany,' "On *Anomoclada*," page 6, 1876); in the segments the outer margin of same rounded, the second and third series of marginal cells are also small, then they gradually increase in size and assume a more hexagonal oblong shape, being large and six-sided in the basal centre of leaf; in the other portions of leaf four-, five-, and six-sided. Trigones small, but very distinct.

Size: marginal cells, ·002 × ·002; centre of leaf, ·005 × ·0025, ·004 × ·003, ·004 × ·002, ·00375 × ·002, ·0035 × ·0025, ·003 × ·002.

Trigones rather less than ·001.

Male stems swollen at the ends where are the antheridia; in a few stems I have found a few antheridia in the middle of the stem; perigonial leaves but little altered from the others, more swollen at the base, and rather broader.

Antheridia few, oval, with swollen base when young; bearers as long or longer than the antheridia (some twelve cells long); the outer skin of antheridia very persistent.

Size, ·25mm. long, by ·15mm. broad, with bearer ·4 long.
·2 ,, ·175 ,, ·4 ,,
·18 ,, ·14 ,, ·35 ,,

Fertile stem. In all the plants examined I have failed to find fruit, having only met with one imperfect female stem, which upon dissection showed a broad involucral leaf with short tongue-shaped segments; archegonia few, oblong, apparently composed of three layers of cells. ·15 × .05mm., ·13 × ·04mm., ·115 × ·03.

Prof. S. O. Lindberg, of Helsingsfors, has very justly raised to the rank of a species what has by some hepaticologists been looked upon as a form either of *Gymnomitrium concinnatum* or *coralloides*, but from both of which it shows itself, upon close examination, to be different, and that constantly.

In the summer of 1876 Dr. Carrington collected it in abundance, along with *G. concinnatum*, at Glen Finnan, Inverness, and was at the time inclined to look upon it as a form of *G. coralloides;* but as it differed in some essential characters, preferred to send it out along with *G. concinnatum*, and so in some copies of Carr. & Pear. Hep. Brit. Ex., Fasc. i., no. 1, *Gymnomitrium obtusum* is found with *G. concinnatum*. Later in the autumn of 1878, I had my attention called closely to it by receiving from my friend, Mr. E. M. Holmes, specimens marked *G. coralloides*, Cader Idris, Merionethshire, August, 1878; I saw that it was the same that I had collected previously on Cader, and Dr. Carrington in Scotland, and which was distinctly different from true *coralloides* specimens of which from the Continent I possess, and as this new species was given in Gott. & Rab., Hep. Eur., no. 567, as *Gymnomitrium concinnatum*, "Rhongebirge Geheeb, Foliis bilobis, lobis obtusis margine cellularum prominentia crenulatis cuticula granulosa pulverulenta," I left it as a singular form of *concinnatum* until lately, when Prof. Lindberg, in a letter to Dr. Carrington, called attention to it as the one described by him as a new species, under the name *Cesia obtusa*.

From *Gymnomitrium concinnatum* it may be distinguished by its rounded obtuse *finely crenulate* segments; the closely and regularly imbricating leaves, bifarously inserted, never secund as Prof. Lindberg especially mentions.

Gymnomitrium crenulatum, Gottsche, is a widely different species with finer stems, arcuately branched, dark blackish brown colour, in shaded stations greenish; in this species the segments are acute, with the hyaline fringe of leaf composed of narrow, sharp-pointed, irregularly projecting cells; well figured in Carrington's 'Irish Cryptogams,' Plate i., fig. 2: "Part of apex of leaf, showing apex of leaf and form of cells +300."

In Limpricht's 'Kryptogamen-Flora von Schlesien,' page 246, *Gymnomitrium crenulatum*, Gott., is given as a variety of *concinnatum*, Corda. After observing it growing for several years, and the examination of specimens from different stations in Britain, I am inclined to look upon it as being a very distinct and characteristic species.

Gymnomitrium coralloides, Nees, has a more pointed leaf without sinus, or if present, very shallow; margin entire, or very irregular

through being weathered, which always has a very delicate diaphanous hyaline border, so delicate that rarely any cellular structure is to be observed; this I find a very constant character, and is to be noted in all the stages of growth of the leaves: this character, along with the entire absence of any approach to crenulation, at once separates it from *obtusum*. Prof. Lindberg mentions that *obtusum* is found in many places in Scandinavia; so Dr. Spruce writes me that it may turn out to be the commonest species in these islands.

Nees von Esenbeck, in his 'Natural History of the European Hepaticæ' (1836), vol. ii., page 52, describes a species *Jungermannia gymnomitrioides*, which is admitted into the 'Synopsis Hepaticarum,' Gottsche, Lindenberg & Nees (1844), page 107; but in the Supplement, on the authority of Gottsche, is referred to the male plant of *Gymnomitrium concinnatum*.

From our present knowledge of the distinctions between *obtusum* and *concinnatum* we might be led to think, from Nees' description, that he had the former in view. The point could at once be settled by the examination of the original specimens from the Herbarium of Nees, but most probably Prof. Lindberg fully satisfied himself of their distinctness before creating the new species *obtusum*.

ENUMERATIO ACANTHACEARUM HERBARII WELWITSCHIANI ANGOLENSIS.

Auctore S. Le M. Moore.

(Continued from p. 314.)

§ Gendarussa.

Justicia Salsola (sp. nov.)—Divaricata, ramosissima, caule obscure tetragono primo pubescente et (sicco) pallide viridi mox glabro nodosulo valido cortice albido spongioso copiose obducto et reliquias ramorum evanidorum ferente, foliis crebris linearibus obtusis coriaceis mox glabris floribus axillaribus solitariis fere omnino sessilibus, bracteis linearibus quam calyx paullo brevioribus, calycis laciniis 5 subæqualibus linearibus acutis pubescentibus, corollæ extus pubescentis tubo fere uniformi limbi labio postico 2-fido lobis omnibus ovatis, filamentis crassiusculis basi glabris antherarum loculis subæqualibus inferiore eximie calcarato, stylo capitellato, capsula oblonga compressa apice acutata obscure puberula 2-sperma, seminibus haud visis.

Hab. In collinis aridis maritimis ad Praia da Amelia. (No. 5023.)

Caulis basi vix 4·0 cm., crassus. Folia 1–1·5 cm. long. vix 2·0 cm. lat., superiora vero minora sicca pallide viridia subtus obscure 1-nervia. Flores parvi brevissime pedunculati. Bracteæ calycisque laciniæ 0·5 cm. long. Capsula 0·6 cm. long.

Cum *J. patula*, Lichst. et præsertim *J. orchioidi*, L. fil comparanda, sed habitu equidem multo minus rigido, bracteis diversis, floribus minoribus, calyce pubescente ab ambabus faciliter dignoscenda. A *J. spartioidi*, T. And. et *J. spergulifolia*, T. And. speciminibus

in herb. Trin. Coll. Dub. servatis et mihi descriptione tantum notis ob characteres multos longe abhorret.

J. BREVICAULIS (sp. nov.)—Herbula, humilis, caulibus e rhizomate polycephalo flavido robusto erectis tenuibus basi incrassatis pubescentibus, foliis parvis sessilibus oblongis obtusiusculis deinde margine ciliato excepto fere glabris subcoriaceis, pedunculis unifloris erectis folia longe excedentibus pubescentibus, bracteis sub flore foliis caulinis similibus nisi minoribus concavis, calycis laciniis 5 fere equalibus lineari-lanceolatis pubescentibus, corollæ calycem longe excedente tubo sub fauce ampliato labii antici lobis lateralibus oblongis obtusissimis lobo mediano oblongo-ovato acutiusculo labii postici lobis brevibus obtusis antherarum loculo inferiore breviter calcarato connectivo præsertim loc. superioris valde expanso, disco cupulari, capsula immatura calyce inclusa.

Hab. Rarior in collinis breve herbidis petrosis inter Mumpulla et Nene distr. Huilla. (No. 5774.)

Circa 2-pollicaris. Rhizoma ad 0·7 cm. crassum, cortice subifero obductum, glabrum. Folia ad 1·7 cm. long. (plerumque minora) et 0·5 cm. lat., conspicue 1-nervia. Pedunculi 2·0 cm. long. Bracteæ 0·4 cm. calycisque lobi 0·6 cm. long. Corolla extus puberula basi glabra, violacea.

§ HARNIERA.

J. insularis, T. And. (*Adhatoda diffusa*, Nees).

Hab. Distr. Golungo Alto sine loci indicatione. (Nos. 5117, 5143.)

§ RHAPHIDOSPORA.

J. extensa ? T. And.

Hab. Rarius et sporadice ad cataractas rivulorum in petrosis editioribus præsidii pr. Cabondo distr. Pungo Andongo. (No. 1248.)

It is with great doubt that I make this provisional identification. Anderson's type is a scrap which was evidently without flowers even when he was so rash as to describe it. On the other hand our plant has no capsules and larger leaves with nearly glabrous petioles. The substance of Dr. Welwitsch's notes upon this plant is as follows:—

Suffrutex debilis. Caulis elongatus, late scandens, flexuosus, cylindricus, 7–10-pedalis, in parte inferiore lignosa griseo-viridis tenuiter sulcatus, in parte superiore læte viridis et lævigatus, tota longitudine ad nodos conspicue elongatus. Calyx viridis, 5-fidus, laciniis subæqualibus, inf. angustior. Corolla pallide viridi-sulphurea intus longitudinaliter purpureo-striata, labio sup. erecto, apice breviter bifido, inf. lobis linearibus, deflexis. Discus ampli-formis. Filamenta compressiuscula, villosa, apice in connectivum inæqualiter didymum carnosum expansa. Ovarium villosum, ovato-conicum. Stylus filiformis, paullo incurvus. Stigma obtusiusculum, tenuissime bilobum. Semina (juvenalia) com-planata, late membranaceo-alata.

J. Anselliana, T. And.

Hab. Natans in stagnis ad cataract. magnum fl. Cuamya prope Condo distr. Pungo Andongo. (Nos. 5172, 5173.)

Flores albi.

Var. *angustifolia*. Folia 5·0 cm. long., 0·2 cm. lat.

Hab. Distr. Pungo Andongo inter Lombe et Candumba. (No. 5098.)

Dubiæ.

Nos. 5124, 5203, *J. sp.* (§ *Betonica ?*). Specimina maxime imperfecta fortasse ad *J. Betonicam* referenda.

No. 5120. *J.* (§ *Rostellaria*) sp. nov. ut videtur aff. *J. Nepetæ* nob.

Herba 1–3-pedalis, ramosissima, graveolens. Flores ex Welwitschio "pallide purpurei" nobis non obvii.

No. 5066. *J. sp.* (§ *Rostellaria*). Ramulus parvus tantum a nobis visus.

No. 5136. *J. sp.* (§ *Rostellaria*). Specimen valde mancum an ad *J. mossamedeam* referendum ?

No. 5137. Fragmentum an aff. *J. mossamedeæ ?*

No. 5032 cujus iconem et fragmentum parvulum tantum vidi videtur eadem ac No. 5137.

No. 5211. Fortasse forma magnibracteata *J. Anselliana*, T. And., sed specimen imperfectum.

No. 5077. Fragmentum. An hujus generis ?

RHINACANTHUS, Nees.

R. communis, Nees.

Hab. Mata de Pungo distr. Pungo Andongo et distr. Jeha do Principe sine loci indicatione et Serra de Xella distr. Bumbo. (Nos. 5191, 5204, 5010.)

The Bumbo plant is the large-flowered hairy form.

(To be continued.)

SHORT NOTES.

NON-GERMINATION OF ARCTIC SEEDS (see p. 306).—I think it right to mention that the experiments made at the Glasnevin and College Botanic Gardens cannot be considered quite conclusive, inasmuch as the seeds were taken from herbarium specimens collected in 1875 and 1876, and afterwards kept in a damp ship's cabin, and the trial was not made until the spring of 1880.—H. C. HART.

CARDAMINE HAYNEANA, *Welw.*—The note about this form of *Cardamine pratensis* in the 'Report of the Botanical Exchange Club for 1879' (p. 5) is misleading. It runs thus:—"*Cardamine* allied to *Hayneana*, Welwitsch. Mr. George Nicholson also distributes specimens of a plant he collected between Kew and Mortlake. In the 'Journal of Botany' Mr. Nicholson says it agrees thoroughly with Welwitsch's specimens, and only differs in its having lanceolate leaves." I sent to the Club specimens of a distinct variety which I at first supposed was *C. Hayneana;* but type specimens in the British Museum showed me that this plant was totally different, and I wrote to Mr. Bailey to that effect, asking him to cross out

the varietal name. The *C. Hayneana* mentioned in 'Journ. Bot.' (p. 202) was not sent to the Club at all; I have now grown it in a pot for a year, and it retains its very distinctive character under these artificial conditions. Dr. Boswell is hardly correct in his conjecture that the plant wrongly named *Hayneana* and the var. *dentata* are respectively starved and luxuriant states of *C. pratensis*, for the former grew by the edge of a moat in damp rich loam, and apparently under conditions which would tend to make it assume anything but a starved appearance.—GEORGE NICHOLSON.

SHROPSHIRE PLANTS.—While botanising in June last in the neighbourhood of Ellesmere with Mr. Beckwith, who is giving great attention to our county flora, we came on a *Potamogeton* floating in the canal near Blackmere, which on carefully examining we felt satisfied was *P. prælongus*, a plant not hitherto recorded for this county. As there is a slight current in the canal we were in doubt where it came from; but Mr. Beckwith has visited the neighbourhood again, and has found it in quantity near the same place. *Carex elongata* is recorded in Leighton's 'Shropshire Flora' as occurring at Colemere, near Ellesmere; but Mr. Beckwith has discovered another locality for it on the margin of Whitemere, near the same town. In the immediate vicinity of Shrewsbury there is a tract of land belonging to the corporation of the town called Kingsland, which has been recently sold to the governing body of King Edward's School for a new site, on which is being built a more commodious structure than the old building for the accommodation of this rapidly increasing school. Some soil having been removed to make room for the foundation of one of the masters' houses, a plentiful crop of *Datura Stramonium*, *Hyoscyamus niger*, and *Erysimum orientale* was detected on it by Mr. T. P. Blunt and Mr. W. Beacall. The last-named plant has not before been recorded for Shropshire. Still more recently on the same heap of soil the Rev. W. A. Leighton found *Amaranthus retroflexus*.—W. PHILLIPS.

MESEMBRIANTHEMUM *not* MESEMBRYANTHEMUM.—So it is properly written by Jacob Breyne, who made the name, and by Dillenius, who took it up, both giving the derivation from *mesembria*, midday, alluding to the time the blossoms open. But both Breyne and Dillenius about half the time wrote *Mesembryanthemum*. Linnæus, adopting the latter, became consistent by making a wrong and far fetched derivation to match the orthography. Among systematic writers, Sprengel almost alone keeps to the correct orthography, and Webb insists on it. The younger Breyne, in his edition of his father's 'Prodromus,' has a note about it (p. 81). He mentions an excuse for changing the orthography, namely, that some species do not open the blossom at noontide, and intimates that Linnæus's derivation, from the insertion of the corolla around the middle of the germ, is open to the same objection. If heeded, that kind of objection would be fatal to very many generic names.—A. GRAY, in 'Coulter's Botanical Gazette,' vol. v., p. 89 (Aug. & Sept., 1880).

Silene Otites, *Sm.*, in Essex. — I have recently gathered *Silene Otites* on the Roman wall at Colchester, in a somewhat exposed situation to the north of the town, by the footpath to the river. I observed but very few plants, but had no time to make any search. There is or was a "Botanic Garden" at no very great distance, and adjoining another portion of the wall; I know nothing, however, of its present state, and the *Silene* does not seem very likely to have been an escape. It is not given for the county in 'Topographical Botany.' Among other unrecorded stations in Essex may be noticed:—*Pulicaria vulgaris*, in a green lane at High Wood Quarter, near Writtle; *Calamintha Nepeta*, very well marked, on the ruins of St. Botolph's Priory, Colchester; *Juncus diffusus*, by the road-side at Redindike, near the Lodge of Writtle Park; and *Calamagrostis Epigeios*, in the neighbouring spring, and for some distance along the lane within the gate.—R. A. Pryor.

Trichomanes radicans in France. — It may interest British botanists to learn that the Irish fern, *Trichomanes radicans*, was discovered for the first time in France during the session of the Societé Botanique de France in the Basque country, last July. It occurred sparingly on the Rhune mountains, near St. Jean de Luz. The Western Pyrenees appear to be remarkably poor in plants, but some species peculiar to Ireland and the West of England were gathered, such as *Dabeocia polifolia*, *Erica vagans* and *ciliaris*, and a moss, *Fissidens polyphyllus*.—T. Howse.

Ranunculus confervoides? in Britain. — To this species Dr. Boswell is inclined to refer a Batrachian *Ranunculus* found this summer in Rescobie Loch, Forfarshire, by Mr. Abram Sturrock, who gives the following description of his discovery in the 'Scottish Naturalist' for October (pp. 350, 351):—"On the 27th of July last a small party of us, consisting of Mr. J. Knox, Mr. W. Graham, and myself, paid a visit to the loch, when Mr. Graham observed a number of small star-like flowers at a considerable depth in the water. This proved to be a Batrachian *Ranunculus*. Though there was a depth of water of from two and a half to three and a half feet, we found to our surprise not only buds and flowers, but well-matured fruit! As several eminent botanists seem to doubt the possibility of any *Ranunculus* fertilising under water, I insist that it is an impossibility that any of these flowers could ever have been near the surface of the water. The whole plant does not exceed a foot in length; it is procumbent in habit, and roots at the nodes; the peduncles do not stand an inch in length; it was found in three feet and upwards of water; and at the time the loch stood at its lowest summer level." Mr. Sturrock gives the following diagnosis of the species:—"Stems about a foot long, slender rooting at the nodes. Leaves all submersed, shortly stalked, mostly twice trifurcate, with (multiplied) segments collapsing. Stipules adnate, not auricled. Buds globose, sub-pentagonal.

Sepals blackish at the edge. Petals five, veined, small, not contiguous, star-like in the water. Stamens few, mostly six, about as long as the pistils. Stigma short, somewhat oblique. Receptacle somewhat conical, thicker than the peduncle, with the usual annulus at the base. Inner edge of carpels nearly straight, outer semicircular. Fr. ped. about one inch long, somewhat exceeding the leaves, curved at the base. Flowering and fruiting in deep water."

Extracts and Notices of Books and Memoirs.

NEW BRITISH AND IRISH FUNGI.

The following five new species of Fungi new to science, found in Great Britain or Ireland, have lately been described:—

Ramularia Cryptostegiæ, Pim.—Forming a very delicate snow-white bloom on decaying seeds of *Cryptostegia* in a stove at Monkstown, Co. Dublin. Threads well developed, simple or slightly branched, spores large, oblong-cylindrical, rounded at the ends, about ·03–·04 × ·006–·007 mm., with one to three very delicate septa inserted on the extremities of the threads. March, 1880. Greenwood Pim, in 'Grevillea,' viii., p. 150.

Peziza electrina, Ph. & Pl.—Gregarious, minute, subgelatinous, glabrous, amber-coloured, disconcave, marginate; stem rather short, firm; asci narrowly clavate, pointed at the summit; sporidia 8, biseriate, cylindraceo-fusiform, ·005 × ·001 mm. On decaying leaves of *Pinus sylvestris*. Forres, N.B., intimately associated with *Dacrymyces succineus*, Fr. The cups are ·1–·5mm. across, paler on the margin; the stem is generally darker at the base. W. Phillips, in 'Grevillea,' viii., p. 155.

The three following are described and figured by Mr. William Phillips in the 'Gardeners' Chronicle' for Sept. 4, pp. 308, 309:—

Peziza (Humaria) misturæ. — Crowded or scattered, sessile, concave when dry, applanate when moist, submarginate, chestnut-brown, glabrous, asci cylindraceo-clavate; sporidia 8, ovate or sub-globose, smooth, with one large nucleus, ·014–·016 × ·011–·012 mm.; paraphyses from one to six times branched, summits proliferously pyriform, or moniliform, or only slightly enlarged. On a mixture of lime and cow-dung spread on the trunks of apple trees. Spring. Clifton [near Bristol], Mr. Cedric Bucknall. ½–3 mm. across. The paraphyses are remarkable for their proliferous growth, and the cells of the exterior of the cup are small, oblong rather than globose.

Peziza (Dasy. sess.) araneo-cincta.—Scattered, minute, sessile, concave, thin, pale yellow; margin fringed with long, slender flexuous, pointed, white hairs; asci broadly clavate; sporidia biseriate, narrowly fusiform, acutely pointed, ·01–·013 × ·001–·0015 mm. On decayed birch-leaves. October. Leigh Down, Clifton, Mr. Cedric Bucknall. Cups ·2–·3 mm. across. The hairs

are without septa, and are so delicate that they are diffluent in water with only slight pressure. I have not seen any paraphyses.

Phacidium tetrasporum, Ph. & Keith. Epiphylous, erumpent, circular or oblong, convex, cinereous, seated on a brownish yellow spot, splitting irregularly into three or four laciniæ; disc black on the surface, brownish yellow within; asci broadly clavate; sporidia 4, elliptical-ovate, with a septum near the lower end, often with a papilla, brown; paraphyses numerous, septate, with brown pear-shaped heads. On the upper side of juniper leaves while yet green, simulating a Puccinia. Forres, Rev. James Keith. 1 mm. across. Sporidia ·025–·021 × ·017 mm.

A Reformed System of Terminology of the Reproductive Organs of the Thallophyta. By Alfred W. Bennett, B.Sc., F.L.S., and George Murray, F.L.S.*

After giving illustrations of the present chaotic state of cryptogamic terminology, the authors proceed to state that the object they have kept in view is to arrive at a system which shall be symmetrical and in accordance with the state of knowledge, and which shall at the same time interfere as little as possible with existing terms. A few new terms are introduced, but the total number is greatly reduced.

In the fourth edition of his 'Lehrbuch,' Sachs defines a "spore" as a "reproductive cell produced directly or indirectly by an act of fertilisation," reserving the term "gonidium" for those reproductive cells which are produced without any previous act of impregnation. The practical objections to this limitation of terms are pointed out, and it is proposed to restore the term *spore* to what has been in the main hitherto its ordinary signification, viz., *any cell produced by ordinary processes of vegetation and not by a union of sexual elements, which becomes detached for the purpose of direct vegetative reproduction.* The spore may be the result of ordinary cell-division or of free cell-formation. In certain cases (*zoospores*) ts first stage is that of a naked mass of protoplasm; in rare instances it is multicellular, breaking up into a number of cells (*polyspores*, composed of *merispores*, or breaking up into *sporidia*). Throughout Thallophytes the term is used in the form of one of numerous compounds expressive of the special character of the organ in the class in question. Thus, in the Protophyta and Mucorini we have *chlamydospores;* in the Myxomycetes, *sporangiospores;* in the Peronosporeæ, *conidiospores;* in the Saprolegnieæ, Oophyceæ, and some Zygophyceæ, *zoospores;* in the Uredineæ, *teleutospores*, *æcidiospores*, *uredospores*, and *sporidia;* in the Basidiomycetes, *basidiospores;* in the Ascomycetes (including Lichenes), *conidiospores*, *stylospores*, *ascospores*, *polyspores*, and *merispores;* in the Hydrodictyeæ, *megaspores;* in the Desmidieæ, *auxospores;* in the Volvocineæ and Mesocarpeæ, *parthenospores;* in the Siphoneæ and Botrydieæ, *hypnospores;* in the Œdogoniaceæ, *androspores;* in

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* Read, Aug. 26th, at the Meeting of the British Association at Swansea.

the Florideæ, *tetraspores* and *octospores*. The cell in which the spores are formed is in all cases a *sporangium*.

In the terminology of the male fecundating organs very little change is necessary. The cell or more complicated structure in which the male element is formed is uniformly termed an *antheridium*, the ciliated fecundating bodies *antherozoids* (in preference to "spermatozoids"). In the Florideæ and Lichenes, the fecundating bodies are destitute of vibratile cilia; in the former case they are still usually termed "antherozoids," in the latter "spermatia," and their receptacles "spermogonia." In order to mark the difference in structure from true antherozoids, it is proposed to designate these motionless bodies in both cases *pollinoids;* the term "spermogonium" is altogether unnecessary, the organ being a true antheridium.

A satisfactory terminology of the female reproductive organs presents greater difficulties. The limits placed to the use of the term spore and its compounds require the abandonment of "oospore" for the fertilised oosphere in its encysted stage anterior to its segmentation into the embryo. The authors propose the syllable *sperm* as the basis of the various terms applied to all those bodies which are the immediate result of impregnation. It is believed that it will be found to supply the basis of a symmetrical system of terminology which will go far to redeem the confusion that at present meets the student at the outset of his researches. For the unfertilised female protoplasmic mass, it is proposed to retain the term *oosphere*, and to establish from it a corresponding series of terms ending in *sphere*. The entire female organ before fertilisation, whether unicellular or multicellular, is designated by a set of terms ending in *gonium*.

In the Zygomycetes and Zygophyceæ, the conjugated *zygospheres*, or contents of the *zygogonia*, constitute a *zygosperm;* in the Oomycetes and Oophyceæ the fertilised *oosphere*, or contents of the *oogonium*, is an *oosperm;* in the Carpophyceæ the fertilised *carposphere*, or contents of the *carpogonium*, constitutes a *carposperm*. In this last class the process is complicated, being effected by means of a special female organ which may be called the *trichogonium* (in preference to "trichogyne"). The ultimate result of impregnation is the production of a mass of tissue known as the *cystocarp* (or "sporocarp"), within which are produced the germinating bodies which must be designated *carpospores*, since they are not the direct results of fertilisation. Any one of these bodies which remains in a dormant condition for a time before germinating is a *hypnosperm*. In the Cormophytes (Characeæ, Muscineæ, and Vascular Cryptogams) the fertilised *archesphere*, or contents of the *archegonium*, is an *archesperm*. In the proposed system zygosperm will replace Strasburger's "zygote," and the "gametes" of the same writer will be zygospheres, his "zoogametes" or "planogametes" being *zoozygospheres*.

In the Basidiomycetes, Ascomycetes, and some other classes, it is proposed to substitute the term *fructification* for "receptacle" for the entire non-sexual generation which bears the spores.

A list is appended of the terms in more frequent use which are disused in the proposed system.

Modes of Reproduction in Thallophytes.

I. Zygospermeæ . Zygogonia containing Zygospheres.
‖
(fertilised) Zygosperm.

	Male Organ.		*Female Organ.*
II. Oospermeæ .	Antheridium containing Antherozoids or Pollinoids	=	Oogonium containing Oosphere

‖
(fertilised) Oosperm.

III. Carpospermeæ .	Antheridium containing Antherozoids or Pollinoids	=	Carpogonium containing Carposphere

‖
(fertilised) Carposperm.

IV. Cormophyta .	Antheridium containing Antherozoids	=	Archegonium containing Archesphere

‖
(fertilised) Archesperm.

Reproductive Organs of Thallophytes.

	Female.	*Non-sexual.*
Protophyta . .		Chlamydospores.
		Sporangia.
Myxomycetes . .		Zoospores.
		Sporangiospores.
Mucorini . . .	Zygogonium.	Chlamydospores.
	Zygosphere.	Sporangiospores.
	Zygosperm.	
Peronosporeæ . .	Oogonium.	Coridiospores.
	Oosphere.	Zoospores.
	Oosperm.	
Saprolegniæ . .		Zoospores.
Uredineæ . . .	Carpogonium.	Teleutospore.
	Carposphere.	Æcidiospore.
	Carposperm.	Uredospore.
		Sporidium.
Ustilagineæ . .		Teleutospore.
		Sporidium.
Basidiomycetes . .		Basidiospore.
		Basidium.
		Sterigma.

	Female.	*Non-sexual.*
Ascomycetes . . (including Lichenes.)	Trichogonium.	Conidiospore. Stylospore. Ascospore. Polyspore. Merispore.
Zygophyceæ . .	Zygogonium. Zygosphere. Zygosperm. Zoozygosphere. Hypnosperm. (Hydrodictyeæ Zygnemaceæ.)	Zoospore. Megazoospore. (Hydrodictyeæ.) Auxospore. (Diatomaceæ.) Hypnospore. Hypnosporangium. (Botrydieæ.) Parthenospore. (Mesocarpeæ.)
Oophyceæ . . .	Oogonium. Oosphere. Oosperm. Hypnosperm. Conceptacle.	Zoospore. Parthenospore. (Volvocineæ.) Androspore. (Oodogoniaceæ.) Hypnospore. (Siphoneæ.) Zoosporangium.
Carpophyceæ . .	Carpogonium. Carposphere. Carposperm. Trichogonium. Trichophore. Cystocarp.	Tetraspore. Octospore. Carpospore. Tetrasporangium.

We have received the numbers of the 'Midland Naturalist' for the current year. The most important botanical paper in them is the continuation of the 'Cryptogamic Flora of Warwickshire' (Mosses), by Mr. J. E. Bagnall; there are also other shorter communications on local botany.

The Tenth Annual Report of the Wellington College (Berks) Natural Science Society contains a very full record of the times of flowering of the plants of the district, which is gratifying as showing that a large number of observers are at work. The list is so arranged as to comprise all the plants known to occur in the neighbourhood, localities being given for the more interesting of these.

We have also to acknowledge the receipt of the 'Transactions of the Yorkshire Union' for 1878–80. The part issued in 1879 contains the Report of the Botanical Section (with Supplement) for 1878, in which is much of local interest; and the commencement of a 'Moss Flora of the East Riding,' by Dr. H. F. Parsons. We note with pleasure that these Transactions are entirely devoted to the investigation of the Natural History of the county.

The last (sixth) decade of Baron F. von Mueller's 'Eucalyptographia' includes an exhaustive sketch of *Eucalyptus Globulus*, containing much new matter which we regret that the space at our disposal will not permit us to extract. The same author has just issued the 92nd part of his 'Fragmenta,' a great part of which is occupied by notes on the Australian species of *Hibbertia*.

We have received from Messrs. Cassell part i. of a new edition of 'Paxton's Flower-Garden,' edited by Mr. Thomas Baines. It is to contain many additional plates, and will be "revised and brought down to date both as regards the text and illustrations." We note that the initials of the specific names are uniformly capital letters,—a deviation from the recognised practice of which it is difficult to see the advantage.

New Books.—R. Hartwig, 'Ueber der Bau der Ctenophoren.' Jena: Fischer (7 mks.)—O. Hoppe, 'Beobachtungen der Würme in der Blüthenschiede e. Colocasia odora.' Leipzig: Engelmann (5 mks.) — Fries, 'Icones Selectæ Hymenomycetum nondum delineatorum,' vol. ii. pt. 5 (*Cortinarius*). — F. von Mueller, 'Select Extra-tropical Plants for industrial culture' (Indian edition). Calcutta: Government Press. — 'Report of the Royal Gardens, Kew, for 1879.' Clowes (1s.) — J. G. Agardh, 'Species, Genera, et Ordines Algarum,' vol. iii., part 2—'Morphologia Floridearum.' Lipsiæ: Weigel. — P. Marès & G. Vigineix, 'Plantes Vasculaires des Iles Baléares.' Paris: Masson. — N. J. C. Müller, 'Handbuch der Botanik.' Heidelberg: Winter. — A. Grisebach, 'Gesammelte Abhandlungen zur Pflanzengeographie.' Leipzig: Engelmann.— F. Schneider, 'Taschenbuch der Flora von Basel.' Basel: Georg.— 'Zur Ætiologie der Infectionskrankheiten mit besonderer Berücksichtigung der Pilztheorie' (Part 1). Munich: Finsterlin, 1881. —W. O. Focke, 'Die Pflanzen-Mischlinge.' Berlin: Eggers, 1881. —H. Berge, 'Pflanzenphysiognomie.' Berlin: Wiegandt. — W. Lanche, 'Deutsche Dendrologie.' Berlin: Wiegandt.

Articles in Journals.—September.

Linnæa (vol. ix., n. s., pt. 1).—C. O. Harz, 'On the Systematic Arrangement of Grasses.'—J. Müller, 'Lichenes Africæ occidentalis a Dr. Pechuel-Loesche et Soyaux e regione fluminis Quillu et ex Angola missi' (many new species).—A. Garcke, 'Schimper's Abyssinian *Malvaceæ* (1869).'—Von Winkler, 'On the Seedlings of *Sisymbrium* (1 tab.)

Botaniska Notiser.—'Descriptions of new species in Wittrock and Nordstedt's 'Algæ aquæ dulcis exsiccatæ.' '—T. O. B. N. Krok, 'Swedish Botanical Literature for 1879.'

Magyar Novenytani Lapok.—A. Sziehlo, 'Additions to the Flora of Glozsán.'—C. Mika, '*Peronospora viticola* in Transylvania.'

Hedwigia.—E. Ihue, 'Experiments on Infection with *Puccinia malvacearum*.'—G. Winter, 'Mycological Notes.'

Revue Bryologique.—Philibert, 'A new species of *Neckera*' (*N. mediterranea*).—Boulay, '*Orthodontium gracile*.'—Duby de Steiger, 'Notes on *Eriopus* and *Mitropoma*.'

Œsterr. Bot. Zeitschrift.—W. Vatke, 'On Hildebrandt's African

Plants' (*Leguminosæ*—many new species).—F. Krasan, 'On Plant-distribution in the districts of Gorz and Gradisca' (continued).—S. Schulzer von Müggenburg, 'Mycological Notes' (*Boletus acris*, n. sp.)—V. v. Borbas, 'Notes on *Ferulago silvatica* and *Roripa hispanica*.'—V. v. Aichinger, 'On the Flora of Vorarlberg.'—D. Hirc, 'On the Flora of Risnjak.'

Flora.—F. Arnold, 'Lichenological Fragments.'—W. Nylander, 'Addenda nova ad Lichenographiam europæam' (14 new spp.)—P. G. Strobl, 'Flora of the Nebrodes.'—W. Behrens, 'Fertilisation in *Cobæa*.'

American Naturalist.—A. N. Prentiss, 'Destruction of noxious insects by fungoid growths' (concluded).—J. E. Udd, 'Cross-fertilisation in *Ranunculaceæ*,'

Bulletin of Torrey Botanical Club.—J. Williamson, 'Ferns on the Cumberland.'

[Coulter's] *Botanical Gazette*.—A. Gray, 'Notulæ exiguæ.'—F. Moray, '*Potamogeton Vaseyi*.'—C. R. Barnes, 'The Anthers of *Clethra*.'

Naturalist (Huddersfield).—J. E. Griffith, 'Flora of Carnarvonshire and Anglesea' (continued).

Midland Naturalist.—A. W. Wills, '*Volvox globator*' (1 tab.)

Botanische Zeitung.—H. Vöchting, 'On the Apex and Base of Plant-organs.'—M. Woronin, '*Chromophyton Rosanoffii*' (1 tab.)

Botanical News.

We are glad to learn that Dr. James Murie has been elected Librarian to the Linnean Society. Dr. Murie has filled the post of Assistant-Secretary to the Society for some years past with great energy and devotion, and is thus fully acquainted with the duties of the post which he has obtained.

Charles Johnson, who died at Camberwell on 21st September last, was born in London 5th October, 1791, and was intended for an assayer; but he early showed much love for Natural History. He was a fellow-student of Michael Faraday under Tatum, began to give public lectures on Botany in 1819, and thenceforward devoted himself entirely to that study. In 1830 he was appointed first occupant of the chair of Botany at Guy's Hospital, upon the founding of the medical school; here he delivered forty-four courses of lectures, relinquishing his post in 1873. He introduced the system of demonstrating upon living specimens, lecturers having previously confined themselves to verbal statements; these specimens came mostly from his own garden, which he sedulously kept up, and which at one time contained more than four thousand species. He condensed the descriptions and arranged the figures, on the Linnean system, of Sowerby's 'English Botany,' ed. 2 (1832–46), in 12 vols. His other productions were 'Ferns of Great Britain' (1855); 'British Poisonous Plants' (1856); 'Grasses of Great Britain' (1861). He retained his faculties to the last, and delivered a course of lectures within two years of his death.

Pritzel has confounded him with his son, Charles Pierpoint Johnson, who wrote 'Useful Plants of Great Britain' (1862).

Josef Sartori was born in Munich 30th June, 1809, and died there 15th September last. He was court physician to King Atho of Greece, and resided in that country from 1833 to 1862. During those thirty years he was indefatigable in collecting plants, and largely aided Boissier in supplying material for his 'Diagnoses' and 'Flora Orientalis,' which he got together for a Flora Hellenica, projected in combination with Heldreich. After his return to his native city he busied himself with the vernacular names of American plants in English, Spanish, Portuguese, and native Indian terms. At the time of his death he had prepared more than 20,000 slips, and it is greatly to be hoped that these are in a sufficiently forward state to permit of publication. His name is commemorated in *Sartoria hedysaroides*, Boiss. & Heldr.

The Annual Fungus Meeting of the Woolhope Club was held during the week ending October 9th. Never, in the annals of the Club, have so few fungi been found, or has such continuous rainy weather been experienced. Agarics and *Boleti* were remarkably scarce, some of the common species, such as *A. melleus*, being altogether absent. On the other hand, a larger number than usual of *Polypori* and other fungi growing on trees and stumps were noticed. The following mycologists took part in the excursions:—Dr. Bull, Dr. Griffiths Morris, Messrs. Broome, Bucknall, Cooke, Howse, Phillips, Plowright, Sir William Guise, and M. Cornu. Dr. Carrington and Mr. G. C. Churchill were amongst the visitors. The first excursion was fixed for Dindor Camp, but heavy rain allowed but short time for work. On the way back to Hereford, *Pleurotus lignatilis* and *Pluteus leoninus* were gathered. An excursion was made on Wednesday to the Downton Woods, but unfortunately most of the species for which this locality is celebrated were conspicuous by their absence. The only rare species found were *Agaricus Russula*, *rubromarginatus*, *atrides*, *Russula aurata*, and *Nœmatelia eucephala*. On Friday an excursion was made to Moccas Park. Few fungi were seen, except on trees and stumps. The following may be recorded:—*A. tessulatus* (allied to *A. ulmarius*, and new to this country), *A. gummosus*, *euchrous*, *echinatus*; *Hygrophorus fornicatus*; *Lactarius mammosus*; *Polyporus ulmarius*, *frondosus*, *varius*, *fomentarius*, *fraxineus* (the latter had undermined a fine large ash-tree and caused its fall); *Trametes mollis*; and *Geoglossum viride*. On Saturday the party started for North Wales, Mrs. Lloyd Wynne, of Coed Coch, and Mr. Walker, of Colwyn, having invited them to a foray in their woods. The following are the most interesting species gathered during the meeting, some of which are new to this country:—*Agaricus lenticularis*, *seminudus*, *meleagris*, *undatus*, *senilis*, *clavipes*, *decastes*, *jubatus*, *Bloxami*, *nudipes*, *curripes*, *centunculus*, *durus*, *Leveillianus*, *inopus*, *pennatus*; *Cortisiarius mucosus*, *laniger*; *Russula Queletii*, *lepida*; *Hygrophorus Wynnei*; *Lactarius fuliginosus*; *Polyporus picipes*.

We regret to record the death of Mr. F. M. Webb, which took place last month at Edinburgh.

Original Articles.

MUSCI PRÆTERITI;

SIVE DE MUSCI NONNULLIS ADHUC NEGLECTIS, PRÆTERVISIS VEL CONFUSIS, NUNC RECOGNITIS.

AUCTORE RICARDO SPRUCE.

(Continued from p. 295.)

3. PLAGIOTHECIUM DENTICULATUM (*L.*), *Schimp.*

Hypnum denticulatum, L.

Although mosses under this name abound in our herbaria—so that, in the aggregate, it cannot be said to have been "passed over"—some confusion has been caused by one form of it having been taken as the type of the species by certain authors, and a very different form by other authors. To introduce what I have to say of these two leading forms, or subspecies, it is needful to speak first of the closely-allied *Pl. sylvaticum*.

It was the late Mr. Wilson (*in litt.* circ. 1843) who first insisted on the dioicous inflorescence of *H. sylvaticum*, taken in conjunction with the usually lurid and opaque foliage in the dry state—as contrasted with the shining leaves of *H. denticulatum*, both fresh and dried,—the wider leaf-cells, and the rostrate lid, as sufficing to separate the two species; which had heretofore been either confounded, as in 'Muscologia Britannica,' or kept apart by very insufficient characters. I at once became a convert to his views, and in 1843 (or 1844) sent specimens of both species to the late M. Bruch, of Zweibrücken. In reply he sent me two well-filled packets, the one (*a*) labelled "*Hypnum sylvaticum*, Schwgr., floresc. monoica (nec dioica). In sylvis ad terram"; the other (*b*) "*Hypnum denticulatum*, L.: est *Hypni sylvatici* forma minor; capsulis brevioribus. Ad arborum radices". In the packet *a* I found two varieties of *H. denticulatum*, and a little true *H. sylvaticum;* in *b*, copious specimens of what was afterwards considered typical *H. denticulatum* in the 'Bryologia Europæa,' with a tuft of *H. sylvaticum*. I picked out of these packets a tuft of each species, and returned it to M. Bruch with a short diagnosis. As he made no remark on them I never knew whether they had sufficed to convince him of the distinctness of the two species; but, shortly after his decease, a parcel of mosses received from M. Schimper contained specimens of *H.sylvaticum*, with the observation "Ab *H. denticulato* floresc. dioica revera distinctum."

In Schimper's latest account of *Plagiothecium sylvaticum* (Syn. ed. ii., p. 696) the capsule is thus described: "Capsula cernua et horizontalis, sicca arcuata *sulcata*"; and *Pl. denticulatum* is said to be distinguishable from *Pl. sylvaticum* mainly by the "flores

monoici, foliorum rete angustius, capsula sicca *lævis*, operculum haud rostratum, annulus e triplici serie cellularum compositus." Now, on none of my specimens of *Pl. sylvaticum*, including those from Schimper himself, is there any capsule answering to the above description, especially as to its being furrowed when dry; all the capsules I have seen being perfectly smooth at every stage, even when old and empty. But there is a form of *Pl. denticulatum*, often seen growing along with *Pl. sylvaticum*—as in Bruch's specimens (*a*) above referred to—which has striated capsules; and I cannot avoid the conclusion that Schimper has combined in his description the characters of the two.

Good specimens of *Pl. sylvaticum* gathered in the Pyrenees (Bois de Jurançon) I find thus described in my notes:—

Dioicum, olivaceo- vel fulvo-viride, siccando fuscidulum flaccidum, basi parum ramosum et stoloniferum; ramis elongatis, suberectis inferne grandi-densifoliis apice sparsifoliis. Folia longiora (quam *Pl. denticulati*) ovata et ovato-lanceolata plus minus acuminulata, margine plano vel toto fere leviter reflexo, costis binis ad folii $\frac{1}{3}$—raro ad $\frac{1}{2}$ usque—attingentibus, cellulis mediis ($\frac{1}{6}$–$\frac{1}{8}$ × $\frac{1}{5}$–$\frac{1}{6}$ mm.) dimidio latioribus quam *Pl. denticulati*. Involucrum ♀ fertile breve, capsula brevius, sterile sæpe auctum; bracteæ semper breviter binerves. Capsula cylindrica vel anguste pyriformi-cylindrica *longicolla*, inclinata, siccando immutata vel subarcuata *estriata*. Operculum *rostratum* capsulam adæquans vel paulo brevius. Flores ♂ sæpe fasciculati, turgidi polyandri.

None of my European specimens diverge essentially from this character, which suffices for my present purpose, although it leaves several features unnoticed.

If we turn now to the published descriptions of *Pl. denticulatum* we find Schimper calling the capsule "incurvo-cernua arcuato-oblonga et arcuato-cylindracea . . . . . sicca *lævis*." But Wilson says of *Pl. denticulatum*, "Capsule oblong inclined . . . . less cernuous than in *H. sylvaticum*. Lid acutely conical, not beaked." He does not mention the striated capsule under *H. denticulatum*, but under *H. sylvaticum* one of the characters he adduces to distinguish it from *H. denticulatum* is "capsule when dry quite smooth, *not furrowed*." From all which it appears that Wilson's typical *H. denticulatum* had a furrowed, but *H. sylvaticum* a smooth, capsule; while for Schimper it was *H. denticulatum* that had the smooth, and *H. sylvaticum* the furrowed, capsule.

Referring to my herbarium for further evidence I found that nearly all my British specimens of *Pl. denticulatum* were of Wilson's type, with the leaves subplane, or only slightly decurved, even or somewhat crispate; the capsule elongate, rather long-necked, pale, often whitish, inclined, straight or slightly arcuate, usually very distinctly striated when dry, and especially when emptied of the spores, rarely smooth or nearly so; lid conico-acuminate or subrostellate. But in July last my friends Messrs Slater and Stabler brought me from an adjacent wood (Coneysthorpe Banks) magnificently-fruited patches of Schimper's type of *Pl. denticulatum*, having deep-green secund and hooked foliage, very like that of some forms

of *Stereodon cupressiformis;* deep red pedicels; shortish capsules, very much arched and cernuous, short-necked, of a fine orange-brown on the upper, yellow or green on the under, side, and quite smooth in every stage; lid conical, subobtuse, never rostellate. They agree exactly, except in colour, with specimens in Schimper's 'Stirpes Normales,' with others from Bruch, and with specimens gathered by myself in Teesdale in 1843. As this, considered the typical form of *Pl. denticulatum* on the Continent, differs considerably from the ordinary English form, I add a description of it.

Plagiothecium denticulatum, *L.*, subsp. aptychus, *Spruce.*—Monoicum humile depresso-cæspitosum viridissimum vel argenteo-viride, recens et siccum nitidum, vage ramosum. Folia plerumque decurvo-subsecunda, ovato-lanceolata breviter apiculata acuminulatave, costis breviusculis, margine infero vix reflexo; cellulæ perangustæ ($\frac{1}{8}$—$\frac{1}{10}$ × $\frac{1}{80}$ mm.), basales paucæ laxiores, alares rectangulares utrinque 2 vel 4. Bracteæ ♀ foliis longiores et angustiores, magis acuminatæ, sæpe enerves. Pedicellus ruber, inferne dextrorsum, supra medium sinistrorsum tortus. Capsula breviuscula, oblongo-cylindrica, collo vix ullo, inclinata vel horizontalis subcernua, sicca arcuato-cernua sæpeque subpendula sub ore constricta, bicolor, facie superiore aurantiaco-badia, inferiore flava vel virescens. Operculum breve, conicum, raro subapiculatum, obtusiusculum. Annulus variabilis, duplex triplexve. Peristomium pallidum sublæve; dentes ext. subulati acuminati arcte trabeculati; internum ad ½ fissum, processus integri vel pertusi, ciliola bina capillacea.

The second, or Wilsonian form, differs from the foregoing mainly in the fruit, and may be thus briefly defined:—

Plagiothecium denticulatum, *L.*, subsp. sulcatum, *Spruce.*—Folia planiora sæpeque laxiora, rarius subsecunda, sicca interdum crispula. Bracteæ persæpe longe uninerves. Capsula longi-pedicellata plerumque pallida—albido-viridis, supramatura flavescens vel pallide badia, raro rubescens—cylindrica, æqualis vel parum cernua, raro distincte cernua, sicca suberecta vel inclinata interdum subincurva, vacua semper fere distincte striata, collo longiusculo. Operculum conico-acuminatum vel rostellatum. Peristomium *Pl. aptychi.* Florescentia, eadem quæ in præcedente subspecie, normaliter antoica; plantæ tamen unisexuales, cum aliis bisexualibus mixtæ, interdum adveniunt.

This is by far the commoner form with us, but the two forms are sometimes found intermixed, each preserving its special characters—no proof either for or against their specific diversity; for two varieties of a species (of various orders of plants) are often seen to grow side by side for years, without any intermediate form making its appearance; such connecting forms, however, existing on other sites, as in the present instance. I have gathered in the Pyrenees (at Gélos, near Pau; also near Luz, and in the Vallée du Lys) a pretty dwarf form of *Pl. denticulatum*, having most of the characters of *Pl. sulcatum*, but with the nearly erect capsule perfectly smooth, on which I have the following note:—Tenellum, valde fertile; foliis parvis, erectioribus vel subhamatis, longius

apiculatis; capsula brevi-cylindrica, collo mediocri, sicca vacua suberecta omnino estriata.—This plainly belongs to neither of our subspecies, and is perhaps worthy to form the type of a third, in which would be included the varieties β. *tenellum* and ε. *myurum* of Schimper. The same author's vars. γ. *laxum* and δ. *densum* may possibly belong to the subspecies *sulcatum*, but as no hint is given of the capsule ever being striated, although such capsules exist among Bruch's specimens, I fear lest Schimper may have (wrongly) placed all such striated capsules to the credit of *Pl. sylvaticum*.

I have fine specimens from the sides of streams in the Mourne Mountains (Ireland) of "the tall mountain form, 'Eng Bot.,' t. 1260, growing in dense patches, with tall erect stems" (Wils. *l. c.*), and they accord in all particulars with the subspecies *sulcatum*.

I have said little thus far of the form of the leaves, for in both subspecies they are normally ovate-lanceolate, rather abruptly apiculate or acuminulate, and always acute at the very point; and, in both, the same variations occur in the degree of reflexion of the margin, the length of the nerves, and the rare presence of subapical teeth. But I have never seen any form of *Pl. denticulatum* with obtuse leaves, as in Wilson's "var. β. *obtusifolium;* leaves elliptical, more or less obtuse, slightly concave," which he considers the same as Turner's var. γ. *obtusifolium* and the *Hyp. Donianum* of 'E. Bot.,' t. 1446. I have not the 'E. Bot.' figure at hand, but Turner's figure is far more like *H. palustre* than *H. denticulatum*, and so is his description:—"Foliis arcte imbricatis obtusis mediotenus obsolete uninervibus" ('Musc. Hibern.,' 146, t. 12, f. 2). Yet Wilson had Turner's herbarium to aid him, and must have seen the original specimens of this moss. The "*Plagiothecium Donianum*" of Mitten's 'Musci Austro-Americani' is surely something very different, for it has "folia subacuminata" and "operculum acuminatum"; such as the author attributes also to *H. denticulatum*, of which it can scarcely be more than a variety.

In general, hooked leaves and hooked capsules go together in those forms of *Pl. denticulatum* where either feature exists, and the subspecific *aptychus* may correspond to Lindberg's *Pl. denticulatum*, var. *secundum*, "foliis suis plus minus secundis vel subhamatis, haud minus in memoriam formus tenuiores *Stereodontis viridis* referens." (Contrib. ad fl. crypt. Asiæ boreali-orientalis, p. 278–9); but his var. *crispatulum*, "robusta et foliis leviter undulatis vel crispatulis" (*l. c.*) cannot well be our *sulcatum*, or he would not have failed to notice so marked a feature as the furrowed capsule. And if there should exist in any herbarium a *Plagiothecium* with dioicous inflorescence, and with the other characters assigned to *Pl. sylvaticum* by Wilson and myself, except that the capsule is furrowed, and not smooth, I have no doubt the benevolent possessor will produce it, and thus enable us to decide whether it be really a form of *Pl. sylvaticum*, or rather a new and distinct species.

I add an account of two remarkable varieties of *Pl. sylvaticum*.

PLAGIOTHECIUM SYLVATICUM (*Dill. L.*), var. SUCCULENTUM (*Wils.*) —This is the moss found by Wilson in Winwick stone-quarry, and

referred by him to *Hypnum denticulatum* as var. γ of that species, of which he says :—"The variety γ is remarkable for its great similarity in habit and foliage to *H. sylvaticum*, and for its large tumid synoicous flowers; it may eventually prove to be a distinct species." (Bryol. Brit., 407–8). He had sent to me fresh plants of it when he first gathered it, with the remark, "*H. denticulatum*, var. with synoicous flowers. If a distinct species call it *H. succulentum*, MSS." I, however, could only see in it young male plants of *H. sylvaticum*. My note on it is :—"Flores prope caulis basin crebri, interdum fasciculati 2–3 ni, globosi turgidi polyphylli, plerique masculi, paucissimi synoici. Bracteæ prælatæ, suborbiculatæ, abrupte breviuscule tenui-acuminatæ, concavæ laxe areolatæ." I have now made a renewed examination, which has confirmed my previous conclusion.

In one flower I found six large stipitate well formed antheridia (yellow); four perfect pistillidia (red-purple); and two indefinite bodies, like very slender antheridia, or widish pistillidia, but pale, and remaining closed at the rounded apex: evidently neither ♂ nor ♀ organs, but intermediate between the two.* In other flowers I found only these neuter organs, along with a few antheridia, but no pistillidia; while the great majority of the flowers contained antheridia alone. Now, in every respect, except the occasional synoicous inflorescence, these plants accord exactly with male plants of true *H. sylvaticum* gathered in our woods (Gilla Leys, &c.) The leaves of the latter are the same in size, form, colour, and texture; the flowers are equally turgid (only, as far as I have seen, purely male), and the bracts in all respects the same. [Fruit of *H. succulentum* I have not seen, for capsuliferous plants in Wilson's packets were merely the ordinary form of *H. denticulatum*, growing intermixed, as he himself acknowledged.]

It may not be generally known that the earliest flowers of many mosses are occasionally synoicous, although those of the adult plant may be distinctly dicliuous. The ♂ inflorescence of *Tetraphis pellucida* is described in books as terminating ramuli that spring in pairs from a sterile ♀ flower; but I have examined a large patch of young plants of it in which every primary flower was *synoicous*. and from many of these flowers were springing young male—or sometimes gemmiparous—ramuli.

PLAGIOTHECIUM SYLVATICUM, var. PHYLLORHIZANS (=*Hypnum phyllorhizans*, nob. in litt. ad Philippe, a. 1847).—Elatum flaccidum pallidum, apice solo virescens, intricato- cæspitosum; caules 3-pollicares erecti simplices vel ramos 1–4 fastigiatos edentes, arhizi, nisi pro radicellarum fasciculo e cujusque rami basi exeunte. Folia patentia, siccando tortella laxa, subquadrifaria, ovata subacuminata concava apice pertenui minute denticulata, basi longissime decurrentia; margine ad ⅔ altitudinis usque recurvo—foliorum inferiorum tota longitudine revoluto;

* They are apparently exactly the same organs as Lindberg has lately found in *Hypnum* (*Brachythecium*) *erythrorhizon*, Br. Eur., as described and figured in his paper on the "Change of female into male organs in a Moss." (Proc. of Stockholm Acad. Sc. 1879, p. 75, t. 11.)

valida ad vel ultra ½ procurrente, medio (raro basi) furcata; cellulis latiusculis *Pl. sylvatici*. Ex utraque facie foliorum inferiorum costæ, necnon e margine, proferuntur radicellæ validæ purpureæ, caulibus foliisque adjacentibus arcte adhærentes. Hab. in rivulis saxosis juxta Bagnères-de-Bizorre Pyrenæorum centralium, ubi anno 1846 amicus Philippe legit.

Although these two plants can only, I think, be considered varieties of *Pl. sylvaticum*, the one I am about to describe, which is certainly the *Pl. Sullivantiæ* figured in Sullivant's beautiful 'Icones,' seems distinct; at least I have seen nothing intermediate. Whether, along with *Pl. Röseanum*, Hpe., and *Pl. orthocladum*, Sch., it should constitute a subspecies of *Pl. sylvaticum*, I cannot undertake to say, my materials being insufficient.

4. Plagiothecium Sullivantiæ, *Schimp.*

Hypnum Sullivantiæ, Sch., Sulliv. Mosses of the U. States, p. 80, 1856), etiam 'Icones Muscorum,' p. 207, t. 126 (a. 1864).

Dioicum cæspitosum pallide viride, basi rufescens, *in sicco nitens*. Caules pollicares erecti fastigiatim ramosi, basi aphyllâ flagella radicantia demittentes. Folia undique imbricata, vix subcomplanata, ramorum apices versus confertiora, basi angusta subtransversa inserta, omnia fere symmetrica, ovata et ovato-lanceolata, concava, inferiora persæpe striata, sensim acuminata et longiuscule apiculata cuspidatave; margine a basi ultra medium reflexulo; costis binis ad folii ⅓ productis; cellulis angustis ($\frac{1}{170} \times \frac{1}{75}$ mm.); alaribus paucis subquadratis. Bracteæ erecto-appressæ, interiores foliis longiores oblongæ cuspidato-acuminatæ, costa nulla vel simplice latiuscula obscura ad ½ usque percursæ. Pedicellus pollicaris rufus. Capsula rufula longicolla suberecta vel leniter inclinata. Operculum (ex ic. Sullivantii) a basi alte conica obtuse brevirostre, dimidiam capsulam haud excedens. Annulus simplex duplexve. Peristomium pallidum scaberulum; processus interni carina integri vel in ætate hiantes, ciliola 1–2na.

Hab. ad saxa in sylvis densis fl. Ohio (Sullivant). In regione Pyrenæorum sylvatica superiore ad saxa juxta lacum Séculégo, mense Sept., 1845, ipse legi, fructu jam supramaturo. Ad Kirkstone Pass, Westmorlandiæ plantam ♀ sterilem, m. Juni, 1876, invenit am. G. Stabler.

Forsan a *Pl. Röseano* (Hpe.), Br. Eur., t. 504, haud distincta species, illi tamen tributa sunt folia "costa maxime obsoleta," quum in nostra folia costis optime distinctis gaudent. A *Pl. sylvatico* foliis vix complanatis, omnibus fere symmetricis, *nitidis* (nec opacis et fuscidulis), cellulis dimidio angustioribus; operculo breviore, etc. facile distinctum mihi videtur; et a *Pl. denticulato* florescentia constanter dioica.

5. Fissidens holomitrius, n. sp.

Monoica pusilla pallida, gregaria vel laxe cæspitosa. Caules brevissimi declinati, nisi pro ramulo masculo basali gemmiformi simplices. Folia 5-juga, infima minuta, superiora valde increscentia, lineari subfalcata acuminulata cuspidatave, costa pellucida et limbo

tenuiusculo pellucido cum folii apice desinentibus, lamina apicali auriculæ laminis subæquilonga, dorsali inferne perangusta folii basin tamen attingente, reti minuto hexagono sat opaco. Flos ♂ e radicellis rubris ad surculi fertilis basin ortus, tetraphyllus, foliis internis prælatis concavis, apice brevi-laminatis ; antheridia sub 4, paraphysibus nullis vel obsoletis. Flos ♀ terminalis 3–4-gynus ; bracteæ foliis supremis conformes. Capsula in pedicello longiusculo stramineo, supra basin sæpe geniculata, erecta vel subinclinata, tenuis ovali-cylindrica, e viridi olivacea, tenuissime annnlata. Operculum dimidiam capsulam parum excedens, e basi convexa recte rostellatum obtusum. Calyptra capsulæ æquilonga straminea anguste conica, pistillidio purpureo cuspidata, basi perfecte integra, demum operculum vix velans et supra eum diu persistens. Peristomium ruberrimum papillosum; dentes profunde (ad $\frac{1}{2}$) fissi, cruribus filiformibus. Sporæ minutæ. Ped. 12–15 ; capsula ·8 ; operculum ·5 ; calyptra 8 mm. longa.

Hab. in terra arenosa prope pagum Gélos Pyrenæorum occidentalium. (R. S. a. 1845).

Obs.—Omnes calyptræ mihi visæ integræ erant, sine ulla fissura basali ; quo caractere a cæteris Fissidentibus europæis omnibus discrepat. *F. osmundioides*, Sw., revera calyptra mitriformi gaudet, basi autem plus minus lacera. Calyptra *F. hyalinæ*, Hook. et Wils. (Sullivant, Ic. t. 21), ex America boreali. conica integra, exacte ac in nostra, nisi multo brevior et latior est ; specie tamen diversissima, foliis solum 3-jugis prælatis laxissime areolatis, supra auriculam ecostatis. *F. laxifolius*, Hsch. (e Cap. Bonæ Spei) quoad calyptram conico-subulatam nostræ similis, cæteris caracteribus bene distinctus. *F. prionodes*, Mont., a meipso in Peruvia ad fl. *Huallaga*, ripas lectus, calyptram longe conicam basi integram vel hic illic fissam habet, foliis autem papillosis serrulatis immarginatis a nostro longius distat.

This is the moss mentioned in my memoir on the Musci and Hepaticæ of the Pyrenees under *Fissidens incurvus*, in these terms :—" Along with the usual state of the species at Gélos grows a delicate form which I am undecided whether or not to regard as a distinct species. It has the calyptra conico-subulate, *quite entire*, *barely sheathing the operculum*. The antheridia are enclosed in a bud springing from the base of the stem, precisely as in *F. taxifolius*. I have not seen one terminating a branch, as in *F. incurvus*."

Renewed examination has convinced me that it is perfectly distinct from every other European *Fissidens*, and more nearly related to several minute exotic species, among which the three above compared with it perhaps stand nearest, either in habit or character ; but among the twenty-four species of *Fissidens* gathered by myself in the Andes and the forests of the Amazon are several others, only to be distinguished from it by careful comparison.

Other Pyrenean *Fissidentes* worthy of notice are the following :—

" FISSIDENS BRYOIDES, var. RIVULARIS, Spruce, Musc. Pyren.

exsicc. no. 318 (a. 1847), foliis 12–20-jugis, elongatis, *limbo valde incrassato circumductis*, capsula plerumque horizontali. Hab. Bagnères-de-Bigorre in lapidibus rivuli supra fontem *La fontaine ferrugineuse* dictum. An species propria? (*F. Pyrenaicus*, Mst.)" This very distinct species has been taken up by Schimper in his 2nd edition as new, under the name "*F. rivularis*, Schimp."; but, whichever name be adopted, both names are mine, and not Schimper's.

"FISSIDENS FONTANUS, Schimp.; Spruce, Musci Pyren., no. 316. Hab. ad saxa emersa rivuli *Adour de Lesponne*."

Syn. *F. incurvus β fontanus*, Bryol. Eur., fasc. 17 (a. 1843), pro parte. *F. crassipes*, Wils., var. *rufipes*, Sch., Syn. ed. 2.=*F. Mildeanus*, Schimp., in Rab. Bryoth. Eur. Cum descriptione Synopseos accurate convenit quoad caulem elatum valde ramosum, folia lurido-viridia toto ambitu crasse flavido-limbata; differt solum pedicello pallido vix rufescente et capsula pallida tenera. Lamina dorsalis folii basin attingens et in caule breviter decurrens.

My Pyrenean specimens were named by Schimper himself; but when he afterwards published the moss as a species, distinct from *F. incurvus*, it was under Wilson's MSS. name *F. crassipes*: although the name "*fontanus*" can claim priority of publication. Such high authorities as C. Müller and Lindberg consider *F. crassipes* at most a subspecies of *F. incurvus*, Schwgr. As regards *F. fontanus* (or *Mildeanus*), I would suggest a suspension of judgment until the inflorescence can be accurately revised, for it seems to me dioicous, as I can find no male flowers whatever on my specimens.

I add a few remarks on the *Fissidentes* growing in this neighbourhood (Castle-Howard) as represented in my herbarium, gathered in 1839–49.

FISSIDENS PUSILLUS, Wils.! This is perhaps our commonest species, growing on sandstone in the Park Quarry (now a rocky, wooded dell), and in many similar sites where the same rock is found; also on arenaceo-calcareous rock in Mowthorpe Dale, &c. My specimens agree perfectly with typical ones from Wilson, but differ so much from Schimper's description (Synopsis, ed. 2, p. 113), especially in the inflorescence, that I copy here my notes on them for comparison.

Heteroicus (dioicus—raro autoicus), simplex vel ipsa basi ramosus. Folia pallida 3- (rarissime 4–5-) juga, superiora lineari-ensiformia, apice lanceolato acuminato integerrimo vel repandulo; limbo perangusto cum costa in folii apice desinente vel subbreviore ad auriculam paulo latiore; lamina dorsali basi valde angustata cum folio vix contermina. Capsula brevi-cylindrica vel ovali-cylindrica, erecta vel inclinata, tenera, sicca sub ore valde coarctata. Operculum e basi conica in rostellum subobliquum acuminatum subobtusum abiens. Peristomium infra capsulæ orificium ortum; dentes ad $\frac{3}{4}$ fissi, crura subulato-filiformia exasperata. Plantæ ♂ humillimæ, simplices vel bi-trifidæ, quoque ramo apice florifero; bracteæ apice lamina brevi auctæ. Rarissime oritur ramulus ♂ e caulis fertilis ipsa basi. Hab. Castle-Howard woods, frequent

(R. S.). Hill Cliff Dingle and Winwick Stone Quarry, near Warrington (Wilson!) Begins to fruit in July, is in best state in September and October, and by November most of the lids have fallen; but in sites where there is perennial shade, and a slight but unfailing supply of moisture, it may be found in good state almost all through the year.

Var. MADIDUS, *Spruce*. Folia viridia 5-juga, longiora et angustiora. Operculum rostratum capsulam interdum æquans. Flores persæpe autoici, masculi in ramo basali, caule fertili vix breviore, terminales, bracteis foliis subconformibus nisi pro auriculæ laminis rotundioribus. Adveniunt etiam plantæ mere masculæ, rarius tamen quam in præcedente. Hab. On dripping stones near the Obelisk bridge, Castle-Howard Park.

Schimper's description of *F. pusillus* seems founded mainly on specimens gathered on railway-banks near Pontefract, "pulcherrime et copiose," by Dr. J. B. Wood. The inflorescence is thus described:—"*Flores bisexuales*, vel *masculi monophylli hypogyni* vel plantulam propriam minimam e radice enatam formantes." (Syn. Musc. Eur., *l. c.*) On none of my specimens of *F. pusillus*, whether gathered by myself, or by Wilson or others, can I find any bisexual flowers, or any hypogynous antheridia. I have no doubt Dr. Wood could clear up the uncertainty that hangs about this moss, and I hope he may see fit to do so, and to tell us whether we have under the name "*Fissidens pusillus*" one or more species.

Fissidens bryoides, Hedw., fruits from October to January; in the latter month the capsules are mostly over-ripe. It is fond of shady banks, in rich or sandy soil, and rarely spreads to stones.

F. incurvus, Schwgr., fruits in early spring, and is easily recognised by its pale syphon-like capsule, almost a reduced copy of that of *Hypnum serpens*, although proportionately shorter. It is much less common here than around York.

F. viridulus, Wils., Bryol. Brit. (*typus*, anne Swartzii?), fruits in winter and early spring; I have found it in good state up to the end of April. This has a much stouter pedicel than the preceding, and a dark-coloured capsule, either erect or inclined, but rarely at all cernuous. Male flowers terminal, either on a distinct plant or on a long branch from the base of the fertile stem.

F. crassipes, Wils., grows on stones in shady rivulets, such as Crambeck, and fruits in September and October.

F. exilis, Hedw. (= *F. Bloxami*, Wils., in Eng. Bot.), fruits in February and March. Easily recognised by its denticulate leaves, quite destitute of pellucid or thickened border. Kirkham Hill, on lias clay, by the roadside near the foot of the hill, and in a ravine below Duffit's farmhouse.

Of *F. taxifolius* and *adiantoides* there is little to remark, except that both are common, but the latter rarely fertile. A tall *Fissidens* grows in dense tufts among grass under bushes of *Rosa spinosissima* on a dryish hillside near Coneysthorpe. The plants are all purely female, with axillary flowers (sterile), and the foliage is exactly that of *F. adiantoides*.

(To be continued.)

ENUMERATIO ACANTHACEARUM HERBARII WELWITSCHIANI ANGOLENSIS.

Auctore S. Le M. Moore.

(Concluded from p. 342.)

Dicliptera, *Juss.*

D. verticillaris, Juss.

Hab. Sparsim ad latera rupestria flum. Baro pr. Boca do Rio distr. Mossamedes, ad Quibôlo, et in maxime umbrosis humidis prope Sange, Bango, Camilongo &c. distr. Golungo Alto. (Nos. 5116, 5133, 4999.)

D. Welwitschii (sp. nov.)—Ramis crassiusculis sexangularibus pubescentibus, foliis sparsis membranaceis breviter petiolatis (superioribus vix sessilibus) cordato-ovatis breviter acuminatis pilis albidis abbreviatis utrinque obtectis, cymis densifloris sessilibus vel pedunculatis, involucri bracteis bracteolisque pro genere magnis firmis lanceolatis vel lineari-lanceolatis acuminatis apice parum induratis piloso-pubescentibus, calycis lobis linearibus acuminatis pubescentibus hyalinis, corollæ pubescentis tubo tenui labio postico ovato emarginato antico oblongo 3-fido lobo mediano quam laterales paullo majore, filamentis obscurissime pilosulis antherarum loculis superpositis, disco conspicuo sinuato-dentato, stylo apice subæqualiter 2-dentato, capsula ———.

Hab. In sylvis prope Ivantala distr. Huilla. (No. 5015.)

Foliorum lamina vix ad 5·0 cm. long. et 3·5 cm. lat.; petiolus nostro in specimine ad 0·6 cm. longitudine, pubescens. Bracteæ fere subæquales ad 1·8 cm. long., inferne ad marginem hyalinæ; bracteolæ quam bractea major paullo breviores quam minor paullo longiores vel eam æquantes. Calycis laciniæ vix 1·0 cm. long. Corolla 2·0 cm. long., violacea, tubus ejus inferne glaber.

Ex affinitate *D. Roxburghianæ*, Nees, et fortasse *D. heterostegiæ*, Nees, speciei revera a me non visæ et descriptione Neesiana nimis brevi tantum notæ; ab iis equidem eximie differt foliis cordato-ovatis, bracteis magnis piloso-pubescentibus aliisque punctis.

D. angolensis (sp. nov.)—Caule sexangulari glabrato sat tenui, foliis sparsis ovato-lanceolatis petiolis brevibus hispidulis fultis supra læte viridibus fere glabris subtus pallidioribus pubescentibus deinde glabris ?, cymis pauci- vel subdensifloris breviter pedunculatis, involucri bracteis bracteolisque modicis coriaceis deinde papyraceis reticulato-nervosis obscure puberulis margine debiliter ciliatis nitidis bracteis inæqualibus obovato-oblanceolatis mucronulatis bracteolis lanceolatis spinose-acuminatis parum decoloribus, calycis lobis erectis linearibus longe acuminatis hyalinis minute pubescentibus, corollæ tubo haud ampliato glabro labio postico ovato antico oblongo brevissime 3-fido, filamentis microscopice pilosulis antherarum loculis superpositis, disco quam maxime conspicuo sinuato-dentato, stylo apice 2-dentato, capsula ———.

Hab. In distrr. Golungo Alto et Bumba sine locorum indicatione. (Nos. 5132, 5166, 5168.)

Caulis 0·3 cm., crassus, ad nodos tumidus. Folia fere ad 4·0 cm. plerumque vero 2·0 cm. long., petioli 0·2–0·7 cm. Bractea major 1·1 cm. long., bractea minor bracteolæque eâ paullo breviore. Corolla circiter 1·8 cm. long., superne puberula.

Mihi videtur ad *D. Roxburghianam*, Nees, proxime accedere, cujus certe non est varietas ob bracteas coriaceas eximie reticulato-nervosas, calycis lacinias erectas multo majores, &c.

HYPOËSTES.

H. mollis, T. And.

Hab. In sylvestribus siccioribus ad Cabango Cacalungo distr. Golungo Alto. (Nos. 5118, 5142, 5144.)

H. verticillaris, R. Br., var. *glabra*.

Hab. In rupestribus dumetosis inter Lag. de Ivantala et Quilongues juxta rip. flum. Caculuvar ast sparsim. (No. 5059.)

Specimina quoad genus dubia.

No. 5083. *Calophanes? ?* sp. Fragmentum.
No. 5166. *C. ?* sp. Exemplarium maxime imperfectum.
Nos. 5121, 5127, 5139, 5186. *An Ruellia?* Flores non vidimus.
No. 6752. Ex icone et fragmento minimo notum. Si *Acanthacea* fortasse genus novum constituat.
No. 5077. Videtur *Justiciæ* sp. sed valde incerta.
No. 5049. *Justiciæ* sp.? Flores non exstant.
No. 5201. *Justiciæ* sp.? quam maxime dubia.
No. 5060. An *Hypoëstes* sp.? cfr. *H. callicomam*, nob.
No. 1228. Exemplarium efloriferum omnino incertum.
No. 5072. Ramulus foliigerus ut videtur *Acanthacea* cujusdam.
No. 5069. Omnino dubia.

In order to exhibit the geographical relations of the Acanthaceous flora of Angola as investigated by Dr. Welwitsch, I have framed the following table. In the third, fourth, fifth, and sixth column, the affinities of the several species are set down. The explanation of the figures is simple enough. Thus, to commence with *Thunbergia*:— Of the seven species found by Dr. Welwitsch (five of them new ones) two have been already found in Eastern Tropical Africa, and four are compared with species from that region; while the seventh (*T. Cycnium*) is a peculiar endemic type for which no comparison was sought. Then *Elytraria* (*crenata*) and *Nelsonia* (*tomentosa*) are seen to be common to all the localities, and so on. Where two or more comparisons are made, and with species from different regions, each of such regions is counted as affording an affinity. I do not say that this system is not open to objection, especially as opinions as to specific affinity and delimitation are very liable to clash one with the other; but I believe that it will express with sufficient clearness the relationship of the flora as a whole to that of neighbouring regions.

I use the terms East and West Tropical Africa only in a proximate sense. In the East, with the exception of Abyssinia and Nile-land, it is chiefly the coast flora which is known, and very little indeed is known of the inland flora of Western Africa. In

East Tropical Africa, then, I include Abyssinia and Schweinfurth's, Speke and Grant's, Kirk's, Hildebrandt's and Peters' areas of research. South Africa includes the whole region south of the tropic of Capricorn.

Genus.	No. of species obtained.	New species.	Affinity.			
			S. Africa.	E. Trop. Africa.	W. Trop. Africa.	India, including Belochistan.
Thunbergia . . .	7	5	0	6	0	0
Elytraria	1	0	1	1	1	1
Nelsonia	1	0	1	1	1	1
Hiernia	1	1	0	0	0	1
Hygrophila . . .	1	1	0	0	0	1
Brillantaisia . . .	1	0	0	1	1	0
Calophanes . . .	1	0	0	1	0	0
Ruellia	2	2	0	2	1	0
Petalidium	7	7	7	0	0	0
Phaylopsis	2	1	0	0	2	0
Whitfieldia	1	0	0	0	1	0
Blepharis	7	4	3	5	1	3
Acanthus	2	1	0	1	1	0
Barleria	12	9	7	5	2	2
Neuracanthus . . .	2	2	0	0	0	1
Asystasia	2	1	1	2	1	1
Eranthemum . . .	1	0	0	0	1	0
Isochoriste	1	1	0	0	0	1
Monothecium . . .	1	0	0	0	0	1
Justicia	14	10	5	3	6	2
Rhinacanthus . . .	1	0	1	1	1	1
Dicliptera	3	2	1	0	1	2
Hypoëstes	2	0	1	1	1	0
Total . . .	73	47	28	30	22	18

From this we gather that the relationship with
East Tropical Africa is rather more than 41 per cent.
South Africa . . . . . 38 ,,
West Tropical Africa . . . . 30 ,,
India (including Beloochistan) . $24\frac{1}{2}$,,

The point most worthy of notice here is the higher figure reached by South Africa: a moment's reflection will, however, lead us to the suspicion that this may be owing to the little-known nature of the Western Flora as compared with the carefully explored Cape and Natal region. The considerable Indian element is also to be remarked; but the connection between India and Angola is a well-known puzzle in the geographical distribution of vegetables, a puzzle which, as in the last case, will in all probability be more or less unriddled when the intervening part of Africa has been more fully opened up.

Undoubtedly the most remarkable plant in the collection is

Hiernia angolensis, not only geographically from its affinity with *Ophiorrhiziphyllon*, but also morphologically from its porous anthers, an arrangement possessed by only one other member of the order. Its habit is very curious for the order, rendering it far more like a Scrophulariad than an Acanthad; but the retinacula to the seeds, though they do not become indurated, plainly pronounce it to belong to *Acanthaceæ*.

Petalidium.—This genus was formerly supposed to be entirely Indian. A few years ago, however, the late Dr. Harvey figured and described in his 'Thesaurus Capensis' the first African species. In Dr. Anderson's enumeration he founded a genus *Pseudobarleria*, to embrace a plant gathered by Curror on the western coast of South Africa; this genus has, however, been merged by Mr. Bentham with *Petalidium*, doubtless with propriety. A third South-African species, which I was fortunate enough to unearth at Kew, was originally described by Nees in DeCandolle's 'Prodromus' as *Barleria halimoides*. Whether Nees had a flower for description I know not; but the specimen at present is in a flowerless condition, and this it is which has caused its position to have been hitherto mistaken. Though I have seen no flower, the curious habit of the dimorphic branches—a dimorphism which I have never seen so well developed as in *Petalidium*—and its strong likeness to *P. loranthifolium*, render its genuine place certain. Even were certainty required, however, I have seen in the British Museum a *Petalidium* in flower which I cannot but think is *P. halimoides*. There being now ten species of this genus known from Africa, its head-quarters must be shifted from the Indian peninsula, where it is not likely that many forms remain undiscovered.

Neuracanthus is a genus which until recently was considered to be Indian alone. One result of Dr. Kirk's valuable labours was to enlarge its area so as to include Africa, though, owing to Dr. Anderson's untimely death, the plant remained for years undescribed. In addition to the two found by Dr. Welwitsch, a fourth has been sent home by Dr. Schweinfurth; so that there are good grounds for suspecting that, as with *Petalidium*, the head-quarters of the genus may have to be transferred to Africa.

Isochoriste africana probably ought, as Acanthaceous genera stand, to be the type of a new genus. The original *Isochoriste* is an Indian Archipelago plant, but there is in the Kew herbarium an incomplete specimen from South Africa which is perhaps to be referred here; so that the geographical improbability is not so great as might otherwise be thought.

Monothecium aristatum is a common Indian plant in herbaria. The Angolan specimens differ in no way from the Indian. The species has not previously been recorded from Africa.

I cannot conclude this notice without adding my testimony to the enlightened conception of the duties of collecting possessed by Dr. Welwitsch, and to the way in which the conception was put into practice. It is owing to this that I have been enabled to give many more details concerning the various species than is the case with other collections; indeed I am not sure that it would not have

been better had I made more use of the copious notes with which the Herbarium is provided, full copies of which are fortunately readily available for reference in the British Museum set of his plants. That Dr. Welwitsch, after having endured such privations as he did, should not have lived to himself make them effectual is a matter for lasting regret; it is a satisfaction, however, to know that his collections are being worked up by Mr. Hiern, to whom the task is most appropriately entrusted.

ON SOME ISLE OF WIGHT PLANTS.

By the Rev. W. Moyle Rogers.

I spent a month of last spring—from May 13th to June 12th—in the Isle of Wight; one fortnight at Sandown, and the other at Niton, a parish which includes a large portion of the Undercliff between Ventnor and Black Gang Chine. I thus saw a good deal of the later spring flowers of the eastern and south-eastern parts of the island; and Mr. Frederic Stratton having most kindly lent me his copies of 'Flora Vectensis' and the 'Supplement to Flora Vectensis' (A. G. More), enriched with his own MS. notes, I was the better able to judge of the comparative rarity of the plants I met with. Hence the following brief notes will be found supplemental to what is contained in those works; all the records being of plants seen by me this year (except in the few cases where an earlier date will be given) in the stations named.

Papaver dubium, Linn., a. *Lamottei*, Bor. Along the railroad east of Brading Station, in considerable quantity. Niton: in a cornfield west of "Pan Lane," abundant; and in the Undercliff, on some recently slipped land east of the "Cripple Path," several plants.—b. *Lecoqii*, Lam. In a turnip-field near Black Gang, a few plants.

Raphanus maritimus, Sm. Between Sandown and Shanklin in two places (one plant in one, and two in the other) at the base of the sea-cliff. Not before reported from any station east of Ventnor.

Matthiola incana, Br. Down the face of the sea-cliff by St. Catherine's Lighthouse; several plants, one being in flower. Looks quite established on the rocks, though probably a recent "garden escape."

Alyssum maritimum, Lam. Sandown Bay, about quarter of a mile west of the pier and a third of the way up the face of the cliff; several plants, no doubt thrown out of a garden, but thriving and likely to spread.

Thlaspi arvense, L. St. Helen's, in considerable quantity in some rough broken ground a little to the west of the new embankment which crosses to Bembridge.

Lepidium Draba, L. St. Helen's, all round the mill in great quantity, and spreading a little along the shore. An alien, of course.

Polygala oxyptera, Reich. St. Helen's, in grass near the *Thlaspi arvense* station, in great quantity. On St. Catharine's Hill, in the short close turf.

Silene inflata, Sm., b. *puberula*. Niton, near the village and in the Undercliff. Whitwell.

S. maritima, With. Niton, by the "Cripple Path," as well as on the shore in the Undercliff.

Cerastium semidecandrum, L. Seen only at the "Red Cliff," in Sandown Bay.

Stellaria aquatica, Scop. "The Wilderness," at Rookley, June, 1875.

Sagina ciliata, Fries. Near "Rocken End," in the short turf. Not observed elsewhere.

Hypericum montanum, L. "The Landslip," among the rocky thickets. I only saw a few plants, and those of course not yet in flower.

Geranium pusillum, L. The "Red Cliff." Banks between Pelham Wood and the road, in some abundance. I failed to find a single plant of *G. columbinum*, L. It must be remarkably local.

Mendicago denticulata, Willd. Keeth Bay, in great quantity for twenty or thirty yards near the site of the former "Victoria Baths." Perhaps only a "colonist" in this station.

Trifolium subterraneum, L. Near "Rocken End." Chale Common. Abundant in both places.

T. medium, L. Undercliff, between "Cripple Path" and Mirables. Only seen in one spot.

T. incarnatum, L. "Red Cliff," spreading along the cliffs from the adjacent field.

T. arvense, L. "Red Cliff."

T. striatum, L. "Red Cliff." Niton Undercliff.

T. scabrum, L. Niton Undercliff and near St. Catherine's Point.

T. glomeratum, L. Niton Undercliff, bank near the road between "Cripple Path" and Mirables, June, 1875. The only Isle of Wight station where I have seen it. I looked in vain for this species and for *T. suffocatum* about the St. Catherine's Lighthouse and at "Redcliff."

T. filiforme, L. Common about Sandown and at "Rocken End." Niton. St. Lawrence.

Astragalus glycyphyllus, L. Niton: in one place close under the main cliff between "Cripple Path" and Mirables; as well as in the previously recorded station near the shore further west, between Puckaster Cove and St. Catherine's Point.

Vicia lathyroides, L. In fairly good quantity (with *Silene nutans* near it in plenty, but mostly out of reach) at the "Red Cliff" station; but already out of flower and rapidly disappearing before the end of May.

V. gracilis, Lois. Near Gurnard, in long grass among rocks close to the sea, abundant, 1865.

Lathyrus sylvestris, L. In one place among bushes at the base of the cliff between Sandown and Shanklin; becoming rather frequent in the broken ground between Shanklin and Ventnor.

Rosa tomentosa, Sm. Chale Common, several bushes. Niton, roadside towards Godshill, a bush or two at intervals. The type, or near it.

R. micrantha, Sm. Very frequent on the Landslip, and on the very similar rocky bushy ground between Pelham Woods and the Ventnor Road. Near Rocken End, and elsewhere in the Niton Undercliff.

R. canina, L.:—*R. lutetiana*, Leman. Brading, Luccombe, Landslip, Pelham Woods, and Niton; but really abundant only on the Landslip, where its great frequency is remarkable.—*R. dumalis*, Bechst. Apparently far the commonest rose (in the east and south-east).—*R. biserrata*, Mérat. Luccombe, in the bushy ground towards the Landslip, several bushes, very characteristic.—*R. urbica*, Leman, seen only at Niton. I was surprised at the seeming scarceness of this usually very common rose.—*R. arvatica*, Baker. Near Luccombe Chine. Niton, quite frequent in several parts of the parish, especially towards Whitwell.—*R. obtusifolia*, Desv. Near Luccombe Chine and on the Landslip.—*R. latebrosa*, Déségl. Niton, near Westcliff.

R. systyla, Bast. Brading, near the railway station, Niton, Newport Road, occasional. Pelham Woods. Near Luccombe Chine. The ordinary form everywhere.

R. arvensis, Huds. Between Shanklin and Ventnor. Niton. Chale. Abundant where it occurs, but not so generally distributed as is usual in the south of England.

Œnothera odorata, Jacq. Sandown Bay, about quarter of a mile west of the pier: a plant or two near the *Alyssum maritimum* station, and another some little way further west; from a garden originally, no doubt. Abundant (where planted) on the sandhills at St. Helen's Spit.

Carduus pratensis, Huds. The "Wilderness" at Rookley, June, 1875.

Erigeron acris, L. West Cowes, in Mr. Ward's grounds, in 1865.

Picris hieracioides, L. Near Black Gang.

Tragopogon porrifolius, L. Still abundant in the old station by the railroad for a considerable distance near Brading.

Crepis taraxacifolia, Thuil. Border of a field east of Shanklin, in some quantity, and extending a little along the adjacent cliffs. Niton, among sown grass, in several fields.

C. nicæensis, Balb. With *C. taraxacifolia* at both Shanklin and Niton; but only among sown grass.

Menyanthes trifoliata, L. In the "Wilderness" at Rookley, June, 1875.

Lithospermum officinale, L. Near Brading. The Landslip. Bushy ground bętween Pelham Woods and the Ventnor Road.

Myosotis cæspitosa, Schultz. The prevailing species in the Sandown and Newchurch Marshes.

M. palustris, With. By the East Yar (only on its actual banks) near Sandown, and at Newchurch. Not yet in flower at the end of May, when the preceding and following species were fruiting freely.

M. repens, Don. Newchurch Marsh, only a few plants.

Samolus Valerandi, L. Marshy ground near "Rocken End," in some quantity; and again in the Undercliff nearer the village of Niton.

Arum italicum, Mill. Rocky ground between Pelham Woods and the Ventnor road. Several plants just flowering on June 5th. Leaves all dead or dying. Plainly distinct from *A. maculatum*, and yet looking strangely unlike *A. italicum* as I remember to have seen it in the Riviera, with its singularly-veined leaves and immense widely ventricose spathes; the leaves in all these Isle of Wight specimens being simply green, and the spathes both shorter and narrower than in *A. maculatum* (as it grows in Devon), though decidedly less constricted in the middle. All the plants had yellow spadices and leaves as broad as long, with widely divaricate lobes.

Elodea canadensis, Mich. In the East Yar, near Brading.

Gymnadenia conopsea, Brown. In the Undercliff, in the neighbourhood of "Rocken End," June, 1875.

Allium vineale, L. The "Red Cliff" in Sandown Bay.

Carex muricata, L. Near Sandown and in Niton Undercliff; but apparently far less common than *C. divulsa*.

C. Boenninghauseniana, Weihe. After a long search in the Newchurch (Parsonage Lynch) station I came upon two weak plants of this singular *Carex*. The species prevailing around were *lævigata*, *remota* (a very slender form), and *paniculata*; the last being far the most abundant and very variable, supplying quite a series of forms, from the nearly simple spiked with rather distant spikelets, to the very compound panicled with long, crowded, drooping panicles of spikelets.

C. pilulifera, L. Down above Whitwell to the south; the only station where I saw it.

C. riparia, Curtis. By the East Yar, not far from its source, between Niton and Whitwell; very fine and in great quantity.

Triodia decumbens, Beauv. St. Catherine's Point and neighbourhood, frequent.

Kæleria cristata, Pers. Frequent along the whole coast from "Red Cliff" to "Rocken End."

Sclerochloa procumbens, Beauv. St. Helen's Spit. One large plant was all that I observed.

Asplenium marinum, L. South coast. One plant (and I fear only one) still left, and putting forth fresh fronds on 9th June.

ON A COLLECTION OF FERNS MADE BY LANGLEY KITCHING, ESQ., IN MADAGASCAR.

By J. G. Baker, F.R.S.

(Concluded from p. 330.)

53*. Polypodium (Phegopteris) Sharpianum, *Baker*, n. sp. Frond ample, 3–4-pinnatifid, moderately firm in texture, green on both surfaces, densely pubescent beneath; rachises bright pale

brown, densely pubescent. Lower pinnæ oblong-lanceolate, 1–1½ ft. long, about ½ ft. broad; pinnules lanceolate, sessile, ¾–1 in. broad, cut down to a narrow distinct wing into oblong obtuse tertiary segments with round lobes reaching about half-way down. Veins copiously pinnate in the tertiary segments, with forked lower veinlets. Sori large, globose, superficial, generally placed one at the base of each 4-nary lobe, 10–12 to each tertiary segment. Between Tamatave and Antananarivo. Named after my relative, Mr. I. Sharp, whom Mr. Kitching accompanied on a missionary visit to Madagascar. General habit and cutting of *Nephrodium Boryanum*, and a near ally of the Himalayan *Polypodium subtripinnatum*, C. B. Clarke in Trans. Linn. Soc. Bot., 2nd ser., vol. i., p. 545, plate 80, fig. 1.

96*. Polypodium (Eupolypodium) holophlebium, *Baker*, n. sp. Rhizome slender, short-creeping; paleæ minute, lanceolate, dull brown. Stipe under an inch long, dull brown, finely pilose. Lamina entire, linear, moderately firm in texture, green on both sides, obscurely pilose, principally on the edge and midrib beneath, 3–4 in. long. ⅙–¼ in. broad, obtuse, narrowed gradually at the base. Veins close, regular, simple, distinct, erecto-patent, ending in a dot a short distance from the margin. Sori round or round-oblong, superficial, forming a couple of long rows close to the midrib, dorsal as regards the veins. Tanala. General habit, texture, and veining very like those of *P. marginellum*.

106*. Polypodium (Eupolypodium) crytophlebium, *Baker*, n. sp. Rhizome slender, short-creeping; paleæ minute, brown, adpressed, lanceolate. Stipe scarcely any. Lamina entire, linear, very rigid and coriaceous in texture, minutely pilose, obtuse, narrowed very gradually to the base, 1½–2 in. long, ⅙–¼ in. broad. Veins quite hidden, arcuate-ascending, forked. Sori oblong, superficial, filling up the whole space between the midrib and margin of the frond except in the narrowed basal portion, the oblong oblique receptacles nearer the midrib than the edge. Between Tamatave and Antananarivo.

P. Gilpinæ, Baker.

P. serrulatum, Mett.

P. subpinnatum, Baker. Tanala.

145*. Polypodium (Eupolypodium) macrorhynchum, *Baker*, n. sp. Rhizome slender, wide-creeping; paleæ small, brown, lanceolate, adpressed. Stipe wiry, naked, erect, under an inch long. Lamina lanceolate, subcoriaceous, green and glabrous on both sides, 2–3 in. long, ¼–⅓ in. broad, with a long simple linear tip, cut down to the rachis in the central portion into erecto-patent obtuse entire oblong or oblong-deltoid pinnæ, the largest about ¼ in. long, narrowed cuneately at the base into a very narrow decurrent wing to the stipe. Veins hidden. Sori superficial, round or oblong, confined to the small upper pinnæ and the entire beak-like tip of the frond, which is about an inch long. Tanala. Allied to the Australian and New Zealand *P. grammitidis*, R. Br., from which it is marked by its caudate fronds and fewer shorter pinnæ.

P. devolutum, Baker. Tanala.

P. fissum, Baker.
P. lanceolatum, L. Tanala.
P. lineare, Thunb. Tanala.
P. bullatum, Baker. Tanala.
P. Phymatodes, L.
P. irioides, Lam. Tanala, and between Tamatave and Antananarivo.

Gymnogramme javanica, Blume. Tanala, and between Tamatave and Antananarivo.
G. argentea, Mett. Tanala, and the hill at Ambotriganahary.
G. argentea, var. *aurea*. Tanala, and between Tamatave and Antananarivo.
G. lanceolata, Hook. Between Tamatave and Antananarivo.
Vittaria lineata, Sw.
V. elongata, Sw. Between Tamatave and Antananarivo.
Antrophyum Boryanum, Kaulf. Forest of Andrangaloaka.
A. coriaceum, Wall. Tanala. This has not been found out of Tropical Asia.
Acrostichum hybridum, Bory. Tanala.
A. conforme, Sw. Between Tamatave and Antananarivo.
A. latifolium, Sw. Forest of Andrangaloaka.
A. lineare, Fée. Tanala.

36*. Acrostichum (Elaphoglossum) achroalepis, *Baker*, n. sp. Rhizome slender, woody, short-creeping; paleæ small, white, membranous, lanceolate acuminate. Stipe of the barren frond 3–4 in. long, coated throughout with adpressed white paleæ like those of the rhizome. Barren frond lanceolate, entire, acute, about a foot long, under an inch broad, moderately firm in texture, green on both surfaces, cuneate at the base, narrowed gradually from the middle to the apex, thinly scattered over on both sides with small white or pale brown deeply stellately laciniated paleæ. Veins erecto-patent, moderately distinct, $\frac{1}{2}$–$\frac{3}{4}$ in. apart, forked at the base and sometimes again above it. Fertile frond smaller, on a longer stipe. Between Tamatave and Antananarivo. Stature and veining of *A. Aubertii*, but paleæ quite different.

38*. Acrostichum (Elaphoglossum) aspidiolepis, *Baker*, n. sp. Rhizome short-creeping; paleæ small, suborbicular, pale brown, membranous. Stipes of the barren frond contiguous, 4–5 in. long, coated throughout with minute pale brown linear membranous entire rather crisped scales. Barren frond linear, light green, firm in texture, 8–10 in. long, about half an inch broad at the middle, narrowed very gradually to the base and an obtuse point, coated on both sides, especially beneath, with numerous minute peltate dark brown scales, generally with a pale membranous tip or margin. Veins close, indistinct, erecto-patent, simple or forked. Fertile frond not seen. Ankaratra mountains. Allied to the Indian *A. stigmatolepis* and *A. viscosum*.

38*. Acrostichum (Elaphoglossum) asterolepis, *Baker*, n. sp. Rhizome short, woody, hardly at all creeping, its paleæ small, densely tufted, dark brown, lanceolate, ciliated. Stipe of the barren frond 2–4 in. long, densely clothed with spreading or

squarrose lanceolate pale brown paleæ with a conspicuously ciliated dark brown margin. Barren frond linear, entire, firm in texture, bright green on both sides, about half a foot long, $\frac{1}{2}$–$\frac{5}{8}$ in. broad, cuneate at the base, narrowed gradually from the middle to the tip, slighly scaly when young, naked when mature on the upper surface, scattered all over beneath with minute stellate-laciniate brown paleæ, the edge fringed with a dense border of minute lanceolate ciliated paleæ, like those of the stipe. Veins close, obscure, erecto-patent, simple or forked. Fertile frond not seen. Tanala. This comes nearest to the Angolan *A. Welwitschii*, Baker, but may be readily distinguished from all its neighbours by the beautiful ciliated squarrose scales of the stipes.

A. squamosum, Sw. Ankaratra mountains.

A. sorbifolium, L. Forest of Andrangaloaka.

Osmunda regalis, L. Tanala, and between Tamatave and Antananarivo.

Mohria caffrorum, Desv. Tanala.

Lygodium lanceolatum, Desv. Tanala.

Schizæa dichotoma, Sw. Forest of Andrangaloaka.

Marattia fraxinea, Smith. Tanala, and between Tamatave and Antananarivo.

Ophioglossum vulgatum, L. Tanala.

Lycopodium clavatum, L. Forest of Andrangaloaka, and between Tamatave and Antananarivo.

L. cernuum, L. Between Tamatave and Antananarivo.

L. complanatum, L. Forest of Andrangaloaka. A variety approaching the Indian *L. Wightianum*, Spring.

L. carolinianum, L. Betsileo country.

Selaginella lævigata, Baker. Between Tamatave and Antananarivo.

S. fissidentoides, Spring. Tanala.

S. MADAGASCARIENSIS, *Baker*, n. sp. Stems erect, pale straw-coloured, $\frac{1}{2}$–1 ft. long, copiously pinnate, the lower branches with numerous compound branchlets. Leaves of the lower plane spaced even on the branchlets, erecto-patent, those of the main stem spreading, oblong-lanceolate, acute, pale green, membranous, very unequal-sided, a line long, broadly rounded, serrulate and slightly imbricated over the stem on the upper side at the base; leaves of the upper plane $\frac{1}{2}$–$\frac{1}{3}$ as long, ovate-lanceolate, cuspidate. Spikes short, copious, resupinate, 1 lin. diam.; bracts of the upper plane ovate-lanceolate, erecto-patent; of the lower plane pale, ovate-lanceolate, more ascending. Between Tamatave and Antananarivo, gathered previously by Mr. Pool and Miss Gilpin. A near ally of *S. molliceps*, Spring.

S. MELLERI, *Baker*, n. sp. Stems $\frac{1}{2}$–1 ft. long, erect, copiously pinnate, the erecto-patent branches copiously compound. Leaves of the lower plane contiguous and erecto-patent on the branchlets, much spaced and spreading on the main stem, oblique oblong, acute, pale green, membranous, $\frac{1}{2}$–$\frac{3}{4}$ lin. long, more rigid in texture than in *S. madagascariensis*, not so unequal-sided, serrulate all down the upper edge, broadly rounded and imbricated over the stem on

the upper side at the base; leaves of the upper plane small, ovate cuspidate. Spikes short, resupinate, 1 lin. diam.; bracts of the upper plane oblong-rhomboid, obtuse, erecto-patent; of the lower plane ovate cuspidate, more ascending. Tanala. Gathered previously by Dr. Meller by mountain paths at Ambatomanga.

Azolla pinnata, R. Br.—Ankaratra mountains, and Betsileo land.

Marsilea diffusa, Lepr. ? Betsileo land.

SHORT NOTES.

Tolypella glomerata, *Leonh.*, in Yorkshire.—In September of the present year I observed this species growing luxuriantly and in some quantity in a small lake on the estate of Earl Cathcart, near Thirsk, N.E. Yorkshire. This seems quite a new record both for locality and county, and is interesting as extending very materially the geographical distribution of the species in Britain. In the 'Review of the British Characeæ,' which has lately appeared in the 'Journal of Botany,' Messrs. H. and J. Groves state that "in Britain it is rare and apparently almost confined to the south-east of England." I may add that a specimen was submitted to the Messrs. Groves. In the same lake *Chara polyacantha*, A. Braun, grew in abundance, as well as *C. vulgaris*, Linn., *C. fragilis*, Desv., and *C. hispida*, Linn. I could find no Nitellas at all, although *N. opaca*, Agardh, was plentiful in a small pond not far off. Some distance away, but on the same estate, I came across a new locality for *Chara polyacantha*—the small lake above-mentioned being the spot where it was discovered some years ago by the Rev. F. Addison.—George Nicholson.

Euphorbia Juice and its uses (see p. 318).—In connection with the subject of the use of the juice of Euphorbias in the preparation of a marine paint, a letter was read at a recent meeting of the Agricultural and Horticultural Society of India from Mr. M'Gibbon, superintendent of the Cape Town Botanic Garden, in which he says "Euphorbia sap is not used in any form at the Cape, nor is it an article of export. I have consulted the Customs Returns to that effect. In the neighbouring colony of Natal a patent was taken out some years ago for the use of Euphorbia sap into a form of paint for use on ships' bottoms, iron and wood, and marine structures generally. I have not learned that it is used in Natal for those purposes, nor do I find any of the sap is exported. I am told that the preparation of Euphorbia juice is worthless as a preventative against the attacks of animal life on wood or iron in water. The species of succulent Euphorbia are very numerous at the Cape. The largest growing Cape species is *E. grandideus*. It reaches a height of twenty feet, with numerous fleshy branches irregularly arranged round a straight stem. It is very abundant

in the eastern districts of the colony. It bleeds freely and copiously. Another species found more to the eastward, and in Natal, is *E. quinata* (a bad name, of no authority I fear). This is the largest growing succulent Euphorbia I am acquainted with, exceeding in height *E. granoideus*, and larger in circumference than that species. A good specimen of *E. quinata* (?) is a handsome object, although of so singular aspect. The quantity of juice yielded by this tree is very plentiful. From this and the preceding species the sap was taken, I believe, for experiment."—J. R. Jackson.

Barbarea stricta, *Fries*, in Worcestershire.—This plant was gathered by Mr. A. D. Melvin and myself at Worcester, near the river, in June last. I have since been informed that it was also met with at Malvern some time since, but, I believe, has never been recorded as a Worcestershire plant. We saw a considerable number of specimens in two meadows, so that it seems fairly established.—R. F. Towndrow.

Rare British Plants.—While on a botanical excursion in the neighbourhood of Dover I was shown, in a garden under the cliff, not far from Lydden Spout, a plant which was unknown to the owner of the garden, who believed it to have sprung up from railway ballast. The plant was *Salvia clandestina*, and not far from it was a solitary specimen of *Xanthium spinosum*. *Frankenia lævis* also occurred sparingly below Shakespeare Cliff, while *Enteromorpha marginata*, Le Jolis, a form not before recorded as British, I believe, was abundant on some muddy ooze by the shore. By some means or other *Teucrium Botrys* has established itself by the roadside near Mill Hill, from whence I have received a specimen gathered by M. C. Chantre this year. It would be interesting to learn if it has been planted there by any botanist.—E. M. Holmes.

New British Lichen.—*Lecanora umbrino-fusca*, Nyl.—Thallus umbrino-fuscus vel umbrino-nigrescens, tenuis, subcontinuus vel obsolete rimulosus, hypothallo plumbeo subplumoso-radiante sæpius circumdatus; apothecia nigra lecideoidea minuta adnata (latit. circiter 0·2 millim) submarginata; sporæ 8-næ fuscæ ellipsoideæ 1-septatæ, longit. 0·010–11 millim., crassit. 0·006–7 millim., epithecium fuscum, hypothecium incolor. Supra saxa silicea ad Thetford in Suffolk (Larbalestier). Videtur species affinis *L. griseo-fuscæ*, Nyl., in 'Flora,' 1875, p. 360; sporis vero minoribus, thallo, &c., differens. Apothecia juniora sæpe sublecanorina. Spermogonia non visa. Maculas super lapidem fingit obscuras, latit. circiter 5 millim. in speciminibus visis.—'Flora,' September 1, 1880, p. 389.

Somersetshire Ferns.—I have lately ascertained that *Polypodium Phegopteris*, which has been known to many botanists in Wiltshire and Somerset as growing in the woods at Stonehead, the seat of

Sir Richard Colt Hoare, was planted in that locality some thirty or forty years since by one of his gardeners. The station for *Adiantum Capillus-Veneris*, at Clevedon, N. Somerset, recorded in the 'Phytologist' (i., 964), has long since been destroyed. The late Rev. W. H. Hawker found a root or two of this fern on moist locks in the neighbourhood of Cheddar (N. Somerset) in 1851, which he recorded in the 'Phytologist' for 1854, but I recollect afterwards he expressed his doubts whether it might not have been planted by Potter, a well-known collector of British ferns, who was frequently in the habit of visiting the district.—T. Bruges Flower.

A New British Jungermannia.—In examining a collection of Hepaticæ made on Cader Idris in April, 1876, I met with a *Jungermannia* which, on account of its paroicous inflorescence, I finally determined as *J. socia*, Nees, a species new to Britain. Dr. Carrington, to whom I am under many obligations for foreign specimens of the species, writes, "I believe you are correct in naming your specimen *J. socia*, Nees." Dr. Spruce says, "The *Jungermannia* is probably really *J. socia*." Prof. Lindberg, to whom I also forwarded specimens, writes, "*J. socia*, Nees, is correctly named; no doubt left." In my paper on *Gymnomitrium obtusum* in last month's issue, in the dimension of the cells (p. 337), I in error put a cypher too many. Dr. Spruce calls my attention to this slip.—W. H. Pearson.

Ranunculus confervoides? (see p. 344).—The record of this Batrachian, with Mr. Sturrock's observations on it, recalled to my mind a small matted *Ranunculus* I gathered on Mitcham Common, Surrey, flowering and fruiting under 12 to 18 inches of water. I watched it for some weeks, and satisfied myself it was no sudden accumulation of water. I called it *R. Drouetii*, var., and still think it to be so. I thought little of this at the time, as Mr. Hiern (Journ. Bot. ix. 102) notes a similar peculiarity in *R. Drouetii*, var. *cabomboides*: an elongated plant collected by Gunn in Lake River, Grindelwald, and at Formosa, Tasmania, where it grows among pebbles, at the bottom of the stream in a matted mass. It would be interesting to try and raise plants from the carpels of these submersed specimens.—Arthur Bennett.

A Correction: Scirpus acicularis, *not* S. parvulus.—In the early summer of this year, Dr. de Crespigny kindly sent Mr. H. C. Watson and myself living specimens of the *Scirpus* from Mortlake, Surrey (see p. 58); there can be no doubt, from these specimens, that the plant is *acicularis*, not *parvulus*; and I regret the publication of the erroneous record at the page mentioned above.—Arthur Bennett.

Is Hutchinsia alpina, *L.*, a British Plant? — Under this heading the Rev. W. W. Newbould, in 'Journ. Bot.,' i., 359 (1863), directed attention to a specimen in the British Museum Herbarium,

labelled "*Lepidium petræum*, Ingleborrow, Mr. M'R[itchie]"; and Mr. Baker ('Journ. Bot.,' iii., 92) mentions one in his possession which had been received from Mr. Caley in 1790. No further evidence has been brought forward in support of the claims of *Hutchinsia alpina* to a place in our Flora; but it may be worth while to place on record that in the private collection of Robert Brown (formerly in the possession of Mr. J. J. Bennett) which is now being incorporated in the National Herbarium, there is a specimen of the plant labelled, "*Lepidium alpinum*. Hudson, Anglia."—JAMES BRITTEN.

Extracts and Notices of Books and Memoirs.

THE DIFFUSION OF THE CONIDIA OF PHYTOPHTHORA INFESTANS, DE BARY.

[FROM the Report of the Evidence given before the Select Committee of the House of Commons on the Potato Crop, which has lately been issued, it appears that two different opinions were maintained as to the mode of the diffusion of the conidia of the above-named fungus. Mr. Dyer, who was supported in his opinion by Prof. Baldwin, of the Agricultural Department of the National Board (Ireland), believed that this takes place by such agencies as "the movements of farm labourers, the transfer of manure, the mere use of implements in one field after they had been used in another," and that the atmosphere was not effective as a mode of communicating the disease. Mr. Carruthers, on the other hand, held that the disease was usually spread by the atmosphere. "If you have a condition fit for the growth of mould of cheese or any decaying matter, you will find spores present in the atmosphere ready to take advantage of this condition of things, and the mould will at once make its appearance; and so it is with this mould of the potato." Mr. Worthington Smith and Dr. Voelcker agreed in this view; and Mr. George Murray, in a letter (printed as an Appendix to the Report) to the Chairman of the Committee (Major Nolan), recounted an experiment which seems to prove the correctness of Mr. Carruthers' judgment. He has given us the following account of the experiment, with several details not included in the above-mentioned letter.]

"In the middle of August, 1876, I instituted the following experiment, with the object of determining the mode of diffusion of the conidia of *Phytophthora infestans*.

"The method of procedure was to expose on the lee side of a field of potatoes, of which only about two per cent. were diseased, ordinary German microscopic slides, measuring two inches long by one inch broad, coated on the exposed surface with a thin layer of glycerine, to which objects alighting would adhere, and in which, if of the nature of conidia, they would be preserved in a condition suitable for examination. These slides were placed on the projecting stones of a dry-stone wall which surrounded the field, and

was distant at the portion to which I refer at least five yards from the nearest potato plant. During the five days and nights of the experiment a gentle wind blew, and the weather was, on the whole, dry and clear. Every morning about nine o'clock I placed fourteen slides on the lee side of the field, and every evening about seven o'clock I removed them, and placed others till the following morning at nine o'clock. Each slide was carefully examined with the microscope immediately before being placed in its position, and I took the precaution of spending the greater part of each day in the neighbourhood to prevent disturbance or communication between the potato field and the slides by any discernible agency except the atmosphere. So far as it was conceivable and possible to me, the slides were isolated during the period of exposure from every agency but the atmosphere. After the slides were placed in position they were never approached until I did so to replace them by others, and this I was careful to effect from the side of the wall more remote from the potato field. The examination of them began within thirty minutes after their removal from the wall. The field was not watched during the night; but as no conidia fell on the slides during that period, the absence of this precaution cannot invalidate any result. On no occasion, however, did I discover any sign of the slides having been disturbed. The fourteen slides exposed during the day, when examined in the evening, showed (among other objects) on the first day, 15 conidia; on the second, 17 conidia; on the third, 27 conidia; on the fourth, only 4 conidia; and on the fifth, 9 conidia. On none of the five nights did a single conidium alight on the slides. This seemed to me to prove that during the day the conidia, through the dryness of the atmosphere and the shaking of the leaves, became detached and wafted by the wind; while during the night the moisture (in the form of dew, and on one occasion of a slight and gently falling shower) prevented the drying of the conidia, and thus rendered them less easy of detachment.

"I determined the authenticity of the conidia (1) by comparing them with conidia directly removed from diseased plants; (2) by there being attached to some of them portions of the characteristic conidiophores; and (3) by cultivating them in a moist chamber; the result of which was that five conidia, not having been immersed in the glycerine, retained vitality, which was shown by their bursting and producing zoospores in the manner characteristic of these organs.

"The fact that on the limited space thus exposed 72 conidia fell during 50 hours from a field bearing about two per cent. of diseased plants shows, in my opinion, that the diffusion of the conidia by the atmosphere is an ordinary mode of spreading the disease.

"There were perceptibly more diseased plants in the field on the fifth day than on the first, but fewer than might have been expected from the number of conidia presumably in the atmosphere. For about a week after these experiments I cursorily examined the field each day, and on the fourth day a sudden in-

crease in the amount of disease was apparent. During the previous day and night the weather had been damper and warmer, and on the day but one previous a high wind had blown (the weather being dry) for several hours. GEORGE MURRAY."

EXTRACTS FROM THE 'REPORT OF THE BOTANICAL EXCHANGE CLUB OF THE BRITISH ISLES FOR 1879.'*

Arenaria ciliata, L. From King's Mountain, Sligo, 18th July, 1879. A good supply is sent by Mr. S. A. Stewart, who writes :—"This plant seems to be either very rare or local on Ben Bulben proper, as for two days I searched for it in vain on that mountain. It occurs in considerable abundance on rocks on the east side of that mountain, some three miles to the south-east of Bulben. Our plant is denser and rougher, with leaves more bluntly spathulate and more strongly ciliate than continental examples in my herbarium." Prof. Babington writes :—"Probably we have all confounded King's Mountain and Ben Bulben. I do not recollect finding it on the hill I was first taken to as the latter, but on the hill which is continuous with it, on the other side of a ravine."

Rubus saltuum, Focke. Dr. Eyre de Crespigny sends a *Rubus* under the name of *R. fusco-ater*, Weihe, from Harrow Weald Common, Middlesex, August, 1879, which Mr. Baker names *saltuum*, Focke = *Guntheri*, Bab. Mr. Briggs says this is certainly *R. Guntheri*, "Weihe," Bloxam = *R. saltuum*, Focke. Prof. Babington does not accept it as *fusco-ater*, but his specimen has not a perfect terminal leaflet.

R. corylifolius, Sm., d. *purpureus*, Bab. Minworth, Warwickshire, September, 1879. Sent by Mr. James E. Bagnall with the following note :—"Specimens from the bushes from which these specimens have been collected were named for me, in 1871, by the late Rev. Andrew Rloxam as *Rubus concinnus*, Baker; but, as I could see no difference between this and what I considered to be *R. purpureus*, Bab., I sent specimens this year to Prof. Babington, labelled *R. purpureus*, and this name was confirmed by him. The plant is remarkably abundant in the Minworth district, often to the exclusion of all other forms. I also noticed it in abundance in the hedges at Twycross this year (1879), and believe it to be the plant named *R. concinnus*, Baker, and distributed by the late Mr. Bloxam, from that district. The bushes in the Appleby Road, Twycross (from which I gathered my specimens), pointed out by Mr. Bloxam, had been cut down this year." Prof. Babington writes :—"My specimen from Mr. Bloxam's 'set' of 1876 is poor, but I agree with Mr. Bagnall in believing this to be the same plant, and correctly named *purpureus*."

Dryas octopetala, var. *pilosa*, Bab. Limestone rocks, Blackhead, County Clare, 12th May, 1876; and *Dryas octopetala*, var. *depressa*,

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* [Several of the plants reported upon have already been noticed in the pages of this Journal.—ED. JOURN. BOT.]

Bab., limestone rocks, Ben Bulben, County Sligo, 16th July, 1879. Both these forms are sent by Mr. S. A. Stewart, who writes that the Ben Bulben plant "is a smaller plant than var. *pilosa*, and very glandular. The flowers are small, with sepals shorter and broader. The Clare plant differs from the type in the absence of glands on the leaves, and in being more hairy. It is a large-flowered conspicuous form, and very abundant. The Ben Bulben plant seems rather scarce, and I regret that I have so few specimens to send to the Club." Mr. Baker considers these two forms to be alike. Prof. Babington accepts them as the vars. *a* and *b* of his 'Manual.'

Rosa tomentilla, Léman, var. *Nicholsoni*, Christ in litt. Mr. Nicholson sends this variety from the same locality as var. *affinis* [banks of the Ure, Ripon, Yorkshire,] with the following note :— Differt a typo aculeis tenuibus, dentibus profundioribus, *fere simplicifolius;* planta magis glabrata, sepala dorso hispidis, fructu ovalis seu rotundato. This rose, collected by my brother on the left banks of the Ure near Sharon, Yorkshire, has been named as above by Dr. Christ. It has a certain *frondosa* look, as that form is understood in Baker's 'Monograph,' but differs from it in its prickles, glandular peduncles, &c."

R. stylosa, Desv., var. *evanida*, Christ in litt. Sent by Mr. George Nicholson from Ham Common, Surrey, 8th September, 1879, with the following remarks :—"Foliolibus biserratis minoribus, pœne glabrata, sed pedunculis hispidis et stylo elongato stylosæ Transitus ad stylosa versus caninam biserratum. Last year I noticed a number of bushes of this Rose on Ham Common. It is strongly characterised by its numerous flowers, its globose fruits, and small leaves. Mr. Baker was good enough to examine fresh specimens, and as he had not met with the form before I carefully went through all the specimens of this section in the Kew Herbarium without finding anything near it. I thereupon sent the plant to Dr. Christ, of Basle, who pronounced it new, and kindly forwarded the above name and diagnosis. A somewhat erect bush from five to eight feet high. Prickles on barren stem five-eighths of an inch long, and the scar about as deep. Leaves of the barren shoot about four inches long, with seven leaflets, the terminal one an inch and a quarter long by about five-eighths of an inch broad, hairs nearly confined to ribs and petiole; the serration double, teeth acute. Flowers from six to twelve or more in a cluster, the peduncles clothed with weak aciculi and setæ. Calyx-tube globose, naked, sepals little more than half an inch long. Other bushes from the same locality agree thoroughly in all respects with that just described, with the exception of their having sepals hispid at the back."

Pyrola secunda, L. Rev. Augustin Ley sends from the Wynd Cliff, Monmouthshire, some plants collected at the end of June, 1879, by Mr. B. M. Watkins. This is a very southern station for this species, as Mr. Watson gives York (County 65) in 'Topographical Botany' as its southernmost county.

Rumex, hybrid between *pulcher* and *conglomeratus?* Sent by

Mr. T. R. Archer Briggs, thus named, from roadside, Swilly, near Plymouth, South Devon, 4th August, 1879. Dr. Boswell says :— "This seems the same as a plant which I raised from Mr. Briggs's seed, and which I have cultivated for many years at Bulmuto, where very few fruits ripen. Among the plants raised from the seed of the original specimen there are considerable differences, some of them inclining towards *pulcher*, and some of them towards *conglomeratus*. I have no doubt about its being a hybrid between these two."

Rumex, hybrid between *conglomeratus* and *pulcher*, from Lewes, Sussex, September, 1879. Sent by Mr. J. H. A. Jenner with the note that "the Hon. J. L. Warren confirms my naming. Both *pulcher* and *conglomeratus* grew on the spot. I could get no root leaves." Dr. Boswell believes this is "rightly named, though it is nearer *pulcher* than any of my seedings from the Devon plant." Mr. T. R. Archer Briggs says that, "had not Mr. Warren confirmed the naming, I might have been disposed to suspect the specimen to be only depauperised *pulcher*, especially as the branches have sprung, late in the season, from a stem previously cut or broken off. It is much more like *pulcher* than Plymouth examples from Swilly, presumed to be hybrids between *conglomeratus* and this species."

Potamogeton heterophyllus, Schreb. Mr. A. Bennett sends a single plant from the canal between Woking and Weybridge, Surrey, with stolons from the axils of the upper leaves. (See Dr. Boswell's remarks upon this character in *P. nitens*, E. B., 3rd ed., vol. 9, p. 37).

P. Zizii, Mer. & Koch. Mr. Andrew Brotherston sends a further supply from Cauldshiels Loch, Melrose, Roxburgh, 9th August, 1879, to show the difference in general appearance which the same species exhibits from the influence of two different kinds of seasons. Mr. Brotherston mentions that the specimens sent to the Club last year (see Report for 1878, p. 19 ['Journ. Bot.,' 1879, p. 252]), "were smaller, more compact and firmer in texture, not drawn out like those of 1879. Mr. Baker remarks, in last Report, 'that *P. Zizii* appears to be a large deep-water form of *P. heterophyllus*,' &c. So far as I have seen, *Zizii* invariably grows near the edge of the loch in comparatively shallow water. The specimens gathered in 1878 were growing in water less than one foot deep; in 1879 about two feet. I have seen type *heterophyllus* in deeper water at Coldingham Loch, Berwick. *P. prælongus* and *P. crispus*, both of which occur at Cauldshiels Loch, prefer the deeper parts, as neither are visible from the side, but very long specimens of both are frequently washed ashore."

Ophioglossum vulgatum, L., b. *ambiguum*, Coss. & Germ. A few specimens only were collected by Mr. Charles Bailey, 21st July, 1879, in the damp sandy ground at the foot of the sandhills, on the land side, one mile west of Dyffryn railway station, between Harlech and Barmouth, Merionethshire. It is figured on plate 46 of Sir William Hooker's 'British Ferns,' and the Welsh specimens

agree well with this figure, though generally smaller in size. The variety *ambiguum* was originally detected more than twenty years ago in the neighbourhood of Paris, and was found shortly afterwards in one of the numerous "laiches" at Arcachon. It was first noticed as a British plant by Dr. J. T. Boswell, who detected it in the Orkney Islands; and Mr. Curnow has recently distributed Scilly Islands specimens through the Club. The Dyffryn locality is, therefore, a connecting link between the extreme stations of western Europe, from the Orkneys in the north to Arcachon in the south. M. Durieu de Maisonneuve finds a separating character between *O. vulgatum* and *O. lusitanicum* in the surface of the spores, which are tuberculated in the former and smooth in the latter. The spores of the Dyffryn plants are, for their size, rather coarsely reticulated, and not tuberculated. (See Ex. Club Reports, 1870, p. 18, and 1877–8, p. 20). Mr. Baker and Dr. Boswell confirm the name.—A single specimen sent by Mr. H. Halcro Johnston from a new station in Orkney, the fifth station now known in that island. It was collected 28th July, 1879, in a pasture at the top of crags at the sea-shore at the north-west end of the Calf of Cava.

Herniaria hirsuta, L. Sent by Mr. F. Townsend from waste ground (sand) at Christchurch, Hampshire, 19th July, 1879. Considered by Prof. Babington "a very interesting discovery of Mr. Townsend's." He thinks that it is indigenous.

Symphytum "peregrinum, Ledeb.?": Baker [see p. 57]. *Symphytum uplandicum*, Nymena; *S. orientale*, Fries (non Linn.); *S. Donii*, DC.? Dr. Boswell sends cultivated specimens of this plant from Balmuto, July, 1879, with the following remarks:—"Mr. Baker supposes this to be a garden hybrid between *S. asperrimum* and *S. officinale*, between which it is intermediate, though much nearer *S. asperrimum* in everything except the shape of the limb of the corolla, which is that of *S. officinale*; it is no doubt from this that Prof. Babington thinks it may be a luxuriant form of *S. officinale*. It is quite as tall and robust as *S. asperrimum* (or even more so), and young plants of it come up like weeds in the garden. The calyx is but little more deeply divided than that of *S. asperrimum*, though the divisions are more acute. In both plants they elongate after flowering. The bristles on the stem are less like prickles, but the so-called white tubercles, on which they are seated, become apparent only when dry, and are smaller than in *S. asperrimum*, in which they are equally green while the plant is alive. It seems to agree better with DeCandolle's description of *S. Donii* than with his or Ledebour's description of *S. peregrinum*, as the stem leaves, especially the upper ones, are shortly decurrent."

Poa serotina, Ehrh., with more branches on lower parts of panicle than usual. Naturalised on the bank of the Thames, Kew, Surrey, 30th June, 1879. Sent by Mr. George Nicholson with the following note:—"There was a considerable quantity of this species on banks of Thames at Kew and Mortlake last year, and there seems every probability of its retaining its hold. As a species it

comes very near *P. nemoralis*, L. Considering that it is a native of many countries of continental Europe, and that it is also found in North America, it does not seem improbable that it may occur in a wild state in Britain."

Articles in Journals.

October.

Journal of Linnean Society (London), vol. xviii., no. 108.—G. Dickie, 'Algæ from the Amazons.'—E. M. Holmes, '*Codiolum gregarium*, Braun.' — G. Allman, 'Anniversary Address.' — G. Murray, 'Application of Pringsheim's Researches on Chlorophyll to life of a Lichen.' — J. G. Baker, 'Synopsis of *Aloineæ* and *Yuccoideæ*.'

Œsterr. Bot. Zeitschrift.—G. Haberlandt, 'Modification of the palisade-web.'—F. de Thümen, 'Symbolæ ad floram mycologicam austriacum' (contd.; many new species).—F. Krasan, 'Plant-distribution in Gorz and Gradisca' (contd.)—S. Schulzer v. Müggenburg, 'Mycological notes.'—M. Gandoger, 'Pugillus Plantarum novarum vel minus recte cognitarum' (forms of *Lycopodium alpinum* and *Cystopteris fragilis*).—V. v. Borbás, 'Flora of Risnjak.'

Flora (Sept. 21).—K. Goebel, 'On the dorsiventral inflorescence of *Borragineæ*.'—P. G. Strobl, 'Flora of the Nebrodes' (contd., (Oct.)—O. Böckeler, 'Diagnoses of new *Cyperaceæ*.'—E. Hampe, 'A new German *Sphagnum*' (*S. subbicolor*, n. sp.)

Brebissonia. P. Miquel, 'Studies on Organisms in the Atmosphere' (contd.)

Ann. Sciences Nat. (Botanique, 6th Series, vol. x. pt. i.)—G. Bonnier, 'On the Alpine Flora of Europe.'—E. Prillieux, 'Spores of *Urocystis*' (1 tab.)

Naturalist (Huddersfield).—J. E. Griffith, 'Flora of Carnarvonshire and Anglesea' (contd.).

Journ. Royal Microscopical Soc.—W. H. Gilburt, 'On the Structure and Function of the scale-leaves of *Lathræa Squamaria*' (1 tab).

Botanische Zeitung.—B. Eyferth, 'On the Morphology of the lower Fungi.'—A. Fischer, 'On echinulate globules in *Saprolegniæ*' (1 tab.)—A. Fischer & J. Moeller, 'On the question of the disk-closing membrane.'—J. Moeller, 'On Cassia-seed.'

Magyar Növènytani Lapok.—J. Schaarschmidt, 'Additamenta ad Algologiam Dacicam' (contd.)

Bull. Torvey Bot. Club.—C. H. Peck, '*Polgporus volvatus* and its varieties.'—T. F. Allen, 'Similarity between *Characeæ* of America and Asia.'

Botanical News.

By the death of Mr. F. M. Webb, which we briefly announced in our last number, the small number of critical British botanists has been still further reduced. Mr. Webb's early years were spent

at Stafford; he subsequently went to Birkenhead, where he was engaged in commercial pursuits, in the intervals of which he devoted much attention to botany. He became a prominent member of the Liverpool Field Naturalists' Club; and in 1863, when the Club commenced the issue of their lithographed 'Naturalists' Scrap-book,' it was he who wrote the pages from which the lithographed copies were taken. In 1866, the 'Scrap-book' was succeeded by 'The Liverpool Naturalists' Journal,' in connection with which a 'Flora of Liverpool' was issued, of which Mr. Webb was editor, although his name is not attached to it except as a contributor. About this time Mr. Webb was an active member of the Botanical Exchange Club; he shortly afterwards left Liverpool, and resided for some time on the Continent. On his return to England, he spent a summer in field-work in Cheshire and Kent, moving from place to place, and making catalogues and careful notes of the plants of each district. For some years before his sudden death he filled the post of Curator to the Edinburgh Botanic Garden. Although so thoroughly and critically acquainted with British plants, and possessing a singularly accurate knowledge of continental forms, Mr. Webb published very little: his longest contribution to the pages of this Journal was a paper 'On *Utricularia neglecta*; and on *U. Bremii* as a British plant' (xiv. 142–147), published in 1876, which sufficiently shows the thoroughness of his work. Some estimate of the value of his careful work in connection with the Edinburgh Herbarium may be formed from the 'Notes upon some plants in the British Herbarium at the Royal Botanic Garden, Edinburgh,' which he published in the 'Transactions of the Botanical Society' of Edinburgh in 1867 (vol. xiii. pp. 88–114). His assistance is acknowledged by Mr. Watson in 'Topographical Botany.' Shortly before his death he had in preparation for this Journal a series of notes upon British plants, but it is to be feared that these will not now be available. We can but regret that so little of the knowledge which Mr. Webb possessed was rendered available for subsequent workers in the same field. He was about forty years of age at the time of his death.

We learn from 'Coulter's Botanical Gazette' (Oct. 1880) that "the Corporation of Brown University [Rhode Island] has established a botanical professorship, in compliance with the wish of the late Stephen F. Olney, who left 25,000 dollars for this purpose. . . . Mr. Olney's Herbarium has been deposited in the library building, and will be hereafter known as 'the Herbarium Olneyanum.'"

Mrs. S. C. Lewis announces the publication, under the title of 'Familiar Indian Flowers,' of "thirty coloured plates of some of the more familiar flowers found in our Indian gardens, with descriptive letterpress."

We regret that, owing to the late date of its issue, we have not been able to include in this year's Journal the Report of the Kew Herbarium for 1879, the publication of which we announced last month. We hope to give the Report in an early number.

EDITORIAL.

I CANNOT let the first year of my editorial connection with this Journal pass without saying a word of thanks to those who have so ably helped me in my work, and to whom, indeed, any value which it may possess is almost entirely due. I have tried to follow carefully in the steps of my predecessor in the carrying out of my editorial duties; and I trust not altogether without success.

As this is the only botanical Journal in which British Botany forms a prominent feature, and as it has always been the wish of the editor for the time being that all information regarding British plants should find a permanent record in its pages, I feel justified in appealing to those interested in our Flora to help me in securing this end. Much of the work done by local societies must remain unknown to botanists in general, unless some means be taken to bring it before their notice in some readily accessible form. I may perhaps be allowed to add that this Journal is still in need of financial support, and that additional subscribers, as well as additional contributors, will be welcome.

JAMES BRITTEN.

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ERRATA ET CORRIGENDA.

Page 20 line 3 from top, *for* "Woodhope,' *read* Woolhope.
27 2 „ *for* "Trelcase," *read* Trelease.
70 6 from bottom, *for* "*Dychnis*," *read Lychnis*.
73 14 „ *for* "45," *read* 4·5.
75 14 from top, *for* "71°," *read* −71°.
88 5 „ *for* "Arteriolomy," *read* Arteriotomy.
„ 6 „ *for* "Arkery," *read* Artery.
94 12 „ *for* "Bentley," *read* Bentham.
103 8 from bottom, *for* "Slapton, Sands," *read* Slapton Sands.
155 8 „ *for* "Street," *read* Salop.
„ 8 from top, *for* "or," *read* on.
159 10 from bottom, *for* "6000," *read* 600.
170 top line, *for* "sire," *read* sive.
188 line 24 from bottom, *for* "Waruztorf," *read* Warnztorf.
197 16 from top, *for* "indicated," *read* indurated.
229 bottom line, *for* "*acanthorioides*," *read acanthodioides*.
245 line 2 from bottom, *for* "affected," *read* effected.
„ 4 „ *for* "as," *read* are.
„ 6 „ *for* "endogonida," *read* endogonidia.
252 10 from top, *for* "Zürich," *read* Basel.
254 4 from bottom, *for* "Northolæna," *read* Notholæna.
256 18 „ *for* "month," *read* March.
318 lines 5 and 21 from bottom, *for* "acid," *read* acrid.
331 line 30 from top, *for* "bog," *read* bay.
„ 13 from bottom, *for* "Fanan," *read* Fahan.
„ 2 from bottom, p. 334, line 20 from top, and p. 335, line 23 from top, *for* "Ramullan," *read* Rathmullan.
333 19 „ *for* "Nunekirk," *read* Muckish.
335 7 from top, *for* "Fauct," *read* Fanet.
„ lines 11 and 23 from top, *for* "Carralsena," *read* Carraleena.
„ 12 „ 37 „ *for* "Aughuish," *read* Anghuish.
„ line 8 from bottom, *for* "Tramote," *read* Tramore.
336 lines 17 and 34 from bottom, *for* "Glenvor," read Glenvar.
„ line 24 from bottom, *for* "Caleabber," *read* Callaber.
„ 29, *for* "Muchish," *read* Muckish.
346 3 from top, *for* "*Phacidum*," *read Phacidium*.
348. The words "Carpogonium, Carposphere, and Carposperm," which stand lowest in the second column, should face Ascomycetes on p. 349.

Directions for placing the Plates.

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„ 214 . . . . . „ 310

„ 215 . . . . . „ 325

The portrait in February No. to be the frontispiece.

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