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Herausgegeben unter der Leitung

des Präsidenten: **Dr. D. H. Scott.** *des Vice-Präsidenten:* **Prof. Dr. Wm. Trelease.** *des Secretärs:* **Dr. J. P. Lotsy.**

und der Redactions-Commissions-Mitglieder:

Prof. Dr. Wm. Trelease, Dr. C. Bonaventura, A. D. Cotton, Prof. Dr. C. Wehmer und Dr. C. H. Ostenfeld.

von zahlreichen Specialredacteuren in den verschiedenen Ländern.

Dr. J. P. Lotsy, Chefredacteur.

No. 37.	**Abonnement für das halbe Jahr 15 Mark** durch alle Buchhandlungen und Postanstalten.	1914.

Alle für die Redaction bestimmten Sendungen sind zu richten an: Redaction des Botanischen Centralblattes, Haarlem (Holland), Spaarne 17.

Mac Dougal, D. T., Annual Report of the Director of the Department of Botanical Research. (Carnegie Institution of Washington Year Book. p. 57—87. pl. 2 and 3. 1913.)

A detailed account of the development of the botanic researches carried out by members of the staff treated under the following captions: the Salton Sea; the Cahuilla Basin and the Desert of the Colorado; Geographical Features of the Cahuilla Basin; the Geology of the Cahuilla Basin; Origin of Travestine, or Tufa, Deposits of Salton Sink; Seventh Annual Analysis of the Salton Sea Water; The Behavior of Micro-Organisms in Brines; Action of Salton Sea Water on Vegetable Tissues; Analysis of the Flora of the Salton Sink; The Repopulation of Sterilized Islands; The Occupation of Sterilized Beaches and the Subsequent Changes; Modifications of Plants under Specialized Conditions presented by Emersed Strands; Analysis of the Effect of Climatic Complexes; Evolution of the Chrysomelid Beetles; Treelessness in Prairie Regions; Root Variation in Desert Plants; The Root-Characters of Trees grown in the Coastal Climate of California; The Transpiration Behavior of Rainforest Plants; Altitudinal Gradients of Growth-rate; Winter Temperature Phenomena in the Santa Catalina Mountains; The Water relations of Plants; Autonomic Movements of Stems of Opuntia; Transpiration of a Desert Tree; The Photolysis of Plant Acids; Photolytic Behavior of Blue-Violet Rays and their Variations in Solar Radiation; Acidity, Gaseous Interchange and Respiration of Cacti; Fruit Development in the Cactaceae; Relationships and Distribution of the Cactaceae. Harshberger.

McLean, R. C., Amitosis in the Parenchyma of Water-Plants. (Proc. Camb. Phil. Soc. XVII. 5. p. 380—382. 1 text-fig. 1914.)

The object of this paper is to record the observation that the amitotic or direct process of nuclear divion commonly occurs in the cortical parenchymes of aquatic angiosperms. The phenomenon was first noticed in *Myriophyllum proserpinacoides* and afterwards in *Hippuris vulgaris*. This suggested that it might be characteristic of aquatics, and the result of an investigation of other water-plants revealed its occurrence in:

Dicotyledons:	*Monocotyledons*:
Trapa bifida	*Elodea canadensis*
Jussieuia sp.	*Potamogeton lucens*
Hippuris vulgaris	*Limnocharis* sp.
Myriophyllum proserpinacoides	*Aponogeton* sp.

The general distribution of amitosis in the tissues follows the general distribution of growth. Cells showing it are commoner in young stems than in older ones; they are much more frequent in sections taken close to a node than in those taken about the middle of the internode. The nuclei which have undergone amitosis are sigmoid in form and their length may be as much as ten or twelve times their diameter. They are frequently to be found associated in pairs in the same cell. Amitosis is the only form of nuclear division which has been recognized in the tissus investigated, and the author infers that it is the only form occurring there. The author speaks of cell division following the amitotic nuclear divisions after some time, but he does not offer actual proof of cell-walls being formed between the daughter nuclei formed by direct division.

The author shows that amitosis also occurs in the tissues of two land plants, *Dionaea muscipula* and *Polypodium ireoides*. He suggests that direct nuclear division in plants may be much more widespread than has hitherto been supposed, and that it is possible that amitosis may be the constant form of nuclear division between sister-cells on all fully differentiated tissues which remain alive and continue to grow in bulk, although this does not preclude the possibility of its occurrence also in meristematic tissues.

Agnes Arber (Cambridge).

Meek, C. F. M., The Problem of Mitosis. (Quart. Journ. Micr. Sci. LVIII. p. 567—592. 1913.)

This paper is mainly occupied with a discussion of all the theories, which have been held regarding the mechanism of mitosis, since the first comparison of the achromatic figure and that representing lines of force was made by Fol in 1873. The author's criticism is largely destructive and he concludes that the only generalisation which may be regarded as established is that the mitotic spindle is not a figure formed entirely by the action of forces at its poles.

Agnes Arber (Cambridge).

Reed, T., The nature of the double spireme in *Allium Cepa*. (Ann. Bot. XXVIII. p. 271—281. 2 pl. 1914.)

In the present investigation root apices were chiefly used, but the divisions in the pollen grains were also examined. Attention was more particularly concentrated upon the following points: the

developpement and significance of the longitudinal fission in the spireme ribbon, the method of origin and grouping of the chromosomes on the prophases, and the origin and subsequent fate of the nucleoli. The results may be summarised as follows:

At the end of the prophase the chromosomes are arranged in eight pairs on the equatorial plate and the members of each pair roughly correspond with one another in form. During the anaphase the fission which will effect the separation of the daughter chromosomes at the subsequent division is marked out A chromatin knot is formed by the fusion of parts of chromosomes and gives rise to the nucleolus. During the prophase the nucleolus gives up its chromatin to the developing spireme. When the spireme is formed it is longitudinally split and appears to be continuous. Later it segments into 8 chromosomes, which finally segment into 16, which are arranged in 8 pairs. No evidence was found in favour of the theory that the sudden collapse of the nuclear vacuole is responsible for the appearance of the achromatic spindle. It was not found possible to demonstrate the presence of a distinct nuclear membrane. The gametophytic nuclei, like the somatic, show the double type of spireme. Agnes Arber (Cambridge).

Welsford, E. J., The Genesis of the male nuclei in *Lilium*. (Ann. Bot. XXVIII. p. 265—270. 2 pl. 1914.)

The present paper forms a continuation of the memoir on the fertilisation in *Lilium auratum* and *L. martagon* published by the author and Prof. Blackman (Ann. Bot. XXVII. p. 3, 1913). The chief results obtained are as follows:

The vermiform nuclei of *Lilium auratum* and *L. Martagon* pass down the pollen tube in male cells and are usually only liberated from their cytoplasm after the pollen tube has entered the embryo sac. The male nuclei are regarded as possessing motility from an early stage of their development. The „X-Körper" of Nawaschin are shown to be the disintegrating cytoplasm of the male cell. The history of the bands of granules sometimes found near the disintegrating cytoplasm suggests the possibility that they may be vestiges of blepharoplasts. Agnes Arber (Cambridge).

Lindman, C. A. M., On *Sagina procumbens* L. × *saginoides* L. Dalla Torre. (Bot. Notiser. p. 267—280. 4 Textfig. 1913.)

Während der internationalen pflanzengeographischen Exkursion nach den britischen Inseln im Jahre 1911 wurde auf Ben Lawers in Schottland eine *Sagina* angetroffen, die später von Druce als *S. scotica* n. sp., von Ostenfeld als *S. procumbens* × *saginoides* beschrieben wurde.

Diese Pflanze kommt nach Verf. auch in Skandinavien und anderen europäischen Landern, sowie in Asien und Grönland vor und ist, ähnlich wie *S. saginoides,* auf alpine und arktische Gegenden beschränkt.

Zuerst wurde dieser Bastard von Brügger im J. 1868 aus der Schweiz mit der Bezeichnung *S. media* publiziert. Lagerheim beschrieb ihn ausführlich aus Tromsö unter den Namen *S. Normaniana.*

Verf. gelangt auf Grund von eingehenden Untersuchungen zu der Auffassung, dass viele Merkmale die hybride Natur dieser Pflanze und deren Mittelstellung zwischen *S. procumbens* und *S. saginoides* anzuzeigen scheinen, dass aber andererseits verschiedene Charaktere vorhanden sind, die auf eine distinkte Art hinweisen. In ihrer ganzen geographischen Verbreitung betrachtet, enthält *S. media* Brügger vielleicht ungleichwertige, obwohl äusserlich identische Formen.

Zum Schluss teilt Verf. eine lateinische Diagnose sowie die geographische Verbreitung der *S. media* (*procumbens* × *saginoides*) mit. Abgebildet werden Pflanzen und Blüten von dieser sowie von *S. saginoides*. Grevillius (Kempen a. Rh.).

Vries, H. de, The probable origin of *Oenothera Lamarckiana* Ser. (Bot. Gaz. LVII. p. 345—361. pl. 17—19. May 1914.)

It is concluded that *O. Lamarckiana,* as represented in the herbaria of Lamarck, Pourret and Michaux was the same plant a century ago as now; it has been a component of the flora of the eastern United States, and is now a component of the English flora; and the strain now cultivated, introduced into the trade about the middle of the last century, was probably from some wild English locality, itself possibly stocked from seeds derived from an introduction through Michaux or some other botanist of his period. Trelease.

Mac Dougal, T. D., The auto-thermal integration of climatic complexes. (Amer. Journ. Bot. I. p. 186—193. Apr. 1914.)

After a review of his own and other workers in regard to the relation of temperature to the plant organism, the autor using the wheat plant as an index uses in modified form a method proposed in 1900. It consists in estimating the area of thermographic diagram by the line of freezing point and by the temperature tracing from the beginning of a season until a plant had attained a certain stage of its development. The vertical component in such figures being degrees of temperature, and the horizontal element being elapsed time, the resulting accounts are designated as hour-degrees. The experimental results are tabulated. Harshberger.

Shive, J. W. and **B. E. Livingston.** The relation of atmospheric evaporating power to soil moisture content at permanent wilting in plants. (The Plant World. XVII. p. 81—121. April 1914.)

The experiments detailed in this paper and tabulated lead first to the substantiation of the general principle, already established by Caldwell, that the amount of water left in any given soil at permanent wilting of plants rooted therein is a function of the intensity of atmospheric evaporating power for the period during which permanent wilting is obtained. The studies of the writers have established a range of atmospheric evaporation intensities. The authors believe that the discrepancy between the conclusions of Briggs and Shantz and their own may lie in some internal difference between plants grown in summer at Tucson and those in the Washington Greenhouse. Details, as to the quantitatve

relation which is found to hold between soil moisture residue and atmospheric evaporating power, are given and expressed in mathematic formule. Harshberger.

Scott, D. H., On *Medullosa pusilla.* (Proc. Roy. Soc. ser. B. LXXXVII. p. 221—228. pl. 13. 1914.)

This species was provisionally named in Scott's 'Studies in Fossil Botany', 1909, and a detailed account now appears. It differs from *Medullosa anglica* principally in being much smaller, and in some minor points, such as the simpler structure of the hypoderm of the leaf-base.

Lotsy's division of the genus *Medullosa* into *Pecoptero-* and *Neuropteromedullosa* is considered to be unsound, and a division even on purely anatomical grounds is thought to be impossible at present. W. N. Edwards.

Seward, A. C., A contribution to our Knowledge of Wealden Floras, with especial reference to a Collection of Plants from Sussex. (Quart. Journ. Geol. Soc. LXIX. p. 85—116. pl. 11—14. 1913.)

Several new species of plants recently obtained from the Fairlight Clay, Sussex, are described, viz.: *Lycopodites teilhardi, Selaginellites dawsoni, Hausmannia pelletieri, Pelletieria valdensis* (gen et sp. n.), *Teilhardia valdensis* (gen. et sp. n.) and *Dichopteris delicatula,* while the plant formerly described by Seward as *Conites armatus* is re-named *C. berryi.* The new genus *Pelletieria* is represented only by fertile fronds, and is probably a member of the *Schizaeaceae,* the sculpturing of the spores especially being of a schizaeceous type. *Teilhardia* is a fern of doubtful affinities. A full account of *Selaginellites dawsoni* appears elsewhere. In addition to these the collection contains many good specimens belonging to previously described species, such as *Malonidium goepperti, Ruffordia goepperti* (from both of which spores were obtained) and *Araucarites pippingfordensis.* The frond described in the "Wealden Flora" as *? Zanites* sp. is now identified with *Pseudoctenis eathiensis,* Sew., and some fragments of *Ctenis* sp. are figured. These additions bring the number of British Wealden plants up to about 70.

A comparison of the floras of different regions shows that there is great similarity between the Wealden of Europe and the corresponding N. American floras, but "the number of cosmopolitan types is smaller than in the case of the Middle Jurassic floras." It is also noteworthy that the *Ginkgoales,* though known from the Wealden of Germany and elsewhere, have not yet been found in England. W. N. Edwards.

Stevenson, J. J., The Formation of Coal beds. I. An Historical Summary of Opinion from 1700 to the present time. (Proc. Am. Phil. Soc. L. p. 1—116. 1911). II. Some Elementary Problems. (Ibidem. L. p. 519—643). III. The Rocks of the Coal Measures. (Ibidem. LI. p. 423—553. 1912). IV. (Ibidem. LII. p. 31—162. 1913.)

A systematic account of the phenomena connected with the formation of coal beds. The first part is a very excellent summary of the literature of the last two hundred years. The second part

discusses the effects of floods upon vegetation, the phenomena of peat deposits and buried forests. The conclusion is reached that true peat is always autochthonous and that flood-borne vegetable debris is practically nil from the viewpoint of coal formation. The third part discusses the rocks of the Appalachian Coal measures and reaches the conclusion that the Appalachian basin is a great river plain, the deposits being of the various kinds found on continents and that the phenomena deduced for the Appalachian basin are those of Coal regions everywhere. The fourth part concludes that coal beds and associated rocks are always continental deposits of a fluvial or flood-plain character. That the coal beds are strictly comparable with peat beds and that they are invariably of autochthonous origin-conclusions whose sweeping character will be heartily contested by most geologists and paleobotanists. Berry.

Stopes, M. C., Catalogue of the Mesozoic plants in the British Museum (Natural History). Part I, Bibliography, Algae and Fungi. (XXIV, 282 pp. 2 pl. 1913.)

This volume consists chiefly of a list of species described from Cretaceous beds (excluding the Wealden of Europe) up to the end of 1910, together with a bibliography of works on Cretaceous plants. The list is not intended to be critical, the object being to give the name and horizon given by the original describer of each species. No species has been renamed, and specific names have not been amended. As regards species which have been transferred from one genus to another, there are a good many cross-references to the various genera in which they have been put, but no attempt has been made to enter the species under all the generic names they have ever received, only those names being included which were accompanied by new figures or descriptions.

The introduction contains a review of Cretaceous floras considered geographically, and the remainder of the book is occupied with an account of Cretaceous Algae and Fungi. Of the former the most important are the calcareous forms belonging to the *Siphoneae* and the *Corallinaceae,* together with the impressions of doubtful position included under *Chondrites* and *Algites.* Many of the specimens originally described as algae are regarded as being very poor leaf impressions or tracks of animals.

The most important fungi are those in petrified material from the Upper Cretaceous of Japan, already described by Suzuki and by Stopes and Fuji, and included in the *Pyrenomycetes.* The other species are mostly represented by patches on leaf impressions, and here again several so-called fungi are rejected owing to the inadequate evidence as to their nature. W. N. Edwards.

Thomas, H. H., The Fossil Flora of the Cleveland District of Yorkshire. I. — The Flora of Marske Quarry. (Quart. Journ. Geol. Soc. LXIX. p. 223—251. pl. 23—26. 1913.)

The author describes a flora of Middle Jurassic type from the Lower Estuarine Series of Marske, which "differs both in its component species and in their relative abundance" from the more southern flora of the neighbourhood of Whitby. The most abundant plants belong to the aggregate species *Ptilophyllum* (*William-*

sonia) *pecten*, and other common species are *Taeniopteris vittata*, *Baiera longifolia*, *Nilssonia mediana*, *Dictyozamites hawelli* and *Sagenopteris phillipsi*. Two new species, *Marattiopsis anglica* and *Pseudoctenis lanei*, are described, and in addition to these *Dictyozamites hawelli* (allied to *D. johnstrupi* from Bornholm) is unknown elsewhere. *Stachypteris hallei* is confined to Marske and Whitby, and *Baiera longifolia* is not known from any other British locality. Male sporophylls of *Williamsonia* are not uncommon, and a single female strobilus has been found. Altogether 21 species are recorded.

W. N. Edwards.

Weiss, F. E., A *Tylodendron*-like Fossil. (Mem. Proc. Manchester Lit. Phil. Soc. LVII. 3. nº. 18. 14 pp. 2 pl. 1913.)

A silicified fossil of doubtful origin is described as *Tylodendron Cowardii*, n. sp. The specimen consists chiefly of pith, with some small masses of woody tissue round the circumference. The pith is composed of thin-walled parenchyma, and contains in the outer layers numerous secretory canals, which have not previously been observed in *Tylodendron*. Small separated groups of tracheids, sometimes reduced to a single tracheid, occur inside the main xylem mass, and apparently represent the remains of centripetal wood, but the position of the protoxylem is indeterminable. The double leaf-traces have an endarch arrangement. The structure and pitting of the secondary wood indicate an Araucarian affinity, while in other characters, such as the secretory ducts, the plant was more primitive, and shows agreement with some *Cordaitales*.

W. N. Edwards.

Weiss, F. E., The Root-apex and young root of *Lyginodendron*. (Mem. Proc. Manchester Lit. and Phil. Soc. LVII. 3. nº. 16. 10 pp. 1 pl. 1913.)

From an examination of the well-preserved delicate rootlets of *Lyginodendron* in the calcareous nodules of Lancashire the author concludes that probably there was a single apical cell, as in the leptosporangiate ferns. W. N. Edwards.

White, D., Resins in Paleozoic Plants and in coals of high rank. (U. S. Geol. Surv. Prof. Paper. 85E. p. 65—83. pl. 9—14. 1914.)

In this extremely important contribution the author shows that high rank coals are simply peats, mainly of swamp types of formation, that have been transformed by normal geologic processes into the various grades of coal. Contrary to the opinion of many, especially European, geologists, Paleozoic coals contain resinous substances in abundance as do also both high and low grade coals of the American Cretaceous and Tertiary. It is shown that Carboniferous floras afford ample evidence that they were as rich in resinous products as the floras of later geologic periods. Finally observations are given of the physical changes in the resins consequent on the alteration of coals to successively higher ranks. Berry.

Wieland, G. R., The Liassic Flora of the Mixteca Alta of Mexico. (Am. Jour. Sci. (IV) XXXVI. p. 251—281. tf. 1—2. 1913.)

A preliminary announcement of the discovery of a rich flora

of Liassic age in the state of Oaxaca in southern Mexico. The geologic section is discussed and tables showing the determined species and their affinities are given. Species are listed as follows: *Anomozamites* 1, *Otozamites* 17, *Pterophyllum* 2, *Pterozamites* 1, *Ptilophyllum* 3, *Stangerites* 1, *Williamsonia* 6, *Zamites* 2, *Cycadospermum* 1, *Cycadolepis* 1, *Araucarioxylon* 1, *Phoenicopsis* 1, *Noeggerathiopsis* 1, *Yuccites* 1, *Trigonocarpus* 1, *Rhabdocarpus* 1, *Alethopteris* 1, *Cladophlebis* 1, *Coniopteris* 1, *Dicksonia* 1, *Glossopteris* 2, *Laccopteris* (?) 1, *Sphenopteris* 1, *Sagenopteris* 1, *Taeniopteris* 3, and *Equisetites* 1. This flora is remarkable in consisting of 70 percent of cycadophytes and in containing such old types as *Glossopteris* and *Noeggerathiopsis*. Berry.

Wilson, W. J., A New Genus of Dicotyledonous Plant from the Tertiary of Kettle River, British Columbia. (Victoria Mem. Mus. Bull. I. p. 87—88. pl. 9. f. 1—2. 1913.)

Describes a fossil leaf of unknown affinity from the Tertiary, stated to be probably Miocene. A non-commital generic name, *Lebephyllum* is proposed and the species is named *Reineckei* after the collector. A reference to the family *Urticaceae* is suggested. Berry.

Wilson, W. J., A New Species of *Lepidostrobus*. (Victoria Mem. Mus. Bull. I. p. 89—92. pl. 9. f. 3—5. 1913.)

Describes *Lepidostrobus Mintoensis* from the upper Pottsville on Minto, New Brunswick. Berry.

Massee, G., Fungi Exotici. XVII. (Kew Bull. Misc. Inform. 2. p. 72—76. 1914.)

A list of 22 species of *Basidiomycetes* collected in the Botanic Gardens, Singapore, by Mrs Burkill. The following are described as new: *Lepiota albida, Schulzeria pellucida, Collybia elata, Clitocybe carnosa, Russula aeruginosa, Lactarius bicolor, Marasmius lanatus, Entoloma Burkillae, Inocybe umbrina, Pholiota hepatica, Flammula bella, Agaricus tenuiceps, Stropharia minima, Auricularia indica, Boletus indecorus, B. craspedius.* E. M. Wakefield (Kew).

Massee, I., Observations on the Life-History of *Ustilago Vaillantii* Tul. (Journ. Econ. Biology. IX. p. 9—14. 1 pl. 1914.)

The species was studied on *Scilla bifolia,* which is its only host in Britain. Infection takes place only in the seedling stage, and the mycelium is confined to the stem, hibernating in the flattened „cushion" and growing up with the flowering stem each year. The mycelium is uninucleate. Spores are produced in the anthers and occasionally in the ovary. Their formation is accompanied by a nuclear fusion, the binucleate condition being stated to arise by the deliquescence of alternate transverse septa. The spores retain their vitality for 3 months. Germination is varied, the spores giving rise to a short promycelium bearing a hemibasidium, or to a slender germ tube with a chain of oidia. The time elapsing before germination also varies.

No conjugation of the spores produced from the hemibasidium was observed. E. M. Wakefield (Kew).

Mc Dougall, W. B., On the Mycorhizas of Forest Trees. (Amer. Journ. Bot. I. p. 51—74. 4 pl. Feb. 1914.)

This paper gives the result of the investigation of six forms of ectotrophic mycorhizas and one heterotrophic form. It adds four species to the list of ectotrophic mycorhiza-forming fungi: *Russula* sp. on *Tilia americana, Boletus scaber* var. *fuscus* on *Betula alba* var. *papyrifera, Cortinarius* sp. on *Betula alba* var. *papyrifera* and *Scleroderma vulgare* on *Quercus alba*. The author finds that at least four fungi may form mycorhizas on the same tree, that infection depends on the chance presence of a fungus, that penetration of the outer wall of the root epidermis and splitting the cells apart results in the formation of a mantle, that the mycorhizas are normally annual, that ectotrophic mycorhizas are instances of the parasitism of fungi on the roots of trees. Harshberger.

Robinson, W., Some Experiments on the Effect of External Stimuli on the Sporidia of *Puccinia malvacearum* (Mont.). (Ann. Bot. XXVIII. p. 331—340. 1914.)

No evidence could be obtained of chemotropic influences radiating from fragments of various leaves laid on drops of gelatine. In the case of certain leaves with glandular hairs a definite toxic effect was observed, but this was found to be specially related to the presence of glandular secretions. The sporidia of *P. malvacearum* and the conidia of a species of *Botrytis* were found to be negatively heliotropic, but in the case of the aecidiospores of *Puccinia poarum*, and the conidia of *Penicillium glaucum, Peronospora parasitica,* and *Alternaria* sp. no irritability to light was apparent.

Penetration of the cuticle and epidermal cells only took place on the normal host, though the tip of the germ-tube became swollen and closely applied to the epidermal surface also of non-susceptible plants. E. M. Wakefield (Kew).

Murbeck, S., Zur Kenntnis der Gattung *Rumex*. (Bot. Notiser. p. 201—237. Mit Textfig. 1913.)

Rumex palustris Sm. lässt sich auf Grund seiner Fertilität, seiner morphologischen und anatomischen Merkmale, seiner geographischen Verbreitung u. s. w. nach Verf. nicht als Bastard betrachten, sondern ist eine reine, auch von *R. maritimus* L. völlig verschiedene Art. Mit *R. conglomeratus* Murr. × *maritimus* L. ist *R. palustris* Sm. oft zusammengeworfen oder verwechselt worden. *R. limosus* Thuill. und *R. palustris* Sm. sind bisher allgemein als Synonyme betrachtet. Da jedoch Thuillier's Originalexemplare nicht der reinen Art, sondern *R. conglomeratus* Murr. × *maritimus* angehören, zieht Verf. den jüngeren Namen *R. palustris* Sm. dem älteren vor.

R. uliginosus Guss. ist mit *R. palustris* Sm. identisch. Nach Lojacono (Fl. sicula II, 1907) soll *R. uliginosus* auf Sicilien angetroffen worden sein, die sicilianische Pflanze gehört aber nach Verf. dem in Nordafrika und Westasien vorkommenden *R. dentatus* L. an.

Der wirkliche Bastard *R. conglomeratus* Murr. × *maritimus* L. (*R. Knafii* Cel.) unterscheidet sich von *R. palustris* Sm. dadurch, dass er öfters perenniert.

Die von Beck und von Ascherson und Graebner als *con-*

glomeratus × *maritimus* c) *R. Wirtgeni* bezeichnete Pflanze ist *R. conglomeratus* Murr. × *palustris* Sm.

Zu der Kombination *R. obtusifolius* L. × *palustris* Sm. dürfte *R. Steinii* Becker zu stellen sein.

R. usticanus Lojacono ist zu *R. pulcher* L. zu ziehen und scheint der typischen Form jener Art zu entsprechen.

R. elongatus Guss. ist mit *R. crispus* identisch.

R. fennicus Murb. (Syn. *R. domesticus*? var. *pseudonatronatus* Borb. — *R. pseudonatronatus* Murb.) ist eine sowohl von *R. domesticus* wie von anderen *Rumices* scharf unterschiedene, in Fenno-Scandia, Russland und Ungarn verbreitete Art. Verf. gibt zu derselben eine ausführliche lateinische Diagnose.

R. arcticus Trautv., in Europa bisher bloss aus Nowaja Semlja und Waigatsch bekannt, kommt auch in Fenno-Scandia vor. Die vom Verf. 1899 aufgestellte *R. aquaticus* var. *kolaënsis* hat sich mit der Trautvetter'schen Art übereinstimmend erwiesen. *R. arcticus* ist sowohl morphologisch wie pflanzengeographisch mit *R. aquaticus* L. nahe verbunden.

Neu beschrieben werden:

R. rossicus n. sp., am nächsten mit *R. palustris* Sm. und *R. maritimus* L. verwandt, in Fenno-Scandia und Russland vorkommend;

R. domesticus Hartm. × *fennicus* Murb. n. hybr., Finnland.

Abgebildet werden Fruchtperigone von *R. maritimus* und *R. rossicus*. Grevillius (Kempen a. Rh.).

Nelson, A. and **J. F. Macbride.** Western plant studies. I. (Bot. Gaz. LV. p. 372—383. May 1913.)

Contains as new: *Calochortus bruneaunis, Clematis aurea, Delphinium megacarpum, Arabis Menziesii lata, A. Menziesii lanuginosa* (*A. pedicellata* A. Nels.), *Horkelia beneolens, Potentilla glomerata dichroa* (*P. dichroa* Rydb.), *Astragalus owyheensis, Geranium caespitosum gracile* (*G. gracile* Engelm.), *Gentiana affinis major, Nemophila explicata, Phacelia foliosepala, Oreocarya cilio-hirsuta, Castilleja Bennittii, C. rhexifolia pubens, C. curticalix, C. fasciculata inverta, Pentstemon rex. P. perpulcher pandus, Downingia brachyantha* (*Bolelia brachyantha* Rydb.), *D. corymbosa* (*Clintonia corymbosa* A. DC.), *Erigeron elkoensis* and *E. poliospermus latus*. Trelease.

Nichols, G. E., The Vegetation of Connecticut. II. Virgin Forest. (Torreya. XIII. p. 199—215. Sept. 1913.)

The paper gives detailed observation in a magnificent stand of virgin forest at Colebrook, which represents the climax forest type that formerly prevailed over at least the greater part of northwestern Connecticut. *Tsuga canadensis* and *Fagus grandifolia* are preeminent, while of secundary importance are *Acer saccharum* (12 pc.), *Betula lutea* (10 pc.), *Quercus rubra* (6 pc.), *Castanea dentata* (6 pc.), *Fraxinus americana, Tilia americana, Prunus serotina, Betula lenta, Acer rubrum* and *Pinus strobus* (4 pc.). The size of the trees is described, as well, as the pteridophytes and herbaceous spermatophytes. Harshberger.

Nichols, G. E., Summer evaporation intensity as a deter-

mining factor in the distribution of vegetation in Connecticut. (Bot. Gaz. LVI. p. 143—152. Aug. 1913.)

During the summer of 1912 continuous evaporation records were taken at numerous localities in the state by means of porous clay cup atmometers and the results tabulated. Upon averaging the results for the inland stations of the Highland and Lowland and of the stations along the coast, it was found that the weekly water loss, as recorded by the atmometers, was as follows: Western Higland, 137 cc.; Central Lowland, 171 cc.; Eastern Highland, 173 cc.; Coastal Region, 135 cc. It appears that the areas dominated largely by the mesophytic northern hardwood type of forest, and the strip along the coast constitute areas of relatively low evaporation intensity; and that the rate of evaporation in the Eastern-Higland, where oaks predominate in the forest, is some what higher than in the Central Lowland, where the more mesophytic chestnut is the character tree. Harshberger.

Nieuwland, J. A., Some new American Lythra. (Amer. Midl. Nat. III. p. 265—270. May 1914.)

Lythrum cordifolium, L. dacotanum, L. parvulum, and *L. flagellare,* the latter a manuscript name of Shuttleworth for which a second choice *L. tenue* is suggested should nomenclatorial quibblers consider *L. flagellare* inapplicable. Trelease.

Pool, R. J., A study of the vegetation of the sandhills of Nebraska. (Minnes. Bot. Stud. IV. 3. p. 184—312 with pl. XXVI—XL and 16 text figures, colored map as frontispiece. 1914.)

This rather voluminous paper begins with an historic introduction followed by a consideration of area, position, geology and soils, topography and drainage. The section on general plant-life conditions deals with climatic and soil factors, much of the matter in tabular form. The several plant formations of the Nebraska sandhills are (A) the prairie-grass formation, (a) bunch grass association, (b) the Muhlenbergia association, (c) the blow out association, (d) the spear-grass association, (e) the wire-grass transition association; (B) the short-grass formation (a) the grama-buffalo-grass association; (C) the broadleaf forest formation (a) the linden-cedar-ironwood-ash association, (b) the paper birch association; (D) the yellow pine formation; (E) the water-plant formation, (a) the pond weed association, (b) the water lily association, (c) the stonewort-naiad association; (F) the marsh formation (a) the bulrush-reed-grass of this area of North America, (b) the smartweed association, (c) the streamside marsh association; (G) the meadow formation (a) the rush-sedge wet meadow association, (b) the water hemlock association, (c) the fern meadow association, (d) the hay meadow association, (e) the willow thicket association. The last two sections treat of general vegetation and summary of successions. Under each formation, the dominant, principal and secondary species are given. The plates of two photographic figures each embellish the text.

Harshberger.

Rydberg, P. A., Studies on the Rocky Montain flora. XXVIII. (Bull. Torr Bot. Cl. XL. p. 43—74. Feb. 1913.)

Contains as new: *Thermopsis ovata* (*T. montana ovata* Rob.)

Lupinus lupinus, Acmispon americanus (*Trigonella americana* Nutt.), *A. elatus* (*Hosackia elata* Nutt.), *Psoralea stenostachys, P. stenophylla, Phaca ampullaria* (*Astragalus ampullarius* Wats.), *P. Wardii* (*A. Wardii* Gray), *P. subcinerea* (*A. subcinereus* Gray), *P. Cusickii* (*A. Cusickii* Gray), *P. sabulonum* (*A. sabulonum* Gray), *P. Preussii* (*A. Preussii* Gray), *P. serpens* (*A. serpens* Jones), *P. Silerana* (*A. Sileranus* Jones), *P. jejuna* (*A. jejunus* Wats.), *P. leptalea* (*A. leptaleus* Gray), *P. artemisiarum* (*A. artemisiarum* Jones), *P. pubentissima* (*A. pubentissimus* T. & Gr.), *P. sesquiflora* (*A. sesquiflorus* Wats.), *Xylophacos cuspidocarpus* (*Astragalus cuspidocarpus* Sheld.), *X. cibarius* (*A. cibarius* Sheld.), *X. puniceus* (*A. puniceus* Osterh.), *X. zionis* (*A. zionis* Jones), *X. argophyllus* (*A. argophyllus* Nutt.), *X. cymboides* (*A. cymboides* Jones), *X. musinensis* (*A. musinensis* Jones), *X. consectus* (*A. consectus* Sheld.), *X. Watsonianus* (*A. Watsoniensis* Sheld.), *X. utabensis* (*A. Utabensis* T. & Gr.), *X. inflexus* (*A. inflexus* Dougl.), *Tium eremiticum* (*Astragalus eremiticus* Sheld.), *T. atropubescens* (*A. atropubescens* Coult. & Fish.), *T. arrectum* (*A. arrectus* Gray), *Hamosa calycosa* (*Astragalus calycosus* Torr.), *Ctenophyllum Grayi* (*Astragalus Grayi* Parry), *Cystium platytropis* (*Astragalus platytropis* Gray), *C. Coulteri* (*A. Coulteri* Benth.), *C. ineptum* (*A. ineptus* Gray), *C. lentiginosum* (*A. lentiginosus* Dougl.), *C. araneosum* (*A. araneosus* Sheld.), *C. boiseanum* (*A. boiseanus* A. Nels.), *Atelophragma lineare* (*Homalobus aboriginum* Rydb.), *A. Forwoodii* (*Astragalus Forwoodii* Wats.), *A. glabriusculum* (*Phaca glabriuscula* Hook.), *A. ibapense* (*Astragalus ibapense* Jones), *A. Arthuri* (*Astragalus Arthuri* Jones), *Onix Mulfordae* (*Astragalus Mulfordae* Jones), *Microphacos parviflorus* (*Dalea parviflora* Prush), *Dibolcos scobinatulus* (*Astragalus scobinatulus* Sheld.), *Phacopsis scaphoides* (*Astragalus arrectus scaphoides* Jones), *Cnemidophacos confertiflorus* (*Astragalus confertiflorus* Gray), *C. argillosus* (*A. argillosus* Jones), *C. reventoides* (*A. reventoides* Jones), *C. reventus* (*A. reventus* Gray), *Kentrophyta tegetaria* (*Astragalus tegetarius* Wats.), *Homalobus lingulatus* (*Astragalus lingulatus* Sheld.), *H. exilifolius* (*A. exilifolius* A. Nels.), *H. simplicifolius* (*A. simplicifolius* Gray), *H. lancearius* (*A. lancearius* Gray), *H. miser* (*A. miser* Dougl.), *H. Dodgeanus* (*A. Dodgeanus* Jones), *H. debilis* (*A. debilis* Gray), *H. strigosus* (*A. strigosus* Coult. & Fish.), *H. episcopus* (*A. episcopus* Wats.), *H. collinus* (*A. collina* Dougl.), *Aragallus Bigelovii* (*Oxytropis Lambertii Bigelovii* Gray), *A. plattensis* (*O. plattensis* Nutt.), *Chamaesyce Parryi* (*Euphorbia Parryi* Engelm.), *C. exstipulata* (*E. exstipulata* Engelm.), *Negundo orizabense, N. Nuttallii* (*Rulac Nuttallii* Nieuwl.), *N. texanum* (*Rulac texana* Small), *N. interius* (*Acer interior* Britt.), *N. Kingii* (*A. Kingii* Britt.), — with key to the genus, *Sphaeralcea grossulariaefolia* (*Sida grossulariaefolia* H. & A.), *S. dissecta* (*Sida dissecta* Nutt.), *S. coccinea* (*S. coccinea* DC.), *S. elata Malvastrum elatum* A. Nels.), *S. digitata* (*M. digitatum* Greene), *S. leptophylla* (*M. leptophyllum* Gray), *S. arizonica* Heller, *S. subrhomboidea, Phymosia acerifolia* (*Sphaeralcea acerifolia* Nutt.), *P. rivularis* (*S. rivularis* Torr.), *P. grandiflora* (*S. grandiflora* Rydb.), *P. Crandallii* (*S. Crandallii* Rydb.), *P. longisepala* (*S. longisepala* Torr.), *Nuttallia humilis* (*Touterea humilis* Rydb.), *N. integra* (*T. integra* Rydb.), *N. Rusbyi* (*T. Rusbyi* Rydb.), *N. lobata, N. acuminata, Boisduvalia salicina* (*Oenothera salicina* Nutt.), *Epilobium latiusculum* (*E. Drummondii latiusculum* Rydb.), *L. platyphyllum* (*E. glaberrimum latifolium* Barby), *E. Tracyi*, — with key of the *paniculatum* group, — *E. subulatum* (*E. paniculatum subulata* Haussk.), *E. laevicaule, E. Sandbergii, Gayophytum Helleri, Anogra leptophylla*

(*Oenothera leptophylla* Nutt.), *Oenothera longissima, O. ornata* (*Onogra ornata* A. Nels.), *O. hirsutissima* (*O. biennis hirsutissima* Gray), *O. subulifera* (*O. strigosa subulata* Rydb.), (*Chylisma tenuissima* (*O. tenuissima* Jones), *Sphaerostigma macrophyllum* (*S. alyssoides macrophyllum* Small), *Osmorrhiza intermedia* (*Washingtonia intermedia* Rydb.), *Glycosma maxima, Atenia montana* (*Carum montanum* Blank.), *A. Garrettii* (*C. Garrettii* A. Nels.), *Oreoxis MacDougali* (*Aletis MacDougali* Coult. & Rose), **Daucophyllum** n. gen. (*Umbelliferae*), with *D. tenuifolium* (*Musenium tenuifolium* Nutt.), *D. lineare* (*Aletes tenuifolia* Coult. & R.), **Coriophyllus** n. gen. (*Umbelliferae*), with *C. Jonesii* (*Aulospermum Jonesii* C. & R.), *C. Rosei* (*A. Rosei* Jones), *C. purpureus* (*A. purpureum* C. & R.) and *C. Betheli* (*A. Betheli* Osterh.), **Pseudopteryxia** n. gen. (*Umbelliferae*), with *P. anisata* (*Cymopterus anisatus* Gray), *P. longiloba* and *P. aletifolia* (*Pseudocymopterus aletifolius* Rydb.), **Pseudoseoxis** n. gen. (*Umbelliferae*), with *P. bipinnatus* (*Cymopterus bipinnatus* Wats.) and *P. nivalis* (*C. nivalis* Wats.), *Cynomarathrum latilobum, Cogswellia simplex* (*Peucedanum simplex* Nutt.), and *C. leptophylla* (*Peucedanum triternatum leptophyllum* Hook.).

Trelease.

Saxton, W. T., The Classification of Conifers. (New Phyt XII. p. 242—262. 1913.)

This paper opens with a useful analysis of those characters upon which a classification of the Conifers should be based. Among these, the development and structure of the pro-embryo and early embryo are regarded as of primary importance. This introductory section is followed by an historical outline of the classifications hitherto published. In the latter part of the paper a new classification of the Coniferales is proposed, in which five families of approximately equal rank are recognized: I. *Araucariaceae,* II. *Podocarpaceae,* III. *Pinaceae,* IV. *Cupressaceae,* and V. *Taxaceae.* In the case of *Pinaceae* and *Cupressaceae,* a further division into sub-families is suggested. These families and sub-families are defined with reference to gametophyte and pro-embryo characters. The paper concludes with a section dealing with the phylogeny of the Gymnosperms, the author's views on this subject being shown graphically on a chart. A bibliography of more than 90 memoirs, bearing on the subjects discussed, is included. Agnes Arber (Cambridge).

Shreve, F., The role of winter temperatures in determining the distribution of plants. (Amer. Journ. Bot. I. p. 194—202. April 1914.)

After a discussion of the views of Willdenow, Humboldt, Schouw and Merriam on the control of plant distribution by the various phases of the temperature factor, Shreve details the results of his observations and instrumentation at different elevations in the deserts and desert mountain ranges of the soutwestern United States. An attempt to determine the normal temperature gradient in the Santa Catalina Mountains from 3,000 to 8,000 feet disclosed the very great importance of inversions of temperature in causing local departures from the normal gradient. These gradients were determined for a number of mountain stations the gradient derived from the absolute winter minima of the Desert Laboratory and of the ridge station at 4,000 and 6,000 feet is 6,6°

per 1,000 feet, and above the commencement of timber 2,5° per 1,000 feet, while in free air the gradient of temperature fall at the Blue Hill Observatory for low altitudes was 2,16° per 1,000 feet. The results indicate that the greatest number of consecutive hours of freezing temperature is the factor most closely corresponding, in its distribution, with the limitation of the species of plants studied. For example, the succulents, which bore the lowest vertical limit, are unable to resist freezing over 19 to 22 hours in duration, while the species of higher and higher limits are progressively able to withstand longer and longer periods of freezing, up to 66 hours.

Harshberger.

Smith, J. D., Undescribed plants from Guatemala and other Central American republics. XXXVIII. (Bot. Gaz. LVII. p. 415—427. May 1914.)

Erysimum Ghiesbreghtii, Xylosma chloranthum, Sloanea Tuerckheimii, Ilex costaricensis, Connarus brachybotryosus, Dalbergia variabilis cubilquitzensis, Drepanocarpus costaricensis, Lonchocarpus santarosanus, Caesalpinia Bonducella urophylla, Leucaena Shannoni, Pithecolobium adinocephalum; **Guamatela,** (n. gen.) (*Rosaceae*), with *G. Tuerckheimii, Rubus leptosepalus, Gilibertia leptopoda, Faramea cobana* (with key to the 6 Central American species), *Jacquemontia platycephala, Cyphomandra aculeata, Brachistus meianthus, Columnea cobana, C. lutea, Aegiphila fasciculata* (with key to the 8 Central American species), and *Scutellaria isocheila.* Trelease.

Swingle, W. T., *Eremocitrus,* a new genus of hardy, drought-resistant citrous fruits from Australia. (Journ. Agric. Research. II. p. 85—100. pl. 8. fig. 1—7. May 25, 1914.)

The desert kumquat, *Triphasia glauca* Lindl., *Atalantia glauca* Benth., is segregated under its specific name as type of the new genus. Trelease.

Netolitzky, F., Die Giftigkeit der „Rauschbeeren" — (*Vaccinium uliginosum*) — ein Missverständnis. (Oester. bot. Zeitschr. LXIV. 1/2. p. 43—45. 1914.)

Unter „Rauschbeeren" versteht das Volk die Beeren der verschiedenen Arten von *Vaccinium,* von *Arctostaphylos officinalis* und *Empetrum nigrum.* In der Literatur wird nur die letztgenannte Art und *Vaccinium uliginosum* einer Giftwirkung verdächtigt. Nun gelang es dem Verf. und Anderen nicht, aus letzterer Pflanze einen Giftstoff zu isolieren. Der Genuss der Früchte ist ungefährlich, der Ref. ass die Beeren in Menge als erfrischendes Obst bei seinen Begehungen der Salzburger Moore. Wie kam nun der Name Rauschbeere zustande? Im Mittelhochdeutschen heisst rusch (= Rausch) soviel wie Binsenbeeren = Moor- oder Bruchbeere, was *V. uliginosum* ist. Anderseits wurden seit jeher aus den Beeren der diversen *Vaccinium*-Arten berauschende Getränke gegoren. Es handelt sich also um einen Gleichklang der beiden Worte.

Matouschek (Wien).

Senft, E., Ueber Phytomelane in der Alantwurzel (*Inula Helenium*). (Pharmazeut. Post. XLVII. 30. p. 207—209. Fig. Wien 1914.)

Daufert und Miklauz bezeichnen 1911 die Phytomelane als

Körper, die komplizierte N.-freie organische Verbindungen darstellen, den H und O in sehr annähernd gleichem Verhältnisse wie Kohlehydrate besitzen, aber viel C-reicher als diese sind. Je niedriger der C-Gehalt der Phytomelane ist, um so leichter werden sie durch Jodsäure angegriffen. — Das Vorkommen der Phytomelane im Perikarp der Kompositen ist durch Hanausek als ein wichtiger physiologischer Prozess gedeutet, als eine Schutzvorrichtung nach verschiedenen Richtungen. Bei *Inula* Wurzeln aber handelt es sich um pathologische Vorgänge nach Verf. Dafür spricht: 1. das unregelmässige Vorkommen des Phytomelans, 2. manche Wurzeln, unter anderen klimatischen und Boden-Verhältnissen gezogen, zeigen keine Spur von diesen Körpern. Es handelt sich sicher um eine gewisse fermentative Wirkung, die durch irgendwelche Stoffwechselstörung nicht normal erst in den Früchten, sondern schon in der Wurzel zur Geltung kommt und sich hier an den verschiedensten Orten manifestiert. Das stellenweise explosionsartige Auftreten erinnert unwillkürlich an die Hypothese einiger Forscher, die sie für die Metastasen der malignen Neubildungen (Krebs) und die Entstehung der sog. Bakteriosen zugrunde gelegt haben. Stets setzt die Bildung der Phytomelane in den Interzellularen ein (wie Hanausek es angibt), auch in der Inula-Wurzel. Durch weitere Anreicherung dieses Stoffes aber wird hier die Mittellamelle auseinandergetrieben. Wenn auch die Zellulosemembran ergriffen wird, so kommt es dazu, dass die Phytomelane auch in der Zelle selbst sich vorfinden. Doch ist das Zellinnere als eine sekundäre Lagerstätte der Phytomelane zu betrachten. Es ist unwahrscheinlich, dass das weitere Studium dieser Auflösungsvorgänge imstande wäre, auch in die Hypothese über das Wachstum der Zellmembran ein neues Licht zu bringen.

Matouschek (Wien).

Nilsson-Ehle, H., Svalöfs Kronhafre. (Sveriges Utsädesf. Tidskr. p. 154—155. 1914.)

Bisher hat der Siegeshafer sich im grossen ganzen als die ertragreichste Weisshafersorte in Schweden gezeigt. Unter gewissen Verhältnissen wird er jedoch von anderen Sorten übertroffen, so auf guten Böden in Südschweden von Svalöfs Kronenhafer. Diese aus Probsteier stammende Sorte ergab, unter Berücksichtigung sowohl des Kornertrages als des Kerngehalts, einen 4,8% höheren Durchschnittsertrag als der Siegeshafer. Der Kronenhafer wird für die fruchtbarsten südschwedischen Boden empfohlen.

Grevillius (Kempen a. Rh.).

Schotte, G., Skogsträdens frösättning hösten 1913. [Der Samenertrag der Waldbäume in Schweden im Herbst 1913]. (Mitt. Forstl. Versuchsanst. Schwedens. X. Stockholm 1913. 24, II pp. Mit Tabellen u. Karten. Deutsche Zusammenfassung.)

Die Blüte der Kiefer ist im grossen ganzen mittelgut, in den nördlichsten Bezirken am reichsten gewesen. Die Fichtenblüte ist in den nördlichen und mittleren Teilen des Landes ungewöhnlich reich, in Südschweden bedeutend schwächer gewesen. Die Fichte blüht in Schweden im allgemeinen etwa eine Woche früher als die Kiefer.

Der Ertrag sowohl an 1- wie an 2-jährigen Kiefernzapfen war

besonders in Nordschweden gut. Die Fichte weist, obwohl sie 4 Jahre nacheinander Zapfen getragen hat, ein sehr reiches Zapfenjahr auf; nach Süden zu war aber der Zapfenertrag schwächer. Die Fichtenzapfen sind jedoch in grosser Ausdehnung von Insekten und von Pilzen (*Puccinastrum Padi* und *Chrysomyxa Pirolae*) befallen; ausserdem hat die warme und trockene Witterung während des Herbstes bewirkt dass besonders im nördlichen und mittleren Schweden die Zapfen ihre Samen zu früh entlassen haben.

Bei den Laubbäumen war die Samenernte im allgemeinen mittelgut, fiel jedoch gleichfalls am schwächsten im südlichsten Teil des Landes aus.

Bemerkenswert ist, dass der Samenertrag in diesem Jahre am reichsten in Nordschweden und am schwächsten im südlichsten Schweden gewesen ist, wo auch der Frost während der Blütenzeit nachteilig auf die Fruchtbildung eingewirkt zu haben scheint.

Grevillius (Kempen a. Rh.).

Uhlander, A., Rodogörelse för verksamketen vid Sveriges Utsädesförenings filial i Luleå år 1912. [Bericht über die Tätigkeit der Filials des schwedischen Saatzuchtvereins in Luleå im J. 1912]. (Sveriges Utsädesf. Tidskr. p. 156—161. 1914.)

Bezüglich der geprüften Hafersorten sei erwähnt, dass sowohl die aus nordnorwegischem Hafer hervorgegangene Stammbuchnummer 0668 als auch die Kreuzung zwischen dieser und Ligowo II es mit der gegenwärtig in Norrland am häufigsten gebauten Sorte, dem Mesdaghafer, aufnehmen können. Im übrigen muss auf das Original verwiesen werden. Grevillius (Kempen a. Rh.).

Weydahl, K., Beretning om Selskapet "Havedyrkningens Venners" forsöksvirksomhet i aaret 1913. [Bericht über die Versuchstätigkeit des Vereins „Freunde des Gartenbaues" im Jahre 1913]. (23, 6 pp. Mit Abb. Kristiania 1914.)

Die Tätigkeit an der Versuchsstation des Vereins in Asker ist im Berichtsjahre erweitert worden; auch die Zahl der lokalen Versuchsfelder in den verschiedenen Teilen von Norwegen ist erhöht worden. In Tabellen werden die Erträge angegeben, die die verschiedenen Sorten und Stämme von Kohl, Kohlrübe und Möhre auf den Versuchsfeldern geliefert haben. Anhangsweise wird über Anbauversuche mit Rettigsorten berichtet.

Grevillius (Kempen a. Rh.).

Głowacki, J., Johann Breidler. Nachruf. (Oesterr. bot. Zeitschr. LXIV. 1/2. p. 39—43. Wien 1914.)

Biographie. Verdienste um die Bryologie. Literarische Tätigkeit. Seine Moossamlung befindet sich um Joanneum (Graz), die in Steiermark gefundenen Flechten im naturhistor. Hofmuseum zu Wien, das Phanerogamenherbar auf der deutschen Prager Universität. Matouschek (Wien).

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