TORREYA

A Bi-Monthly Journal of Botanical Notes and News

John Torrey, 1796–1873

EDITED FOR

THE TORREY BOTANICAL CLUB

BY

GEORGE T. HASTINGS

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THE TORREY BOTANICAL CLUB

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GEORGE T. HASTINGS
2587 Sedgwick Ave.
New York City.

TORREYA

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January-February, 1926

AN UNUSUAL INSECT GALL ON SCARLET OAK (QUERCUS COCCINEA MUENCH.)

Arthur Harmount Graves

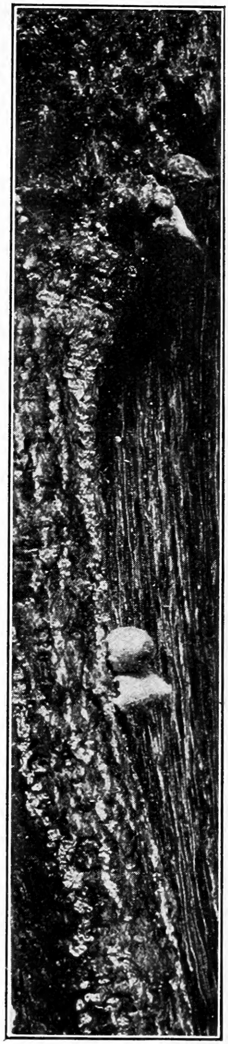
Most of us are familiar with such common insect galls on the oak as the beautiful Wool Sower,* often occurring on twigs of white oak—a spherical, woolly mass, which when young, is of an exquisite, creamy-white tint, interspersed with blotches of bright, pinkish-red; the Large Oak Apple—usually about the size of a golf ball, smooth and firm on the outside, but a spongy mass within, and a single thick-walled larval cell in the center; the Oak Bullet Galls, in clusters of two or three or more on the terminal twigs of the members of the white oak group; as well as many other commonly recurring forms which we know by sight if not by name.

Last summer, at Hamden, Conn., during the first week in August, I noticed on the callus surrounding an old fire scar on a trunk of a Scarlet Oak peculiar growths in such an unusual location on the tree and of such peculiar shape and bright green color that they were not at first recognized even as galls. In color the growths were a bright green, very close to rivage green†; in form, almost symmetrically cone-shaped, except that the pointed apex canted slightly to one side; and in size about 7 mm. high by 5 mm. in diameter at the base. At first sight they appeared to be some abnormal development of the tree itself—possibly of the nature of adventitious buds.

Dr. E. P. Felt, to whom the specimens were submitted, stated that they were galls caused by *Andricus ventricosus* Bass., though slightly abnormal on account of infestation by parasites. Their

* Felt, Ephraim Porter. Insects affecting park and woodland trees. Vol. 2, pp. 615 ff., Memoir 8, N. Y. State Museum, 1906. See also, by the same author, Key to American Insect Galls. Bull. 200, N. Y. State Museum, 1918.

† Ridgway, Robert. Color standards and color nomenclature. Washington, D. C., 1912. See pl. XVIII.



hollow interior was filled with small maggots, whereas, generally speaking, unparasitized galls contain a large maggot nearly filling the cavity. Dr. Felt considers the gall not a well-known one, and from ordinary standards somewhat rare. The specimens observed August 6 are shown at the upper part of the figure. On September 7, when the photograph was taken, these were withering, and the two new ones shown below had developed. Close examination of the bark of the callus with a lens revealed punctures and often slight swellings at other points.

Galls caused primarily by *Andricus ventricosus* Bass. on callus surrounding old fire scar on trunk of scarlet oak (*Quercus coccinea* Muench.).

SOME LOCAL NAMES OF PLANTS—IV.*

W. L. McAtee

Until some very favorably circumstanced individual or institution undertakes the task, the compilation of vernacular names of American plants will continue to be woefully incomplete and correspondingly unsatisfactory. The project is dual, involving the compilation of published, and the collection of unpublished names. Publications that must be searched include those of the early writers who customarily devoted some space to plants, general works on natural history, sporting books, plant manuals, local lists, works on medical botany, ethnobotany, and pharmacology, botanical journals, and special articles on plants in other periodicals. Other special sources of local plant names are lists of honey plants and of food plants of insects other than bees, and publications on range and poisonous plants.

The sources of unpublished plant names are even more numerous and inaccessible and the exploring of them still more time-consuming. Unhurried travel and careful inquiry in characteristic areas, especially isolated ones, is necessary to achievement of a reasonable degree of completion. Labels in herbaria are a profitable hunting ground for the searcher for unusual appellations and no doubt botanical diaries and correspondence of historical value could be examined to advantage. The supply of names is inexhaustible and the ways in which they reach the compiler surprisingly diverse.

The task of collating them is a tremendous one which the present writer can not undertake because he is engaged on a similar compilation of the names of American birds. He enjoys contributing to the subject, however, and hopes his contributions will interest others, among them, possibly one or more who will compile a real dictionary of these terms.

The present contribution consists of a small collection of names not found in current glossaries, and a short bibliography restricted to publications, dealing specifically with American plant names.

* No. 1 of this series was published in Torreya, 13: 225–236, 1913, No. 2 in Torreya, 16: 235–242, 1916, and No. 3 in Torreya, 20: 17–27, 1920.

Plant Names

CHARACEAE

1. *Chara* sp.—Featherbeds, Susquehanna River, Pa. (Forest and Stream, Feb. 1890, p. 104).

ZANNICHELLIACEAE

2. *Potamogeton perfoliatus* L.—Turkle (turtle) grass, Ragged Id., Back Bay, Va. (C. C. Sperry).

3. *Potamogeton pectinatus* L.—Old-fashioned bay-grass, Ragged Id., Back Bay, Va. (C. C. Sperry).

NAIADACEAE

4. *Naias guadalupensis* Spreng.—Gray duck moss, Mississippi Delta, La. (C. C. Sperry).

HYDROCHARITACEAE

5. *Limnobium spongia* Bosc.—Horse-shoe, Florence, La. (C. C. Sperry).

POACEAE

6. *Erianthus tracyi* Nash.—Cat-tail, Port Gibson, Miss. (E. G. Holt.)

7. *Paspalum dilatatum* Poir.—Crow-foot, Morton, Miss. (E. G. Holt).

8. *Panicum hemitomum* Schult.—Paille fine (pyfeen), Vermillion Parish, La. (C. C. Sperry).

9. *Panicum flexile* Gattinger.—Petticoat grass, Morton, Miss. (E. G. Holt).

10. *Panicum virgatum* L.—Johnson Grass, Mississippi Delta, La. (C. C. Sperry). At this same locality the writer had *Panicum repens* L. pointed out as Johnson grass; probably the name is applied to almost any robust grass resembling the cultivated bearer of this name, that is *Sorghum halepense*.

11. *Chaetochloa glauca* L.—Cat-tail, Morton, Miss. (E. G. Holt).

12. *Zizania aquatica* L.—Zimosa (Roosevelt, R. B., Florida and the Game Water-birds of the Atlantic Coast, etc., 1884, p. 324).

13. *Scolochloa festucacea* Willd.—Hollow-stem, Rugby, N. Dak. (O. A. Stevens).

CYPERACEAE

14. *Scirpus robustus* Pursh.—Wild chufa, McClellanville, S. C. (L. A. Beckmann).

15. *Mariscus jamaicensis* Crantz.—Redtop grass, McClellanville, S. C. (L. A. Beckmann).

MELANTHACEAE

16. *Veratrum speciosum* Rydberg.—Skunk-weed, Graham Mts., Ariz. (E. G. Holt).

MYRICACEAE

17. *Myrica* spp.—Sweet myrtle, Sapelo Id., Ga.

FAGACEAE

18. *Quercus gambelii* Nuttall.—White oak, Graham Mts., Ariz. (E. G. Holt).

NELUMBONACEAE

19. *Nelumbo lutea* Willd.—Graine a voler, Monaca nut (Bul. 10, Louisiana Dept. Conservation, 1921, p. 58).

CERATOPHYLLACEAE

20. *Ceratophyllum demersum* L.—Nigger wool, Mississippi Delta, La. (C. C. Sperry).

LAURACEAE

21. *Persea pubescens* Pursh.—Sweet bay, Sapelo Id., Ga.

BRASSICACEAE

22. *Cheirinia asperrima* Greene.—Wild mustard, Graham Mts., Ariz. (E. G. Holt).

HYDRANGEACEAE

23. *Hydrangea quercifolia* Bartram.—Seven-bark, Pickens, Miss. (E. G. Holt),

ROSACEAE

24. *Chamaebatia foliolosa* Benth.—Bear clover, Sequoia National Park, Calif., (C. Hart Merriam); mountain misery, Placerville, Calif. (C. Barlow, Condor, 3. p. 152, Nov. 1901).

MALACEAE

25. *Amelanchier* spp.—Wild pear, Mt. Desert, Me.

AMYGDALACEAE

26. *Laurocerasus caroliniana* Mill.—Wild olive, Sapelo Id., Ga.

MIMOSACEAE

27. *Acacia greggi* Gray.—Cat's-claw, Graham Mts., Ariz. (E. G. Holt).

FABACEAE

28. *Glottidium vesicarium* Jacq.—Snake bean, Sapelo Id., Ga.

29. *Erythrina herbacea* L.—Cherokee, Sapelo Id., Ga. At this locality the root of the plant has a reputation as a tonic, and is called man-root, or woman-root, according to the sex of the person seeking it.

EUPHORBIACEAE

30. *Cnidoscolus stimulosus* Michx.—Nettle, Jekyl Id., Ga.

ANACARDIACEAE

31. *Rhus copallina* L.—Shoemaker berry, Sapelo Id., Ga.; sourball bush, Jekyl Id., Ga.

32. *Rhus trilobata* Nuttall.—Skunk-brush, Graham Mts., Ariz. (E. G. Holt).

AQUIFOLIACEAE

33. *Ilex vomitoria* Ait.—Tea tree, Beaufort, N. C. (Roosevelt, R. B., Florida, etc., 1884, p. 44); Christmas bush, Sapelo Id., Ga.; Christmas berry, Jekyl Id., Ga.

RHAMNACEAE

34. *Ceanothus fendleri* Gray.—Buck-brush, Graham Mts., Ariz. (E. G. Holt).

35. *Ceanothus prostratus* Benth.—Squaw-carpet, Sequoia National Park, Calif (C. Hart Merriam).

36. *Ceanothus velutinus* Dougl.—Deer-brush, Placerville, Calif. (C. Barlow, Condor, 3, p. 152, Nov. 1901).

OPUNTIACEAE

37. *Opuntia pes-corvi* Le Conte.—Nigger-toes, Sapelo Id., Ga.; Jo-jumper, Jekyl Id., Ga.

ELAEAGNACEAE

38. *Lepargyraea argentea* Nutt.—Bull-brush, Graham Mts., Ariz. (E. G. Holt).

ARALIACEAE

39. *Aralia spinosa* L.—Devil's walking-stick, Sapelo Id., Ga.

ERICACEAE

40. *Bejaria racemosa* Vent.—Flycatcher, Jekyl Id., Ga.

41. *Chiogenes hispidula* L.—Tea berry, Grand Manan, N. B. (S. F. Cheney); snake berry, Mt. Desert, Me.

42. *Arbutus texana* Buckl.—Called Palo enquerado (naked tree) by the Mexicans, and slick tree by the Americans, Tough, Tex. (Wm. Lloyd).

43. *Batodendron arboreum* Marsh.—Parker berry, "only the negroes call it sparkle berry," said my informant, Sapelo Id., Ga.

SAPOTACEAE

44. *Bumelia* spp.—Sloe, black sloe, Sapelo Id., Ga.

OLEACEAE

45. *Adelia pubescens* Nuttall.—Buck-brush, Graham Mts., Ariz. (E. G. Holt).

POLEMONIACEAE

46. *Polemonium acutiflorum* Ledeb.—Skunk-weed, Unalakleet, Alaska (H. W. Johnston).

SCROPHULARIACEAE

47. *Monniera monniera* L.—Alligator grass, Mississippi Delta, La. (C. C. Sperry).

RUBIACEAE

48. *Galium* spp.—Chicken-weed, because small chickens get caught in it, Seven Locks, Md. (Chas. Stewart).

49. *Mitchella repens* L.—Turkey berry, Morton, Miss. (E. G. Holt).

AMBROSIACEAE

50. *Ambrosia trifida* L.—Bloodweed, Natchez, Miss. (E. G. Holt).

51. *Iva* spp.—Salt-water myrtle, to distinguish it from the sweet myrtle (Myrica), Sapelo Id., Ga.

CARDUACEAE

52. *Eupatorium capillifolium* Lam.—Yankee weed, Baton Rouge, La. (O. W. Rosewall, Ent. News, 35, No. 10, Dec. 1924, p. 370).

53. *Chrysothamnus* sp.—Chamis, Graham Mts., Ariz. (E. G. Holt).

54. *Baccharis* spp.—Salt water myrtle, Sapelo Id., Ga. See note under No. 51

with which it shares this name. The two plants are confused under other appellations also, as salt-water bush, and high-tide bush.

55. *Bidens involucrata* Nutt.—Nigger-head, Pickens, Miss. (E. G. Holt).

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THE SUPPOSED FOSSIL OPHIOGLOSSUM

T. D. A. Cockerell

In Torreya, vol. 24, p. 10, I described a supposed fossil *Ophioglossum* from the Eocene of Wyoming, naming it *O. hastatiforme.* The specific name had reference to the resemblance to a spear-head, not to the conventional term hastate. In Torreya of the same year, p. 49, Dr. E. W. Berry stated that the plant was by no means an *Ophioglossum*, but was in fact a *Danaea*, belonging to the species *D. coloradensis* Knowlton, described from the Green River shales of Colorado. This led to a lengthy correspondence with Dr. Knowlton, Dr. W. R. Maxon and Dr. Marshall A. Howe, out of which certain results have emerged, showing that the whole matter needs reconsideration. The facts and probabilities are as follows:

(1) The fossil is assuredly not an *Ophioglossum.*

(2) Still less is it a *Danaea.* Dr. Maxon kindly loaned me excellent *Danaea* material for comparison.

(3) The fragment described by Knowlton (1923) as *Danaea coloradensis* is apparently a different thing, and in the absence of proof to the contrary, is to be retained in *Danaea.* I have not seen it.

(4) Lester Ward (Glimpses of the Cosmos, IV, 1915, p. 150) described a plant from the Laramie near Glendive, Montana, calling it *Xantholithes propheticus*. He doubtfully referred it to the Ophioglossaceae.

(5) This *Xantholithes* is to the U. S. National Museum, and was recognized by Dr. Knowlton as similar to my fossil. There can be no doubt, I believe, that it is congeneric, and hence *Ophioglossum hastatiforme* becomes *Xantholithes hastatiformis*.

(6) Ward's material shows that the plant is unlike anything living. Many efforts have been made both by Ward and Knowlton, to get it classified, but so far without tangible result. I concluded, after examining a good figure loaned by Dr. Knowlton, that it was probably an alga. It was accordingly sent to Dr. Howe, who writes me: "I had that strange fossil for two or three weeks, but did not have the nerve to say what it might be. . . . The cell structure suggested at first that of the genus *Caloglossa* of the family Delesseriaceae of the Red Algae, but I did not see how any organism of that group could show no indication of branching, unless radiating from a center." My impression was that it did radiate from a center, and my own feeling still is that it is an alga, but of an extinct family (Xantholithaceae). However, some one should offer a medal for a decisive solution, acceptable to botanists generally! Suppose *Marsilea* had become extinct, and was known only by some rather poor impressions in the rocks, should we be able to form a reasonable opinion about its affinities? It would present another such mystery.

PROCEEDINGS OF THE CLUB

Meeting of October 28, 1925

This meeting was held at the New York Botanical Garden. The program was as follows:

Dr. H. A. Gleason exhibited specimens and discussed the structure of two new species of Styracaceae from British Guiana. The first of these is a *Lissocarpa*, differing in several respects from *L. Benthami Gürke*, the only species hitherto known. The second illustrates an undescribed genus, related to *Diclidanthera* but differing in some remarkable structural peculiarities of the flower. Four of the five petals are weakly connate in two pairs, separated from each other and from the fifth petal by wide sinuses, and only seven or eight stamens are present, instead of the ten usually characteristic of the family. Technical descriptions will be published in the Bulletin of the Club.

Mrs. Britton reported that a long lost species of moss described by Bridel in 1826 as *Orthotrichum stellatum* had been recently borrowed from Berlin through the courtesy of the officials of the Botanical Gardens. This moss had been sent to Dr. John Torrey by Dennis Cooley in 1820, collected in Massachusetts, probably near Deerfield where he lived. No specimen was kept by Dr. Torrey and no mention of the name occurred in any American textbook of mosses. Meanwhile it had been described and figured by W. S. Sullivant as "*O. strangulatum* Beauv." a species which is still poorly understood and probably belongs to another group of terrestrial lime-loving species. *O. stellatum* is a tree-species with well-marked ridges, strongly contracted in the upper part when old and dry, with the teeth reflexed in pairs and the stomata immersed in one row around the base of the ridges. Although the cilia are absent, it is probable that they were present when gathered and there is no doubt that *O. stellatum* Brid. (1826) and *O. strangulatum* Sull. (non Beauv.) are the same species.

The next paper was by Dr. F. E. Denny on "Hastening the starting of dormant potato tubers."

Freshly harvested potato tubers, if replanted under conditions favorable for growth, do not sprout at once but require a period of after-ripening. The length of dormancy varies with the variety but is generally two months or more. In experiments for the purpose of finding a method of chemical treatment that would shorten this rest period and permit early sprouting, two hundred twenty-four different chemicals were tested and about three thousand separate experimental lots were used.

The varieties used were principally Bliss Triumph and Irish Cobbler, but McCormick, Spaulding's Rose, Green Mountain, Rural New Yorker, and Early Ohio were also tried. Of all the chemicals tried, ethylene chlorhydrin ($ClCH_2CH_2OH$) gave the greatest promise of success.

With Bliss Triumph, treated tubers sprouted about one month before the checks, and with Irish Cobbler, 1925 Long Island Crop, the treated lot produced vines two feet high, bearing second crop tubers 1 cm. in diameter before the checks appeared above ground.

Sodium and potassium thiocyanate solutions also gave excellent results. Other chemicals that gave favorable results were: dichloroethylene, triochloroethylene, carbon bisulphide, ethylene dichloride and ethyl bromide. Tests with these are being continued.

Arthur H. Graves,
Secretary.

Meeting of November 10, 1924

This meeting was held at the American Museum of Natural History. The program was an illustrated lecture by Dr. R. H. Cheney of New York University, entitled, "Plant arrow poisons; their sources, preparation and effects." The lecturer stated that the beginning of the use of arrow poisons is lost in antiquity. Mention of them is made in the Bible and by ancient classical writers. Arrow poisons derived from plants come only from the Angiosperms, the chief species used among the monocotyledons being *Haemanthus toxicarius*, *Discorea hirsuta* and *Amorphophallus campanulatus;* among the dicotyledons, *Antiaris toxicaria*, *Anemone ranunculoides*, *Aconitum ferox*, *Physostigma venenosum*, *Lunasia amara*, *Lophopetalum toxicum*, *Strychnos Gubleri*, *Castelnaei*, *Crevauxiana*, *toxifera* and *tieute*, *Acocanthera venenata*, *Adenium somolense*, and *Strophanthus hispidus* and *Kombe*.

No plant arrow poisons have been employed commonly in North America with the exception of Anemone sp. in northern and northwestern Alaska. The southern half of South America is also without the use of arrow poisons. The most effective arrow poison of the Western Hemisphere is curare, a substance prepared from the stems of eighteen species of South American Strychnos. This substance contains two alkaloids, curine and curarine, which paralyze the motor end-plates. The action is very specific and rapid.

Many plants are utilized by the African natives as arrow poisons. There are three main groups that are typical of Africa; namely, Strophanthus (43 species), Acocanthera, and certain xerophyll plants, chiefly Adenium, *Calotropis procera* and Erythrophloem. The seeds are used in preference to the stems which are used in the Strychnos arrow poisons of the American and African bindweed. African Strychnos species produce a tetanizing effect, as they act primarily on the spinal cord and medulla oblongata. The glucosides, strophantin and ouabain, found in Strophanthus species, cause heart block rapidly. An effective African arrow poison is also prepared from *Physostigma venenosum*. The alkaloid physostigmine centers its action on the parasympathetic nervous system.

The principal vegetable poisons used on arrows by the natives of Asia and Oceanica are prepared from the forty-nine species of Asiatic Strychnos, chiefly *Strychnos tieute;* Anemone sp. in northeastern Asia, and *Aconitum ferox* and *napellus* in India. The most powerful arrow poison of the east is called Ipoh (a heart poison). Ipoh is prepared in some instances from *Strychnos tieute* in Borneo but usually from *Antiaris toxicaria* and *innoxia* throughout the Malay Archipelago. The main Philippine arrow poison sources are *Lophopetalum toxicum* and *Lunasia amara*.

The manufacture and use of the blow-gun and darts as developed in Borneo was shown by lantern slides. The process is one of the finest examples of Bornean handicraft.

Arrow poisons may be classified into five groups in accordance with their chief action as follows:

1. Heart and muscles: Ouabain; Strophantin.
2. Nerve endings (motor end-plates): Curare.
3. Nervous system and heart in general: Aconitine.
4. Spinal cord (tetanizer): Strychnine.
5. General systemic effect: Snake venom.

Specific effects were described as demonstrated by the speaker's laboratory experiments on animal life. Numerous effects and death in monkeys and man within fifteen to twenty minutes after slight wounds were reported from authentic accounts in the literature.

ARTHUR H. GRAVES,
Secretary.

Meeting of November 24, 1925

The meeting was held at Schermerhorn Hall, Columbia University, under the joint auspices of the Torrey Botanical Club and the Institute of Arts and Sciences of Columbia University. President Richards introduced the speaker of the evening, Dr. F. O. Bower, Regius Professor, University of Glasgow. An abstract of the lecture, prepared by Professor Bower, on the Natural Classification of Ferns, follows:

A natural classification should be based on the widest possible foundation of fact: theoretically it should accord with all the known facts relating to the organisms classified. If the classification be correctly carried out it should represent accurately their relations by descent. This is the ideal end: but under present conditions it is Utopian, and in practice we must be content with as wide a basis of fact as possible, and a result which at least shall not violate, but rather represent phyletic relations.

Of all the classes of plants none appears to lend itself so readily to phyletic treatment as the Filicales. The reasons for this are: (i) that they are represented today by a very large number of genera and species of wide geographic distribution; (ii) that they have many well marked and relatively stable characters; and (iii) that they have a long and consecutive fossil history, back to Paleozoic time.

The attempt has been made to widen the criteria used in their comparison with a view to phyletic grouping, and twelve criteria have been adopted, though doubtless the number may be added to by later writers:

	(1) External form of the shoot
	(2) Leaf-architecture and venation
	(3) Initial constitution
	(4) The vascular system
Sporophyte	(5) Dermal appendages
	(6) The position and structure of the sorus
	(7) Indusial protections
	(8) The characters of the sporangium
	(9) The spore-output per sporangium
	(10) The form of the prothallus
Gametophyte	(11) The sexual organs
	(12) Embryology

As a cumulative result, checked by comparisons of the related fossils from the Paleozoic period onwards, it is possible to conclude definitely that the more massive Eusporangiate Ferns were of prior existence to the more delicate Leptosporangiate Ferns: indeed it seems probable that the latter were not even existent in the Paleozoic period. It has further been found possible to plot out the main families of ferns into a phyletic scheme, suggesting their relationships, not an "Evolutionary Tree" but in some more loose sense indicating affinities based upon their features as compared, and with the results checked according to paleontological data. Such a scheme was submitted.

Further, the question of the ultimate origin of the class was discussed. It was pointed out that if a précis, or verbal specification were drawn up, embodying all the characters held to be most archaic in Ferns as at present known, that specification would present a primitive organism not unlike such Devonian plants as *Rhynia* or *Hornea*. It is not suggested that anyknown fossil is the actual progenitor of Ferns as we know them. But it is suggested that Ferns may have taken their origin from vegetation of the type now recognized, and known in form and structural detail, as existing in early Devonian time.

Arthur H. Graves,
Secretary.

NEWS NOTES

The Wagner Free Institute of Science of Philadelphia is to publish a quarterly bulletin. Volume II of the Transactions is now in press with a paper on the Chemistry and Physiology of North American Pitcher Plants by Dr. Joseph S. Hepburn.

Dr. Charles F. Chandler, for many years professor of chemistry at the College of Physicians and Surgeons, and a lecturer at the New York College of Pharmacy, died on August 25th last. He was a lover of plants and much interested in botany. For a number of years he was one of the Scientific Directors of the New York Botanical Garden.

Dr. Ralph W. Tower of the American Museum of Natural History died on January 26th. Dr. Tower was for a long time the editor of the weekly bulletin of the New York Academy of Sciences.

The Torrey Botanical Club

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OF THE

TORREY BOTANICAL CLUB

(1) BULLETIN

A monthly journal devoted to general botany, established 1870. Vol. 49, published in 1922, contained 408 pages of text and 17 full page plates. Price $4.00 per annum. For Europe, $4.25. Dulau & Co., 47 Soho Square, London, are agents for England.

Of former volumes, 24–47 can be supplied separately at $4.00 each; certain numbers of other volumes are available, but the entire stock of some numbers has been reserved for the completion of sets. Single copies (40 cents) will be furnished only when not breaking complete volumes.

(2) MEMOIRS

The MEMOIRS, established 1889, are published at irregular intervals. Volumes 1–17 are now completed. The subscription price is fixed at $3.00 per volume in advance; Vol. 17, containing Proceedings of the Semi-Centennial Anniversary of the Club, 490 pages, was issued in 1918, price $5.00. Certain numbers can also be purchased singly. A list of titles of the individual papers and of prices will be furnished on application.

(3) **Preliminary Catalogue of Anthophyta and Pteridophyta** reported as growing within one hundred miles of New York, 1888. Price, $1.00.

Correspondence relating to the above publications should be addressed to

RALPH C. BENEDICT
Brooklyn Botanic Garden,
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BY

GEORGE T. HASTINGS

John Torrey, 1796–1873

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TORREYA

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SHOWY WILD FLOWERS THAT DO NOT NEED TO BE PROTECTED

G. E. Nichols

A unique venture in the interest of wild flower preservation has been launched by the Connecticut Botanical Society, in conjunction with the Garden Club of New Haven. Prizes are offered for the best collections of fifty Connecticut flowers made during the year 1926 to illustrate the title which appears at the head of this paper. The contest is a purely local one, being open only to Connecticut children sixteen years of age or under, and, for the present year, only to those residing in New Haven or one of the towns immediately adjoining (viz., West Haven, Woodbridge, Hamden, North Haven, and East Haven). The nature of the contest is here described with the thought that other organizations or groups may wish to sponsor a similar one.

Three prizes are offered, namely, a First Prize of $20, a Second Prize of $10, and a Third Prize of $5; in addition to which there will be five Honorable Mention awards, each consisting of a year's membership in the Wild Flower Preservation Society, including subscription to "Wild Flower," the official magazine of that society.

The idea of offering prizes for collections of wild flowers is by no means a new one. My own first effort along botanical lines was in competition for a prize of $5 offered by the Massachusetts Horticultural Society, in 1894, for the best collection of 125 native wild flowers. In such contests the chief motive is to encourage the study, among school children in particular, of native plants, and perhaps also to secure data regarding their local distribution. The present contest differs in that its manifest object is to stimulate interest in the subject of wild flower protection. Specifically, it is aimed at one particular phase of the situation, namely, the indiscriminate picking of showy wild flowers for decorative purposes. It is actuated by the realization of two facts: first, that some of our native wild flowers are in danger of extermination while many others are rapidly becoming scarcer as a result, very largely, of picking; second, that there are various common wild flowers, some of them ordinarily classed as weeds, which are quite as showy as their more sensitive relations and which can be utilized for decorative purposes with equal effect, but which can be picked freely, without the slightest danger of decreasing their abundance in the wild.

The plants comprising each collection are to be pressed, dried, mounted on herbarium sheets of standard size, and labeled, according to directions which will be provided.* The specimens are to show stem, leaves and flowers; but they are not to include the roots. Each collection is to be accompanied by a list of the species represented, giving both common and scientific names. The relative merits of the various collections are to be judged and the prizes awarded with reference, first of all, to the discrimination shown in selecting the kinds of plants to be included. There should be fifty species, no more and no less. Assuming, as the primary requisite, that only those flowers are included which can be picked without endangering their continued abundance in the wild, these should be chosen further with particular reference to their decorative value as cut (or picked) flowers; so much so that they may fairly be recommended as appropriate substitutes for various native wild flowers which need to be protected. A second point to be considered in judging the collections will be the neatness and care shown in the preparation, mounting and labeling of the individual specimens, and the accuracy shown in their determination. Credit will also be given for the inclusion of any original ideas which may be in harmony with the spirit of the contest.

All collections are to be sent to the Osborn Botanical Laboratory of Yale University during the week between Christmas and New Year. The awards will be announced at the annual meeting of the Connecticut Botanical Society, early in 1927, and the collections will be placed on exhibition at that time. At the close of the competition, all specimens will be returned to their owners.

So much for the details of the competition itself. The present article is being written with the intention, in part, of offering

* Detailed directions, together with a copy of this paper, can be secured for 15 cents (stamps) from the Corresponding Secretary of the Connecticut Botanical Society (Mr. A. E. Blewitt, 71 Eastwood Ave., Waterbury, Conn.).

certain suggestions to prospective contestants—suggestions which might apply equally well in any other similar contest; in part with a view to setting forth a few fundamental ideas regarding wild flower protection.

At the outset it is urged that all the contestants should enter fully into the spirit of the wild life conservation idea, of which wild flower protection is but one aspect. Much of the wild life that formerly predominated in Connecticut has vanished. To a large extent, of course, this has been brought about, as an unavoidable accompaniment of advancing civilization, through the destruction or modification of the habitat conditions which originally prevailed. The clearing of land for settlement and agriculture, the cutting of the forests for lumber and firewood, the devastation of vast tracts by forest fires, the draining of many swamps and the flooding of others, the plowing up of the ground for the production of crops, the introduction of grazing animals, the laying out of highways and railroads, the establishment and growth of towns and cities, the pollution of streams and lakes by sewage and other waste products and of the air by gas and smoke—all of these and various other more or less inevitable effects of human activity have contributed toward bringing about the disappearance of our native wild life. But they are by no means wholly responsible. In no small degree this disappearance must be attributed to the neglect of past generations in failing to take adequate conservation measures, a neglect which too often has found, and indeed still finds, deliberate expression in actions bordering closely on vandalism. Fifteen years ago, for example, in the northern Michigan cedar swamp where the accompanying photograph (Fig. 1) was taken, there were estimated to be fully fifteen thousand showy lady's slippers in bloom. Last summer there probably were not more than a thousand blossoms, most of these back in the more inaccessible parts of the swamp. The others had been carted away by the flower-pickers. This beautiful orchid once abounded in a swamp within three miles of the New Haven city hall, but the last recorded specimen from that locality was collected in 1875. As late as the early nineties the *Arethusa* grew in great profusion in the so-called Beaver Meadows, New Haven; in 1904 we were able to find just one single plant. Dozens of other showy plants might be cited which have practically (and some completely) vanished from the vicinity of New Haven within the past fifty years, and not a few within the past decade.

FIG. 1.
Showy lady's slippers in a northern Michigan cedar swamp.

It is not a mere matter of sentiment, this movement to protect not only our wild flowers but all forms of wild life which are in danger of extermination. And yet, sentiment we must have, for by no other means can interest be created in the necessity of taking the active measures which are essential if the desired results are to be accomplished. The wild life of today represents a heritage from the past. It is something which we of the present generation are under obligation to preserve, if future generations are to inherit in full measure their share in the great out-of-doors. The wild flower protection movement does not aim to discourage the picking of wild flowers of every description. It aims rather to encourage an intelligent discrimination between the many plants whose flowers can be picked freely, without endangering their continued abundance in the wild, and the comparatively few whose very existence, like that of the showy lady's slipper and the *Arethusa*, may be terminated by picking.

Why it is that certain plants can be picked freely, and others not, may be more readily understood, perhaps, if we consider for a moment the life relations of plants in general; for plants, in common with animals, are living organisms. The life activities of plants, like those of animals, are directed toward two ends, namely the maintenance of the plant as an individual and the propagation of the plant as a species. The flower is the reproductive organ of the plant. It gives rise to the seeds, by which the plant is propagated. Picking the flowers, therefore, means that no seeds will be produced. In many cases, however, where the plants are abundant and where they blossom prolifically, producing numerous seeds which germinate readily, the flowers may be picked freely without apparent detriment. This, of course, is notoriously true of the plants we commonly class as weeds, which flourish in spite of all our efforts to get rid of them; and it is equally true of various other plants. With many plants, however, propagation is uncertain enough, even when the flowers are left to go to seed. In some forms, such as the trailing arbutus, for example, seasonal or other conditions may be such that seeds are produced only at infrequent intervals; and even then there may be but a few that are fertile. Again, the seeds of no plant will germinate unless they happen to fall in situations which are favorable to germination; and some plants are very exacting in this respect. In any event, the majority of the seeds produced in nature fall on "sterile ground." With annual plants, therefore, which are dependent entirely upon seeds to carry over the species from one year to the next, only those forms should be picked which, as indicated by their present abundance, have demonstrated an unquestioned ability to take care of themselves.

With perennial plants the situation is somewhat different. For the most part, wild herbaceous perennials, like the cultivated ones of our gardens, are provided with underground parts by which, under favorable circumstances, the individual plant may live on indefinitely, dying down to the ground at the end of one season and sprouting up afresh at the beginning of the next. But if the part of the plant above ground be broken off in mid-season, and with it the leaves, the chances are that the subterranean parts which remain will die of starvation; for the leaves are the factories, so to speak, where the plant's food is manufactured. The danger of extermination in this way is particularly great in plants such as the trilliums and the jack-in-the-pulpit, where the leaves inevitably are taken in picking the flower. The danger is much less in plants which develop tall flowering-stems that are leafy nearly to the ground, provided the flowers are broken off with a short stem and few leaves, care being taken to leave sufficient foliage on the stump to maintain the continued activity of the underground parts. To this class belong various of the wild lilies, the increasing scarcity of which is due very largely to the insistence of people, intentional or otherwise, on picking long stems. The flowers alone of any plant, for that matter, may be plucked without endangering the life of the plant as an individual. Such procedure is practicable, however, only in the case of forms such as the dog-tooth violet, the pink lady's slipper, and the Dutchman's breeches which have long-stemmed flowers; and even with these it is important to remember that the removal of the flowers, while it may not interfere with the life of the plant as an individual, does prevent the development of seeds.

There are a goodly number of herbaceous perennials, however, in which the multiplication in the number of individual plants is not wholly dependent upon propagation by seeds; although here again it is the seeds which must be depended on if new individuals are to be developed at any great distance from the parent plant. These plants propagate themselves more or less copiously by means of rootstocks and other so-called "vegetative" methods. Such, for example, are the golden rods and the asters, which almost invariably show young sprouts with well-developed clumps of leaves around the base of the flowering-stem. In plants of this description the entire stem may be broken off, with reasonable assurance that the particular individual will continue not only to thrive but to multiply. Again, in some perennial plants, such as the violets, there are two kinds of flowers: large, showy ones which are mostly sterile, and small, inconspicuous ones which produce the seeds. But even in picking violets, more especially the leafy-stemmed forms, it must be remembered that the development of the inconspicuous fertile flowers cannot take place in the absence of leaves.

Coming now to the practical application of the facts just outlined to the principle of wild flower protection, it would seem a fairly conservative general rule that all wild plants should be picked sparingly, if at all, with the exception of those which exhibit a marked ability to propagate themselves vegetatively or to spread and establish themselves by means of seeds. As the outstanding illustration of plants which spread prolifically, it may well be asked to what extent weeds can be utilized for decorative purposes. In answer to this question, I will only suggest that while, as a group, these economically undesirable plants, mostly immigrants from other sections of the world, may seem to present little in the way of attractiveness, nevertheless there are a remarkably large number of exceptions; such, for instance, as the common white daisy and the black-eyed Susan, the musk-mallow and the wild carrot, the butter and eggs and the bouncing-bet. Between those flowers which can be picked in practically unlimited quantities, without fear of extermination, and flowers that should not be picked at all, there are, of course, all degrees of intergradation. In the list of plants which should not be picked at all belong all forms which, for any reason whatsoever, are notably rare; and in this connection it may well be pointed out that there are some plants which may reasonably be picked in one section of the country, or in one locality, but not in another; as the twin-flower in the northwoods where it reproduces vigorously, but not in southern New England, near the southward limit of its range, where it is on the verge of extinction. Mountain laurel in Connecticut is in no danger of actual extermination: in localities where it is abundant and which are not too accessible, no stigma can be attached to picking its blossoms, in moderation. But the situation is very different where the laurel grows along highways or in the vicinity of towns. Here it should not be picked at all. The blossoms of the flowering dogwood should never be taken: the mutilated trees are an eyesore and the flowers quickly wilt after being picked.

In the case of evergreen plants, the practise of using the foliage for decorative purposes during the Christmas season would seem to constitute an even greater menace to continued existence in the wild than the custom of picking during the blossoming season, especially where these plants are subject to commercial exploitation. Some enthusiasts would go so far as to completely taboo the use of wild evergreens in this way. They would even prohibit the use of the balsam fir for Christmas trees because, they assert, this practice constitutes a source of danger to our future lumber supplies. The absurdity of this latter contention is fully appreciated by the forester and by all who are familiar with the balsam fir in its native home, to say nothing of its inconsequential value as a timber tree; but it continues to occupy space in the news columns every year. The mountain laurel has indeed been exterminated in many populous localities, chiefly through the use of its foliage for winter greens; and yet there is every reason to believe that, if properly safeguarded as to methods of picking, the future of the laurel is in little danger. The use of the holly for Christmas decorations, on the other hand, constitutes a very real menace: formerly a native Connecticut tree, not a single wild specimen is now known in this State, and it has been getting noticeably scarcer in recent years throughout its entire geographic range. So also, perhaps, the ground pine and running pine (species of *Lycopodium*) which, by reason of their popularity in making Christmas wreaths, seem destined to extinction over large parts of their ranges, unless measures are taken for their protection.

SPARE THE FLOWERS

Don't Pull Them Up by the Roots.
Don't Pick Many of Them.
Don't Take the Rare Kinds at All.

YOU CAN DO YOUR PART

Save our native wild flowers from destruction. Help to keep them for next year and every year.

Connecticut Botanical Society

FIG. 2.

Wild flower protection poster used by the Connecticut Botanical Society.

Wild flower protection, then, does not mean that we should forego the enjoyment of all except the very commonest and most prolific flowers. It does mean that, except for these commoner and more prolific forms, we should pick them sparingly and that we should not pick the rare kinds at all; and the true spirit of wild flower protection will often lead one, in the effort to influence others by force of example, to live up to the rules of conservation somewhat more strictly than circumstances might otherwise demand. There would have been no harm, for example, if each of the four children pictured in the accompanying photograph had picked a single lady's slipper to carry back to camp. And yet, to have done so might very likely have paved the way for others to pick them by the armful, by way of demonstrating their greater appreciation of Nature's beauty.

After all, one does not have to pick one's favorite wild flowers in order to enjoy them. I know a fine bed of trailing arbutus, for example, almost within the New Haven city limits. No one else seems to have discovered it. Nearly every year I go out and rake off the dead leaves; but I would not think of picking the blossoms. There is a certain pride in its "possession," a sort of proprietary feeling which any one can enjoy who knows the location of some woodland rarity, even if, as in this case, the land it grows on happens to belong to somebody else. Again, many of the native wild flowers readily adapt themselves to cultivation in the garden; although it should also be emphasized that many do not, especially various of the rarer woodland varieties which speedily succumb except under very special treatment. In the Marsh Botanical Garden, at Yale, we have made a start in the cultivation of native American herbaceous perennials under ordinary garden conditions, the collection now, at the beginning of the third season, comprising upwards of 250 different kinds. Finally, there is the camera, with the aid of which one can gradually build up a year-round collection of all his favorite wild flowers; a collection which can be supplemented, if desired, by the purchase of various other "photo-flowers," obtainable in the market for a comparatively trifling sum.

To select fifty showy Connecticut wild flowers which do not need to be protected is not at all a difficult matter, since the number of kinds which may indisputably be included in this category is many times greater. Among the native golden-rods and asters, for example, there are nearly forty rather common species, all of which are more or less attractive and many decidedly showy. To select fifty kinds which are among those most suitable for decorative purposes, while at the same time among those least in need of protection, is the ideal to be aimed at in the present competition. Chiefly by way of suggestion, two lists of Connecticut wild plants are herewith appended, the first of flowers which need to be protected, the second of flowers which do not. In the first list a star is placed against the names of those which should not be picked at all; in the second against those that should be protected in certain sections of the State. These lists are intended to apply to conditions prevailing in the State of Connecticut, taken as a whole, and in large measure to conditions prevailing in the country, since in the immediate vicinity of cities and towns, picnic places and resorts, it is only through the adoption of more or less drastic regulations that the extermination even of various common forms can be prevented. The disposition of the various species in these lists is based partly on the field observations of the writer and partly on the opinions offered by several other members of the Connecticut Botanical Society. The lists do not pretend to be complete. They do not necessarily include all of the showy wild plants of Connecticut; neither would all the plants listed necessarily be classed as showy. In particular it might be mentioned, in this connection, that some otherwise rather showy plants are worthless for decorative purposes because they wilt almost immediately after being picked. Among those which behave in this way to a more or less pronounced degree, in addition to the flowering dogwood, are the blue-eyed grass, blood-root, chicory, elderberries, evening primroses, gerardias, golden ragwort, jewel weed, meadow beauty, morning glory, and wild geranium. The plants are listed by their common names, as given in the Catalogue of the flowering plants and ferns of Connecticut, published by the State Geological and Natural History Survey, scientific names being given only in cases where the identity might otherwise be in question.

YALE UNIVERSITY,
NEW HAVEN, CONN.

CONNECTICUT WILD FLOWERS WHICH NEED TO BE PROTECTED

Especially those marked with a star

Arethusa*
Azaleas
Baneberries
Bird-foot violet
Blazing star (*Chamaelirium*)*
Bluebell
Buckbean
Bunchberry
Calopogon
Canada violet
Cardinal flower
Climbing fumitory
Columbine
Cordalis
Dragon root
Dutchman's breeches
Early yellow violet

False miterwort
Flowering dogwood
Gentians*
Ginseng*
Globe-flower*
Golden seal*
Great blue lobelia
Holly*
Indian pipe
Lady's slippers*
Ladies' tresses
May apple
Meadow beauty
Miterwort
Orchids (all kinds)*
Painted trillium*
Pipsissewas
Pitcher plant*
Pogonias
Prickly pear
Purple clematis*
Redbud*
Rhododendron*
Rhodora
Sea pink*
Shin leaf
Squirrel corn*
Trailing arbutus*
Twin-flower*
Twisted stalk
White trilliums
Wild calla
Wild lilies
Wild pink
Wild senna

Connecticut Wild Flowers which do not need to be Protected
Except, in certain localities, those marked with a star

Agrimony
Anemone*
Angelica
Arrow-head
Asters (most kinds)
Barberry
Beach pea*
Beard-tongues*
Bedstraws
Bellworts*
Bittersweet*
Blackberries
Black cohosh*
Black-eyed Susan
Blazing star (*Liatris*)*
Bloodroot*
Blueberries
Blue curls
Blue-eyed grass
Blue flags*
Bluets
Boneset
Bouncing-bet
Bush honeysuckle
Butter and eggs
Buttercups
Butterfly-weed*
Button bush
Canadian burnet*
Caraway
Cat-tails
Celandine
Chicory
Chokeberries
Climbing hempweed*
Clovers
Cone-flowers
Cornels (the shrubby kinds)
Culver's physic*
Cypress spurge
Daisy
Dandelion
Day lily
Devil's paint-brush
Dogbanes
Dog-tooth violet
Elecampane
Elderberries
Evening primroses
Everlastings
False Solomon's seal*
Figworts
Fireweed
Fleabanes
Fringed polygala*
Goat's rue*
Golden Alexanders
Golden club*
Golden ragwort
Golden-rods (most kinds)
Grass of Parnassus*
Hawkweeds
Hawthorns
Heal-all
Hepatica*
Huckleberry
Ironweed
Jack-in-the-pulpit*
Jewelweed
Joe-pye weed
Knotweeds
Loosestrifes
Lousewort
Lupine*
Marsh marigold
Meadow rue
Meadow-sweet
Milkweeds (most kinds)
Mints
Mountain laurel*
Mulleins
Musk mallow
New Jersey tea
Painted cup*
Partridge berry*
Pokeweed
Purple-flowering raspberry*
Purple gerardias
Rattlesnake root
Robin's plantain
Rock cress
Rose mallow*
Rue anemone
St. John's worts
Sarsaparillas
Saxifrages
Sea lavendar*

Shad bushes
Sheep laurel
Skullcaps
Sneezeweed
Solomon's seal
Spice bush
Spikenard*
Spring beauty*
Star flower*
Star grass (*Hypoxis*)
Steeple bush
Sweet Cicely
Sweet clovers
Sweet pepperbush
Tansy
Thistles
Thoroughwort
Tick trefoils
Toadflaxes
Toothworts*
Turtlehead*
Vervains
Vetches
Viburnums
Violets (most kinds)
Viper's bugloss
Water hemlock
Water lilies
Water parsnip
White clematis*
White-flowered bush clovers
White snakeroot
Wild bean (*Apios*)
Wild carrot
Wild cherries
Wild currants
Wild geranium
Wild indigo
Wild lettuce
Wild lily of the valley
Wild morning glory
Wild mustards
Wild parsnip
Wild plums*
Wild radish
Wild roses
Wild sarsaparilla
Wild sunflowers
Winterberries*
Witch-hazel
Yarrow
Yellow-flowered cinquefoils
Yellow gerardias*
Yellow rocket

THE PERSISTENCE OF SOME OF OUR NATIVE PLANTS*

George Redles

Conopholis Americana.—This colony was observed about 1825 by the late Wm. Wynne Wister along the Wissahickon and then my father located it, who showed it to me at least fifty years ago, so it has been under observation for at least 100 years. The same directions for finding it still hold good, notwithstanding a sewer and bridle path have been constructed in the immediate vicinity. It seems to be of about the same dimensions as originally noted, even to the same black oak host. Efforts to propagate it from seed have so far failed in other locations.

Aletris farinosa and *Chamaelirium luteum*.—These were found growing in what was originally a more or less damp situation, caused by a brook running on a level with the place, but now, owing to erosion, they are left high and dry close to the top of the hill, the brook twenty feet below and the road close to a hundred feet below, which naturally causes the situation to become very dry under ordinary conditions. The Chamaelirium, originally about twenty-five plants, has dwindled to a single

* A paper delivered at the meeting of the Phila. Botanic Club, October 22, 1925.

specimen, persisting in spite of the adverse conditions. The *Aletris*, consisting of about fifteen plants, has persisted in spite of the conditions.

Schizea pusilla at the Egg Harbor station, so graphically described in Witmer Stone's "The Plants of the New Jersey Pine Barrens," was still numerous about 10 years ago when visited by a delegation of the American Fern Society under my leadership. It has now so far disappeared that only one plant was noted on a recent visit, no doubt due to its accessibility.

Gentiana Andrewsii, a clump has furnished material for porch decoration for at least twenty years and was more vigorous this year than ever. Being a perennial it is not subject to such wide variation as *G. crinita*, this being one of the years when that species is extremely abundant.

Pogonia verticillata, which was previously found in dry situations, was shown growing in a white cedar swamp in New Jersey alongside of *Helonias bullata*, *Schizea* and *Blephariglottis*.

Aristolochia serpentaria, 85 plants growing with *Polygala polygama* in a space of 3 yards square.

Amianthium muscitoxicum, growing in a swamp at Clementon, N. J. and on dry hills in Pennsylvania.

Cypripedium pubescens, a clump with 30 blooms growing in a bog which is the condition always noted for this variety.

Hydrastis Canadensis, while collecting the berries in previous years I had noted that ants carried mud up to the berries where they lay on the leaves and buried them for, I suppose, future eating. This year I noted a large number of the common daddy-long-legs feeding on the berries.

Germantown,
Philadelphia, Pa.

TWO NEW SPECIES FROM THE MOUNTAINS OF WEST VIRGINIA

P. A. Rydberg

While botanizing last summer in the higher Alleghany Mountains I found a few undescribed species. Two of these were collected in West Virginia. For several days we were camped at Simmons' farm near Dry Run Gap, half way between Crab-

ACONITUM VACCARUM Rydb.

bottom, Va., and Circleville, W. Va. On the slopes south of said farm, a species of *Heuchera* was collected. Mr. Simmons told us that one of his neighbors had lost several head of cattle from larkspur poison. He took us to the place where the plant was supposed to grow, but we found no specimens. Very likely the owner of the land had eradicated all the obnoxious plants. A week later we collected on Spruce Knob, the highest mountain in West Virginia. We stayed at the house of Mr. Moses Bennett, the United States Forest Ranger, and he told us that he knew where larkspur grew, and that cattle had been poisoned also in his neighborhood. He took me to the place. The plant, however, was not a larkspur (*Delphinium*) but a monkshood (*Aconitum*), with nearly white flowers. The hood is high and narrow, which gives the flower some likeness with that of a larkspur.

Aconitum vaccarum Rydb. n. sp.

A perennial with a fleshy root; stem 0.5–2 m. high, glabrous, or sparingly pubescent, erect; basal leaves long-petioled, the petioles 2–3 dm. long; blades reniform, 10–15 cm. broad, deeply 5–7-cleft, the divisions sub-rhombic, 3- or 2-lobed and coarsely serrate, glabrous on both sides, somewhat paler beneath; lower stem-leaves similar but smaller and short-petioled, the uppermost subsessile and 3-cleft; racemes 2–4 dm. long, simple or with a few branches below; pedicels 1–2 cm. long, strongly ascending; flowers dull-white, tinged with greenish yellow without; lower sepals obliquely lanceolate or ovate, 8 mm. long, ciliolate, the lateral ones suborbicular, 8–9 mm. long, ciliate, the hood elongate, 2 cm. long, 4–5 mm. broad at the middle, rounded at the apex; the nectaries of the petals 4 mm. long, equaling the claws, often shaped like the petals of the garden *Aquilegia;* carpels 3, glabrous, erect, with erect styles.

It is related to *A. reclinatum* but the stem is erect, the pedicels more ascending, nearly erect, and the lobes of the leaves longer and more pointed. It was originally discovered by U. S. Forest Ranger Moses Bennett.

Type collected on the east slope of Spruce Knob, West Virginia, *P. A. Rydberg 9206* (herb. N. Y. Bot. Garden).

Heuchera alba Rydb. sp. nov.

V

Perennial with a thick root-stock; flowering shoots scape-like or with 1–3 small leaves, 3–4 dm. high, minutely glandular puberulent; leaves mostly basal; petioles 5–10 cm. long; blades

HEUCHERA ALBA Rydb.

rounded-reniform, 4–6 cm. broad, glandular granuliferous beneath, ciliate on the margins and less so on the veins beneath, mostly 7-lobed, the lobes broadly rounded-ovate, and dentate with broadly ovate teeth; stem leaves, if present, smaller and with more acute lobes and teeth; inflorescence rather narrow, branched below, the branches short; hypanthium obliquely campanulate, green, with the sepals about 8 mm. long; sepals unequal, the upper slightly longer, oblong, rounded at the apex, ciliolate; petals white, broadly ovate or spatulate, slightly exceeding the sepals, crenulate stamens as long as the sepals.

This species is most closely related to *H. scabra* Rydb., but differs in the more rounded lobes and teeth of the leaves, the more open and shorter flowers, shorter sepals, shorter, broader and pure-white petals.

Type collected on the northeast slope of Snowy Mountain, Pendleton County, West Virginia, opposite Simmons' farm, June 17, 1925, *P. A. Rydberg 9026* (herb. N. Y. Bot. Gard.).

Explanation of plates

PLATE 1. *Aconitum vaccarum* Rydb. n. sp.

1. Upper parts of plant. 2. Basal leaf, *2/3, nat. size.* 3. Hood (upper sepal). 4. Lateral sepals. 5. Lower sepals. 6. Petals. 7. Stamens and pistils. 8. Stamens, separate, of different series. 9. Pistils, *nat. size.* 10. Young carpels, $\times 1\frac{1}{2}$.

PLATE 2. *Heuchera alba* Rydb. n. sp.

1. Scape. 2, 3. Basal leaves, $\times \frac{2}{3}$. 4. Flower. 5. The same laid open, $\times 1\frac{1}{3}$. 6. Petals. 7. Stamens, the uppermost ones longest, $\times 3$.

A NEW PALM FROM THE MISSISSIPPI DELTA

JOHN K. SMALL

"It is also in the lower portion of this belt [Coastal Plain of Texas] (where the palm tribe is represented by the *Chamaerops Palmetto*) that the Palmetto attains a growth as gorgeous even as in the lower Mississippi; it extends on the Rio Bravo [Rio Grande] up to about 80 miles from the gulf."

"In addition to the Palmetto common to the lower portions of these two great rivers, . . ."* The reference to a gorgeous growth of cabbage-trees along the lower Mississippi River has

* Arthur V. Schott, in Report, United States and Mexican Boundary Survey 1^2: 44. 1857.

been taken as a somewhat exaggerated statement, for the cabbage tree had not been collected from or otherwise mentioned as growing in the nearly one thousand miles of coast line extending from Saint Andrews Bay in Florida to the mouth of the Rio Grande in Texas. Perhaps the extensive engineering operations along the lower Mississippi, a half century ago, exterminated the more conspicuous growths of this palm. The engineers in charge of the work there were, evidently, not botanists, else some record of the occurrence there, in addition to Schott's, would have found its way into print.

We now know that Arthur Schott's record should have been taken as an interesting clue for investigation. The clue was not followed up; but after a lapse of three-quarters of a century, this palm was rediscovered by mere accident. On the tenth day of last April, while driving from Point aux Herbes on Lake Pontchartrain to New Orleans, Edgar T. Wherry and the writer unexpectedly came upon a grove of palms which evidently represent the kind referred to by Arthur Schott in the above quotation. To meet with erect-stemmed palms far out of the known range of any such plant was a great surprise. A first glance at the trees naturally suggested the cabbage-tree (*Sabal Palmetto*). A second glance indicated something quite different. This palm, although resembling the cabbage-tree in habit, is really related to the blue-stem (*Sabal minor*). As this discovery was the direct outcome of the interest and cooperation of Mr. Charles Deering, this palm may be known as:

Sabal Deeringiana Small, sp. nov. Tree up to 4 m. tall, the stout trunk often 1–2 m. usually soon devoid of the leaf-bases: leaves spreading in all directions, 2–3 m. long: petioles longer than the blades, stout; blades ample, suborbicular, deep-green, coarsely many-ribbed, the midrib stout, extending high up into the flat blade, the segments longer than the palm of the blade, filiferous: spadix erect or ascending, conspicuously elongate, up to 5 m. long, the branches numerous, short: sepals very broad, fully 1 mm. long: petals white, strongly involute, ovate, broadly so when flattened out, 2.5–3 mm. long: stamens 3–3.5 mm. long; filaments lanceolate or subulate-lanceolate; anthers ovoid, much shorter than the filaments, usually about 1 mm. long: drupes much depressed, 10–13 mm. in diameter, black: seeds much-depressed, 8–9 mm. in diameter, yellow until maturity, then becoming dark-brown.—Flat alluvial places, near Point aux Herbes, along Lake Pontchartrain, Louisiana.

The salient characters separating *Sabal Deeringiana* from *S. minor* are the erect habit, the large trunk, the long midrib of the leaf, the broader petals and anthers, and the larger depressed drupe. Leaf-specimens were collected by the writer on April 10th, 1925. Flowering specimens (July 5, 1925) and fruiting specimens (November, 1925) were secured for us by Professor R. S. Cocks. The type specimens are in the herbarium of The New York Botanical Garden.

New York Botanical Garden,
New York

A NEW BELLFLOWER FROM FLORIDA

John K. Small

An endemic bellflower—*Campanula floridana*—has been known from Florida for many years, although it was not formally named and published until 1878. The earliest specimens were collected during the Seminole Wars by Dr. Leavenworth an army surgeon who records that they were "Found in a savannah not far from the scene of Dade's Massacre." This is a delicate plant with bright-blue starry flowers. Less than two years ago a second endemic species was discovered in the same part of Florida. It grows on the northern slopes of Chinsegut Hill about five miles north of Brooksville. This hill is said to be the highest point in Florida—reported as 366 feet altitude—and a historic spot, having been close to De Soto's trail in his northward march through the Florida peninsula. This bellflower may be known as:

Campanula Robinsiae Small, sp. nov. Annual with a slender tap-root and delicate roots: stem 1–15 cm. tall, very slender, simple or branched at the base and above, angled: leaves alternate; blades various, those on the lower part of the plant ovate to elliptic-ovate, 6–12 mm. long, those on the upper parts of the stem elliptic to lanceolate or linear-lanceolate, all with few remote gland-like teeth, or those of the upper ones entire: flowers on slender ascending or spreading axillary and terminal pedicels 2–6 mm. long: hypanthium hemispheric at anthesis, subglobose in fruit, glabrous: sepals lanceolate or subulate-lanceolate, about 1.5 mm. long, acute, glabrous: corolla rotate-campanulate, pale-blue, 7–8 mm. wide: lobes elliptic-ovate or elliptic-lanceolate, longer than the tube, obtuse or acutish, faintly veined: stamens shorter than the corolla; filaments subulate-filiform; anthers linear, about 1 mm. long, rather longer than the filaments: style slender-columnar; stigmas curled backward: capsule subglobose, about 2 mm. in diameter, topped by the persistent calyx, opening by usually 3 large basal pores: seeds numerous, about .025 mm. in diameter.—Grassy slopes, Chinsegut Hill, near Brooksville, Florida.—Spring.

Curiously enough the plant just described is most closely related to the Texan bellflower (*Campanula Reverchonii*). It differs conspicuously, however, in the glabrous leaves, the short hypanthium, the smaller calyx, the smaller corolla with a shorter tube, and the subglobose capsule. The plants grow most abundantly about half way up the hill from Lake Lindsay and near the summit. The species is named for Mrs. Raymond Robins who was present when the specimens were discovered. Mrs. Robins is making an extensive botanical garden on Chinsegut Hill where plants have a great variety of natural habitats to suit their various demands as to protection, exposure, moisture, light, shade, and soil. The type specimen is in the herbarium of The New York Botanical Garden, New York.

BOOK REVIEWS

Mosses with a Hand-lens.

The 3rd edition of Dr. Grout's "Mosses with a Hand-lens"* is practically a new book. The treatment of the Hepaticae has been prepared by Dr. Marshall A. Howe. In the preliminary introductory discussions we are told that the relation of mosses to soil making and ecology, and the treatment of their life history is much fuller "to serve the purpose of a textbook in schools and colleges.

A wealth of many illustrations, mostly halftone pictures, both of moss habitats and of the plants themselves, give the volume a most attractive appearance and should make many new moss lovers and students. Many of these pictures very successfully present the miniature parts of these moss subjects. *Mnium punctatum elatum* becomes a thing of flower-like beauty suggestive of florets of Verbena. The habitat pictures, as of *Thuidium* and

* A. J. Grout, Mosses with a Hand-lens. 3rd Edition. A popular guide to the common or conspicuous mosses and liverworts of the northeastern United States. A. J. Grout, New Brighton, Staten Island, New York.

Hypnum, very successfully show characteristic features of these forms in growth. The technical illustrations are clear and very well represented.

Dr. Howe's treatment of Hepaticae has also a wealth of illustrations including many halftone pictures as well as line drawings. An illustrated glossary of special bryological terms is a valuable feature both for the individual student who wants to become acquainted with some of the native Hepatics and for class work.

R. C. Benedict

The Native Flora of the Vicinity of Cold Spring Harbor, L. I., N. Y.*

This work should be of great interest and value to any botanist who may wish to study the plants of the Cold Spring Harbor (N. Y.) region, as either a systematist or an ecologist. Preliminary chapters on the geology, soils and climate of Long Island, which are written with special reference to the region around Cold Spring Harbor, serve as a background for the understanding of the floristic characteristics to which they give rise. The great variety of habitats found in morainic ridges, alluvial plains, prairies, bogs, salt meadows, estuaries of all degrees of salinity, lagoons, littoral dunes and boulder strewn beaches affords an unusually large number of ecological types for so limited an area.

The list of species, which constitutes the major portion of the work, is particularly broad in scope, although the author does not claim completeness, especially in the lower divisions of the thallophytes. "Die Natürliche Pflanzenfamilien" and the "Syllabus der Pflanzenfamilien" (1919) form the basis for the taxonomic sequence of the cryptograms, (exclusive of Pteridophytes), used in this paper, while the arrangement of Britton and Brown's "Illustrated Flora" is followed for the Pteridophytes and seed plants. The list includes 1865 species of living plants, belonging to 991 genera and ranging from the bacteria to the composites. With a few exceptions among the lowest forms, the author gives

* Grier, N. M.—The Native Flora of the Vicinity of Cold Spring Harbor, L. I., N. Y. The American Midland Naturalist, IX, Nov., Jan., May, July and Sept., 1924–25.

the localities in which each species is to be found. In addition to the living plants, the work includes a list of 213 species of fossils, mostly of Cretaceous age, which have been unearthed on Long Island. Following this, a section is devoted to the insect galls of the region, of which 95 are included. An extensive bibliography of works dealing with the flora of Long Island and vicinity completes this very comprehensive guide.

Alexander F. Skutch

PROCEEDINGS OF THE CLUB

Meeting of December 8, 1925

This meeting was held at the American Museum of Natural History. The following were elected to membership in the Club:

Mr. Frank W. Johnson, 1362 Amherst Street, Buffalo, N. Y.

Miss Katherine W. Browne, Barnard College, New York City.

Professor Richards addressed the Club on "Some features of the desert vegetation of Southern Arizona.

A series of lantern slides, illustrating the region around Tucson, were shown with running comment by the speaker.

Geographically there are in this region the mountain ranges running up sometimes to as much as 9,000 feet, the bajadas or foothills, and the mesa-like slopes which fall off gradually to the flood plains of the water courses.

There are two rainy seasons in this part of Arizona, together averaging 10–12 inches: the winter rains, which are light, beginning in the middle of November and lasting until the end of March; the summer rains consisting of few storms, often of great violence, lasting through July and early August.

Three vegetational regions may be considered, corresponding in a general way to the geographical features.

1. The montane region, where the flora is not xerophytic in the strictest sense, for the precipitation is relatively greater here than at lower altitudes. At the higher elevations, species of pine, juniper, live oaks and other arboreal forms are characteristic.

2. The flood plain region, with its cottonwoods and mesquite, is even less typically xerophytic, since the level of the ground water is here well within the reach of the roots of such forms.

The shallower rooted forms may indeed be of a more desert type.

3. The region of the bajadas and mesa-like slopes which lies between, supports a flora which is typically xerophytic, for here during the major part of the year the water supply is at a minimum.

There can, in a broad sense, be distinguished three types of desert vegetation. First, the water storage type with its massive parenchymatous tissues and with the practical absence of leaves of which the cactus is the best example: next the type which meets the dry season by dropping its leaves and entering into a resting condition, out of which it may awaken with surprising speed when the rains come. This is well represented by *Fouquieria splendens*, sometimes incorrectly called the "cane cactus." The last type is that which has leathery leaves which it maintains even in the dry season, of which the creosote bush, *Covillea tridentata*, may be taken as an example.

In addition, a fourth type may be added—the annuals, which are really not xerophytic, growing both winter and summer in the moist season. The seeds of the winter annuals do not germinate in the summer rainy season, but wait until the following winter; nor do the summer annuals develop in the winter. Thus there are two quite distinct annual floras.

The respiration of the succulent type as illustrated by cacti was briefly spoken of at the end. It has long been known that such plants absorb far more oxygen than they emit of carbon dioxide, whereas in the typical plant the amounts are approximately equal. This is due to the fact that the oxidation of the reserve carbohydrates is only partial and stops at the formation of an acid, in this case apparently malic acid. This acid, however, is very unstable in light and during the daytime it is split into simpler products, of which carbon dioxide is the final one. Carbon dioxide arising from the photolytic effect of light on the accumulated acid is not however to be regarded as a true respiratory by-product. One of the results of this action of light is to cause a periodicity in the acidity of the tissues, which rises at night and falls as the day progresses, to rise again as the sun sinks. The amount of carbon dioxide must also vary, and indeed on a bright and warm day the cactus, despite the fact that the photosynthetic processes are active, actually gives forth this gas. The problem is thus a very complicated one. The true respiratory activity of the cactus can only be studied in the absence of light and at moderate temperatures.

Arthur H. Graves,
Secretary.

Meeting of January 12, 1926

The meeting of this date was held at the American Museum of Natural History.

According to the usual program of the annual business meeting, the reports of the various officers for the year were next received.

The Secretary reported that 15 regular meetings of the Club had been held during the year, with a total attendance of 486, an average of 32 persons per meeting. Twenty-six new members were elected during 1925; four were lost through death and six others through resignation. Deducting those dropped for non-payment of dues, the present membership is 291.

The Treasurer, Dr. R. C. Benedict, reported gross receipts of $4852.63 including a balance of $1071.16 brought over from 1924. Disbursements amounted to $4197.47, leaving a balance of $655.16.

Dr. T. E. Hazen, Editor of the Bulletin, reported that Volume 52 contained 553 pages and 10 plates.

The Editor of Torreya, Mr. George T. Hastings, reported the publication of six bi-monthly numbers totaling 138 pages. Dr. Michael Levine, the Business Manager, reported an income of about $105 from advertisers.

Dr. H. M. Denslow, Honorary Custodian of the local herbarium of the New York Botanical Garden reported accessions during the year of about 800 sheets, and spoke of the large collection of the late Eugene Pintard Bicknell presented by Mrs. Bicknell. The number of cases must be increased for the incorporation of this collection.

Dr. M. A. Howe, Delegate to the Council for the New York Academy of Sciences, reported upon attendance at meetings of the Council.

The Chairman of the Field Committee, Dr. Alfred Gundersen, reported that, as in previous years, the field meetings had been held in conjunction with the New York Microscopical Society.

Thirty-nine field meetings were held with an average attendance of 10 persons per meeting.

By unanimous vote of the Club, all officers were reelected for the ensuing year with the exception of Dr. Howe, Delegate to the Council of the New York Academy of Sciences, since Dr. Howe is now a member of the Council in the Academy. Dr. Barnhart was elected in his place.

Dr. Howe recommended that, as in the past, the records of the Club be carefully preserved and bound together for each year.

Arthur H. Graves,
Secretary.

Meeting of January 27, 1926

This meeting was held at the Museum Building of the N. Y. Botanical Garden. The minutes of the meeting of January 12 were read and approved.

Mr. Solomon Kenner, 30 Osborn St., Brooklyn, N. Y., was elected to membership. The following resignations were accepted: Dr. N. E. Stevens, Mr. Augustus O. Bourn, Jr., Mrs. Paula Milton, Mrs. Reginald Hunter Colley, Dr. M. A. Raines, Mrs. Louis B. Fairbanks.

The Secretary spoke of the sudden death of Dr. Tower the day before. Although not a member, Dr. Tower, Secretary of the N. Y. Academy of Sciences, had long been in close touch with the affairs of the Club and had always manifested a splendid spirit of cooperation.

The death of Mr. C. H. Bissell of Southington, Conn., in April, 1925, was also read into the minutes. Mr. Bissell was well known for his work on ferns and also as a collaborator in preparation of the Catalog of the Ferns and Flowering plants of Connecticut, published in 1910.

Dr. Barnhart, Chairman of the Budget Committee offered the following estimates for 1926:

Estimated Income		*Estimated Outgo*	
Membership dues	$1500.00	Bulletin	$2000.00
Bulletin	1000.00	Editor (Bulletin)	100.00
Torreya	150.00	Torreya	500.00
Memoirs	100.00	Index Cards	600.00
Index Cards	650.00	Treasurer	150.00

Interest	$150.00	Bibliographer	$175.00
Advertisements	100.00	Sundries	125.00
Miscellaneous sales	100.00		
	$3750.00		$3650.00
		Bulletin (from surplus)	600.00
			$4250.00

The report of the Budget Committee was adopted by the vote of the Club.

In a brief talk which followed, entitled "The present status of the American chestnut," the Secretary sketched the history of the chestnut blight since its first discovery in the N. Y. Zoological Garden by Mr. H. W. Merkel in 1904. At the present time the disease is spreading in the southern limits of the range of the chestnut and may probably be found in any county where chestnut grows. Experiments carried on by the Brooklyn Botanic Garden in collaboration with the U. S. Dept. of Agriculture have shown that the root tissues are much more resistant than the trunk or stem tissues, hence the fact that in many places coppice or basal shoots are springing from trees apparently killed by the blight. The fact that in some cases these shoots are now bearing nuts is of great significance and importance, since it will enable the chestnut to maintain itself and postpone still further into the future its possible extinction as a species.

Arthur H. Graves,
Secretary.

NEWS NOTES

Fourth International Botanical Congress. Investigators and teachers of the plant sciences, representing all aspects of botany, are invited to attend the International Congress of Plant Sciences to be held in Ithaca, August 16–23, 1926. The congress will be divided into about twelve sections, each with its own program. There will be round table or informal discussions, exhibitions and excursions and inspection trips. General communications concerning the congress should be addressed to Dr. B. M. Duggar, Missouri Botanical Garden, St. Louis, Mo.

Last year the legislature of New York state passed an amendment to the conservation law to protect trailing arbutus. This season the law has been further amended to protect flowering dogwood, mountain laurel and pink lady's slipper. It is made a misdemeanor to pick or injure any of these plants on any public land or along any street or highway.

A new method of controlling crow gall in apple nurseries has been devised by the U. S. Department of Agriculture. The method consists in dipping both stock and scion in an organic mercury solution. The particular compound rejoices in the name hydroxymercurichlorophenol and is used at the rate of one part to four hundred of water. Department Circular No. 376 describes the method.

The University of Minnesota has started work on a new building for botanical work. The building with its equipment will cost $225,000.

We read in Science that Dr. George T. Moore, director of the Missouri Botanical Garden, has returned from a trip to Central America where he secured many additions for the garden's collection of tropical plants. Also that Prof. Samuel J. Record, of the Yale Forestry School, has returned from a collecting trip of two and a half months in the forests of Central America.

G. E. Collins and F. E. Kempton, of the U. S. Bureau of Plant Industries are in Hayti at present, starting experiments with corn hybrids.

Lovers of plants, botanists and horticulturists of the whole world have mourned the death of Luther Burbank, the great breeder of plants. Known as the plant wizard, he has developed more varieties of plants and done more to enrich agriculture and horticulture than any other man. He was active in the work of developing new forms up to the time of his last illness. He died on April 11th at his home in Santa Barbara, California, at the age of seventy-seven.

The Torrey Botanical Club

Contributors of accepted articles and reviews who wish six gratuitous copies of the number of TORREYA in which their papers appear, will kindly notify the editor when returning proof.

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OTHER PUBLICATIONS

OF THE

TORREY BOTANICAL CLUB

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(1) BULLETIN

A monthly journal devoted to general botany, established 1870. Vol. 49, published in 1922, contained 408 pages of text and 17 full page plates. Price $4.00 per annum. For Europe, $4.25. Dulau & Co., 47 Soho Square, London, are agents for England.

Of former volumes, 24–47 can be supplied separately at $4.00 each; certain numbers of other volumes are available, but the entire stock of some numbers has been reserved for the completion of sets. Single copies (40 cents) will be furnished only when not breaking complete volumes.

(2) MEMOIRS

The MEMOIRS, established 1889, are published at irregular intervals. Volumes 1–17 are now completed. The subscription price is fixed at $3.00 per volume in advance; Vol. 17, containing Proceedings of the Semi-Centennial Anniversary of the Club, 490 pages, was issued in 1918, price $5.00. Certain numbers can also be purchased singly. A list of titles of the individual papers and of prices will be furnished on application.

(3) **Preliminary Catalogue of Anthophyta and Pteridophyta** reported as growing within one hundred miles of New York, 1888. Price, $1.00.

Correspondence relating to the above publications should be addressed to

RALPH C. BENEDICT
Brooklyn Botanic Garden,
Brooklyn, N. Y.

Vol. 26 May–June, 1926 No. 3

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A Bi-Monthly Journal of Botanical Notes and News

EDITED FOR

THE TORREY BOTANICAL CLUB

BY

GEORGE T. HASTINGS

John Torrey, 1796–1873

CONTENTS

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THE TORREY BOTANICAL CLUB

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Matter for publication, and books and papers for review, should be addressed to

GEORGE T. HASTINGS
2587 Sedgwick Ave.
New York City.

TORREYA

Vol. 26 No. 3

May-June, 1926

THE EFFECT OF INUNDATION ABOVE A BEAVER DAM UPON UPLAND VEGETATION

Frank C. Gates* and Edith C. Woollett

Late in August, 1924, a beaver dam was discovered in Carp Creek, a small stream about 13 meters wide, flowing from the Gorge—a prominent scenic feature in the region of Douglas Lake, the location of the Biological Station of the University of Michigan. The water flows from Douglas Lake via an underground route and empties into the heads of the Gorge as cold, (8–12° C.), moderately swift flowing streamlets which soon unite as Carp Creek. This stream is about 1.5 kilometers in length and empties into Burt Lake.

The dam as first seen was approximately 38 meters in length and 1.3 meters above the bed of the stream. It empounded water above it a distance of about 180 meters. Time did not permit any special study of the effects upon the vegetation, beyond the general observations that the ground vegetation was quite or entirely wiped out in the upland area covered by the empounded water. Very many of the trees were dying.

By June, 1925, considerable addition had been made to the dam, so that it was now about 69 meters across. This raised the level somewhat, making the empounded water run up stream some 275 meters, furnishing a pond with an area of approximately 9700 square meters. The depth varied from a few centimeters to a maximum of 2.2 meters in a place just above the dam, from which the bottom material had been scooped to plaster the dam. In June, 1925, a subsidiary dam was commenced about 30 meters downstream causing a new inundated area in the woods.

During 1925, the vegetation of the empounded area was studied. This area had previously been streamside woods,

* Contribution No. 249 from the Department of Botany & Plant Pathology, Kansas State Agricultural College and a contribution from the Biological Station of the University of Michigan.

low wooded land, and higher wooded land. Observations were made on the herbaceous, shrubby and arboreous vegetation, including a count of the plants concerned with annotations on their state of vitality.

In the case of the herbaceous vegetation, with two exceptions, the plants formerly existing in moderate profusion had been entirely wiped out following the flooding. The fern, *Onoclea sensibilis*, was sending up its leaves thru 20 centimeters of water in two places and one patch of a species of Carex was maintaining its clump of leaves below 17 centimeters of water, but had not sent up a flowering shoot. A patch of *Lycopodium annotinum* was still alive under 10 centimeters of water, but was obviously dying. No other herbaceous vegetation was noted.

The case of the former shrubs was hardly any better. It was of course somewhat complicated by the fact that many—perhaps most—had been cut off or uprooted to furnish small material in the construction of the dam. Among the shrubs to be expected were:

Acer pennsylvanicum, *Acer spicatum*, *Cornus rugosa*, *Diervilla diervilla*, *Rhus radicans*, *Ribes* spp., *Salix discolor*, *Salix* spp., *Taxus canadensis*, *Viburnum cassinoides*, besides seedlings and saplings of the tree species of the area. Of these, the living seedlings or very small saplings (that is, not over 1 centimeter in diameter) were only on large logs which were projecting above the water and in no case were to be found at or in the water. Some may have died on account of inundation, others doubtless were eaten by the beavers, still others disappeared because of the fact that they were in the route of the beaver operations and were tramped on or uprooted to become part of the constructing material.

The shrubs found above the dam in the empounded water were *Alnus incana*, most of which were thrifty; one very small dead plant of *Lonicera canadensis;* three patches of *Taxus canadensis*, of which two were dead and a third, altho but a trifle submerged, was dying; and a very small dying plant of *Viburnum cassinoides*.

Trees

The trees in the affected area may be conveniently taken up in groups depending upon their normal habitat. Representatives of the beech-maple association predominated in the better upland areas. This included *Fagus grandifolia*, *Acer saccharum* and *Tsuga canadensis*, all or virtually all of which were dead or dying. Of these Tsuga, by far the most abundant in number in the empounded area still had 6 specimens (8%) of varying sizes that were thrifty. As these, however were all in the area empounded this year, it is to be expected that they will all be dead by another year.

The pine association was only represented by 6 large specimens of *Pinus strobus*, all of which were dead.

Because of the location of the area in the flood plain of Carp Creek, more of the lowland types of trees were found, as would be expected. These included *Abies balsames*, *Acer rubrum*, *Fraxinus nigra*, *Thuja occidentalis*, and *Ulmus americana*, typically present in low areas and *Betula papyrifera* and *Populus tremuloides*, present as a result of past fires. Of these trees *Fraxinus nigra* was scarcely affected, as was to be surmised. *Ulmus americana* also withstood inundation very well, but all the individuals of *Acer rubrum*, contrary to normal expectation were seriously affected. The case of *Populus tremuloides* is a special one in itself as these trees form the preferred food of the beavers and consequently have been largely removed. Of the many aspens previously on the area, but one dead and one thrifty remain. Of the two remaining trees, Abies usually grows in wet but not submerged ground and Thuja naturally grows under either condition. In this case both had developed in unsubmerged ground. The result of the persistent inundation has been to seriously affect 95% of the Abies and 71% of the Thuja.

Food Habits of the Beaver

Beaver* normally eat the bark of species of Populus as their preferred food. In case of scarcity of this preference, *Salix* spp., *Betula* spp., *Prunus pennsylvanica*, *Alnus spp.*, *Acer pennsylvanicum*, *Acer spicatum* and certain small shrubs are felled for food. In this area, most of the woody plants cut or barked were *Populus tremuloides*. Others that had been attacked were *Abies balsamea*, *Fagus grandifolia*, *Picea mariana* (the only specimen in the vicinity, a small tree back from the stream), *Thuja occidentalis*, *Tsuga canadensis*, and *Alnus incana*.

* Bailey, Vernon. Beaver Habits, Beaver Control and Possibilities in Beaver Farming. Bulletin 1078. U. S. D. A. Oct. 18, 1922.

Vegetation of the Unempounded Area

A study of the area below the dam for a comparison of the vegetation normal to such an area with that of the empounded area showed that the ground below the dam was densely and closely covered with herbaceous plants. Projecting above them was a moderate growth of shrubs and trees of various sizes. Indications showed that formerly all grew above the dam.

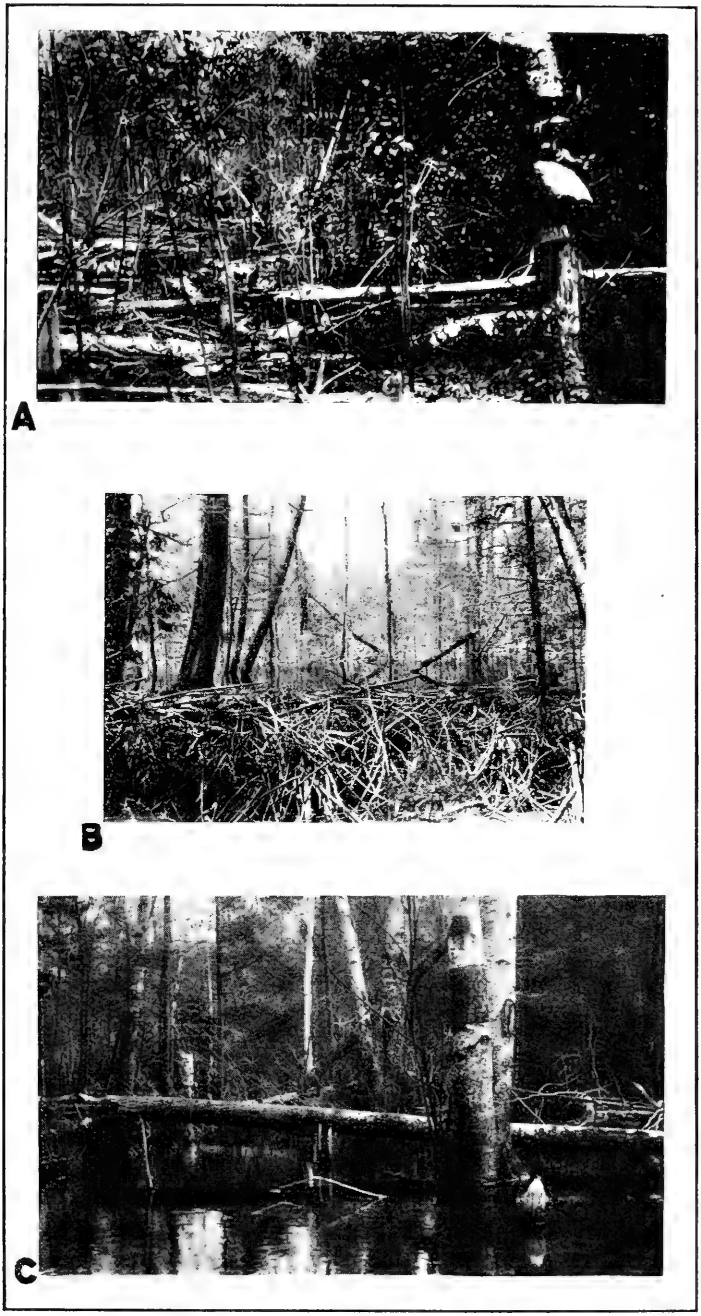
The following classified list of plants is representative of an area previous to empounding.

Herbaceous

Anaphalis margaritacea
Aralia nudicaulis
Asplenium filix-femina (both on wet ground and growing up thru a few centimeters of water)
Aster macrophyllus
Actaea rubra
Botrychium virginianum
Caltha palustris
Carex intumescens
Carex spp.
Circaea alpina
Cirsium arvense
Clintonia borealis
Dryopteris thelypteris
Filix fragilis
Fragaria virginiana
Galium triflorum
Impatiens biflora (in water)
Lycopodium lucidulum
Medeola virginica
Melica striata
Mimulus geyeri
Polytrichum juniperinum
Onoclea sensibilis (abundant even in water of 30 cm. in depth)
Petasites palmata
Philotria canadensis (in Carp Creek)
Poa compressa
Polygala paucifolia
Polygonatum biflorum
Solidago sp.
Taraxacum vulgare
Viola renifolia
Washingtonia longistylis

Shrubs

Acer spicatum
Alnus incana
Cornus canadensis
Cornus rugosa
Diervilla diervilla
Lonicera canadensis
Rhus radicans
Rubus triflorus
Salix bebbiana (growing high)
Salix discolor
Salix sp.
Taxus canadensis
Viburnum cassinoides



Views Near the Beaver Dam in Carp Creek, Cheboyan County, Michigan, 1925

Trees

Abies balsamea	*Populus balsamifera*
Acer pennsylvanicum	*Populus grandidentata*
Acer rubrum	*Populus tremuloides*
Acer saccharum	*Prunus pennsylvanica*
Betula papyrifera	*Prunus virginiana*
Fagus grandifolia	*Thuja occidentalis*
Fraxinus nigra	*Tsuga canadensis*
Pinus strobus	*Ulmus americana*

Summary

1. The effect of inundation upon upland vegetation (beech-maple forest and lowland forest) was studied above a beaver dam in Carp Creek (an area of approximately 9700 square meters), in the vicinity of Douglas Lake, Michigan, during the second summer of its construction.

2. The original vegetation was affected seriously. All herbaceous vegetation with two exceptions was eliminated following the flooding; no shrubs except seedlings or very small saplings, on large logs at or in the water, were to be found, and 77% of all the trees in the empounded area were dead or dying.

Kansas State Agricultural College
Manhattan, Kansas.

Explanation of plate

A. The west end of the dam contrasting the unattacked area in the background with that worked over in the foreground.

B. Upstream over the dam. The large hemlock near the left is now in 1.3 meters of water.

C. Appearance towards the upper end of the pond.

Photographs A by F. C. Gates; B by H. K. Gloyd; and C by Edward Breakey.

AN ECONOMICAL HERBARIUM CASE

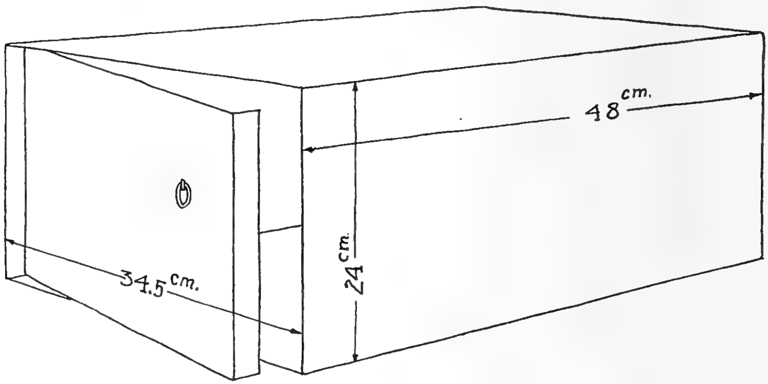
E. D. Merrill

I was recently obliged to provide storage space for a large and rapidly increasing herbarium, in connection with my efforts to build up at the University of California a general Indo-Malaysian and Chinese reference collection. Within a period of less than two years material in excess of 40,000 mounted sheets has been acquired, but no herbarium space was available for this rapid expansion, and funds were not available for the purchase of steel, or even wooden cases.

I accordingly investigated the feasibility of adapting ordinary corrugated paper cartons, such as are now extensively used for shipping various products by express and parcel post, to herbarium storage purposes. Several different types were designed until finally a form was evolved that is not only eminently satisfactory for the purposes indicated but which is also very economical, convenient, and, generally speaking, as tight and as nearly insect and dust proof as is the average wooden case. These cartons have been found to be so thoroughly satisfactory after two years of constant use that I feel that botanical institutions, and botanists generally who maintain working collections of herbarium material, should be apprised of this innovation. These specially designed cartons are not only eminently satisfactory for the economical storage of mounted botanical material but also form a most excellent medium for the storage of duplicate specimens, unmounted material that is awaiting attention, and for various other needs of the growing herbarium.

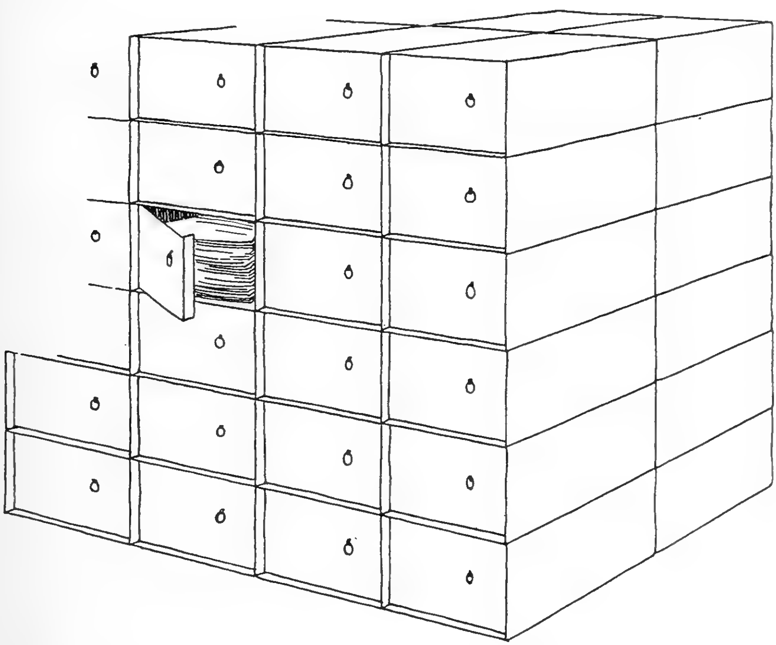
The size finally selected as best adapted to the purposes indicated is 48 cm. long, 34.5 cm. wide, and 24 cm. high, *outside measurements.* Each unit consists of an outer and inner sleeve. The outer sleeve forms an oblong case open at both ends, the edges of the sheet of corrugated cardboard forming this sleeve being firmly fastened with a single strip of gummed cloth on the outside; manufacturers deliver them in this form.

The inner sleeve is merely a strip of corrugated cardboard about 1.6 m. long and just wide enough to fit snugly inside the inner sleeve. This is creased so as to automatically form an oblong case open at top and bottom, fitting closely inside the outer sleeve. This inner sleeve forms the rear end of the unit, double sides, the front end forming a flap which serves as a door; a flange about 4 cm. wide serves to hold the door in place when closed. Compensation for this flange is provided for by making the right hand side of the inner sleeve correspondingly shorter than the left hand side. The inner sleeve is firmly pasted in position through the use of sodium silicate (water glass). The rear end is sealed with craft tape such as is used by tradesmen for fastening packages and cartons, the 5 cm. width being the preferable size. It is essential that this inner sleeve, when in place, be approximately 1 cm. shorter than the outer one so that when the units are full of heavy herbarium sheets and their accompanying genus and species covers there shall be no sagging at the front end; the inset front end or door prevents undue sagging. The details of these units are best brought out in the figure.



To complete a unit, a slip of paper should be pasted in the rear of each and a handful of flake naphthalene placed under the flap to act as a repellent to keep out destructive insects; if a small amount of paradichlorobenzine be mixed with the naphthalene a thoroughly efficient repellent and disinfectant is provided. The front flap of the door should be provided with the proper knob or handle to facilitate opening and closing. The pull clips supplied by the Globe Warnicke Co. for their cardboard filing cases serve the purpose admirably, or a very satisfactory one may be improvised by using an ordinary brass curtain ring, fastened in place by means of a flat brass manuscript staple about one and one-half inches long, the prongs passing through a half-inch washer and spread on the inside of the door.

These cartons, when constructed of good grade corrugated cardboard, are exceedingly durable if protected from moisture; are strong enough to bear the weight of an average man without breaking down; are as tight as any ordinary wooden case; and when stacked in tiers and filled with botanical specimens have shown no deterioration after two years' constant use. In those used by me there has been no indication of the front flap breaking at the hinge, and should it eventually break it can be very easily repaired with gummed cloth or craft tape. In arranging the boxes in single or double tiers, the individual units may be pasted in place with sodium silicate (water glass) or the upper and outer rows may be merely bound in place with craft tape. The former method is best, as thoroughly pasting the bottom of one unit on the top of the one next below is structurally stronger and tends to prevent sagging. The individual units may be stacked in double rows, back to back, forming alcoves and the containers are so strong that they may be stacked to any reasonable height. The stacks at present in use are about six feet high.



In these days of high costs, the economy of this type of herbarium case is most striking. On the basis of orders of five hundred units delivered "knocked down" and ready to put together, the cost in San Francisco is about fifteen cents each. At a cost of about $150.00 storage space for approximately

100,000 mounted sheets can be provided. These cartons may be had of paper box manufacturers or wholesale paper dealers in any large city.

A modification of these units as to size (about 28 cm. high, 9 cm. wide, and 21 cm. deep), forms excellent, durable, dust proof pamphlet holders, which may even be stacked without the use of shelving if so desired. No doubt many other uses will be developed for these very satisfactory containers.

University of California
Berkeley, Calif.

REMARKABLE BEHAVIOR OF A VETERAN WHITE OAK

Eliza Frances Andrews

It is not the great age and size of this tree that claims our attention here, but its surprising defiance of natural conditions during the unprecedented drouth of the past summer which has been so fatal to vegetation throughout the Southeastern States, and has, in many cases baffled the efforts of man himself to save his crops and herds and keep the machinery of his great industries running. When it first attracted my attention some four or five years ago, "Time's effacing fingers" had already left their marks upon it, as indicated by the following record, made at the time in my note book; "It is now in a very decadent condition, and among the undergrowth around it there are no signs of progeny to take its place." It continued to decline slowly, the foliage gradually becoming paler and thinner until the great drouth came—and then, behold! a miracle.

About the middle of September, 1925, when the drouth had reached its climax, I made a visit to this Methusaleh of the forest, expecting to find it dead, or dying, but imagine my surprise at seeing it covered with luxuriant foliage of the rich deep green color indicative of health and vigor, and a fine crop of seedlings on the ground around it. In fact, this tree appeared to be thriving under conditions that were destroying vegetation all around it. The two girls in the foreground of the photograph are four feet and a half, and five feet tall respectively, and the contrast between their size and that of the tree may give the reader a fair idea of the cyclopean dimensions of the latter.

Its location on the border of an open pasture in the valley between two steep hillsides, was a very favorable one before the drouth, but at this time the pasture was a desert, and the bed of the little stream which had watered the valley was as dry as a brick.

While the deep ramifications of its root system may account for the survival of this forest giant, it does not explain its sudden rejuvenation in health and vigor under conditions that were killing healthy trees all around it. Not being an expert in such matters, the only explanation that I can suggest, is that competition for the scanty supply of moisture in the soil had been greatly reduced by the death of other competitors, and possibly, enriched by a greater proportion of chemical nutrients which under normal conditions would have been absorbed by the trees that had died. But this is merely a supposition of the writer, who would like very much to know the opinion of other readers of Torreya who are better qualified to form a correct one.

Rome, Ga.

A New Pawpaw from Florida.—The genus Asimina is confined to eastern North America. It separates naturally into two groups, the one typified by *Asimina triloba*—the type of the genus—with a geographic range extending from about the latitude of Lake Erie to upper peninsula Florida. The other group is typified by *Asimina pygmaea*, which together with a half dozen associates has a geographic range covering most of Florida, with an extension into the southeastern corner of Alabama and into southern Georgia.

While on the last leg of an extensive excursion on which all the species of the second mentioned group were studied in the field we unexpectedly discovered an additional species, which is here named and described:

Asimina tetramera Small, sp. nov. Shrub 1–3 m. tall, with irregularly-placed often virgate branches, the bark gray and glabrous, except on the red finely pubescent twigs: leaf-blades spatulate to elliptic-spatulate, 3–13 cm. long, obtuse, bright-green, glabrous and finely reticulate on maturity, sessile: flowers solitary in the axils of the leaves: sepals 4, rhombic-ovate, 7–10 mm. long, obtuse or acutish: petals 8, the four outer lanceolate or elliptic-lanceolate, 1.5–2.5 cm. long, obtuse, white above, reddish-purple below the middle, the four inner rhombic-ovate or rhombic, 9–11 mm. long, reddish-purple, obtuse, constricted at the base, stamens numerous, nearly 2 mm. long, the connective ending in an expanded gland-like tip: carpels 5–7, the stigma knob-like: fruit ellipsoid or cylindric-ellipsoid, mostly 5–9 cm. long, greenish-yellow: seeds ovoid-ellipsoid, 15–18 mm. long.—Ancient dunes, "scrub," near the estuary of the St. Lucie River, Florida.

Technically this shrub is related to *Asimina pygmaea* which is smallest in habit and bears the smallest flowers, and as in the case of its associates the perianth is trimerous. The species just described is one of the tallest in habit, has the smallest flowers now known in the group, and the perianth is tetramerous, as far as it is known.

Fortunately the shrubs, when we discovered them, were in full flower and ripe fruit. The type specimens collected by the writer near Rio, Florida, July 26, 1924, are now in the herbarium of The New York Botanical Garden.

John K. Small.

A New Butterfly-pea from Florida.—In returning from an extended botanical trip through the Gulf States we crossed the southern part of the Florida lake region. This unique formation never fails to yield plants of great interest or novelties. The following proposed species was found in full flower in the white sands of the scrub.

Clitoria fragrans Small sp. nov. Perennial herb with a slender-fusiform tap-root up to 4.5 dm. long: stems solitary or several together from the top of the tap-root, 2–4 dm. tall, often sparingly branched, glaucous, obscurely puberulent and slightly viscid, usually slightly zigzag: petioles slender-wiry, mostly 1–3 cm. long: leaflets 3; blades various, those of the upper leaves linear, 2–5 cm. long, those midway up the stem linear-lanceolate, those of the lower leaves elliptic to narrowly ovate, shorter than the upper, all minutely bristle-tipped, reticulate, glaucous beneath, glaucescent above: flowers solitary or paired: calyx 12–15 mm. long, minutely pubescent, reticulate: lobes of the lower lip lanceolate, acuminate, the middle lobe usually nearly or quite as long as the tube: flower very fragrant: corolla pale-purple: standard sub-orbicular in outline when flattened out, 4.5–5 cm. long: wings broadly spatulate in outline, about 3.5 cm. long, the blade very inequilateral: keel about 2.5 cm. long, the blade and claw about equal in length: pod linear, glaucous, 5–8 cm. long, 8–9 mm. wide, slender-beaked, the stipe much exceeding the calyx.—In scrub, sandhills near De Soto City, Florida.—Spring. Type in the herbarium of The New York Botanical Garden, J. K. Small, May 20, 1925.

The above described species is a relative of *Clitoria mariana*. The glaucous foliage, the narrow reticulate leaflets which resemble those of *Galuctia pinetorum*, the smaller flowers with the relatively short-clawed keel-petals and the long-stipitate pods are marks which distinguish it from the related species. The fragrance of the flowers sometimes resembles that of the European violet, at other times that of tea-roses.

John K. Small.

PROCEEDINGS OF THE CLUB

Meeting of February 9, 1926.

This meeting was held at the American Museum of Natural History, with President Richards in the Chair. The Secretary read a communication from the Ecological Society of America urging action of all interested parties against the passage of the proposed bill granting private individuals or corporations long-time rights in the grazing areas of the National Forests or Public Domain. On the motion of Dr. Chrysler, the Secretary was authorized to write letters to the senators and to the Hon. N. J. Sinnott, Chairman of the House Committee on Public Lands, protesting against the passage of this bill. The President recommended that the individual members of the club also write.

The President stated that the society has been asked by the International Botanical Congress to send a delegate to the Congress at Ithaca, N. Y., in August. By vote of the club the President was authorized to appoint such a delegate.

The scientific part of the program was an illustrated lecture by Dr. Wm. Crocker, entitled "Experimental studies of difficulties in plant propagation." The work reported is being conducted at the Boyce Thompson Institute for Plant Research in cooperation with nurserymen, geneticists, and others who are confronted with practical difficulties in propagation. Three lines of investigation were discussed: 1. difficulties in propagation from seeds, 2. difficulties in propagation from cuttings, and 3. the forcing of dormant tubers and bulbs. The speaker stated that the investigations should be extended to a study of grafting, especially the matter of degrees of compatibility between stocks and scions, because of the troubles being met in the line by nurserymen and others.

In speaking of difficulties met in propagation from seeds the speaker emphasized the work in seed stratification. This is a very old practice that often succeeds and often fails. Aside from bad seeds the failure is commonly due to failure to control the temperature of the stratification bed. There are three classes of seeds that need stratification: 1. seeds that do not stand excessive drying and are stratified to prevent this—the chestnut and some oaks are said to belong in this class; 2. seeds that need a long period in the germination bed preparatory to germination, but in which the temperature of the bed is not so important, provided it is well above freezing—the hollies belong in this class; and 3. seeds that need a considerable period in the stratification bed at approximately 5° C. The seeds in this third class needing stratification have dormant mature embryos.

The speaker and his co-workers have given little attention to the first two classes but have studied the third class in considerable detail. He showed slides in proof of the fact that in this class seeds after-ripen, or get ready for germination, perfectly when stratified at 5° C. but do not do so at all in some seeds when stratified at 0° C. or 10° C. One exception was mentioned, *Cornus Nuttallii*, which after-ripens better at 0° C. than at 5° C. or 10° C. Amongst the seeds that after-ripen best in stratification at about 5° C. are most rosaceous seeds, including all the roses, most large rosaceous fruits (apple, peach, pear, plum, cherry, etc.), Crataegus, Cotoneaster, and many other rosaceous plants; *Cornus florida*, Tilia, Juniperus, fall-fruiting maples, Ambrosia, and probably many other genera. There are probably scores of genera of the temperate zone that demand stratification for a period at a low temperature. The temperature may fluctuate considerably during the stratification if it runs between 0° C. and 10° C. and averages about 5° C. It is probable that in other forms than *Cornus Nuttallii* a temperature very near freezing will be best, as 10° C. is nearly as good in some as 5° C.

The speaker also emphasized the fact that in stratification the medium is of considerable importance. A certain granulated peat proved much better for Cotoneaster and for certain roses than sand.

In stratifying good seeds no doubt the main trouble in the stratification of the seeds mentioned above and probably in many others will be overcome by proper regulation of the temperature and by proper choice of the stratification medium. Of these the regulation of the temperature is of prime importance.

The length of time necessary for stratification at this low temperature varies greatly with different genera and even different species of the same genus. Apple seeds and *Rosa multiflora* seeds require 60 to 75 days; *Rosa rugosa*, *Rosa rubiginosa*, *Cornus florida*, *Tilia americana*, Juniperus, and various species of maple require 3 to 4 months. Some roses, Crataegus, and others require 6 months or more.

The speaker emphasized the fact that freezing temperatures were of no value in furthering the germination of this class of seeds. Freezing is either indifferent in its effect or actually injures the seed, especially in the latter stages of stratification. He believes that commercial cold storage can be economically adopted for the stratification of many seeds of this class.

In the class of seeds with dormant differentiated embryos Dr. Crocker spoke of the failure of chemical forcing agents, because they force the least dormant organs of the embryo, i. e., the cotyledons and the epicotyl, and produce a seedling without a root. He feels that there are better prospects of success with chemical forcing agents in hollies that need stratification at higher temperatures; for these seeds have rudimentary embryos, and chemical forcing agents are less likely to interfere with the proper correlation of parts.

Propagation from seeds that have embryos that are not dormant or are only slightly dormant were also discussed.

In discussing forcing agents for tubers and bulbs a brief resumé was given of the work of Dr. Denny, which is reported in part in the American Journal of Botany, February, 1926; and in discussing work on the rooting of cuttings a resumé was given of the work of Dr. Zimmerman and associates, which is reported in part in the 1925 Annual of the American Society of Horticultural Science.

Respectfully submitted,
ARTHUR H. GRAVES,
Secretary.

NEWS NOTES

Professor W. A. Setchell of the University of California started early in May on an extended tour among the central Pacific islands, expecting to be absent more than a year.

Professor B. L. Robinson of Harvard University has been elected a corresponding member of the Botanical Society of Geneva, Switzerland, in recognition of his work in systematic botany.

Dr. William Tufts Bringham, Director Emeritus of the Bishop Museum of Honolulu died on the 29th of January in Honolulu. Dr. Brigham was born in Boston in 1841 and in his earlier years collected extensively in Central America and our own Southern States.

The International Congress of Plant Sciences (The Fourth International Botanical Congress) will meet in Ithaca, N. Y., from August 16 to 23. Botanists from all parts of the world have been invited. For information regarding local arrangements, transportation, etc., address Dr. H. H. Whetzel, Cornell University, Ithaca, N. Y. For information regarding exhibits and general program address Dr. L. W. Sharp, Cornell University.

The Torrey Botanical Club

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(1) BULLETIN

A monthly journal devoted to general botany, established 1870. Vol. 49, published in 1922, contained 408 pages of text and 17 full page plates. Price $4.00 per annum. For Europe, $4.25. Dulau & Co., 47 Soho Square, London, are agents for England.

Of former volumes, 24–47 can be supplied separately at $4.00 each; certain numbers of other volumes are available, but the entire stock of some numbers has been reserved for the completion of sets. Single copies (40 cents) will be furnished only when not breaking complete volumes.

(2) MEMOIRS

The MEMOIRS, established 1889, are published at irregular intervals. Volumes 1–17 are now completed. The subscription price is fixed at $3.00 per volume in advance; Vol. 17, containing Proceedings of the Semi-Centennial Anniversary of the Club, 490 pages, was issued in 1918, price $5.00. Certain numbers can also be purchased singly. A list of titles of the individual papers and of prices will be furnished on application.

(3) **Preliminary Catalogue of Anthophyta and Pteridophyta** reported as growing within one hundred miles of New York, 1888. Price, $1.00.

Correspondence relating to the above publications should be addressed to

RALPH C. BENEDICT
Brooklyn Botanic Garden,
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BY

GEORGE T. HASTINGS

John Torrey, 1796–1873

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GEORGE T. HASTINGS
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TORREYA

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July-August, 1926

FROM RIO TO PETROPOLIS

William Alphonso Murrill

Petropolis is a summer resort in the Organ Mountains about thirty-five miles north of Rio. Leaving the hotel a little before seven on a trolley car, I changed to a taxi at the foot of the mountain and caught the 8:30 train at Praia Formoza for Petropolis. As I passed through the gate with my first-class ticket, the guard handed me a slip of paper with M 3 on it, which meant that seat three in car M was reserved for me and that I should take no other. This prevented a rush for seats, giving preference to those arriving first at the station, and indicating when the train was full.

For the first half-hour, our journey lay through low ground partly covered with mangrove (*Avicenna*) and various other marsh plants, and then we reached a low terrace, slightly above sea-level, on which bamboo, palms, bracken, and a number of young trees of second growth appeared; the most conspicuous being a purple-flowered Tibouchina and a low, spreading acacia with beautiful white flowers. I had seen this acacia before, but never in such great abundance, and the purple and white together made a very pleasing color scheme.

At Rozario, forty-five minutes from Rio, the blue mountains ahead looked quite near and the vegetation became denser and more varied, resembling that on top of the mountain near São Paulo. The same terrace continued unbroken, but there were now older trees covered with moisture-loving cacti, air-plants, aroids, and other vines. The villages were not attractive, gardens were practically wanting, and the people seemed poor. Passing Estrella and Entroncamento, we entered a small valley between foothills covered with forests like those on Corcovado, in which the same white-leaved tree mingled with gold and purple-flowered trees on the steep granite slopes, while the white-flowered acacia grew in the valley.

At Raiz da Serra the ascent of the mountain began, the train being divided into sections with an engine behind each, and the wheels running on cogs up a heavy grade. Here at the base of the mountain, over an hour's ride from Rio, is the first place one would care to stop, and it would be a good place to collect plants that grow near sea-level. The ginger lily, or garland flower, appeared here and grew along the track all the way to the summit as it did between Santos and São Paulo, while the ferns and small plants on the banks were like those on the sides of Corcovado.

Slowly up the mountain we climbed, the view becoming finer and the scenery wilder as we ascended. Very few houses appeared—only rocky slopes covered with an unbroken forest. At Meio da Serra, where there is a factory, the collecting might be good, but the train did not stop coming up. Near the summit much of the forest has been cleared, and there are scattered houses marking the beginning of Alto da Serra, which really connects with the town of Petropolis two miles further on.

At Alto da Serra, 3000 feet above sea-level, I left the train and went into the woods collecting, finding a number of very interesting things; but, after a couple of hours, my meager early breakfast began to fail me and I took a trolley car down to Petropolis to hunt up a restaurant. The natural attractions of this far-famed place are many, being surrounded by forest-covered mountains at an elevation that insures a delightful climate. There is also a dashing, clear mountain stream passing through the town, shaded with splendid trees and ornamented along both banks with Japanese lily-of-the-valley and thousands of blue hydrangeas.

I have driven around the town and seen its parks and gardens, its hotel and charming villas, and the well-dressed people leading an easy life; but my mind turns again to a comfortable châlet forty miles away, perched up on the side of Corcovado, and my watch tells me that the train will leave in a few minutes. Soon I will see again the wonderful panorama stretching from the summit of the Organ Mountains to the harbor of Rio, and, if I had the time, I would walk the entire distance from the top of the mountain to its base along the highway through the forest, and botanize to my heart's content.

AN EFFICIENT AND ECONOMICAL HERBARIUM PASTE

E. D. Merrill

Generally speaking, ordinary types of fish glue have been found to be very unsatisfactory for mounting botanical specimens, because, when dry, there is a great tendency for thick leaves, branchlets, etc., to "snap off" as the sheets are handled. This entails considerable loss of valuable material and much extra repair work in any large herbarium; yet curiously, little attention seems to have been given to the matter of selecting adhesives better adapted to the purpose. Aqueous solutions of gum arabic (the best form for use is powdered acacia), or a mixture of gum arabic and gum tragacanth protected against fermentation by the addition of a small amount of carbolic acid, are, generally speaking, more satisfactory than ordinary types of glue. The chief objection to the use of gum arabic or of gum tragacanth is the fact that a certain degree of viscosity is essential to insure the best results, and proper viscosity can be determined only through actual experience.

About two years ago my attention was called to Special A Tin Paste, manufactured by the Russia Cement Company, Gloucester, Mass. This product was developed primarily for attaching labels to tin cans. A wide experience with this paste, involving the actual mounting of over 30,000 sheets of herbarium material, has demonstrated that it is in general eminently satisfactory for the purposes indicated and is far superior to the ordinary types of glue now generally used.

The product is one of the inverted starch pastes much thinner than the ordinary library pastes of the same general class. It is low in price, flows readily, has a pleasant odor, and comes in a form entirely satisfactory for immediate use, requiring no thinning, heating, or other treatment. Furthermore, it is durable, does not become brittle, nor weaken, crack, or loosen with age, as do the ordinary types of fish glue such as are currently used in mounting botanical materials. It is available in one-gallon cans, six cans to the case, in five and ten-gallon kegs, and in half-barrels and barrels. It keeps indefinitely.

Shortly after I commenced using this product, the preliminary results being so excellent, I called the attention of the curators of several large herbaria to its advantages. At the Field Museum of Natural History, an analysis of it was made by Dr. H. W. Nichols. This analysis indicates that the paste is entirely free from the corrosive soluble sulphates and chlorides that are commonly found in inverted starch pastes. It does contain small percentages of free phosphoric acid and acid phosphate of sodium. Dr. Nichols' tests indicate that it does not discolor white paper and a two months' test indicated no deleterious effect on either the specimens or the paper. He suggested, however, the possibility that the corrosive acids may in the course of years, damage the specimens. Judging from the experience I have had with the product over a period of two years, this possibility does not seem to be at all likely.

In order to check the possible action of Special A Tin Paste on delicate plant tissues, I selected the petals of about twenty-five species of plants, representing yellows, pinks, blues, reds and purples, dried them quickly to preserve the natural colors, and then mounted them in parallel columns on white paper, using ordinary fish glue for one set and an unusually large quantity of Special A Tin Paste for the other. This test sheet was exposed to the light of an ordinary laboratory for a period of eight months and during a part of the time to direct sunlight. Actual fading was practically the same in both sets. The only colors affected at all by the paste were the blues and purples and then only in very small areas where the petals had been bruised in pressing; there was in such areas a tendency for the blues and purples to turn red on account of the acid character of the paste. This insignificant discoloration was immediate and the areas affected showed no increase in size after the paste was set. Otherwise there was no discoloration of the delicate petals mounted with the paste, and no deterioration has been noted.

Special A Tin Paste is admirably adapted for mounting thin plants, but with specimens having very thick stiff leaves it is sometimes difficult to secure proper adhesion between the paste and the plant. At the Gray Herbarium, where, following my suggestion, it has been rather extensively used, this difficulty has been overcome by using it in connection with Improved

Process Glue, manufactured by the same company. The mix is made on the plate, the Improved Process Glue being spread on the plate and then thinned by wetting the brush with Special A Tin Paste. Occasionally the glue is renewed, but not often. In general practice, the use of about one-fourth Improved Process Glue and three-fourths Special A Tin Paste seems to give the best results.

Experienced mounters will of course vary their methods according to circumstances in the light of previous experience, and with reference to the general type of material being mounted. I do not hesitate in recommending Special A Tin Paste, either alone or combined with Improved Process Glue, as being definitely superior to any type of ordinary fish glue I have been able to secure.

University of California,
Berkeley, California.

A NEW CATCHFLY FROM THE SOUTHEASTERN STATES

John K. Small

Recent studies, both in the field and in the herbarium, have brought an additional catchfly to our attention. Concerning the recognition of this plant as a new species, Dr. Wherry writes me as follows: "The common rock-catchfly of the eastern states, *Silene caroliniana* Walter, grows typically on shaly or gravelly slopes, where the soil reaction is usually distinctly acid. I was therefore rather surprised to see, while on a trip across Kentucky a few years ago, what appeared from the train window to be the same plant thriving on limestone ledges in the Interior Low Plateaus Province. Later on, during a trip in search of *Phlox Stellaria* along the Kentucky River near Camp Nelson, south of Lexington, under the guidance of Professor Frank B. McFarland of the University of Kentucky, opportunity to examine the *Silene* more closely presented itself, and it then seemed that it might possibly be new. I am accordingly sending to you these notes upon it, because if it is a new species you will wish to include it in your forthcoming Manual of the Flora of the Southeastern States."

That it is in fact a distinct species is shown by the following characters:

Calyx equalling the claws of the petals, densely pilose with non-glandular hairs: style about as long as the ovary. *S. Wherryi.*

Calyx decidedly shorter than the claws of the petals, rather sparsely covered with gland-tipped hairs: style much longer than the ovary. *S. caroliniana.*

HABITAT VIEW OF THE NEW SPECIES OF SILENE.

In open woods over limestone rock, near gorge of Kentucky River, two miles north of Camp Nelson, in Jessamine County, Kentucky. May 15, 1923. Edgar T. Wherry, photo.

Silene Wherryi may be described as a perennial plant with a cluster of long, thick roots, the several stems from the crown decumbent and spreading to form a rosette: leaf margins ciliate with short whitish hairs: leaf-blades variable in size and shape, the basal more or less spatulate, the cauline lanceolate: flowers numerous, brilliant rose-pink: calyx equalling the claws of the petals, so that the tips of the sepals touch the backs of the spreading petal-blades, densely covered with whitish hairs quite free from glands: petal-blades less notched and with a shorter crown than in *S. caroliniana:* ovary cylindric, about 5 mm. long at anthesis: styles of the same length. Type specimen, in Herbarium of The New York Botanical Garden from Albertsville, Alabama, *11*, April 22, 1899.

Dr. Wherry reports that when this and *S. caroliniana* are grown side by side at Washington, D. C., in soils of the reactions favored by each respectively (minimalkaline and subacid), *S. caroliniana* begins to bloom in late April, and the new species about two weeks later.

A herbarium specimen of this new species was sent by Dr. S. F. Blake to the British Museum, with the request that it be compared with the type specimen of Walter's *S. caroliniana.* This was done, and the reply stated definitely that the two were clearly different, as Walter's plant has the calyx distinctly (though sparsely) glandular.

Silene Wherryi is represented: In the herbarium of The New York Botanical Garden and of the Academy of Natural Sciences of Philadelphia by two specimens from Alabama and one from Kentucky: In the United States National Herbarium there are three from Alabama. In the Gray Herbarium there are two inferior ones from Kentucky. Had this species been better represented in the latter herbarium, it would no doubt have been recognized as new by Professor B. L. Robinson when he monographed Silene for the Synoptical Flora.

The New York Botanical Garden.

LAMARCK'S NEW NAMES IN THE FRENCH EDITION OF PALLAS

T. D. A. Cockerell

I have just obtained a copy of the French edition of the Voyages of Pallas, in eight volumes, of which the eighth (published in 1794) consists of descriptions of plants and animals. This volume is edited by Lamarck who adds numerous comments and bibliographical references, as well as short diagnoses in Latin. In a number of cases he differs from the nomenclature of Pallas and sometimes proposes entirely new names. All the new names of animals are carefully cited by Sherborn in Index Animalium, but the plant names have not fared so well and I find only one of them (*Cheiranthus caspicus*) cited from this source in the Index Kewensis. There are 41 instances in which Lamarck offers plant names differing from those of Pallas. In most cases these are corrections of identification or nomenclature and do not specially affect us. Some, usually cited from other sources, may find their earliest publication here. In a few cases, entirely new specific names are proposed. These are as follows:

1. *Polycnemum corispermoides* for *P. triandrum* of Pallas.
2. *Salsala fragilis* for *S. frutescens* of Pallas. The *S. frutescens* of Pallas is cited in Index Kewensis as a synonym of *S. crassa* Bieb. 1811. Pallas has "*Salsola* an (*frutescens?*) Kali fruticosum spicatum, Buxb. cent. L. p. 8, t. 13." Did he mean to query identity with *S. fruticosa* L., which is a *Suaeda* or *Dondia?* If *S. frutescens* is not intended in that sense, it seems to be a valid new name. The leaves are described as terete, and evidently a *Dondia* is intended. On the whole it appears reasonable to suppose that Pallas did not intend to propose a new name, and in that case the species becomes *Dondia fragilis*.
3. *Gentiana alpestris* for *G. punctatae affinis*, *alpina*, *albiflora*, of Pallas. This is, I believe, *G. decumbens* L. f., but the name *alpestris* seems to have escaped all bibliographers.
4. *Saxifraga daurica* for *S. punctata* of Pallas (erroneous determination). This is the plant known today as *S. davurica* Willd. 1799. The section Davuricae Engler and Irmscher must accordingly become Dauricae, and if we follow the generic nomenclature of Small, the species is *Micranthes daurica* (Lamarck).
5. *Cheiranthus caspicus*, which is accounted for in Index Kewensis and said to be *Sterigma tomentosum*. Under Pallas 335, *Dryas geoides*, Lamarck has a discussion in which he separates *Geum potentilloides* (*Dryas geoides* Pallas) from *Geum anemonoides* (*Dryas anemonoides* Pallas). The *Dryas geoides* is *Coluria geoides*, also called *C. potentilloides* by Robert Brown. *Potentilla geoides* Birch (*Drymocallis geoides* Rydberg, the combination only in index to *Potentilla* monograph) is quite another thing, apparently. The combination *Geum anemonoides* dates from Lamarck, 1794, not

Willdenow, 1799, as generally cited. The plant is now called *Sieversia pentapetala* (L.) Greene.

So far as I can see, none of the other changes offered by Lamarck affect us today.

Boulder, Col.

A MIOCENE ORONTIUM (ARACEAE)

T. D. A. Cockerell

Orontium aquaticum L. is the only living member of an Araceous genus occurring in swamps from Massachusetts to Florida, but not in the Western States. It was known to Catesby, and was cited by Linnaeus from Virginia. The Japanese *O. japonicum* of Thunberg is not congeneric. In the Miocene shales of Florissant Colorado, at station 13, we have obtained a spadix which is sufficiently characteristic to be referred to this genus. The apex is missing but the part present is 20 mm. long and 5 wide, the individual flowers having a diameter of about 2.5 mm. The portion of the scape present is about 35 mm. long, with a diameter of 2.3 mm.; there is no evident thickening or flattening below the spadix. The last character is the only tangible one separating the plant from the modern species. This fossil may take the name **Orontium fossile** n. sp.; it adds one more to the numerous examples of genera now existing in the Eastern and southern states, but found in the Rocky Mountain Region only in the fossil state.

Orontium fossile Ckll.

BOOK REVIEWS

The Classification of Dicotyledons*

Alfred Gundersen

During the past fifty years two great systems have become widely established in different countries, namely those of Bentham and Hooker's Genera Plantarum and of Engler and Prantl's Natürliche Pflanzenfamilien. During the twentieth century a number of suggestive expositions, more or less detailed, relating to the classification of the higher plants have been made; among others, in Austria by Wettstein, in Denmark by Warming, in Germany by Hallier, in Holland by Lotsy, in France by Van Tieghem and by Vuillemin, in England by Arber and Parkin, by Wernham and in America by Bessey and others.

The new works by Rendle, of the Department of Botany of the British Museum, and by Hutchinson, of the Herbarium of the Royal Botanic Gardens, Kew, may be considered modern adaptations of the two classic systems. These comprehensive works remind us that systematic botany is not all confined to the endless question of species. Rendle's work follows Engler much more closely than Hutchinson follows Bentham and Hooker. On following pages the orders of Rendle and of Hutchinson are compared with those of the 9–10th edition of the Engler–Gilg Syllabus.

Engler-Gilg 1924	*Rendle 1925*	*Hutchinson 1926*	
ARCHICHLAMYDEAE	MONOCHYLAMYDEAE	ARCHICHLAMYDEAE	
Verticillatae		Magnoliales	Theales
Piperales		Anonales	Myrtales
Salicales	Salicales	Laurales	Guttiferales
Garryales	Garryales		
Myricales	Juglandales	Ranales	Tiliales
Balanopsidales	Julianiales	Berberidales	Malvales
Leitneriales	Fagales	Aristolochiales	Malpighiales
Juglandales	Casuarinales	Piperales	Euphorbiales
Batidales	Urticiflorae		

* Rendle, Alfred Barton. The Classification of Flowering Plants, II, Dicotyledons xix—636 pp., 279 fig., Cambridge (England) University Press, 1925.

Hutchinson, J. The Families of Flowering Plants, I Dicotyledons, Arranged According to a New System Based on Their Probable Phylogeny. xi—328 pp., 264 fig., numerous maps. Macmillan & Co., London, 1926.

Julianiales		Rhoedales	Cunoniales
Fagales		Loasales	Rosales
Urticales		Capparidales	Leguminosae
		Cruciales	
Proteales	Proteales	Violales	Hamamelidales
Santalales	Santalales	Polygalales	Salicales
Aristolochiales	Aristolochiales		Garryales
Polygonales	Polygonales	Saxifragales	Leitneriales
Centrospermae	Piperales	Sarraceniales	Myricales
	Centrospermae	Podostemonales	Balanopsidales
		Caryophyllales	Fagales
	DIALYPETALAE	Polygonales	Casuarinales
		Chenopodiales	Urticales
Ranales	Ranales		
Rhoedales	Rhoedales	Geraniales	Celastrales
Sarraceniales	Sarraceniales		Olacales
		Lythrales	Santalales
Rosales	Parietales	Thymeladales	
Pandales	Peponiferae		Rhamnales
Geraniales	Guttiferales	Proteales	
Sapindales	Malvales		Rutales
Rhamnales	Tricoccae	Dilleniales	Meliales
Malvales	Geraniales	Coriariales	Sapindales
Parietales	Rutales		Juglandales
	Sapindales	Pittosporales	
	Celastrales	Bixales	Umbelliflorae
	Rhamnales	Tamaricales	
	Rosales	Passiflorales	
		Cucurbitales	
Opuntiales	Myrtiflorae	Cactales	
Myrtiflorae	Opuntiales		
Umbelliflorae	Umbelliflorae		
METACHLAMYDEAE		METACHLAMYDEAE	
or SYMPETALAE	SYMPETALAE		
Diapensiales			
Ericales	Ericales	Ericales	Gentianales
Primulales	Primulales		Primulales
Plumbaginales	Plumbaginales		Plantaginales
Ebenales	Ebenales	Ebenales	
		Myrsinales	Campanales
Contortae	Oleales	Styracales	
Tubiflorae	Contortae	Loganiales	Polemoniales
Plantaginales	Convolvulales	Apocynales	Boraginales
	Tubiflorae		
	Plantaginales		
Rubiales	Rubiales	Rubiales	Solanales
Cucurbitales			Personales
Campanulatae	Campanulales	Asterales	Lamiales

Rendle states "The arrangement does not claim to be strictly phylogenetic. Various attempts have been made to construct a phylogenetic system of Angiosperms, but the results are not convincing, bear no suggestion of permanence, and bristle with difficulties for the student." "A key mostly emphasizes the differences amongst plants," writes Hutchinson; "a truly natural and phylogenetic classification, however, should rather emphasize their resemblances, by which alone their true affinities may be ascertained. This I have attempted to do in the pages of this book."

Rendle writes: "While it is possible that some (of the Apetalae) may be reduced forms, it is on the other hand possible to regard these as representing lines of development from earlier extinct groups. It seems likely that the development of the highly differentiated, insect-pollinated dichlamydeous flower was preceded by numerous, so to speak, experimental stages, arising from earlier, now long extinct, angiosperms, and it is a tenable view that such stages are represented among the Monochlamydeae." Hutchinson takes another view: "It seems very probable that extreme reduction of the perianth and consequent loss of attractiveness to insects would result in the adoption of another mode of pollen transference, by the wind, which in this case would not be a primitive condition, as it undoubtedly is in the Gymnosperms. In my opinion, the universally accepted theory of the foliar origin of the carpel is fatal to the assumption that the "Amentiferae" are primitive. Many of these have an ovary composed of the union of two or more carpels, which must be the result of cohesion and reduction from older groups which originally had free carpels."

Possibly the views may not be entirely irreconcilable; ancestors of the Amentiferae may have had separate carpels, yet not have resembled primitive insect pollinated groups like Magnoliaceae.

The divergent interpretations in these works lend special significance to their points of agreement, such as the following:

Casuarinales are placed by both near Fagales (cf. Benson);

Piperales are removed from the early position occupied in Engler's system (cf. Johnson);

Magnoliaceae precede Nymphaeaceae;

Balsaminaceae come with Tropaeolaceae in the Geraniales;

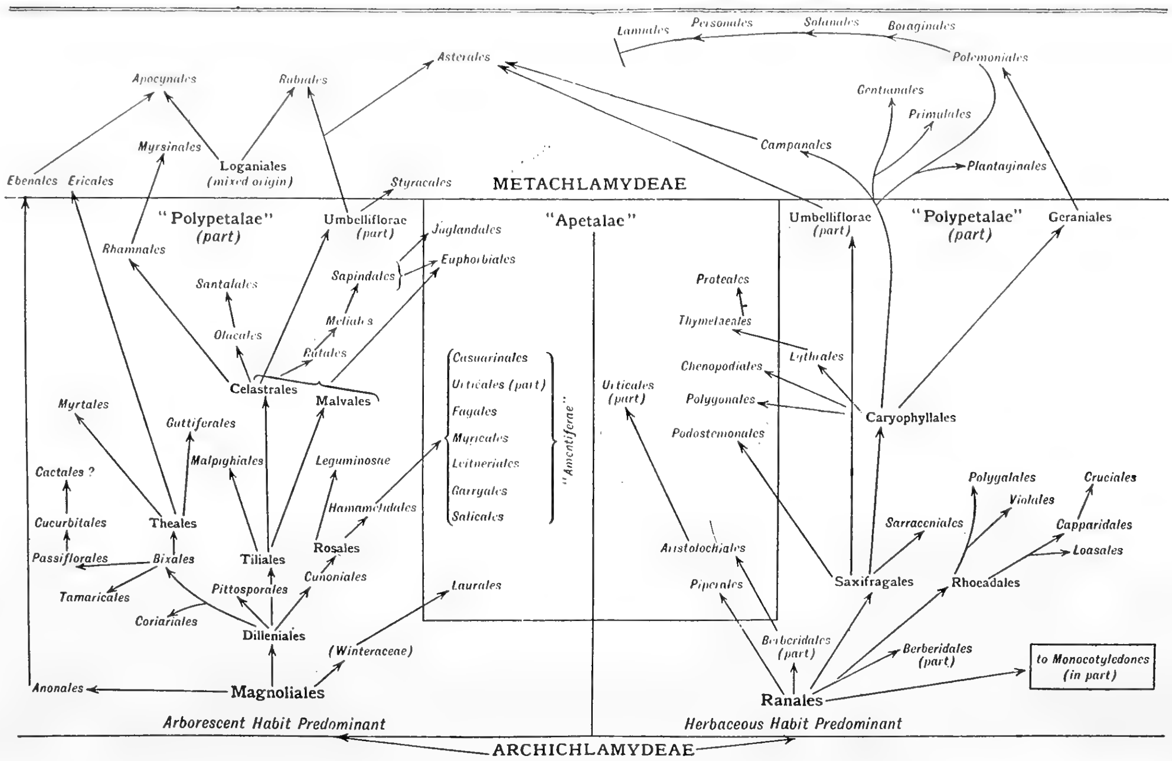
Cucurbitaceae are placed not far from Passifloraceae, as by Linnaeus, Jussieu, Bentham and Hooker, etc.

Some of Engler's orders, such as Geraniales, Sapindales, Parietales, Contortae and Tubiflorae are divided by both Rendle and Hutchinson. Along this line Moss wrote in 1912 "Warming's orders and families are smaller than those recognized by Engler. The immense size of some of Engler's orders, e. g. his Geraniales, make them almost if not quite unworkable." With the exception of Cucurbitaceae, the Sympetalae are maintained as a group by both authors, though both admit that these are related along different lines with polypetalous groups.

In Rendle's book some of the smaller families have been omitted, and more space given to families represented in Britain. Hutchinson, who includes all families, favors going "slightly further even than Engler" in dividing them; "the delimitation of families, of genera and species is sometimes very much of a matter of taste and personal idiosyncrasy; also of judgment and experience." Bentham and Hooker had 160 families of Dicotyledons. In the Pflanzenfamilies there are about 250 families of this group, 255 in the 9–10th edition of the Syllabus (1924); ten of these are not taken up by Hutchinson, namely: Hippocastanaceae and Bretschneideraceae (H. in Sapindaceae), Roridulaceae (in Byblidaceae), Pentaphylacaceae (in Theaceae), Elaeocarpaceae (in Tiliaceae), Hydrocaryaceae (in Onagraceae), Desfontaineaceae (in Loganiaceae), Brunoniaceae (in Goodeniaceae), Strasburgiaceae, Hoplestigmataceae.

Hutchinson has 264 families; the 19 additional ones are: Winteraceae, Schizandraceae, Cabombaceae, Circaeasteraceae, Sargentadoxaceae, Molluginaceae, Illecebraceae, Samydaceae, Saurauiaceae, Greyiaceae, Grossulariaceae, Hydrangeaceae, Caesalpiniaceae, Mimosaceae, Barbeyaceae, Corylaceae, Cannabinaceae, Monotropaceae, Selaginaceae.

In the outline of orders and families reasons are given for the arrangement adopted. Lines separate groups of orders, the larger groups are not named; this was the suggestive method used by Bernard de Jussieu. As appears from the diagram an important feature of Hutchinson's system is the division of Archichlamydeae into a woody and herbaceous series. Thus it "becomes possible to establish more natural groups of closely allied families." In this connection importance is attached to



The Evolution of Dicotyledous, according to Hutchinson the structure of stomata. Hutchinson refers to the studies of Sinnott and Bailey, but considers that Ranunculaceae cannot have been derived from any existing woody group, and that often herbaceous groups may have evolved woody types. By this separation Hydrangeaceae become widely separated from Saxifragaceae, Myrsinaceae from Primulaceae; such groups as Umbelliflorae, Asterales and Urticales are considered polyphyletic, having had separate woody and herbaceous ancestral lines; these appear to be difficult points to accept. A number of largely herbaceous families, such as Malvaceae and Cucurbitaceae are included with the woody division.

Both works are copiously illustrated. In Hutchinson's book the numerous clear maps showing distribution of families or genera are of special value. An artificial key to all families extends over nearly forty pages.

Will floras adopt the new system? The use of works on systematic botany is much simplified by somewhat uniform classifications; it is a great advantage when floras of different regions more or less correspond with each other. Nearly forty years have passed since the presentation of the Engler system, and the necessity for modification is becoming increasingly apparent. The evidences as to the course of plant evolution are as yet somewhat conflicting. Yet for the practical purposes of floras we must hope that a desire to agree may to some extent modify the diversity of international botanical opinion.

Brooklyn Botanic Garden.

PROCEEDINGS OF THE CLUB

Meeting of February 24, 1926

This meeting was held at the N. Y. Botanical Garden Museum Building. Miss Helen Wing, of Upper Montclair, New Jersey, was elected to membership.

The first speaker on the scientific part of the program was Dr. Gundersen, who addressed the Club on "Observations on the structure of the Frankeniaceae." He stated:

The little family of the Frankeniaceae includes mostly rather inconspicuous plants of desert or dry regions. Four genera are recognized, two from southern South America, one from Persia, and one, Frankenia, widely distributed. He has studied material of five species, *F. hirsuta* and *pulverulenta* of the Mediterranean region, *F. Jamesii* of Texas, *F. grandifolia* of California and *F. Fischeri* of Argentina. These plants exhibit a series of remarkable resemblances to genera of the Caryophyllaceae, in particular to Dianthus: in the somewhat swollen nodes, the opposite, entire leaves connected by a scarious membrane, the long, deeply-angled calyx, the five petals, their texture, their claw and ligule, the compound one-celled ovary, the double seed-coat with pearly surface and rather conspicuous funiculus. The placentation in *F. hirsuta* and *grandifolia* is parietal along the lower part of the ovary, in *pulverulenta* somewhat higher; in *Fischeri* and *Jamesii* almost basal. We see here variation similar to what we have in the Cactaceae in Opuntia and Pereskia. The embryo in Frankenia is straight, in the Centrospermae generally curved, but in Dianthus nearly straight.

These numerous resemblances indicate that in a natural classification the Frankeniaceae must be near the Caryophyllaceae. This implies that the Centrospermae as a whole must be considered as derived from the *Parietales* group of families; the position usually assigned them before the Ranales is misleading.

Mrs. G. P. Anderson followed, with a talk on the "Disappearance of certain species of lichens from the vicinity of New York City." She stated that she has been interested in comparing the present lichen flora in the triassic lowlands of New Jersey with that given for the lowlands of Bergen County by Austin in his list of New Jersey lichens, published in 1889.* In this county, which is irregularly 14 by 10 miles in area, he listed 224 species. 26 are listed as very common or frequent. 21 of these are lichens growing on trees, and 17 are fruticose species. Mrs. Anderson said that of these common and conspicuous lichens, which are well known to her and which she has collected many times in other regions, not one fruticose tree lichen has been found in the lowland from Staten Island to the Delaware

* Britton, N. L. Catalogue of plants found in New Jersey. From the final report of the State Geologist, Vol. II, Thallophyta, Class I, Lichens. Prepared from manuscript of C. F. Austin, revised by Dr. J. W. Eckfeldt. Pp. 357–384. 1889.

after repeated careful search. Of Austin's total of 131 arboreal lichens she has found but 7. But in the case of lichens growing upon the earth or rock, or old logs lying upon the ground, there are a greater number of individuals as well as species. Yet even here there is a great difference, for Austin's figures are 98, and she, although Cladonias and crustose lichens have not been completely collected, has found 40.

The increasing amount of smoke from the cities and the repeated cutting over of woodlands were mentioned as possible causes for the disappearance of so many species.

Arthur H. Graves,
Secretary.

Meeting of March 9, 1926

This meeting was held at the American Museum of Natural History. The following were elected to membership:

Mr. W. S. Atwood, 535 Hillside Ave., Palisade Park, N. J.

Mrs. E. H. Holmes, 286 Eastern Parkway, Brooklyn, N. Y.

Prof. George G. Scott, College of New York City, Convent Ave. & 139th Street, New York City.

Dr. A. B. Stout of the New York Botanical Garden addressed the Club on his work with avocados, the title of his lecture being "The flower behavior of avocados: a climax in the regulation of sex." The periodicity in the flower opening was explained. Although the flowers are perfect, at their first opening the pistils are receptive and the anthers remain unopened. At the second opening the stamens shed the pollen. The period of time between these two openings varies in different varieties from 12 to 24 to 36 hours, with modifications due to weather conditions. This behavior decidedly prevents close pollination, and makes it imperative, for the best setting of fruit, that varieties which shed pollen and have their pistils receptive, respectively, at the same period, be planted near each other.

A full account of this work will be published shortly in the Memoirs of the New York Botanical Garden.

Arthur H. Graves,
Secretary.

Meeting of March 27, 1926

This was the occasion of the joint meeting and dinner with the New York Science Teachers' Association at the Hotel Majestic, Central Park West and 72nd Street.

Dr. Coulter of the Boyce Thompson Institute for Plant Research was the principal speaker of the evening and addressed the gathering on "The history of organic evolution." Dr. Coulter stated that there have been three stages in the history of the development of the idea of organic evolution; first, speculative; second, observational; third, experimental. The first stage began with the ancient philosophers, the second stage began in 1790 and included the work of Lamarck, Darwin and others. The last stage began with the work of de Vries and has continued up to the present time. The address has been published in *Science* for May 14, 1926.

Arthur H. Graves,
Secretary.

Meeting of April 13, 1926

This meeting was held at the American Museum of Natural History. The following candidates were unanimously elected to membership in the Club:

Dr. O. E. Jennings, Carnegie Museum, Pittsburgh, Pa.
Mr. Ben Bauman, 1530 Plimpton Ave., Bronx, New York.
Mr. W. T. Willis, Union Carbide and Carbon Research Laboratories, Thompson Ave. & Manley Street, L. I. C.
Mr. H. T. Middleton, Palisades, New Jersey.
Mr. Raymond Wallace, Columbia University, New York.

The following resignations were accepted:

Miss Mary E. Reid, Boyce Thompson Institute, Yonkers.
Mrs. R. S. P. Trowbridge, now of Marseilles, Illinois.

The scientific part of the program consisted of a talk by Mr. Montague Free, Horticulturist at the Brooklyn Botanic Garden, entitled "English Gardens." A number of very beautifully colored slides were shown, illustrating various types of gardens in England, such well known gardens as that of the Honorable Vicary Gibbs, Warley Place, and the Royal Botanical Garden, Kew, being described. Various types of gardening, such as the naturalistic style so much in vogue in England, rock gardens, wall gardens, formal gardens, and water gardens were explained.

Arthur H. Graves,
Secretary.

NEWS NOTES

It is announced that at the International Congress of Plant Sciences to be held at Ithaca from August 16 to 20 the public addresses will be by Dr. Livingston Farrand, president of Cornell University, W. M. Jardine, U. S. Secretary of Agriculture, Professor A. F. C. Wentz of the University of Utrecht and Dr. Edwin F. Smith of the Bureau of Plant Industry. The special section meetings will include Agronomy, Cytology, Ecology, Forestry, Genetics, Horticulture, Physiology, Pathology, Pharmocognosy, and Taxonomy. A large attendance of foreign botanists is expected.

We learn from Science that Dr. Lewis R. Jones, professor of plant pathology at the University of Wisconsin, is spending the summer in Hawaii studying diseases of the pineapple.

The Brooklyn Botanic Garden has recently raised a sum of $250,000 to meet a like sum pledged by Mr. John D. Rockefeller to be devoted to its educational and scientific work.

From the daily press we have recently heard that two members of the Soveit Botanical Expedition to Siberia have arrived at a station in Bokhara. The party was attacked and plundered by natives, their entire equipment being destroyed. The fate of the other members of the expedition is unknown.

Science reports that Dr. Duncan S. Johnson of the Johns Hopkins University sailed for Jamaica on July 2nd with a party of nine to conduct researches on the taxonomy and ecology of the lichens and ferns, the development of the liverworts, the Myrtaceae, the water moulds and banana.

Dr. Benjamin M. Duggar, Professor of Plant Physiology at the University of Missouri, has been elected a member of the board of trustees of the Bermuda Biological Station. At present he is acting as chairman of the board.

The discovery of several new types of cotton is reported by O. F. Cook, J. W. Hubbard, and F. C. Baker, members of the Bureau of Plant Industry, United States Department of Agriculture, who returned recently form a three months' exploration trip in the West Indies and South America. Some of these cotton plants have characters that may be of value in practical cotton-breeding work in the United States.

One of the new types has bracts that are open or turned back from the buds and young bolls so that little protection is afforded for boll weevils or other pests and diseases. Such cotton could also be picked with less "trash" or broken bract material and the grades would be improved.

Because of the recent spread of the destructive wilt of maples in various parts of the country it is thought advisable in future plantings, in limited localities where the wilt is prevalent, to substitute other kinds of trees for maples, says the United States Department of Agriculture.

Maple wilt, which was first reported in the United States 11 years ago, is now known in spots in the region extending from North Carolina and Tennessee to Canada and westward to Wisconsin. This disease has been noted principally upon Norway and sugar maples, according to Department Circular 382-C, "Maple Wilt."

The fungus, which frequently gains entrance to healthy trees through wounds, can be carried from tree to tree by insects and by pruning tools, though there are various other ways for its spread. The rate of spread of the wilt varies greatly.

The Torrey Botanical Club

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OF THE

TORREY BOTANICAL CLUB

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(1) BULLETIN

A monthly journal devoted to general botany, established 1870. Vol. 49, published in 1922, contained 408 pages of text and 17 full page plates. Price $4.00 per annum. For Europe, $4.25. Dulau & Co., 47 Soho Square, London, are agents for England.

Of former volumes, 24–47 can be supplied separately at $4.00 each; certain numbers of other volumes are available, but the entire stock of some numbers has been reserved for the completion of sets. Single copies (40 cents) will be furnished only when not breaking complete volumes.

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Correspondence relating to the above publications should be addressed to

RALPH C. BENEDICT
Brooklyn Botanic Garden,
Brooklyn, N. Y.

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A Bi-Monthly Journal of Botanical Notes and News

EDITED FOR

THE TORREY BOTANICAL CLUB

BY

GEORGE T. HASTINGS

John Torrey, 1796–1873

CONTENTS

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GEORGE T. HASTINGS
2587 Sedgwick Ave.
New York City.

TORREYA

Vol. 26 No. 5

September-October, 1926

A MIDDLE FLORIDA CEDAR SWAMP

Roland M. Harper

Chamaecyparis thyoides, known as white cedar in the North and juniper in the South, has a fairly wide but very irregular distribution in the glaciated region and coastal plain, mainly from Massachusetts to Mississippi and within 150 miles of the coast.* It seems to skip most of Delaware and Maryland, all of Virginia except Dismal Swamp, and all of Georgia except for a locality near Juniper on the line between Talbot and Marion Counties, though there are unconfirmed rumors of its occurrence elsewhere in that vicinity and in Okefinokee Swamp. In Florida it ranges from Gadsden and Liberty Counties, just east of the Apalachicola River, westward, and is chiefly confined to the West Florida pine hills, a continuation of the Altamaha Grit region of Georgia.† (The post-office of Juniper, in Gadsden County, is probably named for it.)

In December, 1924, a man in Bainbridge, Georgia, was advertising in Jacksonville (Florida) papers that he had white cedar or juniper poles for sale; and as I felt pretty sure that there was no such tree growing in that corner of Georgia, I wrote and asked him if his stock did not come from Florida. He admitted that I had guessed correctly, and furnished information showing that the cutting of *Chamaecyparis* poles (for telephone wires, etc.) in Liberty and adjoining counties was quite a flourishing industry, which I had not heard of in those parts before.

In January, 1925, I gave a news item about this industry, and the circumstances through which I had learned of it, to the daily papers of Florida; and soon afterward I received a letter

* See Torreya **7**: 198–200, Oct., 1907; Pop. Sci. Monthly **85**: 347–348. 1914; Taylor, Mem. N. Y. Bot. Gard. **6**: 79–88, pl. 6–10. 1916.

† See Ann. Rep. Fla. Geol. Surv. **3**: 218–219, 315, 352. 1911; **6**: 208, 234, 238, 253, 423, 334, 342, 400. 1914.

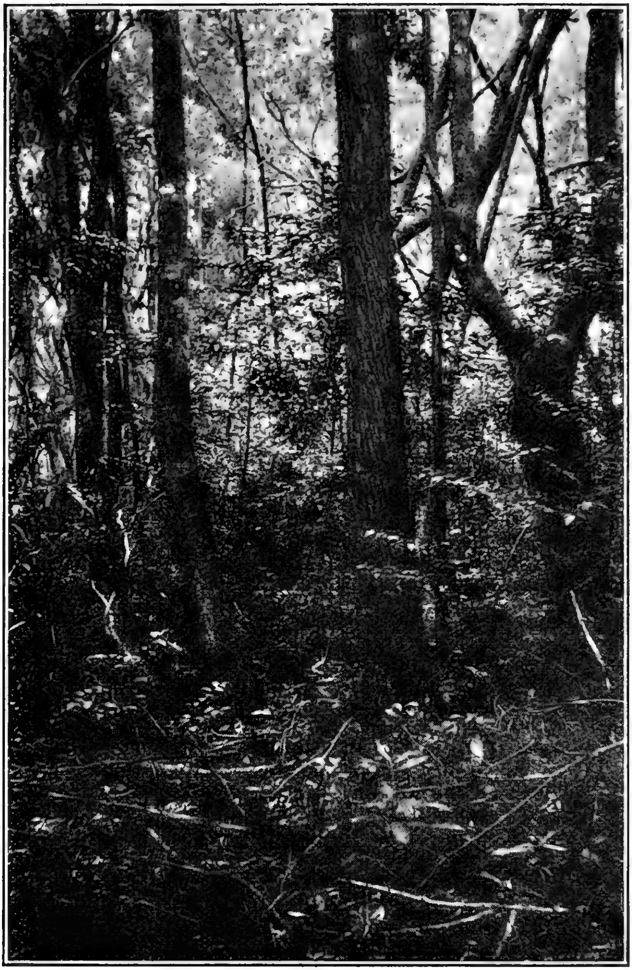
from a man in Jacksonville, stating that he owned a large body of juniper in Liberty County, six miles south of Bristol. Further correspondence elicited a little more information about it, but I did not have an opportunity to visit the place until the 7th of July.

On that date I arrived in Bristol shortly before noon, and planned to spend the afternoon walking out to the cedar swamp and back. I found it accessible enough, with a good road leading past it, but it was eight miles from town instead of six, so that my time for exploring it was very limited. Very likely I did not see the best part of it (and the owner assures me that such is the case), but as it is now for sale, and may soon be subject to destructive exploitation, it seems desirable to put on record at least an imperfect description of the place.

The swamp, known locally as "Johnson's Juniper," borders a small creek just about on the line between the pine hills and the flatwoods, on the road from Bristol to Estiffanulga. The surrounding soil is pretty sandy, and decidedly non-calcareous, but has clay subsoil within a few feet of the surface. Longleaf pine is the commonest tree on the neighboring uplands. At the point where I entered the swamp, through a thick fringe of bushes (much of which had been recently burned, to the annoyance of the would-be explorer), *Chamaecyparis* is not the largest or most abundant tree, and it is scarcely visible from outside the swamp, at least in summer. (There is also a little of it in some smaller swamps near by, though.) Inside the swamp the ground was covered with peat, and fallen logs in all stages of decay, and it was fairly dry at the time of my visit, though probably wet enough in rainier seasons. The trees make a very dense shade, and there is almost no herbaceous undergrowth.

The accompanying illustration is from a photograph made with a 15-minute exposure; but the afternoon was cloudy and late, and in the middle of a bright day possibly one minute would have sufficed.

The composition of the vegetation of the swamp, as nearly as could be determined from my brief visit, is indicated by the following list, in which the plants are divided first into trees, shrubs, etc., and then arranged in approximate order of abundance. Evergreens are indicated by heavy type.



Interior of "Johnson's Juniper," near north end. July 7, 1925. The largest tree near the center is *Chamaecyparis.*

TREES

Magnolia glauca (bay)
Cliftonia monophylla (tyty)
Chamaecyparis thyoides (juniper)
Pinus Taeda (short-leaf pine)

Pinus Elliottii (slash pine)
Taxodium imbricarium (cypress)
Nyssa biflora (black gum)
Persea pubescens (red bay)

SHRUBS

Ilex coriacea
Pinckneya pubens (maiden's blushes)
Clethra alnifolia
Itea Virginica
Pieris nitida (hurrah bush)

VINES

Smilax laurifolia (bamboo vine)
Pieris phillyreifolia*

HERBS

Mitchella repens (turkey-berry)

BRYOPHYTES

Sphagnum cymbifolium?
Bazzania trilobata

Very few of the trees that I saw were over a foot in diameter, but there may be larger ones in other parts of the swamp. Evergreens predominate, as in many other sour swamps. *Ilex coriacea* is more abundant than all the other shrubs combined. Except for the presence of *Chamaecyparis*, this swamp is much like the non-alluvial swamps of South Georgia,† Bear Swamp in Autauga County, Alabama,‡ the bays of West Florida,§ and many other coastal plain swamps with soft water which does not vary much in level from one season to another.

* See Torreya **3**: 21–22. Feb., 1903.
† See Ann. N. Y. Acad. Sci. **17**: 93–95, pl. 13, 14. 1906.
‡ See Torreya **24**: 78–79, 82. 1924.
§ See Ann. Rep. Fla. Geol. Surv. **6**: 203, 351. 1914.

THE HEPATICAE OF FISHER'S ISLAND*

ALEXANDER W. EVANS

Fisher's Island lies in the eastern part of Long Island Sound. Although belonging to the State of New York, it is less than three miles from Connecticut and is therefore much closer to the New England coast than to any part of Long Island. Its total length is about seven miles and its greatest width about a mile and a half; much of the island, however, is less than half a mile wide. The highest elevations are about one hundred feet above sea level, and the slopes are mostly gradual.

A few wooded areas of limited extent, a few small swamps and bogs, and a few ponds with sandy or peaty shores afford favorable habitats for the Hepaticae; but most of the island, even where not under cultivation, is too dry and too well drained to meet the special requirements of these plants. It is not surprising, therefore, that the liverworts are rather scantily represented.

The following list of species is based on two collections, the first made by the writer during the summer of 1916, and the second by Mr. Roy Latham in June, 1924. The records based on Mr. Latham's specimens are indicated by his initials.

Riccia fluitans L. (R. L.)
Marchantia polymorpha L. (R. L.)
Riccardia latifrons Lindb.
R. multifida (L.) S. F. Gray.
R. pinguis (L.) S. F. Gray (R. L.)
Pallavicinia Lyellii (L.) S. F. Gray.
Pellia epiphylla (L.) Corda.
Nardia crenulata (Sm.) Lindb.
Lophozia Mildeana (Gottsche) Schiffn.
Lophocolea heterophylla (Schrad.) Dumort.
Cephaloziella elachista (Jack) Schiffn.
C. Hampeana (Nees) Schiffn.
Cephalozia curvifolia (Dicks.) Dumort. (R. L.)
C. fluitans (Nees) Spruce. (R. L.)
C. Francisci (Hook.) Dumort. (R. L.)
C. macrostachya Kaal. (R. L.)

* Contribution from the Osborn Botanical Laboratory.

C. media Lindb.
Odontoschisma prostratum (Sw.) Trevis.
Calypogeia Sullivantii Aust.
C. Trichomanis (L.) Corda.
Lepidozia sylvatica Evans.
Telaranea nematodes (Gottsche) M. A. Howe.
Porella pinnata L. (R. L.)
Frullania Asagrayana Mont. (R. L.)
F. eboracensis Gottsche.
Anthoceros laevis L. (R. L.)

Of the species listed *Cephalozia Francisci* and *Telaranea nematodes* are perhaps the most interesting from the standpoint of plant distribution. *Cephalozia Francisci* has a northern range. It occurs in Maine, New Hampshire and Massachusetts and also in the eastern part of Long Island but is still unknown from Connecticut and Rhode Island. *Telaranea nematodes*, on the other hand, is southern in its distribution and is not known in New England or at any other point north of Fisher's Island. It occurs, however, in eastern Long Island, in New Jersey, and along the Atlantic and Gulf Coasts, and is a characteristic species in many tropical regions. The other species of the island are widely distributed in eastern North America and most of them occur also in Europe.

Yale University,
New Haven, Connecticut

SOME EXTINCT OR LOST AND REDISCOVERED PLANTS III.

Psoralea stipulata T. & G.

P. A. Rydberg

Psoralea stipulata was described in the appendix of Torrey & Gray's Flora (1: 688. 1840.) The type came from "Falls of the Ohio," *Mr. Wm. Jones* (communicated by *Dr. Clapp.*) The type specimen in the Torrey Herbarium bears the following label:

Psoralea? stipulata T. & Gr. [congesta]
Jun. 8—39 Rock Island,
Falls of the Ohio

Collected by Mr. Wm. Jones of Portland, Ky.
[Dr. Clapp—rec'd. July 9th, 1839]

There is also another specimen in said herbarium from "Rock Island, Falls of Ohio, June, 1842, C. W. Short, M.D.," and in the Columbia University Herbarium one labeled, "New Albany, Ind." collected by A. Clapp. This was received from Matindale. New Albany was Dr. Clapp's home. As no date is given, this might have been a specimen from the original collection or it might be an additional station. In the herbarium of The New York Botanical Garden there is one from the Falls of Ohio collected by Short in 1860. The Gray Herbarium and the U. S. National Herbarium contain no other specimens except duplicates of one or two specimens given above, and no specimens have been collected since 1860. The plant seems, therefore, to have been confined to Clark County, Indiana, and Jefferson County, Kentucky.

The species is not mentioned in the earlier editions of Wood's Classbook, but in the editions of 1863–1872 (p. 315), and in his Botanist and Florist (1873–1889, p. 92), there are short descriptions and the locality is given as Ohio Falls, Ky. In Gray's Manual (ed. 1, p. 105) the distribution is also given as Ohio Falls. This remains unchanged up to the 6th edition, where it is changed to "Rocks, S. Ind. and Ky." In the New Gray's Manual it reads: "Limestone ledges, Ohio River above Louisville, Ky., and New Albany, Ind."

In Britton & Brown's illustrated Flora (both editions) and in Britton's Manual (both editions) the distribution is given as, "in rocky places, Ohio, Indiana and Kentucky." The extended distribution seems to be due to Miss A. M. Vail's revision of the genus (Bull. Torrey Club **21**: 113), where she erroneously placed "Falls of the Ohio" and "Rock Island" in the State of Ohio. Miss Vail also states that in Short's herbarium at the Philadelphia Academy there is a note "That he never found this plant in fruit growing wild, and that he cultivated it vainly for years."

In local publications of Indiana and Kentucky we find the following records:

In Barnes' Catalogue of the plants of Jefferson County (1881, p. 7) is given "Knobs" without authority. (This is probably a mistake in that the author confused the county with Jefferson Co., Kentucky. Young does does not mention it in his Botany of Jefferson County, Indiana, 1871.)

In the Catalogue of the Phanerogamous and Vascular Cryntogamous Plants of Indiana, prepared by the editors of the Botanical Gazette and C. R. Barnes in 1881, the only word indicating the distribution is "Knobs."

In Stanley Coulter's Catalogue of the Flowering Plants and Ferns of Indiana (1900) we read: "It occurs in Jefferson and Clark Counties sparingly. No other stations are reported." (The records from Jefferson County, Indiana, are probably erroneous; see above.)

In Short's Fourth Supplementary Catalogue of the Plants of Kentucky we read: "*Psoralea congesta*,—a new species lately discovered by Dr. Clapp and Mr. Jones of New Albany, on the islands of the Ohio River near that place." (This specific name was never published but it appears on the type sheets of *P. stipulata*.)

I have written to Mr. C. C. Deam, Bluffton, Indiana, to Prof. Stanley Coulter at Purdue University and Prof. Young at Hanover College. Mr. Deam has never collected it. He answered among other things, "The area about the Ohio Falls is now all town and there is very little chance for anything to survive there. If it is a plant of low ground and local it is no doubt extinct now, as all area about the Falls is under cultivation or has buildings on it." I understand that the Rock Island, the original locality, was blasted away some years ago when the Ohio was made more navigable.

Professor Coulter answered that in preparing his catalogue he "relied for citations from Jefferson County on the catalogues" by A. H. Young, J. M. Coulter and C. R. Barnes (respectively). Young's catalogue does not cite *P. stipulata*, J. M. Coulter's I have not seen unless it is the one published by the editors of the Botanical Gazette. In Barnes' catalogue the plant is credited to Jefferson County, Indiana, but I believe that this County has been confused with Jefferson County, Kentucky, where the plant has existed. In a later letter, Prof. S. Coulter added: "I do not believe the plant exists at present in Indiana. I have no specimen of it in my herbarium. I have written to my brother about it and his reference was from Clapp's collection."

Professor Young wrote: "It has not been my pleasure to become acquainted with *Psoralea stipulata.*" He has resided in Jefferson County since 1870, collected thoroughly through Scott, Jefferson, and Switzerland counties, Indiana, and Trimble County, Kentucky, but not in the immediate vicinity of the Falls. Neither he nor his students have ever met it.

It seems, therefore, evident that the plant was found locally in the neighborhood of Louisville, on both sides of the river, *i. e.* in Clark County, Indiana, and Jefferson County, Kentucky, but is now extinct. Furthermore that it never has been collected in fruit. It may be that after all it is not a *Psoralea* (in broad sense). The flowers resemble much those of *P. Onobrychis*, but even the calyx is without glands. Glands are present on at least the calyx and the fruit in all the other species of the tribe *Psoraleae.* I though once that it might be a species of *Meibomia*, but I have not found a species in that genus to match it.

Any further information will be thankfully received.

New York Botanical Garden
New York, N. Y.

FURTHER NOTES ON CYNOSURUS ECHINATUS L. IN OREGON

F. Lyle Wynd

Cynosurus echinatus L. was first reported from Eugene by J. C. Nelson, October, 1919 (Torreya, Vol. 19, No. 9, page 189). R. V. Bradshaw reported its occurrence at Eugene, Feb., 1920 (American Botanist, Vol. 26, No. I, page 19). Again it was reported by J. C. Nelson in his list of introduced plants, March, 1921 (Torreya, Vol. 21, No. 2, page 24). It was here indicated as an introduced species. The latest and most detailed account of its occurrence at Eugene was given by Mr. Bradshaw in Torreya, September, 1921 (Torreya, Vol. 21, No. 5, page 81). It is here stated that C. echinatus occurred on Skinner's Butte and Spencer's Butte.

It would not be at all difficult to think of this species as being introduced in both of these localities as Skinner's Butte is a small hill overlooking the depot, and used as a municipal park. Cars and pedestrians are constantly entering from foreign localities thus giving ample opportunity for the accidental introduction of foreign species. Spencer's Butte, even though more than six miles from Eugene is a favorite hiking and camping spot for people about Eugene. In both of these localities C. echinatus L. was found growing on dry, exposed slopes.

Thus far it seems plain that it is an introduced species, but since the publication of these papers the writer has found it abundantly established on dry sunny hillsides in the foot-hills of the Cascade Mountains some twenty miles southeast of Eugene, far from the usual route of travelers. These outlying stations were in all cases separated from the stations at Eugene by miles and miles of dense timber and several rivers. It seems incredible that it should have been artificially introduced in these widely separated localities. Even more incredible seems the possibility of its being a rare native of these foothills.

Possibly in years past some solitary hunter or prospector carried the seeds into the hills in grain for his horse, and yet it seems unlikely that grain would be carried for stock in a region where green fodder is comparatively easy to find.

The old military road, over which some of the immigrants entered the Williamette valley in years past, follows up the valley a few miles from these outlying *Cynosurus* stations. Perhaps some wondering straggler of the immigration trains caused the introduction of this grass while feeding his horse.

At all events, whether it was introduced by prospectors, hunters, or immigrants, *C. echinatus* L. is firmly established in the foot-hills southeast of Eugene. The writer has for several seasons seen this interesting grass growing so profusely along roadsides near Eugene, that it had been cut and shocked for hay. Stock must indeed be hungry to eat *Cynosurus* hay with the quantity of dry, wiry empty glumes which occur on each spikelet.

R. V. Bradshaw cites specimens (Torreya, Vol. 21, page 83) in the United States National Herbarium to show the wide range of this species, but he points out its extreme rarity in North America, but four localities being represented. They are as follows:—British Columbia; Vancouver Island; Eugene, Oregon; Marion Co., California.

To this record the writer wishes to add the following collections; Eugene, Wynd 218, May 22, 1920; Fall Creek, Wynd 673, June 7, 1921; Jasper, Wynd 1025, June 20, 1922.

UNIVERSITY OF OREGON,
EUGENE, OREGON

TWO NEW SPECIES FROM FLORIDA

A NEW LUPINE FROM NORTHERN FLORIDA.—There has been much confusion regarding the characters of the single-leafleted kinds of Florida lupines. Recent exploration has served to clear up some of the confusion.

The first species of this group described was *Lupinus villosus* (Willdenow 1800). This species is sharply marked off from its several relatives by the copious, loose, usually shaggy pubescence, particularly on the stem, petioles, and pods and by the reddish-purple corolla with the standard-blade maroon in the center. In 1818, Thomas Nuttall described *Lupinus diffusus* from specimens without either flower or fruit. However, this species may be properly determined by the original locality—"Around Wilmington, and in many other parts of North and South Carolina, in the barren forests of the Quercus Catesbaei and Q. nigra." In this plant the corolla is blue and the standard has a white spot. In 1860 A. W. Chapman associated the name *L. diffusus* with the plant of coast region of middle and western Florida—witness his statement "flowers blue, the vexillum dark-purple in the centre;"

While in the St. Andrews Bay region last May the writer found this lupine in full flower. It grows on the sand-dunes along and near the bay. The dissimilarity between it and the true *Lupinus diffusus* was at once apparent, not only by the dark spot in the standard-blade, but also by the shrubby habit of the plant. Mature fruit was secured for us by Mr. G. M. West of St. Andrews, in July. This, too, furnished an additional distinguishing character. The pod is elliptic, and only about half as large as the broadly linear pod of *L. diffusus*.

Lupinus Westiana Small, sp. nov. Plant shrubby, up to 1 m. tall, conspicuously silvery-pubescent: stem erect, woody below, branched, closely but finely villous: leaves numerous:

leaflet elliptic or ovate-elliptic, 4–9 cm. long, obtuse or acutish, entire, closely-pubescent, rounded or obtuse at the base; petioles as long as the leaflet-blade or shorter; stipules wanting or obsolete: raceme erect, 1–3 dm. long, continuous, the rachis pubescent like the stem: bracts lanceolate, 4–5 mm. long, fugaceous, acuminate: calyx about 1 cm. long, with a pair of lanceolate-subulate bractlets adnate to the short tube, silvery-pubescent; lips much longer than the tube, the lower lip broadly ovate, with two deltoid lobes at the apex, the upper lip lanceolate, entire or obscurely 3-lobed at the apex: corolla mainly blue; standard 1.5 cm. long, the blade orbicular-ovate, with a central red-purple spot: wing-petals 1.5 cm. long, the blade very wide, with a broad blunt basal lobe: keel less than 1.5 cm. long, scimitar-shaped, the blade with a more or less spreading or outcurved sharp basal auricle: pod elliptic, turgid, about 2.5 cm. long, closely shaggy-villous, the beak nearly central.—Sand-dunes along or near the coast, middle and western Florida. Types in the herbarium of The New York Botanical Garden, for flowers, St. Andrews, Florida, J. K. Small, May, 1926; for fruit, G. M. West, July, 1926.

John K. Small

A New Candy-root from Florida. About a dozen species of the twenty-seven polygalas growing naturally in Florida are endemic. A few of the endemic ones are restricted in their geographic ranges—*Polygala praetervisa* to the lower Florida Keys, *P. arenicola*, *P. flagellaris*, *P. miamensis* to the Everglade Keys, *P. Lewtonii* to the "Ridge,"* *P. cumulicola* to the lower eastern coast sand-dunes. The other endemics are mostly widely distributed in the State.

While collecting in the Coronado-Turtle Mound region of Florida last May (the twenty-fourth day) we discovered an undescribed species at two localities, both of them hammock clad: one, the primeval hammock a few miles south of the settlement of Coronado, the other, the celebrated Turtle Mound. Both of these stations are on ground which less than four centuries ago was actively occupied by the now extinct Florida aborigines, hence it is appropriate to designate the species in question:

Polygala aboriginum Small, sp. nov. Plant similar to *Polygala polygama* in habit, mostly 1–3 dm. tall: stem erect

* The southern end of the Lake Region.

from a biennial finely branched tap-root, simple or sometimes branched at the base or near the inflorescence, or both, glabrous, finely ridged: leaves alternate, ascending; blades elliptic-spatulate to narrowly elliptic, 1–2.5 cm. long, usually acutish, glabrous, paler beneath than above, narrowed at the base but sessile: racemes narrowly-cylindric, closely flowered, 1–11 cm. long, continuous: bracts narrowly ovate, acute, longer than the pedicels, deciduous: pedicels less than 1 mm. long, glabrous: sepals (upper one and lower 2) green with pink margins, the upper one oval or ovate, about 1.5 mm. long, the lower ones slightly shorter and narrower: wings (lateral sepals) pink, 3–4 mm., long at maturity, the orbicular or orbicular-oval blades narrowed into a short claw: corolla pink, about 3 mm. long, the lateral lobes broad, rounded, the middle lobe with about 6 minute appendages: anthers scarcely 0.5 mm. long: capsule somewhat quadrate, about 3.5 mm. long, sharply notched at the apex, about as long as the wings or slightly longer, glabrous: seed narrowly obovoid, or slightly cylindric-obovoid, about 3 mm. long, with short ascending hairs, the aril with two appressed lobes reaching to beyond the middle of the seed. Cleistogamous flowers borne on branches from the base of the stem produce capsules similar to those of the upper flowers.—Hammocks on off-shore bars, Coronado, opposite New Smyrna, to Turtle Mound, Florida. Type from Turtle Mound, May 24, 1926.

This recently discovered species differs from *P. polygama* in the narrow continuous racemes, the short pedicels which are exceeded by the bracts, the smaller flowers, with scant appendages on the middle petal, and the wings which are only slightly longer than the capsule or shorter.

John K. Small

BOOK REVIEWS

The American Species of Stipa*

Professor A. S. Hitchcock has published a noteworthy account of the American species of the large grass genus *Stipa*. Those of North Amreica are fully described, with citations of synonyms, comments upon the type specimens and copious lists of specimens cited. The type species is *Stipa pennata* L. of Europe. Forty species are recognized in North America,

* Contr. U. S. Nat. Herb. **24**: Part 7. 1925.

ranging from Guatemala northward to Alberta, Manitoba, Ontario and Massachusetts; none are known to inhabit the West Indies nor Central America south of Guatemala; those here first described are *Stipa saxicola* from Puebla, *S. leiantha* also from Puebla, *S. constricta* from Hidalgo, *S. angustifolia* from Coahuila, and *S. mexicana* from Mexico and Hidalgo.

Those inhabiting South America extend from Columbia and Venezuela to Chile, Brazil and Argentina; Professor Hitchcock recognizes eighty-nine species, describing nineteen of them as new to Science. No species are known to exist in the Guianas nor in northern Brazil.

The geographic distribution of the genus and of its species, as indicated by Professor Hitchcock, is significant. Its absence from the hot tropical regions, both insular and continental, implies physiological adaptation to the lower temperatures; from the Guatemala locality of *Stipa Ichu* (Volcano Agua), to the mountains of northern Colombia, where several species occur, is a distance of about 10 degrees of latitude or about 700 miles, through which no species are known to exist, and probably do not exist unless as rarities as yet unobserved. From central Florida (*Stipa avenacioides*) to northern Brazil, there is a much greater gap of about 35 degrees, or about 2400 miles.

Considering individual species, this striking discontinuous distribution appears as follows:—

Stipa speciosa, Colorado to California and Lower California—Bolivia, Chile, Argentina.

Stipa Ichu, San Luis Potosi to Guatemala—Colombia to Bolivia and Argentina.

Stipa tenuissima, Texas and New Mexico to Puebla—Argentina.

Stipa mexicana, Mexico and Hidalgo—Colombia, Venezuela, Peru.

Stipa mucronata, Nuevo Leon to Tlaxcala—Colombia to Chile and Argentina.

While similar discontinuous distribution is well known in other plants, these detailed studies of *Stipa* provide a convenient opportunity for calling attention to it as a very interesting phenomenon, its cause or causes as yet obscure, perhaps attributable to migratory birds.

The three plates of figures contain illustrations of the fruits of all the species found in North America. The fruits are so characteristic that the species can usually be identified from these alone. N. L. Britton

Life of Plants*

The title of this little book is too modest and conservative. The author's aim as given in the preface is "to suggest that Science is more than a body of doctrine—an illumination of life." The first sentence of the introductory chapter "the study of plants is an adventure unto another world, the inhabitants of which are strangely different from those of the animal world," suggests what the reader will find throughout, that the book is written in a manner to make the life of plants real and active. As far as is possible in a book of its size, the latest discoveries in plant physiology are given in simple language that can be understood by the non-scientific reader. The descriptions of colloids and their work in absorption, of the part played by enzymes, of the growth of the cell, of the responses to stimuli and their transmission are all clear and definite. Each of the nine chapters begins with an outline of the contents. Chapter VIII, for example:—"Variation and heredity; Evolution; Reproduction; asexual and sexual; Cell and nuclear division; The Chromosomes as the material bases of Heredity; The experimental breeding of plants; Mendelian inheritance." The explanation of Mendelism is accompanied by simple diagrams and one plate. Some of the modifications and corollaries of the law are explained or suggested. If the general reader carries away the idea that Mendelian inheritance is the chief factor in evolution, the concluding paragraph of the chapter shows that the author did not intend to give such an impression. "The task with which this chapter was charged is now done. It has given a glimpse of the Mendelian threads out of which the fabric of life is woven and by which that fabric is maintained and renewed. The larger enterprise, to inquire into the nature of variation, and to consider the part played by natural selection or the influence of environment in evolution, may be left to the authors of the companion volume on the lives of animals;

* Life of Plants, Sir Frederick Keeble, XII, 256 pp., 51 fig. Clarendon Science Series. Oxford University Press, American Branch, New York, 1926, $1.75.

great themes, to search out the propulsive force which has driven and yet drives, organism on its eventful evolutionary voyages, and to scan the heavens to discover what may be the star whereby evolution has steered its immemorial course."

The book gives little space to figures or tables. Those that are used are carefully chosen. The fifty-one illustrations are all good but not evenly distributed. In describing the vascular system of stems and roots, eleven excellent photomicrographs are used, some chapters have but one or two illustrations. The book should prove of value to everyone interested in plants. The botanist will find known facts presented in a new, stimulating manner, the student will find clear, up-to-date statements of the essentials of plant physiology and the general reader will get a glimpse of a fascinating world of action.

George T. Hastings

THE LONDON CATALOGUE OF BRITISH PLANTS

There are two stages in the history of any scientific undertaking which are most productive of interesting results. One is the pioneer stage, when novelties, facts or ideas, crowd to be recorded, and the observer feels that he is laying the foundations of a structure, the size and importance of which he can only surmise. The other stage is that when the final structure appears to take shape, and out of the labors of years the more or less finished product begins to be realized. I say more or less finished because it is soon discovered that the apparent completion is deceptive in so far as it represents only a stage in the development of the science, a development which will never cease so long as the human mind remains active and progressive.

The American botanist, accustomed to our vast and only partially exploited resources, may regard the small British flora with a certain measure of indifference if not contempt. Was it not well known a century ago, and does it not seem that modern students, in their efforts to discover new facts in such a field, are merely dealing with trifles? But the truth is, that the British flora, just because it has been so intensively studied, can teach us many things. It is by no means completely known, but its larger features are clearly perceptible and every new observation fits into the scheme of things and has a significant meaning. We are at the stage when analysis permits synthesis, and the scientific harvest can be gathered in.

Perhaps the most indispensable publication on British plants is the London Catalogue, which covers the flowering plants, ferns and their allies, and Charophyta. It enumerates all the species, giving the number of geographical units in which each is found, and indicating which are native, which introduced. The first edition was published in 1844. The one current when I began to study botany was the seventh. It bears no date, but was published in 1874, according to a statement in the eighth edition. My copy refers to the year 1880 in an advertisement on the cover, so I suppose it represents a later impression. The eighth edition appeared in 1886, and was reprinted in 1890; I possess the reprint. The ninth edition is dated 1895. The last published, the eleventh, has recently (late in 1925) appeared. It is interesting to note the increase in recorded species of flowering plants: 1601 in the seventh edition, 1760 in the eighth, 1861 in the ninth, 2256 in the eleventh. This increase is partly due to "splitting," partly to the discovery of plants hitherto overlooked, partly to the naturalization of aliens. The aliens are less numerous than one might expect; thus it is much easier for European weeds to get established in North America than vice versa. In the eleventh edition the plants which are certainly or most probably aliens include about 267 species, which is after all more than one in ten. These include some of the well established and familiar species, such as *Lychnis githago*, *Centaurea cyanus*, etc., which now have the aspect of natives. A very striking feature is the enormous number of hybrids, along with the fact that they are reported only in certain genera. The eleventh edition records the following hybrids: *Ranunculus*, 4 (all in *Batrachium*); *Papaver*, 1; *Fumaria*, 1; *Nasturtium*, 1; *Helianthemum*, 2; *Viola*, 11; *Polygala*, 1; *Silene*, 1; *Lychnis*, 1; *Cerastium*, 3; *Sagina*, 1; *Spergularia*, 2; *Hypericum*, 1; *Geranium*, 1; (not one in Leguminosae); *Prunus*, 1; *Rubus*, 23; *Geum*, 1; *Potentilla*, 3; *Rosa*, 26; *Sorbus*, 3; *Saxifraga*, 3; *Drosera*, 1; *Epilobium*, 35; *Apium*, 1; *Galium*, 2; *Erigeron*, 1; *Bidens*, 1; *Senecio*, 3; *Arctium*, 1; *Carduus*, 1; *Cnicus* (i. e.

Cirsium), 7; *Centaurea*, 2; (none in *Hieracium*); *Sonchus*, 1; *Tragopogon*, 1; *Vaccinium*, 1; *Erica*, 4; *Limonium*, 1; *Armeria*, 1; *Primula*, 3; *Erythraea*, 1; *Gentiana*, 1; *Symphytum*, 1; *Verbascum*, 5; *Scrophularia*, 1; *Euphrasia*, 16; *Utricularia*, 1; *Pingnicula*, 1; *Mentha*, 8; *Scutellaria*, 1; *Prunella*, 1; *Stachys*, 1; *Lamium*, 1; *Ajuga*, 1; *Chenopodium*, 1; *Salicornia*, 5; *Polygonum*, 8; *Rumex*, 16; *Euphorbia*, 1; *Ulmus*, 3; *Betula*, 2; *Quercus*, 1; *Salix*, 70 (many multiple); *Populus*, 1; *Epipactis*, 1; *Anacamptis*, 1 (bigeneric, with *Gymnadenia*); *Orchis*, 15; *Ophrys*, 4; *Gymnadenia*, 6 (all bigeneric with *Cocloglossum*, *Leucorchis*, and *Orchis*); *Coeloglossum*, 2 (both bigeneric with *Orchis*); *Platanthera*, 1 (bigeneric with *Orchis*); *Juncus*, 3; *Luzula*, 1; *Sparganium*, 1; *Potamogeton*, 19; *Zostera*, 1; *Scirpus*, 1; *Carex*, 31; *Alopecurus*, 1; *Polypogon*, 1 (bigeneric with *Agrostis*); *Koeleria*, 1; *Glyceria*, 3; *Festuca*, 2; *Agropyron*, 2. In all, 303 plant forms regarded as hybrids, eleven of them between different genera. We are usually left to assume that these are first generation hybrids, but this may not always be the case, and cannot be in the multiple *Salix* hybrids.

The known polymorphism of certain species is only partly dealt with and it is stated that the many forms of *Capsella* and *Taraxacum* have been purposely omitted. Nevertheless, 46 varieties or races are listed under *Rosa canina*. *Rosa involuta* and *R. hibernica*, long considered species, now stand as hybrids. I am glad to see *Anagallis foemina* Mill. (*coerulea* Schreb.) given as a distinct species, as I have long so regarded it. The dimorphism of *Digitalis*, observed by Miss Saunders, is not recognized.

A matter of special interest to us in America is the number of species in several genera, as compared with the number in our flora. Thus Britain is extremely rich in *Rubus* and *Hieracium*, but very poor in *Aster*, *Oxytropis*, *Clematis*, *Quercus*, etc. The recent investigations of C. C. Hurst on *Rosa* may throw a flood of light on these phenomena. The groups in which there is great diversity, with a large number of species, may be expected to be found, when their chromosomes are examined, to be polyploid. Such polyploid species, according to Hurst's observations on *Rosa*, may give rise to diploids, which if they survive will remain relatively constant, with only small variations. They can only do otherwise through a slow process of mutation, which involves heavy risks, many mutations being lethal, others disadvantageous. But the polyploid species may themselves have arisen by duplication, combined with mutation, and hence it appears that those regions characterized by polyploids, while not necessarily the original homes of the genera concerned, have at least been inhabited by them a very long while. Consequently the cytology of all these plants acquires a new interest, and the chromosome count is no longer merely a matter of record, lacking special significance. For instance, with reference to the very recent (Botanical Gazette, April, 1926) discussion of *Xanthium* by Symons, it seems possible that the true *X. Wootoni* will be found to have fewer chromosomes than those allied species which occasionally produce *Wootoni*-like burrs. If so, the genuine *X. Wootoni* will always breed true, as it did in the experiments of DeVries.

I notice only one misprint in the eleventh edition: *Hippophæ* for *Hippophaë*. To the American botanist some of the generic arrangements will seem illogical, and indeed the amount of generic division allowed seems to vary with the authority who last revised the group. These catalogues are certainly most useful, and stimulating to botanists in the regions where they are used. It would be a great service to American botany to issue a series of similar lists, dealing with the various major divisions of our country. It is important that the price should be low. The eleventh edition of the London Catalogue, though well printed on good paper, is sold for ten pence (20 cents), and may be had interleaved and bound in limp cloth for a shilling and sixpence. The publisher is Geo. Bell and Sons, 6 Portugal Street, W. C., London.

T. D. A. Cockerell

"TROPICAL WOODS"

In March, 1925, the School of Forestry of Yale University began the publication, under the name "Tropical Woods," of a small quarterly journal which, under the efficient editorship of Prof. Samuel J. Record, has now reached its seventh number. It is devoted to the forestry and botany of tropical trees, with special reference to those of America. The first five numbers were distributed gratuitously and widely, but with the sixth the journal takes a somewhat more regular footing as a botanical periodical by the adoption of a subscription price ($.25 per copy). The publication of numbers 4, 5, and 6 was financed by the United Fruit Company.

Unless the limitations imposed by the issue of only about 144 small octavo pages annually are removed by the adoption of a larger format, it will evidently be impossible for this journal to print more than a small fraction of the rapidly increasing output of papers on the botany and forestry of tropical trees. A field of perhaps greater usefulness is open to it, however—that of presenting, in addition to such short original notes as the limits of space may permit, summary reviews of at least all the important items in the current literature of the world relating to its subject. That the editor has envisaged this opportunity is shown by the number and variety of the reviews already printed, which occupy two-fifths of the pages.

Among the original papers, the following (all by the editor unless otherwise noted) may be mentioned: in no. 1, "Lapachol," "Secretory cells in dicotyledonous woods," "Preliminary check list of British Honduras woods" (vernacular and botanical names); in no. 2, "Schizolobium: a promising source of pulp-wood," "Forest conditions in southeastern Bahia, Brazil," by H. M. Curran; in no. 3, "Cystoliths in wood," "Spiral tracheids and fiber-tracheids;" in no. 4, "An enumeration of the Sapotaceae of Central America," by P. C. Standley (with descriptions of 5 new species of *Lucuma* and 2 of *Bumelia*), "Occurrence of intercellular canals in dicotyledonous woods"; in no. 5, "Notes on new cabinet woods from Brazil," by K. Schmieg, "Trees of the Bayano River watershed, Panama," by H. C. Kluge and S. J. Record; in no. 6, "Mahogany in the upper Amazon," "Mucilage cells and oil cells in the woods of the Lauraceae," by H. H. Janssonius, "Some fundamental considerations of specific gravity," by S. J. Record and H. D. Tiemann; in no. 7, "New species of trees collected in Guatemala and British Honduras by Samuel J. Record," by P. C. Standley, "Trees of the lower Rio Motagua Valley, Guatemala," by S. J. Record and H. Kuylen, "Native woods used for railway crossties in British Honduras," by G. W. E. Francis. There are also numerous short notes. The journal is well printed and carefully edited.

S. F. Blake

NEWS NOTES

Botany had headlines on the front pages of the newspapers when Sir Jagadis Chunder Bose gave a demonstration of the heart beats of plants before the British Association for the advancement of Science on August sixth. The delicate apparatus, apparently refinements of those previously used by Dr. Bose, showed the breathing of the plants, the effect of poisons, narcotics and stimuli. The following day many papers commented editorily on the reports, giving the opinions of various prominent botanists to the effect that the experiments were interesting but the interpretations misleading. Dr. McDougal stated that the vibrations of plants incident to growth are of no more importance in understanding their vital activities than the vibrations of a train are in showing the work of the locomotive.

The International Conference on Flower and Fruit Sterility was held in New York from August 12–14. Papers were read on the effects of sterility on flower and fruit production, the relation of sterility to the origin of species, its relation to self and cross pollination, the causes of sterility, and on sterility as manifest in a large number of cultivated plants.

Lack of plant-quarantine laws in the past permitted entry into the United States of the parasitic fungus causing the blight or bark disease of chestnut, which has already laid waste the chestnut north of the Potomac River and east of the Allegheny Mountains. The most important stands of chestnut left in this country, located in the southern Appalachian Mountains, now face certain destruction by the blight, says the United States Department of Agriculture in Department Circular 370-C, "Chestnut Blight in the Southern Appalachians."

By 1935, it is estimated, nine-tenths of the counties of the southern Appalachians will be more than 80 per cent blighted. Ordinarily a large part of the chestnut in a blighted stand will die within from two to five years after the 80 per cent infection stage has been reached.

The chestnut-blight organism was brought from Asia on small nursery trees. The blight was first observed in New York City in 1904, and recognized as a new disease in this country, though it must have been here for some time prior to that date, according to the bulletin.

No practical control of the disease is known. Search is, however, being made for native and foreign chestnuts resistant to the blight in the hope of finding a tree suitable for partially replacing the rapidly disappearing stands of chestnut timber. Lumber from blight-killed trees is equal to that cut from live trees if salvaged before deterioration sets in. The increased use of such lumber is important in order to prevent serious loss.

Ever since fruit trees have been sprayed with arsenicals, beekeepers have been much interested in the effects of the practice on the mortality of honeybees. They have long felt that many bees were poisoned as a result of spraying, but until recently few systematic investigations have been conducted to determine whether or not honeybees are actually injured by these chemicals.

In the hope of finding definite answers to some of the questions, so long debated, the entomologists of the United States Department of Agriculture planned and conducted a series of experiments, the results of which are discussed in Department Bulletin No. 1364-D. The investigations, extending over a period of three years, were made along three lines: (1) The effect on honeybees of spraying fruit trees in full bloom; (2) the effect on honeybees of spraying the trees at the customary time, after most of the petals have fallen; and (3) a determination of the minimum amount of arsenic required to kill the bees in confinement.

After one season's work in two States, it was ascertained that spraying during full bloom was detrimental to bees. After three seasons' work on the problem, in four States and five localities, it was determined that spraying at the customary time under nearly ideal conditions was not injurious to the bees; but nearly ideal conditions seldom occur.

The minimum fatal dosage of arsenic per bee, according to laboratory determinations, is between 0.0004 and 0.0005 milligrams.

The subject of poisoning bees is very large and of vital interest, not only to beekeepers but to everyone who is interested directly or indirectly in the growing of crops, including particularly fruit growers, entomologists, and plant pathologists, says the department. Of course, the beekeeper does not want his bees poisoned, but the loss of honey is only secondary in comparison with the loss from lack of cross-pollination of flowers. In this respect, the beekeeper, the fruit grower, and in fact everyone is benefited by bees.

It is now generally admitted that in using arsenicals as a control for the codling moth the best results are in nearly all cases obtained by applying the first spray after most of the petals have fallen, although in commercial orchards where hundreds of acres of trees must be sprayed within a limited time it is necessary to begin spraying early in order to finish the work before the calyx cups close.

Because the codling moth can be as well controlled by spraying when 90 per cent of the petals have fallen, entomologists recommend spraying at that time rather than during full bloom, especially since it has been definitely proved that spraying when trees are in full bloom is injurious to insect pollinators.

Dr. C. D. Fretz of Sellersville, Pennsylvania, died suddenly on August 17th at the age of 81 years. Dr. Fretz was well known for his botanical work and had long been a member of the Torrey Club. Some years ago he revised the Flora of Bucks County, Pa., adding some three hundred species to those previously listed. His herbarium of over 8,000 specimens was donated to the Philadelphia Academy of Science. Dr. Fretz had a large medical practice but retired from professional work to become president of the Sellersville National Bank, a position he held for twenty-three years. He was prominent in local educational and religious affairs.

In October a nation wide quarentine against five needled pines went into effect in order to check the spread of blister rust. No white pines can be shipped out of New York state. No shipment can be made from an infected state to a non-infected one. The quarentine also restricts the shipping of currant and gooseberry plants, the intermediate hosts of the rust, from areas where pine blister is found.

The Brooklyn Botanic Garden announce their fall and winter courses in botany and gardening. They include a large number for elementary and high school pupils in gardening and green house work, a course in tree identification for scouts and courses in botany and nature study for teachers.

Dr. George Newton Best, one of the most widely-known physicians of Hunterdon County, Penna. and a scientist of national repute, died at his home in Rosemont on the 18th of June. Dr. Best was born at Round Valley, Hunterdon County, October 16, 1846. As a youth he spent his leisure hours largely in hard study, taking his recreation in finding out what the brooks, fields and forests could teach him. He began the practice of medicine in Rosemont in 1875, "expecting to stay there only a little while" as he smilingly declared on a recent occasion. Being asked why he changed his mind he replied: "These people seemed to need me and I liked them. By the time I had thought to be ready to leave, I couldn't break away. So here I am after more than fifty years." Besides keeping well up with the changing practice of medicine, Dr. Best gave much attention to other scientific subjects, especially botany. He had long been recognized both in this country and in Europe as an authority on mosses. He was formerly the president of the Sullivant Moss Society. Among Dr. Best's published botanical papers are "Revision of the North American Thuidiums;" "Revision of the Claopodiums;" "Revision of the North American Species of Heterocladium."

Among his own people Dr. Best was known as a good old-time country doctor whose judgment and advice on matters in general were always worthy of careful consideration; to the scientific world he was known as a pains-taking scientist whose decisions in his special field were those of a competent judge.

The Torrey Botanical Club

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OF THE

TORREY BOTANICAL CLUB

(1) BULLETIN

A monthly journal devoted to general botany, established 1870. Vol. 49, published in 1922, contained 408 pages of text and 17 full page plates. Price $4.00 per annum. For Europe, $4.25. Dulau & Co., 47 Soho Square, London, are agents for England.

Of former volumes, 24–47 can be supplied separately at $4.00 each; certain numbers of other volumes are available, but the entire stock of some numbers has been reserved for the completion of sets. Single copies (40 cents) will be furnished only when not breaking complete volumes.

(2) MEMOIRS

The MEMOIRS, established 1889, are published at irregular intervals. Volumes 1–17 are now completed. The subscription price is fixed at $3.00 per volume in advance; Vol. 17, containing Proceedings of the Semi-Centennial Anniversary of the Club, 490 pages, was issued in 1918, price $5.00. Certain numbers can also be purchased singly. A list of titles of the individual papers and of prices will be furnished on application.

(3) **Preliminary Catalogue of Anthophyta and Pteridophyta** reported as growing within one hundred miles of New York, 1888. Price, $1.00.

Correspondence relating to the above publications should be addressed to

RALPH C. BENEDICT
Brooklyn Botanic Garden,
Brooklyn, N. Y.

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BY

GEORGE T. HASTINGS

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GEORGE T. HASTINGS
2587 Sedgwick Ave.
New York City.

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BOTANY OF THE MONTANA ROCKIES

J. E. Kirkwood

The wide topographic diversity of Montana is reflected in the varied forms of its plant life. Its high mountains, deep canyons, broad valleys and open plains provide the settings for a display of floral compositions lending charm and interest to its landscapes. As one travels westward over the wide plains of eastern Montana he views from the car window great rolling ranges of grassland through which the courses of streams are marked by lines of cottonwoods and willows. Along the breaks between the benches and the river bottoms are scattered pines and junipers, the outposts of the coniferous forests darkening the slopes of distant mountains which appear first in isolated peaks like sentinels guarding the approach to the summit of the continent. In the more arid localities the grasses thin out and patches of sage appear. If in June, one may see stalks of the Spanish bayonet covered with white flowers and the yellow blossoms of the low prickly pear. Both the Yucca and the cactus are the northernmost representatives of their kind, but are widely distributed over the plains and foothills adjacent to the Rocky Mountains.

The annual rainfall lessens with the distance westward until the ascent of the mountains begins when it increases, owing to greater altitudes. This accounts for the appearance of forests which begin to cover the slopes and ridges. Throughout the Rocky Mountains coniferous forests abound especially at elevations above 5000 feet. Below this level the effect of diminished precipitation is seen in the occurrence of grasslands especially on southern exposures, while on the northern slopes the forests extend into the valleys. These forests reach far to the northwest into British Columbia and Alaska, thence southward along the Cascade and Coast Ranges to California.

As coniferous forests are the dominant form of vegetation over most of the mountain landscape a word as to their composition may be of interest. In Montana there are five species of pine: the western yellow pine which is found from British America to Mexico and from the Black Hills to the coast; the lodgepole pine, abundant over large areas at middle elevations; the western white pine confined to the moister valleys and lower slopes; and two which occupy the high mountains, the white bark and limber pines. Larch or tamarack is represented by two species, one only on the highest mountains and comparatively rare, the other growing in northern valleys and on lower slopes where it constitutes one of the valuable assets of the lumber industry. Spruce also abounds at higher elevations and follows down the narrow canyons almost to the open valleys. Two kinds of hemlock appear in the western and more humid parts of the state. One of these, the larger, is found abundantly in Glacier Park and west to Oregon and Washington; the other, a species of the higher mountains, is more restricted in its range and abounds especially in the Coeur d'Alenes. Douglas fir, which forms the bulk of the great forests along the Pacific Coast of the northwest, is plentiful here also, but of smaller form due to the drier and colder climate. The true firs are represented by two species: one, the grand fir, confined to a limited range in the moister localities; the other extensively distributed over the higher elevations of the Rockies where it often braves the rigors of an alpine climate bound in snow and ice for nine months of the year. Its sharp spire-like form marks it as far as it can be seen. One of our most pleasing trees is the arbor vitae which in favored localities forms heavy forests so dense that sunlight rarely reaches the ground beneath their spreading boughs. This also is one of the west coast trees which has migrated into the Rocky Mountains. A few junipers may be added to complete the list. The most conspicuous of these forms small bushy trees on the drier slopes. These trees are commonly known as cedars and have a wide range of form and size in relation to the conditions under which they grow.

Hardwood species which constitute the main body of the forests of the middle west are almost wholly absent. Along the streams of the mountain region, cottonwoods and willows, birch and alder, a few hawthorns and choke cherries, make up nine-tenths of the broad-leaved, deciduous trees and shrubs. Their occurrence is these places is due apparently to the shallow distribution of the underground waters.

Shrubby vegetation is largely mingled with the forest trees. it occurs along streams and over the uplands. One of the most beautiful shrubs in flower is the mock orange or wild syringa, which bears masses of large white fragrant flowers. The nine-bark, the white and red spiraeas, the service berry, hawthorn and chokecherry, the mountain ash, honeysuckles and elders, huckle-berrys and heaths, the white and the purple clematis, the roses, mountain laurel, and sumac, buffalo berry and silver berry, the currants,—most of these are attractive in flower or leaf or fruit. Of about two hundred fifty species of woody plants in the northern Rockies about fifty are willows which vary from tree forms down to dwarf arctic species which flower and fruit at a height of two inches. Many of these have a northern range only, from here to the arctic circle. They grow under varied conditions from stream banks to the tops of the highest mountains.

Our woodland flora is not complete without mention of the low flowering herbs which abound in the shelter of the forest. Here are the Solomon's seals, and bellworts, the dogtooth violet, the yellow Mariposa lily, the little pink lady-slipper and the large yellow mocassin flower, the mitrewort and the false mitrewort, the trailing kinnikinnic, the blue, the white, and the yellow violets, the pasque flower and paint brush, some of the arnicas, the bane berries and many others.

While the forests clothe the higher slopes and sheltered places, large treeless areas of the intermountain valleys are occupied by a prairie flora rich in its diversity of color and abundant in its variety of forms. Spring opens with a carpet of green figured in elaborate patterns of floral composition in bright hues and shades. Fields of gold appear where the balsam-root bursts forth on the sunny hillside. The little mountain pink brings a blush of color here and there. Acres of the bitter root in varying shades of rose and pink are spread in rich profusion, and the blues of lupine and pentstemon and patches of scarlet Gilia lend color everywhere across the wide flats. Clarkia with its rich pink extends in profusion along the lower slopes, varied with tufts of white meadow sweet and bunches of golden aster.

On drier spots Oreocarya and patches of matted Phlox lie like little snow drifts. Time will not suffice to mention all of the beautiful flowers that enrich the summer landscape.

From the earliest yellow buttercups the march of the season brings in review the mountain pink and shooting stars of the primrose family, the saxifrages, the lilies, the roses, the peas, the parsleys, borages, mints, daisies, asters, golden rods and many others. And one need not go far afield to find them all. They begin in February or March, swell to fullest abundance in June and July, and end in October.

The season of flowering depends much upon the altitude, being earliest at the lowest and latest at the highest elevations. In this way some of the species bloom from May to August at successively higher levels. The dogtooth violet flowering at 3500 feet in May at the latitude of Missoula may often be found in bloom on the first of August, at the altitude of 7000 feet. From the middle of July to the middle of August the mountain parks of the northern Rockies are gorgeous gardens of wild flowers in a riot of colors. The alpine summer is a brief season. It seems as if the spring, summer and autumn floras of lower levels were concentrated into one brief month. Its days are filled with bright sunshine and surging growth. Snow banks thin to the edge in a layer of ice through which the shoots of tender plants bore their way as if unable to wait for the ground to clear. Here are the dogtooth violets, the paint brushes and anemones, hare bells and blue-bells, saxifrages and daisies. In some places the meadow is filled with gentians of deepest blue, again they abound in the white spikes of the bog orchid and ladies tresses, or in the green flowers of the Scottish asphodel. Some of the more luxuriant meadows abound in cone flower, boneset, groundsel and the tall larkspur and purple monkshood.

Among the other mountain flowers a few may be mentioned. The bear grass which sends up tall spikes of creamy white flowers extends in great profusion through the open woods and over treeless slopes. Its delicate grace is worthy of a place in park or garden if it could be lured successfully from its mountain home. The white rhododendron occurs in the Bitter Root and Mission ranges and with the Labrador tea bears white flowers, while the mountain heather spreads its evergreen mats covered by mantles of purple bells. Stately stalks of white hellebore rise in sheltered places with attractive foliage and tall panicles of green flowers. Lesser plants of the buckwheats, the mustards, the pinks and many others combine to make the high mountain flora one of exceptional interest. Of interest not only because of its beauty and comparative rarity, but because it represents largely an arctic or northern type of vegetation which lives in places of exposure and vicissitudes and also because it represents a flora less familiar to the botanist on account of its more remote and less accessible location.

Another point of interest in connection with the northern vegetation, is that we have here, near the ridge of the continent, an overlapping of the eastern and western floras. Plants from the Atlantic states and the middle west have spread westward to the summit of the Rocky Mountains and beyond. Those of the Pacific region have moved eastward, in the case of some species, as far as the Great Lakes. Many spread by means of wind-blown seeds and the direction of prevailing winds has much to do with their distribution. Some are scattered mainly by birds which are influenced largely in their movements by topography and the climatic conditions which follow from it. The history of the recent geological past is bound up with that of the Rocky Mountain flora and adds much to the interest of its study.

State University, Missoula, Montana.

An Additional Species of Peperomia from Florida.—The large tropical genus *Peperomia* has crossed the Gulf Stream sparingly and settled in Florida in five species which fall into three groups. They are all humus plants. The two species with small herbaceous leaves—*P. humilis* and *P. cumulicola*—grow in the humus of the hammock floor, thus they are terrestrial, at least in position. The three plants with coriaceous leaves fall into two groups: *P. spatulifolia* has a branching inflorescence and grows on humus covered rocks, while *P. obtusifolia* and *P. floridana* have a simple inflorescence and grow on living trees or decaying logs.

Peperomia floridana Small, sp. nov. Plants epiphytic, odorless or faintly aromatic: stems prostrate and creeping or sometimes elongate and vinelike, often matted: leaf-blades ovate to suborbicular, broadest above the middle or below it, 4–9 cm. long, rounded to retuse at the apex, rather long-petioled: inflorescence with a short stout stalk, with usually a single stiffly stout spike less than 1 dm. long, green, the rachis 5 mm. thick or less, stout-tipped; bracts orbicular, scarcely 0.3 mm. in diameter: anthers about 0.2 mm. in diameter: berries densely crowded, the bodies cylindric-ovoid or cylindric, 1 mm. long, more or less truncate at the base, the beak slightly shorter than the body, hooked.—Tree trunks, rotten logs, and humus, hammocks, southern peninsular Florida and Florida Keys.—(W. I.) Type from the Ross Hammock, Dade County, Florida. Small and Carter No. 2478, collected November 12, 1906.

Upon entering any hammock on the Everglade Keys, one of the more peculiar plants to meet one's eye is the above described *Peperomia*. It not only grows on the trunks and branches of living rough-barked trees, particularly on the live-oak (*Quercus virginiana*), where it is often intimately tangled, but also on decaying logs. The stems are sometimes greatly elongate and vine-like. Although an epiphyte, plants of this species also grow well under cultivation in the greenhouses of The New York Botanical Garden. In the herbarium, localities additional to that of the type specimen are represented as follows:

Hammock eastern border of Everglades, A. H. Curtiss No. 2460**.

Hammock, Lemon City, J. H. Simpson No. 571 (1892).

Snapper Creek hammock, J. K. Small & G. V. Nash No. 48 (1901).

Brickell hammock, J. K. Small & J. J. Carter No. 1443 (1903).

Scott hammock, J. K. Small & J. J. Carter No. 981 (1903).

Snapper Creek hammock, E. G. Britton No. 387 (1904).

Brickell hammock, J. K. Small & G. K. Small No. 4811 (1913).

Royal Palm hammock, J. K. Small & E. W. Small No. 5442 (1915).

Sykes hammock, J. K. Small & C. A. Mosier No. 5501 (1915).

Sykes hammock, J. K. Small, C. A. Mosier & E. W. Small No. 5649 (1915).

Nixon-Lewis hammock, J. K. Small & C. A. Mosier No. 5892 (1915).

John K. Small.

AN ALGA FROM THE EOCENE OF COLORADO

T. D. A. Cockerell

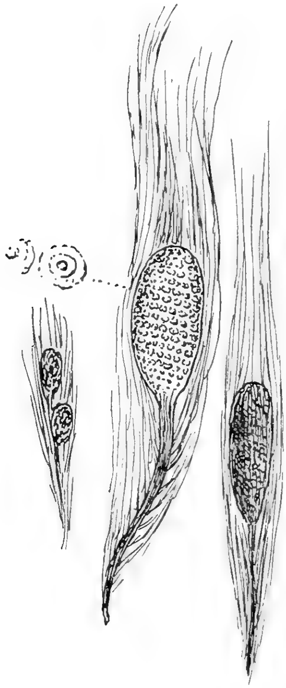
In 1923, Professor Junius Henderson and Mr. John Byram found a peculiar fossil plant in the Green River Eocene rocks of the Roan Mountains, Colorado. Two specimens are from their Station 25, on Kimball Creek; the other, with reverse, is from Station 24, Roan Plateau. My first impression was that we had a moss, but on using the binocular, the specimens having been covered with water, it soon became apparent that the characters were not at all those of a moss, but of an alga. No genus of fresh-water algae can be found that is at all similar, but the resemblance to certain of the marine Rhodomelaceae is so close that the plant may be provisionally included in that family. It offers one more indication that the waters of the lake were saline and that the Green River aquatic fauna and flora were remote descendants of a group of marine organisms isolated by orogenic movements perhaps near or soon after the end of the Mesozoic. The fishes long ago suggested such an idea; and the peculiar *Xantholithes* of the Wyoming Eocene, mistaken for *Ophioglossum*, may be another relic of this ancient group. There may have been a deep rift containing a lake comparable to Lake Baikal. The problem is a fascinating one and should be fully investigated. At the present time many precious fossils are to be found in the dumps of the many assessment holes in the oil shale; in a short time all this material will have decayed though fresh excavations may afford new opportunities. The fossil may be described as follows:

Phenacocladus new genus

Small moss-like branches, bearing innumerable long capillary filaments, not attached to the branches altogether at random, but more or less distinctly verticillate; branches terminating in one or two stichidia, the spores arranged in numerous rows, apparently singular (not tetrasporic); stichidia oblong, obtuse, resembling the capsule of a moss.

Phenacocladus hendersoni n. sp.

Stichidium when mature about 3.6 mm. long, and slightly over 2 mm. broad; at an earlier stage narrower. Sporangia in



about 16 transverse rows, each row with about eight, exhibiting a central round object surrounded by two circles, not always perfect, the general effect comparable to *Pleurostichidium*. Filaments long, some reaching a length of 18 mm. (compare *Polysiphonia*).

The type is No. 15659, University of Colorado Museum; Station 25, Kimball Creek.

For further information about the Green River problem see Henderson, "The Origin of the Green River Formation," Bull. Amer. Assn. Petroleum Geologists, Vol. VIII, pp. 662–668. 1924.

Boulder, Colorado.

THE MILDEW SPHAEROTHECA CASTAGNI ON BIDENS AS A FUNGUS FOR CLASS USE

Illo Hein

In the course of my studies on the mildews I have found that *Bidens frondosa* lends itself admirably to the growing of *Sphaerotheca castagnei* on the leaves of potted plants in the greenhouse Bidens is very common in fields, waste places and roadsides, and in the late summer and early fall the mildew spreads abundantly all over the plant; it is, in fact, difficult to find plants at this time that do not have some fungus on them and most plants are literally covered with it. Towards the end of September infected Bidens were brought into the greenhouse, potted and kept growing until plants grown from seed were ready for infection. The first sowing was made October 24, and when the seedlings were four weeks old they were placed among the infected field plants. It was soon found that the mildew spread naturally from plant to plant and a week after exposure a few ripe perithecia were visible on the leaves. A second sowing was made December 4, the plants producing perithecia after the holidays. No difficulty was found in transferring the mildew from one host plant to another; it spread naturally from field plants to greenhouse plants. That the spores are carried a considerable distance by light currents of air in the greenhouse is shown by the fact that uninfected plants placed over ten feet away from the infected plants showed abundant growth of mildew about as soon as the plants that were growing close by. To insure infection an infected plant should be placed in the midst of the new plants, but this precaution is perhaps unnecessary. Successive crops of Sphaerotheca have been grown in the greenhouse throughout the winter, the fungus spreading with undiminished vigor.

A point of interest is that the host plant during the period of shortened daylight comes to maturity very early. The plants grown from seed sown in December started to produce flowers after four weeks and in five weeks, though they were but seven inches tall, many plants had ripe seeds and then died off rapidly. This early maturing can be delayed somewhat as has been shown in the case of other lots of plants, by picking off the buds as soon as they appear.

Plants from seed sown in January were exposed to artificial illumination at night, and these all made decided increases in growth and seed production was delayed three weeks. A 50-watt electric light bulb placed 18 inches above the plants provides the illumination. During February and March the increase in growth was doubtless due to the longer period of daylight at this time, as well as to the artificial illumination. Although they were kept in six-inch pots the plants that were sown in March were 6 to 7 feet high in June and were still making rapid growth until in July many were over 7 feet high and all then came to maturity and died off. The mildew on these tall plants did not make as good growth on the upper leaves as on the lower ones; only a few scattered round patches of mildew appeared on the former, although the lower leaves showed an abundance of mildew. *Bidens frondosa* is a good vigorous greenhouse plant and thrives throughout the year under greenhouse conditions.

Sphaerotheca is a typical ascomycete, and because all sexual and asexual stages may be found in a small area, and because of its availability, it is excellent material for class use. The ascocarp of *Sphaerotheca castagnei* develops on both sides of the leaves of Bidens and usually spreads in circular patches which become irregularly distributed over the leaves and other parts of the plant. The mildew first appears on the leaves as small white specks. With a lens these specks will prove to consist largely of conidia with a few closely appressed antheridia and oögonia and possibly some very young white, spherical ascocarps. Pairs of oogonia and antheridia appear almost simultaneously with the conidia. Older spots will show ascocarps which may be slightly yellowed; eventually these ascocarps turn very dark brown and appear under the lens as glistening black spheres. The spots themselves are more or less circular in outline with an abundance of conidia around the margins and irregularly distributed conidia and ascocarps of all ages throughout the rest of the area. The mildew spreads in all directions forming gradually enlarging circular patches which after one week show ripe, blackish perithecia in the center and numerous perithecia of varying ages over the rest of the spots. The central part of the mildewed area soon turns a very dark brown because of the many dark brown perithecia. Conidia continue to develop along with the production of perithecia, though in older spots the production of conidia diminishes until finally a diseased area shows little but ripe perithecia, very few conidia and very little of the mycelium remaining.

The growth of the mildew on greenhouse plants started in all the cases observed on the upper surface of the leaves, the mycelia appearing later on under the surface. None of the younger spots on the under surface of the leaves were independent of the mildew on the upper surface; it was always possible in the spots examined to trace the mycelium connecting the areas of mildew on both upper and lower leaf surfaces. Between November and May the mildew grew most abundantly on the upper surfaces of the leaves and in many cases during December, January and February there was no growth of mildew on the under surfaces of the leaves. In May and June there was abundant growth on both sides of the leaves, but after this period the mildew grew most abundantly on the under leaf surfaces producing no ascocarps on the upper parts.

For classes in mycology Sphaerotheca should prove to be a very desirable type, since one may plan to have it in vigorous growing condition for study at any specified time of the year. From the time of sowing the seed of the host plant to the time when ripe perithecia may be produced varies from five to eight weeks according to conditions.

Columbia University, New York.

BOOK REVIEW

Schaffner's Field Manual of Trees*

Another book to add to the many reflecting the present interest in nature study and helping increase such interest, this little manual is both convenient and very usable. There are keys to the trees in the summer condition based chiefly on leaves; in the winter condition based on twigs and buds; to the fruits and a general key based on both leaf and flower characters. The last key seems unnecessary. The keys are simple and easily followed through to the genera. Under these are keys to the

* John H. Schaffner, Field Manual of Trees, 3rd Edition, 154 pp., R. G. Adams and Co. Columbus, Ohio, 1926. $1.50.

species where more than one is described. There is a brief account of each species giving the general characters, habitat, distribution, and the character and uses of the wood. All of the native trees of the Northeastern United States and most of these commonly cultivated for ornament or fruit are included. The nomenclature is that of the second edition of Britton and Brown. A single common name is given for each species, though a few others are to be found in the index. The use of synonyms and of several common names would have added to the value of the book, especially where a tree is known by different names in different regions. There is a glossary and a complete index. The introduction attempts in six pages to give an outline of all the activities of the growing tree from the absorption of water to the development of seed. The book easily fits in the coat pocket. It is well bound in semi-flexible dark blue cloth and printed on good quality paper. It will be helpful to all who wish to know the trees, especially as it can be used at all seasons of the year.

George T. Hastings.

PROCEEDINGS OF THE CLUB

Minutes of the Meeting of April 28, 1926

This meeting was held at the Museum Building of the New York Botanical Garden with Vice President Barnhart in the Chair. The following were elected to membership in the Club:

Prof. Oakes Ames, North Easton, Mass.

Mr. E. J. Schreiner, New York Botanical Garden.

Mr. F. A. Varrelman, American University Campus, Washington, D. C.

Mrs. Britton read a part of a communication from the Committee on the Preservation of Natural Conditions of the Ecological Society of America, in which it was suggested that the societies affiliated with it contribute $1.00 to pay for the correspondence involved in circularizing matters relating to the preservation of natural features in the United States. By vote of the Club this sum was appropriated.

The scientific part of the program consisted of a talk by Dr. Arthur Hollick entitled "Recent discoveries of fossil plants in Porto Rico." In 1915 Hubbard and Reed visited Porto Rico in connection with a scientific survey of the Island. They collected fossil plants in the ravine of the Collazo River. Dr. Hollick described 19 species from the material sent him at that time. In 1924 a collection was sent to the New York Botanical Garden by Senor Narciso Rabell, the owner of the region. This year about 300 specimens were collected by Dr. Hollick, of which perhaps 150 may be new species. The fossils were found in layers of clay and in clay shales, which hardened on exposure to the air. The specimens, as soon as brought to headquarters, were saturated with a solution of paraffin dissolved in benzole, which held the matrix together. They are probably of Eocene age, and represent land flora, but invertebrate remains, possibly of marine or brackish water origin, occur associated with them. They are earlier than those discovered in the Island of Trinidad, which latter are probably of Miocene age.

One specimen resembled a fragment of a fascicle of needles of a Pinus, another was evidently a fragment of a Cycad. Fragments of a fern and what appeared to be a fucoid plant were shown. A few monocotyledons were represented. All the rest were dicotyledons.

Dr. Britton remarked that Pinus does not now occur in Porto Rico. But since there are large forests of pines in Hispaniola it is not impossible that Pinus existed in Porto Rico in ancient times. There are three species of pine in Cuba and one in the Bahamas.

Arthur H. Graves,
Secretary.

Minutes of the Meeting of May 11, 1926

This meeting was held at the American Museum of Natural History. Dr. Arthur P. Kelley of Rutgers University addressed the Club on "Similarity in plant associations and the causal factors."

Dr. Kelley said that every landscape has a definite appearance or physiognomy which is conditioned by certain factors. These include soil factors, presence or absence of vegetation, height and density of vegetation when present, its color, seasonal aspect, and development of the principal species.

Plant associations in various habitats and in different parts of North America may be compared, as aquatic, marsh, meadow, forest and alpine associations. Identity in genera is evident because of the past history of the region; similarity in aspect is evident where conditions of growth are comparable, and as these conditions vary then the associations vary. Slides were shown of plant associations of similar appearance in Pennsylvania and the Rockies; in the Arizona desert and in an African desert, etc.

Arthur H. Graves,
Secretary.

Minutes of the Meeting of May 26, 1926

This was a joint meeting of the Torrey Botanical Club, the Wild Flower Preservation Society, the New York Bird and Tree Club, the American Fern Society, and the Federated Garden Clubs of New York State. The attendance was about 100. Dr. C. Stuart Gager, Vice President of the Torrey Botanical Club, occupied the chair. In the preliminary business meeting the following candidates were elected to membership in the Torrey Botanical Club.

Mr. Illo Hein, Schermerhorn Hall, Columbia University, New York City.

Miss H. Crane, 1 West 102 Street, New York City.

The subject of the meeting was the conservation of the native wild plants, and the following discussed various phases.

Mr. Raymond H. Torrey was the first speaker, his topic being "Outing clubs and the survival and protection of harried flowers." He said that while a great deal of carelessness and thoughtlessness still exists in the matter of picking wild flowers, he believes that the increase of outing clubs during the last 10 years has had a considerable salutary effect. Many clubs make the conservation of wild flowers part of their definite program. For example, when particular flowers needing protection are in bloom, attention is called to them. One Paterson club sets apart each Sunday in the spring for the study and observation of a particular flower.

The next speaker was Mr. J. Otis Swift, Nature Editor of the New York World, and leader of the "Yosians," whose topic was "Walking clubs and wild flower conservation." Mr. Swift spoke of the "Yosian" brotherhood in particular. He said that it is estimated that 50,000 New Yorkers walk out of the City on Saturdays and Sundays to get their feet on the ground and come closer to wild life. A great portion of these people are city-bred, and have for the most part no appreciation of the protection of wild life. The Yosian brotherhood has some 4500 members, which grew from a small beginning of 200 members. They hail from all over the Union—from every state, there being from 30 to 40 from California, but the great majority are from New York City and surroundings. If these people go out into the country with leaders who will give then some idea of nature, and definite instruction, it will do them much good. For from 250 to 350 people who walk through the woods they have from 12 to 20 nature teachers stationed along the line. They go ahead of a little group and talk through a megaphone, telling of the trees, plants, birds, geography, and other things all along the way. The fact that some wild flowers need protection is emphasized. Mr. Swift suggested that like the well known Society of Seed Scatterers, the New York outing clubs make it part of their program to scatter seeds of both cultivated and wild flowers along the roadsides; also, that the clubs bring back and plant in the public parks different kinds of wild flowers. He believed that a great deal could be done in the way of planting seeds of nut trees along the roadways.

Dr. R. C. Benedict's topic was "Saving the Hart's Tongue Fern." This fern is rather unusual because of its long, slender leaf. It is so rare that no dealer in wild flowers offers it for sale. There are only a few places in North America where it is found. Near Jamesville, N. Y. it grows on a limestone formation, on high ridges in shaded places, and here the problem of saving it is a critical one. There are two stations for the plant here. One has already been saved. It is part of the Clark Reservoir belonging to the State, but it is the smaller of the two and does not harbor as many specimens as does that which is now controlled by the Solvay Process Company, makers of baking soda. This larger station cannot all be saved, but Dr. Benedict hopes that the Company might be persuaded to leave the south and east sides of it untouched. Plants of the Hart's Tongue grown from spores have been raised at the Brooklyn Botanic Garden.

This might be done elsewhere and the sporelings planted on limestone ledges, in cool, shady, moist soil. Experimental studies of many rare ferns show that they may be grown easily. Educational propaganda through the newspapers, leaflets, pamphlets, etc., to promote a general wide-spread interest in the problem, will help to save this rare plant from annihilation.

Mr. Henry Hicks of Hicks Nurseries was the last speaker, his title being "What private landowners can do to promote wild flower conservation." Mr. Hicks stated that fires of one sort or another have been in the past, and are now, responsible for the loss of a large part of our wild flowers. He outlined methods of fire prevention. In the promotion of the cultivation of our native wild plants, landscape architects have been an important factor in recent years, since they have created a demand for these plants, and have encouraged the nurseries to grow them. Private landowners can help in two ways; first by asking the nurserymen for wild plants, and second by furnishing the nurserymen with seeds or plants for propagation. As to laws prohibiting the gathering of wild plants, Mr. Hicks felt that there are many sides to the question. These should be carefully considered before laws are enacted. In the case of state and federal lands it may be feasible to grant special permits to nurserymen and botanists, limiting the number of plants to be collected by any one person, and specifying a certain distance from roads and trails within which they must not be collected. We must also learn the best methods of growing our own wild flowers.

Arthur H. Graves,
Secretary.

Meeting of October 12, 1926

The meeting was called to order at Barnard College with President Richards in the chair. The following were elected to membership in the club:

Mr. J. Ashton Allis, Grace National Bank, 7 Hanover Square, New York City.

Miss Norma Loeb, 328 West 83rd Street, New York City.

Mrs. Walter Rautenstrauch, 235 Dorin Court Road, Palisade, N. J.

The secretary reported with regret the deaths of three members:

Dr. W. E. Wheelock, of N. Y. City, who died on February 3rd; Dr. George N. Best, of Rosemont, N. J., June 18; and Dr. C. D. Fretz, of Sellersville, Pennsylvania, August 17.

The Secretary, as delegate for the Torrey Club to the International Congress of Plant Sciences at Ithaca, August 9–14, 1926, made a brief general report on the meeting.

Of those who spoke on their experiences and work of the summer, Dr. Harper remarked upon the study of elaioplasts going forward in his laboratory. An effort is being made to ascertain if these structures may not arise in the cell *de novo*. It has been generally believed that living structures in the cell must arise by division, and so if elaioplasts can be found to arise *de novo*, the discovery will have large significance. Miss Nicholson reported on the interesting Forestry Exhibit at the Sesquicentennial Exhibition. The Wild Flower Preservation Society also had an attractive booth, lists of those plants which should be conserved, and those which may be picked, having a prominent place.

In the town of Tully, New York, visited this year by Mr. Hastings, he found six patches of the rare *Asplenium angustifolium*. Formerly there was only a single patch. The Walking Leaf Fern is still found on the same ledge where it has been growing for many years, but other rare ferns, as well as the Purple Fringed Orchis, have disappeared from places where they formerly grew. Elodea, in Tully Lake, increased in abundance for many years, but has now gone back to its former condition of comparative scarcity. Dr. Hazen reported that both *Cabomba caroliniana* and the long leaved species of Elodea are now found in Van Cortlandt Park, perhaps planted there by some one interested in the culture of water plants. Mr. Hein remarked that this is a very good year for powdery mildews. Dr. Richards spoke of the great success of the Sterility Conference in N. Y., August 13 and 14. This, the 4th conference, was held under the auspices of the Horticultural Society of N. Y. The proceedings will be published.

Arthur H. Graves,
Secretary.

NEWS NOTES

Dr. John K. Small left for Florida in November to continue his exploring and collecting. He is travelling through the state by auto truck collecting as he goes.

The New York Botanical Garden contributed one hundred dollars towards the expenses of the work in Indo China being carried on by Dr. Petelot. He is seeking to obtain specimens of the species described by Louriers in 1879.

From 'Science' we learn that Professor A. S. Hitchcock of the U. S. Department of Agriculture is in Cuba studying the grasses of the island in coöperation with the Tropical Plant Research Foundation.

From "Science" we learn that the trustees of Dartmouth College have voted to construct a new building for the natural science departments. This will house the departments of botany, zoology, geology and biology giving them equipment and facilities that they have not had before.

The New York Botanical Garden will give a series of lectures during the winter on Saturday afternoons in the Central Display Greenhouse of Conservatory Range, No. 2. In January Mr. Kenneth R. Boynton will speak on Garden Vegetables and Herbs, on the 22nd Dr. H. A. Gleason will speak on The Spices of Commerce, on the 29th Dr. John K. Small, on Cacti; February 5th, Dr. F. J. Seaver, Cocoa and Chocolate; February 19, Mr. George Friedhof, The Planting of Flower Seeds; February 26, Dr. Arthur Hollick, Geological Features of the New York Botanical Garden.

DATES OF PUBLICATION OF TORREYA, VOLUME 26, 1926

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The names of species and varieties described as new are in **bold faced** type.

The Torrey Botanical Club

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(1) BULLETIN

A monthly journal devoted to general botany, established 1870. Vol. 49, published in 1922, contained 408 pages of text and 17 full page plates. Price $4.00 per annum. For Europe, $4.25. Dulau & Co., 47 Soho Square, London, are agents for England.

Of former volumes, 24–47 can be supplied separately at $4.00 each; certain numbers of other volumes are available, but the entire stock of some numbers has been reserved for the completion of sets. Single copies (40 cents) will be furnished only when not breaking complete volumes.

(2) MEMOIRS

The MEMOIRS, established 1889, are published at irregular intervals. Volumes 1–17 are now completed. The subscription price is fixed at $3.00 per volume in advance; Vol. 17, containing Proceedings of the Semi-Centennial Anniversary of the Club, 490 pages, was issued in 1918, price $5.00. Certain numbers can also be purchased singly. A list of titles of the individual papers and of prices will be furnished on application.

(3) **Preliminary Catalogue of Anthophyta and Pteridophyta** reported as growing within one hundred miles of New York, 1888. Price, $1.00.

Correspondence relating to the above publications should be addressed to

RALPH C. BENEDICT
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TORREYA

A BI-MONTHLY JOURNAL OF BOTANICAL NOTES AND NEWS

John Torrey, 1796–1873

EDITED FOR

THE TORREY BOTANICAL CLUB

BY

GEORGE T. HASTINGS

VOLUME 27

NEW YORK
1927

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January-February, 1927

A SIX-HOUR CROSS-SECTION OF THE VEGETATION OF SOUTHERN ONTARIO

Roland M. Harper

To travel over 200 miles through a foreign country and return to the United States the same day without any formalities at the border is an experience that many people have every day, but few if any have thought it worth while to publish an account of what they saw on such a trip, and there is apparently no record of such observations in recent botanical literature. On October 11, 1925, the writer had such an opportunity of traveling through Canada, in going from Detroit to Buffalo by the Michigan Central R. R. (Canada Southern division), and took full advantage of it by making notes all the way.

When I entered the train at Detroit a Canadian official asked my destination, and when told it was Buffalo no proof was demanded and no further questions were asked. A little later the conductor took my ticket and gave me a red hat-check, which signified to the United States customs and immigration inspectors at Niagara Falls, and any one else who might be interested, that I was a through passenger. Any one taking notes from a train on that route seven or eight years before might have been regarded with suspicion (as sometimes happened in this country at that time), but my activities in that line attracted no attention, apparently.

The Michigan Central R. R. crosses the Detroit River in a tunnel about two miles long, and the Niagara River on a high bridge about two miles below the falls. The route lies at an average distance of about ten miles from Lake Erie, nowhere within sight of the lake. The distance between the two crossings of the international boundary is about 225 miles, and the journey was made between 9:25 a. m. and 3:25 p. m., 75th meridian time. As the train stopped half an hour for dinner at St. Thomas, and a few minutes at several other places, its average speed between stations was something over 40 miles an hour; a little too fast for the satisfactory identification of plants at close range.

An unexpected difficulty was presented by the fact that an early snow had fallen the day before (not in Detroit but farther east), while most of the trees were still in full leaf; and the ground was covered a few inches deep most of the way from Charing Cross to Shedden, a distance of nearly 50 miles, in Kent and Elgin Counties. (Remnants of the same snowfall were seen in New York state in the next few days.) That of course obscured some of the smaller herbs, but did not interfere with the identification of the trees and shrubs.

As this route was not very far from states that I had previously explored, no unfamiliar plants were to be expected. In fact one can go all the way from the northern boundary of the United States, east of the 100th meridian, to the North Pole, without encountering any species of trees which do not occur in the United States, with the possible exception of some recently described (and perhaps not very distinct) species of *Crataegus;* and shrubs and herbs unknown in this country must be scarce in the inhabited parts of eastern Canada.

Southern Ontario is the southernmost part of Canada (extending to latitude 42°), and probably also the warmest; and many plants common in the United States occur there and nowhere else in the country. It has doubtless been traversed by numerous botanists, but the botanical literature about it is mainly floristic. In addition to the writings of the Macouns and C. K. Dodge, Dr. C. D. Howe has described the forests briefly on page 288 of the Naturalists' Guide to the Americas (1926), giving percentage figures for some of the common trees, but telling nothing about the shrubs and herbs.

The country traversed is all underlaid by essentially horizontal Paleozoic strata (Silurian and Devonian), mostly limestone, but they are pretty well covered by glacial drift and lacustrine deposits. The only bed-rock seen was around Hagersville, in the western edge of Haldimand County, about 55 miles from Niagara Falls, where the limestone is near enough to the surface to be quarried for cement making and other purposes. The glacial drift is not very rocky, only a few boulders having been noticed between Tilbury and Fletcher in Kent County, about 40 miles from Windsor (which is at the eastern end of the Detroit tunnel). Stone walls, which are such a characteristic feature of the same latitudes in New England, were therefore almost wanting. Pebbles or small rock fragments were frequent, though, in the more hilly portions.

The soil seemed to be much the same all the way from Windsor to Niagara Falls, a buff or brownish loam, evidently near or above the average in fertility. Fertile soil and good water hardly ever go together, and many of the houses in both town and country have cisterns for rain water.

The topography along this route is not very diversified. For a distance of about 65 miles at the west end (Windsor to Ridgetown, in Essex and Kent Counties), and 18 miles at the east end (a little west of Welland to Niagara Falls, in Welland County), the surface is almost perfectly level, probably representing an old lake-bottom plain, like the Maumee basin at the southwest end of Lake Erie. In this flat portion drainage ditches and tile drains are frequent.

Between Ridgetown and Welland, a distance of about 140 miles, the topography is mostly undulating or moderately hilly, with valleys 25 or 30 feet deep along some of the streams; but there are occasional level stretches, probably representing the edge of the plain bordering Lake Erie. The hills are not high enough to present any obstacle to railroad builders, though, and any good map will show that the railroads are about as straight in the undulating country as in the lake plains. Swamps and ponds, such as characterize most glaciated regions, were hardly seen at all.

About Brownsville, near the southern corner of Oxford County, 62 miles from Ridgetown and 82 from Welland, there is a change in vegetation which must be correlated with a difference in soil, indicating poorer soil east of that point (as will be shown presently). It happens that the boundary between the Delaware and Onondaga limestones (both Devonian) passes through or close to Brownsville, but it is not obvious why that should make a difference in the vegetation, and the change is more likely due to some difference in the glacial drift, which covers the bed rock to a considerable depth. Available maps do not throw much light on this point, however.

Streams are rather few and small in this part of southern

Ontario, probably on account of its being a peninsula partly surrounded by the Great Lakes. In the level lake plains, and also in the rolling country between Ridgetown and Brownsville, all the streams crossed were muddy, as in Illinois, Ohio, and farther south. But between Brownsville and Welland, where the vegetation indicates poorer soil, as just stated, only clear streams (as in New England and most other glaciated regions) were seen; and they were also more frequent there than in the other parts of my route.

On account of the generally fertile soil about nine-tenths of the flat country and three-fourths of the rolling country has been cleared (with more hay and pasture than plowed fields, apparently, at least in the rolling country), and there is very little of what might be called virgin forest to be seen from the train. Besides the difficulties already mentioned (snow and speed, which might have been avoided by taking a slower train in warmer weather), in the more open country some of the trees seen were too far away to be identified with certainty. For these reasons my notes are not as full as might be desired. But as there seem to have been very few attempts heretofore to study Canadian vegetation quantitatively, these superficial observations ought to be better than none at all. If one could go through the same region by another route, or by the same route earlier in the season, or take notes from the other (south) side of the train at the same season, and put the notes of two or more trips together, the results would be more accurate; but no such opportunity can be counted on in the near future.

In the next few pages the plants seen on three different portions of the route will be divided into trees, shrubs and herbs, and arranged as nearly as possible in order of abundance, with the names of evergreens in heavy type, and weeds in parenthesis. Species seen only once are omitted in most cases.

As in many other regions with fertile soil and hardwood forests, most of the herbs recognizable from a moving train are weeds.

In the level lake plains of Kent, Essex and Welland Counties *Ulmus Americana* is now more abundant than all other trees combined. As in the northeastern United States, it grows usually solitary or in rather open pastured groves. Next in order seem to be *Quercus macrocarpa*, *Hicoria ovata* and *Quercus pal-*

*ustris.** Small trees and shrubs are represented by one or more species of *Crataegus*, scattered in pastures. The commonest herbs recognizable in October seem to be as follows:—

(Melilotus alba)
(Daucus Carota)
(Solidago Canadensis?)
Aster oblongifolius?
(Arctium minus)
(Linaria vulgaris)
Fragaria Virginiana
(Asclepias Syriaca)
(Taraxacum officinale)
(Achillea Millefolium)
(Dipsacus sylvestris)
(Verbascum Thapsus)
Typha angustifolia

In the more hilly areas the woods are usually denser and not pastured so much. The commonest plants between Ridgetown and Brownsville (mostly in Elgin County) seem to be as follows:

TREES

Ulmus Americana
Acer Saccharum
Fagus grandifolia
Quercus macrocarpa
Acer saccharinum?
Castanea dentata
Fraxinus Americana
Acer rubrum

SMALL TREES

(Populus tremuloides)

SHRUBS

(Rhus typhina)
Salix (perhaps several species)

HERBS

(Solidago Canadensis?)
(Achillea Millefolium)
(Daucus Carota)
(Melilotus alba)
(Linaria vulgaris)
Spartina Michauxiana
Aster oblongifolius?
Fragaria Virginiana
(Ambrosia artemisiifolia)
(Verbascum Thapsus)

Between Brownsville and Welland, the region of comparatively poor soil and clear streams, (mostly in Oxford, Norfolk and Haldimand Counties), the species of the following list are most conspicuous:†

*C. K. Dodge, in Rep. Mich. Acad. Sci. **16:** 135. 1915, has listed in approximate order of abundance the commonest trees in Lambton County. which is in the lake plains just north of Kent, and he also puts *Ulmus Americana* at the head of the list.

†Although the underlying rock is mapped as mostly limestone (Devonian west of Hagersville and Silurian east of there), no lime-loving plants were noticed, unless *Thuya* and *Melilotus* are so classed.

Trees	Shrubs
Ulmus Americana	Salix sps.
Pinus Strobus	(Rhus typhina)
Acer Saccharum	Spiraea tomentosa
Thuya occidentalis	Rubus strigosus?
Quercus macrocarpa?	**Herbs**
Acer rubrum?	(Solidago Canadensis?)
Fagus grandifolia	(Melilotus alba)
Quercus alba	Typha latifolia
Tsuga Canadensis	(Dipsacus sylvestris)
Quercus velutina	(Achillea Millefolium)
Small Trees	Aster oblongifolius?
Salix nigra?	(Linaria vulgaris)
(Populus tremuloides)	(Daucus Carota)
Crataegus sp.	(Verbascum Thapsus)
(Betula populifolia?)	Scirpus cyperinus

In this last list the presence of three evergreen trees, making up perhaps one-tenth of the forest, seems to indicate poorer soil than that west of Brownsville.

It is also significant that more trees and shrubs and fewer weeds, in proportion to the distance traveled, were seen in this section than in the others, even though some of the weeds west of Brownsville were concealed by snow.

A few notes on the local distribution of some of the species may now be added. *Fagus* and *Acer Saccharum* were not seen at all in the lake plains, except once each in Welland County; but they appeared pretty promptly on entering the rolling country near Ridgetown. *Rhus typhina* was first seen a little farther along, near the boundary between Kent and Elgin Counties. *Castanea dentata*, which is not common in Canada, was seen two or three times in Elgin County. *Pinus Strobus*, which was not observed in the western half of the route at all, appeared rather suddenly after passing Brownsville, and was fairly common between there and Welland. (In that section there are many fences made of its stumps, as in parts of Michigan where it was once abundant.) *Thuya* was seen several times between La Salette and Townsend Centre, *Tsuga* twice near Windham, and *Larix* once near Waterford, making four conifers seen in the pine area and nowhere else on the route, and three of them only in a space of ten or twelve miles in Norfolk County.

Among the trees which have been reported from this general region by others, or are more or less common in about the same latitude in the eastern United States, but were seen only once or not at all in Ontario, are the following:—*Picea, Juniperus Virginiana,** *Juglans, Ostrya, Quercus borealis* (and other red oaks), *Celtis, Morus, Platanus, Liriodendron, Magnolia acuminata, Sassafras, Tilia, Cornus florida*, and *Nyssa*. (Where the generic name only is given it means either that there is only one species in the northeastern states, or that the whole genus is scarce in southern Ontario.)

Some statistics of population and agriculture compiled from the Canadian census of 1921 correlate very nicely with the observed features of the vegetation.

In Kent, Essex, and Welland Counties, representing the level lake plains, there were 113.3 inhabitants per square mile, 58.5% of them living in incorporated towns and cities, the largest of which are Windsor, Niagara Falls, Chatham and Welland, which together include over half the urban population. The population increased 58.1% between 1901 and 1921, doubtless on account of the growth of the manufacturing cities on the border. Farm woodlands constituted 7.5% of the area, pasture 20.3%, and field crops (including hay) 53.8%. The average value of farm land was $78.50 per acre.

The undulating country with deciduous forests is represented by Elgin County, which had 62.4 persons per square mile, 49.7% of them in incorporated places, by far the largest of which is St. Thomas, the county-seat. Outside of St. Thomas the population decreased a little between 1901 and 1921. Farm woodlands covered 9.7% of the area, pasture 33.9%, and field crops 43.0%. The farm land was valued at $44.60 per acre.

Taking Oxford, Norfolk and Haldimand Counties to represent the white pine country, we find that they have 50 inhabitants per square mile (a decrease of 4.4% in twenty years), 37.1% of them in incorporated places. The agricultural statistics do not differ much from those for Elgin County, except for having less pasture and a little more crop land, but possibly the parts of

*See Torreya **12:** 150. 1912; also Dodge, Rep. Mich. Acad. Sci. **16:** 140. 1915.

those counties that I did not see are more fertile than the immediate vicinity of the Michigan Central R. R. However, the figures for Norfolk County alone (which seems to have the largest proportion of evergreens) indicate somewhat poorer soil. It has 41.5 inhabitants per square mile (a decrease of 9.5% in twenty years), 30.4% of them in incorporated places, 13.0% farm woodland, 21.4% pasture, 40.9% field crops, and the farm land is worth only $37.70 per acre.

TALLAHASSEE, FLA.

A NOTE ON THE INTERRUPTED FERN

N. M. GRIER

I observed at Hanover, N. H., specimens of the interrupted fern, (*Osmunda Claytoniana*, L.) which did not conform to the descriptions for this species in that the number of fertile pinnae was greater than five pairs or even less than one. I was led to examine many other plants to see if a predominating number of fertile pinnae could be established for this species, since the descriptions of the manuals state that two to five pairs are present. This seemed further justified because of the probability that the species was described from a fewer number of specimens than I first examined.

A field in which this fern was one of the dominating species enabled me to secure counts from 609 fronds growing under three different conditions so far as the light factor was concerned. 178 of those observed belonged to plants fully exposed in the open, 71 to some growing completely in the shade of trees, while the remainder, 360, were from the border of the field adjacent to the woods where they received the full effect of the sunlight during part of the day only. It was noted in about 16% of all the cases that only portions of the fertile pinnae had developed sporangia, sometimes as little as one-third of the pinna being so occupied. Regardless of the proportion of it occupied by sporangia, a fertile pinna was counted as one.

All observed fertile pinnae were grouped by classes and a frequency polygon plotted. This indicated that 3 pairs were the most commonly distributed, making up 24% of the total number. Minor modes of the curve, (all percentages are approximate), were in order 2 pairs (17%), 4 pairs (14%), 2½ pairs (10%), 3½ pairs (9%), 1½ pairs (6%), 1 pair (5%), 5 pairs (5%), 6 pairs (3%), 4½ pairs (3%), 5½ pairs (2%), totalling 98%. One half of a pair was represented by 1%, 7 pairs by two-thirds of one per cent, 6½ pairs, one-half of one per cent, while but one case of the 609 fronds represented 7½ pairs.

It is noted that combinations observed, but not included in the descriptive manuals were 1 pair, 6 pairs, and 7 pairs. Of perhaps greater interest is the fact that separate frequency polygons plotted from the observations made under each light condition, showed modes in the same order of predomination as that already indicated for the species as a whole.

While some of the above facts may represent the response of this fern to peculiar environmental conditions, they are perhaps suggestive to the plant systematist, ecologist and geneticist alike. Data of this kind for many species can easily be acquired on the field trips of the botanist, and may not only give us a more accurate idea of a particular species but may also lead to some fascinating problem connected with it. Finally, these observations indicate that this particular species is well adapted for an elementary class room study in variation in those regions where it is abundant.

Des Moines University,
Des Moines, Iowa.

THE CAT TAIL, *TYPHA ANGUSTIFOLIA*, IN UTAH

J. Arthur Harris

In his comprehensive *Flora of Utah and Nevada*, Tidestrom records the occurrence of both species of *Typha*. While *T. latifolia* is well known in Utah, where it is frequently seen in the drainage waters from irrigation canals, as well as in natural habitats, the distribution of *T. angustifolia* seems to be very limited. The plant, up to the present time, has been reported from two localities only.

Typha angustifolia is familiar to students of the Eastern United States as a plant occurring frequently in brackish coastal marshes. In 1921 Wetmore* noted quite incidentally the occurrence of

*Wetmore, A. Wild ducks and duck foods of the Bear River Marshes, Utah. Bull. U. S. Dep. Agr. **936**: 1–20. 1921.

both species of *Typha* in the marshes of varying salinity formed by the emptying of the relatively pure waters of Bear River into the highly concentrated waters of the Great Salt Lake. During the summer of 1923, I found *T. angustifolia* growing under conditions which make its occurrence in Utah of considerable biological interest.

The station in question represents a small area only a few square yards in extent in the marshes which are fed by the Fumerole Butte hot springs near the northern end of the Sevier desert.*

These hot springs, with a temperature of 110–178° F., are rather highly mineralized, having an osmotic concentration (determined cryoscopically) of 2.15 to 2.40 atmospheres,† and have built up considerable mounds of deposits, below which are densely vegetated sloughs. The vegetation of the low ridges between the sloughs is typical of the surrounding highly saline deserts, with the stem succulent *Allenrolfea occidentalis* (S. Wats.)Kuntze, having an osmotic concentration of its tissue fluids of forty atmospheres or more,‡ a conspicuous species.

On some very recent deposits from the springs *Sesuvium sessile* Pers., with an osmotic concentration of the tissue fluids of its succulent leaves of about twenty-five atmospheres, is the only species. A much dwarfed sunflower, presumably *Helianthus aridus* Rydb. (fourteen to eighteen atmospheres) is represented by a few individuals on the banks of the streamlets of hot water. *Glaux maritima* L. (with an osmotic concentration of twenty atmospheres) was taken near the margins of the marshes. *Crepis glauca* (Nutt.) Torr. and Gray, with succulent leaves (about eighteen atmospheres) and *Aster pauciflorus* Nutt., are also found.

*The position of this group of springs is indicated on the map of the old river bed which formed the connection between the Sevier and the Great Salt Lake Desert Sections of the main lake. See G. K. Gilbert, Lake Bonneville, *Pl. 31*, pp. 332–335. 1890.

†These are the values determined from the water emerging from the springs or from pools near the springs. After exposure to evaporation in the lower portion of the marshes the concentration of the soil solution is undoubtedly very much higher.

‡Osmotic concentrations of the leaf tissue fluids, or of the stem-tissue fluids in the case of leafless forms, has been determined by a technique developed and used for this purpose in a number of investigations published during the past several years. The results are given in round numbers of atmospheres.

In the sloughs themselves, *Scirpus olneyi* A. Gray (fourteen to eighteen atmospheres), *Juncus balticus* Willd., *Eleocharis palustris* (L.) Roem. and Schultz, and *Scirpus paludosa* A. Nels., are conspicuous. Small areas of the grass *Phragmites communis* Trin. (about eighteen atmospheres) are found near the margin of the densely vegetated areas, and extend as very dwarfed individuals into the moister saline and largely sterile surrounding areas. Where the salinity of the soil has been much increased by evaporation, the salt-grass *Distichlis spicata* (L.) Greene and some other grasses occur.

The extremely limited area occupied by *T. angustifolia* in this locality may be due to its inability to compete under the conditions of this habitat with *Scirpus*, *Juncus* and *Eleocharis* or it may indicate a recent and successful introduction in regions in which conditions are not generally suitable for its growth. *T. angustifolia* is typically a brackish water form often found in maritime marshes. It is interesting to note that the very dwarfed plants of this colony had an osmotic concentration of their tissue fluids of about fifteen atmospheres, whereas collections of *T. latifolia* taken in water of lower osmotic concentration (about 1.2 atmospheres) in high valley marshes near Moroni, Utah, had an osmotic concentration of their leaf tissue fluids of about ten atmospheres.

University of Minnesota,
Minneapolis, Minn.

PROCEEDINGS OF THE CLUB

Meeting of October 27, 1926

The meeting was held at the Museum Building of the New York Botanical Garden. The minutes of the meeting of October 12 were read and approved. The following were elected to membership in the Club:

Mrs. Inez M. Haring, Woodland, Ulster Co., New York.

Mr. Samuel Hirschberg, 1215 42 St., Brooklyn, New York.

Mr. Edward D. Lehrer, 1519 55 St., Brooklyn, New York.

After some discussion it was unanimously voted that the last monthly meeting in November, on the Wednesday before Thanksgiving Day, be omitted, and a committee on the time and place of meetings, to be appointed by the Chair, wait over for future report.

In the discussion on the time of meeting as authorized by the Constitution, Drs. Britton and Barnhart referred to the present condition of the Constitution, which consists of an original document plus all amendments and by-laws passed during the last 37 years, and existent only in the minutes of the Club. It will be necessary either to go through all these minutes for all these years, find the new legislation and incorporate it all in one body with the original Constitiuton, or else to draft an entirely new Constitution.

As a result of this discussion the Secretary was authorized to ascertain whether the minutes for the period stated are complete so that the necessary data for revising the Constitution may be obtained from them. If they should be found complete, the sum of $50 was voted by the Club as a remuneration for the work of revising the Constitution in accordance with them.

For the scientific part of the program, Dr. J. S. Karling of Columbia University, addressed the Club on "Variations in the Antheridium of the Characeae."

In method of development and growth the Characeae are perhaps the most diagrammatic of any organism, plant or animal. It is not merely that their diagrammatic and metameric organization leads to the development of the beautiful chandelier-like habit of growth, but their cellular make-up is so simple as to at once suggest the possibility of mathematical analysis. This regularity of growth, according to Braun and Sachs, extends to the antheridia and oogonia as well. In the development of the antheridium, the globular antheridium mother-cell divides until 24 cells are formed. The eight outer cells become the shield cells, the eight middle cells the manubria, and the eight inner cells the primary capitula. Each primary capitulum bears four secondary capitula, which in turn bear four antheridial filaments. This method of development as described by Braun and Sachs has been regarded as the type development. However, a considerable number of variations from this type have been observed, which may be classified into eight groups:

1. In addition to primary and secondary capitula, tertiary and quaternary capitula are frequently formed which bear antheridial filaments.

2. The number of manubria and primary capitula often varies. As many as 12 manubria and 16 primary capitula have been found in a single antheridium.

3. The antheridial filaments may often branch, sometimes as many as five times.

4. Irregular partitioning of the antheridial filaments is not uncommon. Septa may be formed parallel, diagonal and at right angles to the long axis of the filament.

5. Variations in the number of antheridial filaments borne on each secondary capitulum occur. In *Chara fragilis* the number may vary from one to nine.

6. The tertiary, secondary and primary capitula, and the manubria may often produce bud-like outgrowths which sometimes are cut off by transverse septa.

7. The number of cells in the antheridial filament varies to a considerable degree. In a single species the variation may range from 5 to 150 cells.

8. Inequalities in the size of cells and nuclei occur in the antheridial filaments as a result of irregularities in the distribution of the chromosomes during mitosis. The large and small cells, nevertheless, develop into germ cells, thus forming large and small antherozoids.

Arthur H. Graves
Secretary.

Meeting of November 9, 1926

This meeting was held at the American Museum of Natural History. Miss Mary E. Hopper, Barnard College, New York City, was unanimously elected to membership in the Club. Professor Oliver P. Medsger, Head of the Science Department of the Jersey City Schools, gave an illustrated lecture entitled "Flora of the Catskills." The lecturer said in part:

"The tops of many of the Catskills are covered with red spruce and balsam fir. Years ago the hemlock and white pine were probably the most abundant species of trees in the Catskills, but the pines were cut for lumber and the hemlocks for tan bark. The logs of the latter were left to decay on the ground. Hard woods, especially the yellow birch, have taken the place of these conifers. But on a plateau bounded by Wittenberg, Cornell Slide (the highest peak of the Catskills) and extending south toward Peekamoose, a virgin forest of almost pure red spruce covers several square miles.

The southern Catskills are one of the best regions in the east for the study of ferns. Forty species have been found in Woodland Valley, near Slide Mountain, within a radius of three miles. Among the rare species found here may be mentioned *Ophioglossum vulgatum*, the Adder's Tongue; *Botrychium simplex* and *B. neglectum; Matteuccia Struthiopteris*, or Ostrich Fern; *Filix bulbifera*, the Bulblet Bladder Fern; *Polystichum Braunii*, Braun's Holly Fern; *Camptosorus rhizophyllus*, Walking Fern, growing on sandstone rocks, and Boott's Shield Fern, *Dryopteris Boottii*. The last named species Mr. Medsger has cultivated for a number of years and is convinced that it is a natural hybrid between *D. cristata* and *D. intermedia*.

Since the southern Catskills are chiefly covered by forests, the grass and sedge flora is not large but interesting. Peck's Bulrush, *Scirpus Peckii*, apparently new to the area, is found in Woodland Valley. The Catskills are not especially rich in species of orchids. Among the sixteen species that the speaker has collected in the southern Catskills are *Coeloglossum bracteatum*, *Limnorchis hyperborea*, *Lysias orbiculata*, *Blephariglottis lacera*, *Blephariglottis grandiflora*, *Peramium ophioides* and *Malaxis unifolia*.

The most abundant weed of the southern Catskills is Wild or Sweet Marjoram, *Origanum vulgare*. The greatest pest of the northern Catskills is also a labiate, a closely related species, Wild or Creeping Thyme, *Thymus Serpyllum*. A dozen years ago, the thyme was so abundant on the dairy farms of the northern Catskills that some of the farmers gave up in dispair. On one large farm dairying was dropped and bee-keeping substituted with excellent success. The thyme is now far less abundant than formerly, and the Marjoram does not seem so plentiful as it was a few years ago."

The lecture was illustrated by a large number of lantern slides, among them photographs of typical woodland plants from the lowlands to the summits of the highest peaks.

ARTHUR H. GRAVES
Secretary.

Meeting of December 14, 1926

This meeting was called to order at the American Museum of Natural History. The following candidates were elected to membership by unanimous vote of the Club:

Miss Grace Griffin, Johnson Hall, 411 W. 116th St., N. Y. C.
Miss Ruth Turner, Johnson Hall, 411 W. 116th St., N. Y. C.
Miss Olga Hingsberg, 1285 Hoe Avenue, New York City.
Mr. William P. Jenks, Morristown, N. J.
Mrs. William P. Jenks, Morristown, N. J.
Mr. Randolph Jenks, Morristown, N. J.

The program for the evening consisted of an illustrated lecture by Dr. Fred J. Seaver entitled "Views of the Bermudas, with notes on some botanical features." Dr. Seaver said in part: The Bermuda Islands are located about 700 miles from New York City and nearly 600 miles from the nearest land, few islands in the world being more remote from large bodies of land. The islands are said to be 365 in number, one for each day in the year. They are so arranged as to form a long irregular hook of land about 20 miles long and never more than 3 miles in width; the total area being about 19½ square miles.

The islands, built up through the agency of coral organisms on a volcanic base, are composed of white limestone, made up of broken shells, corals, and calcareous algae, which have been ground into sand and fused together. The soil is of a reddish color and not of any great depth. The predominating type of vegetation is the Bermuda cedar, similar to our red cedar, but more spreading and of larger growth.

One species of palm, *Sabal blackburniana*, endemic on the Islands, has been threatened with extinction, since it has been in great demand for several purposes. The leaves were used by the first settlers for thatching the roofs of their houses, the buds were found to be edible, and large numbers of trees were thus destroyed. Also, it was found that a good rum could be manufactured from the pith. Finally, however, the government interfered. Nowadays the houses are built of the soft, white limestone which is easily quarried and can be cut with a saw. Even the roofs are made of thin overlapping slabs of this, which becomes harder on exposure to the air. The red cedar, *Juniperus bermudiana*, is much used now in the building of houses.

There are no wells on the islands, and so all water must be caught from the skies. Large stone catch basins are constructed, the run off from which is collected in cisterns. The only methods of travel on the Islands are by donkey or horse and carriage, and by bicycle. There is very little sickness, and the longevity is noteworthy, perhaps due to the easy-going ways of living and the healthful climate.

The Bermudians appear to be especially fond of ornamental gardening, the entire section being almost one continuous park. This tendency is accentuated through the activities of several local garden clubs. Abandoned quarries, which are common in the Islands and had formerly been used as dumping places, have been cleared out and are being used as quarry gardens. "Quarry gardening," has become quite a fad and the results are very interesting. Because of the prevailing winds the gardens are often enclosed by limestone fences or oleander hedges. No place visited by the lecturer has such a display of beautiful gardens, whether they be associated with the wealthiest mansion or the humblest cottage.

Arthur H. Graves,
Secretary.

Meeting of January 11, 1927

This meeting was held at the American Museum of Natural History. The minutes of the meetings of October 27, November 9, and December 14 were read and approved. The following new members were unanimously elected to the Club:

Mr. James B. McFarlin, Winter Haven, Florida.

Dr. Ernest A. Petzke, Hixton, Wisconsin.

Miss Aravilla M. Taylor, Lake Erie College, Painesville, O.

Mrs. Helen M. Trelease, New York City.

According to the usual program of the annual business meeting the reports of the various officers for the year were next received.

The Secretary reported that 14 regular meetings of the Club had been held during the year, with a total attendance of 395, an average of 28 persons per meeting. Twenty-seven new members were elected during 1926; eight were lost through resignation, and 3 by death. The present membership is 305.

The treasurer, Dr. R. C. Benedict, reported gross receipts of \$4848.41, including a balance of \$655.16 brought over from 1925. The disbursements in 1926 amounted to \$4452.70, leaving a balance of \$395.71.

Dr. T. E. Hazen, Editor of the Bulletin, reported that volume 53 comprised 671 pages. This is 118 pages in excess of the number published in the preceding volume. About 190 pages in the current volume and a considerable portion of the illustrations were paid for by the authors.

The Editor of Torreya, Mr. George T. Hastings, reported the publication of six bimonthly numbers, totaling 126 pages. He spoke of the delay in printing the proceedings of the Club under the present method of waiting for their approval at the next business meeting—sometimes months later. It was therefore voted that the Secretary be authorized to supply the Editor of Torreya with the minutes immediately after each meeting.

Dr. Michael Levine, the Business Manager, reported an income of \$139 from advertisers.

Dr. H. M. Denslow, Honorary Custodian of the local herbarium, was unable to be present, but his written report was read by the Secretary. During the year Mrs. Mitchell has worked chiefly in the Bicknell collection, sorting and recording the monocotyledons, the genus Carex being especially well represented. The accessions for 1926 were 112.

The reports of Dr. Barnhart, delegate to the Council of the N. Y. Academy of Sciences, and of Dr. Gundersen, Chairman of the Field Committee, who were unavoidably absent, were deferred until a later date.

Officers for 1927 were then elected as follows:

President—Dr. H. M. Richards

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Delegate to the Council of the New York Academy of Sciences—
Dr. John H. Barnhart

Arthur H. Graves,
Secretary.

NEWS NOTES

The Smithsonian Institution recently received the botanical library and herbarium of Captain John Donnell Smith of Baltimore. The herbarium of over 100,000 specimens is especially rich in material from Central America, but also has valuable collections from China, Tibet, India, Syria, and Africa. The collection and library are said to be the most valuable botanical gift ever received by the Institution. Captain Smith is now ninety-seven years old, the oldest American botanist. He is still active and interested in botanical work. (*Science*)

Dr. N. L. Britton, director of the New York Botanical Garden sailed on January 23rd for Porto Rico and the Virgin Islands. Dr. Britton will continue work on the plants of the islands, part of the scientific survey being made by the New York Academy of Sciences, the Botanical Garden and Columbia University. Mrs. Britton accompanied her husband and will continue studies of the mosses of the islands.

The Bronx Park Botanical Museum is to have electric light installed. The New York City Board of Estimate having recently granted an appropriation for the purpose. This will be of especial value to the laboratories, but will make the exhibition halls more attractive on dark days.

Prof. Harley H. Bartlett, head of the Department of Botany and Director of the Botanical Gardens of the University of Michigan will spend this year in botanical exploration in Eastern Asia. He will visit Japan and later carry on field work in Sumatra and Formosa. (*Science*)

Dr. H. K. Lewcock is studying fungus diseases of the prickly pear, *Opuntia* in this country as the representative of the Australian Government. On January 26th Dr. Lewcock was married to Miss Ena Orrock at the home of Dr. Fred J. Seaver, Mrs. Lewcock is a graduate of Adelaide University and herself a botanist. She will assist her husband in his work in the greenhouses of Cornell University. The prickly pear has become the worst pest in Australia. It has covered over 60,000,000 acres, much of it fertile land, making it impossible to cultivate or even to use it for pasture. The cactus is spreading at the rate of about 1,000,000 acres a year, and costing the country an estimated amount of $10,000,000. A year ago Dr. Lewcock went with Dr. Seaver of the New York Botanical Garden and Prof. H. H. Whetzel of Cornell University to Bermuda to study and collect a fungus of the prickly pear previously found there by Dr. Seaver.

The Florida State Mail Service of the Associated Press reported recently that Dr. R. M. Harper, whose "Cross-Section of the Vegetation of Southern Ontario" appears in this issue, had received three requests for berries of the saw-palmetto. The palmetto covers millions of acres of land in Florida, but produces little fruit, seeming to depend chiefly on vegetative growth for propagation. Dr. Harper says that though "large sums of money have been spent in grubbing the palmetto out of land desired for agricultural or residential purposes, it is not an unmitigated nuisance. Its stems yield fiber and tannin, its terminal bud is edible, its young leaves are eaten by cattle, its flowers are an important source of honey, and its berries are in demand for medicinal purposes, the oil extracted from them acting beneficially on the mucous membranes."

Dr. T. D. A. Cockerell, professor of zoology at the University of Colorado, whose notes on fossil plants have appeared frequently in Torreya, expects to sail for England next June. From there he will go to Russia and Siberia. Later he will visit India and Siam, and about the first of next February go to Australia and New Zealand. He will return to Boilder about the first of September, 1928. (*Science*)

P. H. Dorsett, Agricultural Explorer for the United States Department of Agriculture, recently returned to the United States after two and a half years of searching in China and the tropical islands of Sumatra, Java, and Ceylon for plants that may be useful in American agriculture. With the assistance of his son, J. H. Dorsett, he made thousands of selections of seeds, plants, scions, bulbs, tubers, and cuttings. What is considered as perhaps the best collection of soybean varieties ever brought to the United States is the one collected by the Dorsetts in Manchuria with the help of B. W. Skvortzow, a Russian botanist teaching agriculture in the High School in Harbin, Manchuria. Upon learning the mission of the Americans, he planted 100 varieties of soybeans in the local botanical garden. When the Dorsetts visited the place in the fall after harvest they were told to take what they wanted, plant and all.

It is estimated that 70 per cent of the soybeans grown in China are produced in Manchuria and that upward of 9,000,000 acres in that region is devoted to this crop. Something like 4,000,000 acres of soybeans were grown in the United States last year as a result of previous introductions.

The Torrey Botanical Club

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OF THE

TORREY BOTANICAL CLUB

(1) BULLETIN

A monthly journal devoted to general botany, established 1870. Vol. 49, published in 1922, contained 408 pages of text and 17 full page plates. Price $4.00 per annum. For Europe, $4.25. Dulau & Co., 47 Soho Square, London, are agents for England.

Of former volumes, 24–47 can be supplied separately at $4.00 each; certain numbers of other volumes are available, but the entire stock of some numbers has been reserved for the completion of sets. Single copies (40 cents) will be furnished only when not breaking complete volumes.

(2) MEMOIRS

The MEMOIRS, established 1889, are published at irregular intervals. Volumes 1–17 are now completed. The subscription price is fixed at $3.00 per volume in advance; Vol. 17, containing Proceedings of the Semi-Centennial Anniversary of the Club, 490 pages, was issued in 1918, price $5.00. Certain numbers can also be purchased singly. A list of titles of the individual papers and of prices will be furnished on application.

(3) **Preliminary Catalogue of Anthophyta and Pteridophyta** reported as growing within one hundred miles of New York, 1888. Price, $1.00.

Correspondence relating to the above publications should be addressed to

MRS. HELEN M. TRELEASE
Box 42 Schermerhorn Hall,
Columbia University,
New York.

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EDITED FOR

THE TORREY BOTANICAL CLUB

BY

GEORGE T. HASTINGS

John Torrey, 1796–1873

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Torreya is the Official Organ of the
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Torreya is furnished to subscribers in the United States and Canada for one dollar per annum; single copies, thirty cents. To subscribers elsewhere, twenty-five cents extra, or the equivalent thereof. Postal or express money orders and drafts or personal checks on New York City banks are accepted in payment, but the rules of the New York Clearing House compel the request that ten cents be added to the amount of any other local checks that may be sent. Subscriptions are received only for full volumes, beginning with the January issue. Reprints will be furnished at cost prices. Subscriptions and remittances should be sent to Treasurer, Torrey Botanical Club, 8 West King St., Lancaster, Pa., or Mrs. Helen M. Trelease, Box 42 Schermerhorn Hall, Columbia University, New York.

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GEORGE T. HASTINGS
2587 Sedgwick Ave.
New York City.

TORREYA

Vol. 27 No. 2

March-April, 1927

NEW PLANT RECORDS FROM THE PLEISTOCENE

EDWARD W. BERRY

The following notes refer to determinations of miscellaneous plants identified from small collections sent me at various times during the past few years, and coming from scattered localities in the southeastern United States. It is desirable to place these on record for the benefit of students of the life of the Pleistocene, and of the distribution of recent plants.

CORNFIELD HARBOR, MARYLAND

This historic locality has long been known for its Pleistocene molluscan remains. It is in southern St. Mary's County, and has furnished a considerable marine fauna.* The general stratigraphic relations are dark clays resting unconformably on the Miocene, becoming more sandy and oyster bearing upward, and overlain by non-fossiliferous sands, the whole belonging to the Talbot formation of the Pleistocene.

In 1909 Mr. James Hall of Cornfield Harbor sent me part of a log from the lower part of the dark shell bearing clay. The specimen is 52 inches long and 7 inches in diameter, and is clearly drift wood, since it is extensively Teredo bored. I am indebted to Dr. R. Thiessen of the Bureau of Mines for cutting and examining sections for me.

The log obviously belongs to Juniperus. The preservation is not perfect and in some of the anatomical features the structure departs from that characteristic of our widespread eastern *Juniperus virginiana* Linné, and resembles the western *Juniperus occidentalis* Hooker. It can hardly represent the latter species, and probably represents the former, although there is a possibility that it might represent the northern Holarctic *Juniperus communis* Linné, which has been recorded† recently from New York.

* Described in Maryland Geol. Survey Pleistocene, 1916.

† Hollick, A., Amer. Mus. Novitates **213,** 1926.

In view of the relatively warm water character of the associated mollusca this is hardly probable.

American Pleistocene records of Juniperus comprise wood from the Don Valley in Ontario, and from Humboldt County, California; and seeds from the Talbot formation of New Jersey.

District of Columbia

In an excavation on the southeast corner of North Capitol and Pierce Sts., Washington, N. E., a black muck with drift wood, of Talbot age, lies unconformably on the Potomac Cretaceous. Speciments of the wood, collected by Laurence La Forge, were sectioned and the wood determined to be that of the *Taxodium distichum*, the existing bald cypress. This species has been found fossil at numerous Pleistocene localities in the southeastern United States; and stumps in situ, seeds, and cone scales were common in the excavation at Connecticut Avenue and De Sales Street, N. W.* The present locality is a considerable distance northwest of the inland limit of range of this species at the present time.

At an excavation at 17th & K. Sts., Washington, N. W., from a carbonaceous muck of the same age as that encountered at Connecticut Ave., & De Sales St., that is, belonging to the Wicomico formation, Arthur Keith collected several characteristic husks and a nut of what proves to be *Hicoria ovata* Britton, (figures 5–7). This species has been recorded previously from the Pleistocene of Pennsylvania and North Carolina.

In the recent flora it is found from the valley of the St. Lawrence southward along the uplands to western Florida. In the latitude of the District of Columbia it does not occur in the Coastal Plain but is confined to the Piedmont and Mountain zones, although it is recorded from the Potomac valley within the northwestern limits of the District.

Virginia

Messrs. Maddren, Messler and Mansfield of the U. S. Geological Survey collected cones of *Pinus echinata* Miller from the Talbot formation on the left bank of the Rappahannock River, 1½ miles below Taft P. O. in Lancaster County. This species

* Berry, E. W., Jour. Wash. Acad. Sci. **14:** 15, *pl. 1 figs. 37–42; pl. 3,* 1924.

has been recorded previously from the Pleistocene of Maryland and Alabama.

Tennessee

A newly opened clay pit near Hilltop, between Paris and Whitlock, and about 2 miles south of the latter town, in Henry County, Tennessee, was studied during the past summer by R. Lee Collins. The clay is dark in color and full of roots and wood. The following plants, which are of considerable interest, were recognized from this deposit:

Pinus taeda Linné. Figs. 8, 9

Berry, A. Jour. Sci. **29:** 391. 1910; Torreya, **10:** 263, 1910; Jour. Geol. **25:** 662, 1917; 9th Ann. Rept. Fla. Geol. Survey, 20, 1917.

The loblolly pine is represented by cones, scales or seeds in the Pleistocene of New Jersey, Florida and Alabama. There are two specimens of cones in the present collection which certainly belong to this species. I have compared the fossils with a series of cones of recent species and the only other modern form that resembles them are the cones of *Pinus caribaea* Morelet, the slash or swamp pine, of the present coastal region from South Carolina to Louisiana. In the latter the scales have more corrugated tips and the prickles are more slender. I have mutilated the larger fossil specimen sufficiently to get the full outline of one of the scales and there is no doubt but that it represents *Pinus taeda*.

In the recent flora this species extends from Cape May, N. J., southward in the Costal Plain to peninsular Florida, and in the Gulf States to the valley of the Colorado River in Texas. It extends up the Mississippi valley to southern Arkansas and the southern boundary of west Tennessee. According to Mohr it rarely gets northward of this southern boundary, nor do I recall having seen it during long continued field work in that part of the state, so that the present fossil occurrence is about 100 miles north of its present northern limit of growth.

Scirpus or Cyperus

The collection contains 2 specimens of small lenticular achenes lacking their beaks. It is impossible to determine with certainty the genus of Cyperaceae to which they belong. They do not represent Carex, but similar fruits are present in some of the modern species of both Scirpus and Cyperus, to the one or the other of which I am convinced that these fossils belong.

SMILAX (?) sp. Figs. 10–13

There are a number of specimens of a small globular berry, about 4 millimeters in diameter, preserved in a more or less flattened condition. After extended comparisons with recent material I believe them to represent the genus Smilax, although it must be admitted that this cannot be conclusively demonstrated. The most similar fruits among existing species are those of *Smilax rotundifolia* Linné and *Smilax lanceolata* Linné, although unusually small fruited specimens of *Smilax walteri* Pursh are also similar. All three occur in western Tennessee at the present time, the first ranging from southern Canada to the Gulf of Mexico, the second from Virginia to Arkansas and southward, and the third from New Jersey to Tennessee and southward The last is the only one of the three especially characteristic of swamps and wet pine lands. There is no evidence that the Pleistocene environment here was swampy, and my impression is that the fossils are closest to *Smilax lanceolata*, a dry woods type in the existing flora.

BRASENIA SCHREBERI Gmelin. Figs. 1–4

Brasenia peltata Pursh. Penhallow, Bull. Geol. Soc. Am. **1**: 326. 1890.

Brasenia purpurea (Michx.) Caspary. Coleman, Idem., **26**: 247. 1915: Berry, Jour. Geol. **25**: 662. 1917; 9th Ann. Fla. Geol. Survey 26. 1917.

Our American water shield, a denizen of slow streams and ponds, is now usually given the above name, which we owe to Gmelin. It is considered to be the same as *Brasenia peltata* of Pursh and *Brasenia purpurea* (Michx.) Caspary. Its seeds are the most abundant fossils in this deposit, and they are indistinguishable from the seeds in existing material They have been previously recorded from Ontario and Florida, and are interesting in the present instance in that they show that these clays were probably accumulated in a pond. Similar seeds have been recorded throughout the European Tertiary, and they are exceedingly common throughout the Pleistocene of Europe from Sweden and Finland to Italy where they are generally referred to under the name of *Brasenia purpurea*. A fairly complete discussion of them has been given by Stoller.*

In America the water shield is widely distributed in appropriate situations from Canada to Central America, and in the Atlantic and Pacific regions, and what systematists consider the same species occurs in similar environments on all of the continents except Europe, where it is no longer native.

This small florule is interesting in several ways: First, because of its occurrence in the center of a region of many and extensive clay workings of lower Eocene age, it being the only Pleistocene clay recognized along this upland ridge; Second, in showing no traces of oaks, beech or of the bald cypress which are so common in the Pleistocene deposits of southeastern North America; Third, in that the plants preserved are those of dry pine land (*Pinus taeda*), associated with pond or slow stream types, notably Brasenia, thus disclosing a fleeting picture of the Pleistocene environment in Henry County which is considerably different from that of the present in this region.

Texas

From a limonitic sandstone of Pleistocene age at a locality 2 miles northwest of Jacksonville in Cherokee County, Texas, Julia A. Gardner of the U. S. Geological Survey, collected the following species of plants:

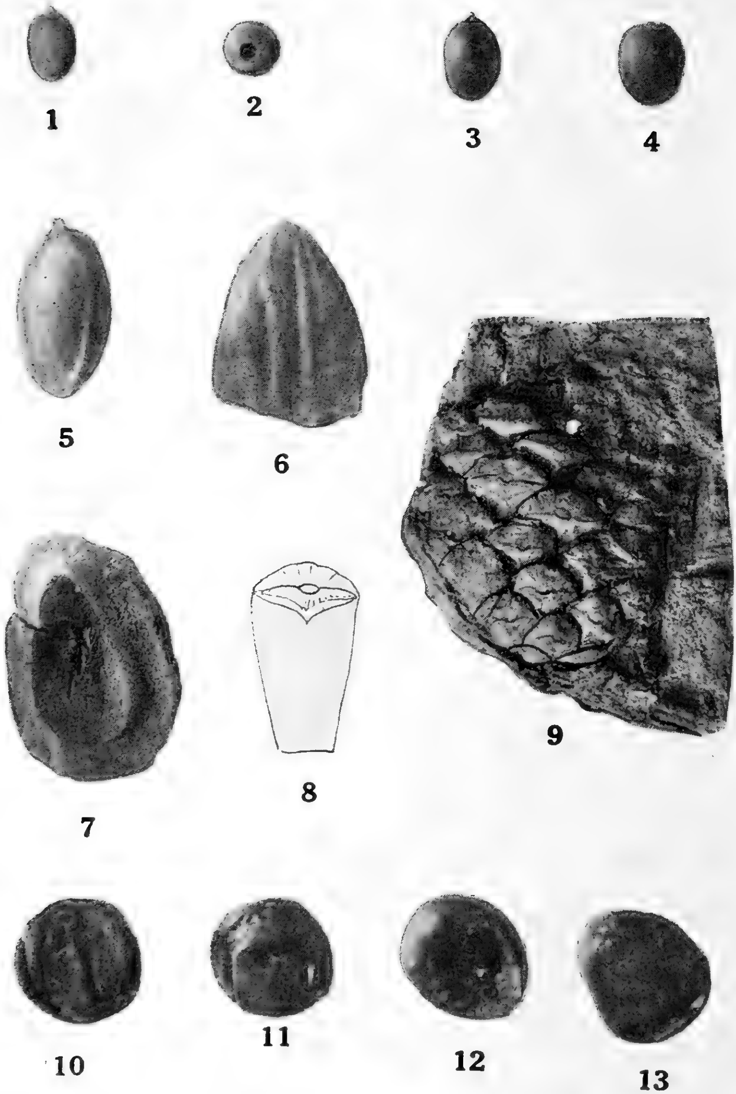
Fagus americana Sweet

This species is widespread in Pleistocene deposits, although it has never before been encountered as far west as this. It has been recorded from the Pleistocene of Massachusetts, Pennsylvania, Maryland, West Virginia, Virginia, North Carolina, Alabama, and Mississippi.

Quercus lyrata Walt

This, like the associated fossil forms, is characteristic of deep and moist soils. In the recent flora it ranges from Maryland to Florida and Texas, reaching its maximum size in Louisiana and

* Stoller, J. Jahrb. k. Preuss. Geol. Landes. **29**: 62–93. 1908; **32**: 126. 1911.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east Texas. Both leaves and acorns have been found in the Pleistocene of North Carolina.

Persea borbonia Spreng (?)

Somewhat doubtfully determined leaves of this species occur at this locality. In the recent flora it ranges from Virginia to Florida and Texas. It has not certainly been found fossil before but allied *Persea pubescens* (Pursh) Sargent has been found in the Pleistocene of North Carolina and Alabama. The separation of the two on the basis of leaves alone is attended with some uncertainties.

Explanation of Plate

Figs. 1–4. Brasenia schreberi Gmelin. Seeds × 4 from near Whitlock, Tenn.

Figs. 5–7. Hicoria ovata Britton, nat. size. Wicomico formation, 17th & K. Sts., Washington. 5. a nut, 6, 7. Outer and inner view of husks.

Figs. 8, 9. Pinus taeda Linné, nat size. From near Whitlock, Tenn. 8. A single scale from the outside, 9. Part of cone in matrix.

Figs. 10–13. Smilax (?) sp., × 4, from near Whitlock, Tenn.

Johns Hopkins University
Baltimore, Md.

NATURE TRAILS AT WALKING CLUB CAMPS

Raymond Torry

Among a large number of outdoor study groups, throughout the United States, and even in Europe and Asia, which have adopted the methods of Dr. Frank E. Lutz, Curator of Entomology at the American Museum of Natural History, in labelling natural exhibits "in place," on Nature Trails, are two of the largest of the walking clubs of the New York City metropolitan district, the New York Section of the Green Mountain Club and the New York Chapter of the Adirondack Mountain Club.

Nature Trails have been started at the Wyanokie Lodge, the gathering place of the New York Section of the Green Mountain Club, three miles west of Wanaque-Midvale, in Passaic County, on the Greenwood Lake division of the Erie Railroad; and at Camp Thendara, the Section's all year camp on Lake Tiorati, in the Harriman State Park, nine miles southwest of Bear Mountain.

The Wyanokie Lodge headquarters has long been a centre for nature study, under the inspiration and direction of Dr. Will S. Monroe, Honorary President of the New York Section of the Green Mountain Club, who established a fern garden there, laid out forty miles of trails, and maintained for ten years an annual bird census, in cooperation with the United States Biological Survey. The Lodge continues as a centre of outdoor instruction, particularly in botany, and is the scene of weekly nature guidance outings, under the general direction of William Gavin Taylor, assisted by many members of the section who are versed in the natural sciences.

The Wyanokie Nature Trail was established December 12, at a meeting of the Green Mountain Club at Wyanokie Lodge, to which members of the Torrey Botanical Club were also invited. For the beginning, trees and shrubs were identified according to their winter aspects, and some geological features were labelled. Linen tags, two by four inches were used, inscribed in ordinary typewriter ribbon or with indelible ink. The results of the winter's exposure upon these labels will determine if they may be considered as reasonably persistent, or if some methods of waterproofing, or perhaps the use of metal labels, may be adopted. Among those who gave useful advice and helped in the identifications at the inauguration of this trail were Dr. Arthur H. Graves, of the Brooklyn Botanic Garden, secretary of the Torrey Botanical Club; Dr. B. T. Butler, of the College of the City of New York, who named geological features, and Major Barrington Moore, Secretary of the Council on Wild Life, National Parks and Forests, who identified the trees.

At Camp Thendara, a similar Nature Trail was begun in December, with identification of trees and shrubs from bark, buds, persistent fruits, etc., and of geological features. This is a particularly rich region for ferns, which, with other herbaceous plants, will be added to the "exhibits" as the spring advances.

At the Adirondack Mountain Club headquarters in the Harriman Park, Camp Nawakwa, on Lake Sebago, three miles east of Tuxedo, a Nature Trail, primarily for winter botany and geology, was established in December, and will be extended as the changing seasons permit, under the direction of A. T. Shorey, a Boy Scout troop leader, of Brooklyn, who has been active in the nature study and trail making program of the Scouts at their headquarters at Kanohwahke Lakes, in the Harriman Park. An interesting feature of plant life at both Camp Nawakwa and Camp Thendara, each on a new artificial lake, with shore lines cut out of the forest, is the progressive adaptation to the new shore of moisture loving plants which formerly grew in the swamp now filled by the lake, and are now forced to move out to its boundaries.

Similar nature trails are proposed by Major W. A. Welch, general manager of the Palisades Interstate Park, in the vicinity of four new over-night shelters which he will build on the trails laid out during the past six years by volunteer workers from the New York City walking clubs in the Harriman Park.

WALKING WITH AN OBJECT

Forty Wild Flowers Worth Hunting

Norman Taylor

For nearly a hundred years nature enthusiasts have collected plants within the vicinity of New York, and many of these specimens have found their way into the herbarium of the Torrey Botanical Club, which is at the New York Botanical Garden, and into that of the Brooklyn Botanic Garden. The latter collections have been studied with a view to publishing a "Flora of Long Island," to be issued by the Brooklyn Botanic Garden, as soon as more field work has been completed.

The work of John Torrey in the local area resulted in his publishing in 1819 a "Catalogue of Plants Growing Spontaneously Within Thirty Miles of the City of New York," now a very rare book. Many of the specimens upon which he based that work are scarce in the region. In 1915 the writer's "Flora of the Vicinity of New York" was published by the New York Botanical Garden. This attempted to bring together all the old records, specimens and notes, and perhaps its greatest weakness is that much of it necessarily had to be based on specimens collected long ago. Some of the local plants are in any case rare. Some may be merely undetected from particular localities. Others are uncommon in some parts of the area, but common elsewhere. Much remains to be done in increasing our knowledge of the present distribution of local wild flowers. A distinct revival of interest among members of the Torrey Botanical Club as well as many walking and outdoor clubs makes it timely to prepare the following list of plants. Only rare or interesting species are listed and they are needed from the regions mentioned. Weeds are naturally omitted, but any others may be collected and sent to the writer at the Brooklyn Botanic Garden, or to the Herbarium of the Torrey Botanical Club, New York Botanical Garden, Bronx Park, New York City. They will be added to the collections at either institution and form the basis of new and much desired records of our local plants.

It is unnecessary to emphasize here that this proposal does not mean the indiscriminate collection of any plant in the area. And those to whom it is addressed need no reminding that one complete specimen is all that should be picked. We must not, in our desire to extend the knowledge of local plants, indirectly align ourselves with those who 'love nature' so much that they carry a good bit of it home with them.

Wild Plants Worth Collecting

From the region most popular among local hikers

In the following list will be given the common and Latin names of the plants, a brief description of them, the counties from which they are particularly desired, and their approximate flowering period. The region most favored by the different hiking organizations of the metropolitan area is as follows: Westchester, Putnam Dutchess, Greene, Ulster, Orange, and Rockland Counties in New York and Bergen, Essex, Passaic, Morris, Warren and Sussex Counties in New Jersey.

Blazing star. *Chamaelirium luteum.* An herb of medium height, with long narrow leaves, and small white flowers in a terminal raceme. From Dutchess and Orange Counties, New York, southward. June.

White adder's-tongue. *Erythronium albidum.* Resembling the common dog's-tooth violet, but the flowers white. Warren and Bergen Counties in New Jersey and Rockland County in New York. April.

White Clintonia. *Clintonia umbellulata.* Somewhat like the common yellow species, but with erect white flowers in a close cluster. Essex County in New Jersey, and vicinity: very rare. June.

Small white ladies'-slipper. *Cypripedium candidum.* A leafy-stemmed white-flowered relative of the mocassin flower. Bergen, Warren, Sussex, and Morris Counties in New Jersey, and adjacent New York. June.

Long-bracted orchis. *Coeloglossum bracteatum.* A leafy-stemmed green-flowered orchid with bracts at least three times longer than the flowers. Westchester, Putnam, Dutchess, Orange, and Rockland Counties in New York, and adjacent New Jersey.

Smaller whorled Pogonia. *Isotria affinis.* Foliage resembling cucumber root, and a pair of terminal green flowers. One of the rarest local plants; desired from anywhere. Collected originally at Closter, New Jersey, and scarcely ever seen since. June.

White adder's-mouth. *Malaxis monophylla.* With a single broad-leaf and slender terminal spike of small whitish flowers. Known only from Sam's Point, Ulster County, and Pine Plains, Dutchess County, New York. Rare, and desired from anywhere else. July.

Putty root. *Aplectrum hyemale.* A raceme of delicate yellowish-brown flowers, followed, weeks later, by a single basal broad leaf. Putnam, Orange, and Rockland Counties in New York, and Morris County, New Jersey. May. Leaf in August or September.

Pellitory. *Parietaria pennsylvanica.* An alternate-leaved herb with toothless leaves and small clusters of axillary green flowers. Putnam, Dutchess, Ulster, Orange and Rockland Counties in New York, and adjacent New Jersey. July.

Virginia snakeroot. *Aristolochia Serpentaria.* A greenish tubular S-shaped flower, with alternate stalked leaves, heart-shaped at the base. Dutchess, Ulster, Orange, and Rockland Counties in New York, and adjacent New Jersey. June.

Carolina spring beauty. *Claytonia caroliniana.* Like the common sort, but with broader leaves. From anywhere below 1,000 feet elevation. Unknown in New Jersey. April.

Mountain starwort. *Arenaria groenlandica.* A low cushion-like plant with almost moss-like foliage, and a few wnite flowers on slender branched stalks. From anywhere below 1,000 feet elevation, especially in the Highlands of the Hudson, or from High Point, Sussex County, New Jersey. Common on the peaks of the Catskills. June to September.

American lotus. *Nelumbo lutea.* An aquatic, with large leaves raised above the surface, and with large yellow flowers. From ponds or lakes in New York, or from New Jersey. Rare in its occurrence, but plentiful where found. July.

American globe flower. *Trollius laxus.* A buttercup-like meadow plant with cut leaves, and lemon-yellow slightly globe-shaped flowers. Dutchess, Ulster and Orange Counties in New York. June.

Gold thread. *Coptis trifolia.* Low, mostly bog or moist woodland plant with 3-divided toothed leaves, solitary white flowers, and golden thread-like roots. South of the Highlands of the Hudson. July.

New York Monkshood. *Aconitum noveboracense.* Not unlike the common garden monkshood; with blue irregular flowers on hairy stalklets. Known only from near Beaverkill, Ulster County, New York, and from an unrecorded locality in Orange County; wanted from anywhere else. Perhaps our rarest local wild flower. July.

Golden seal. *Hydrastis canadensis.* Woodland plant with deeply cut toothed leaves, and solitary greenish-white flowers, without petals. Known only from an old, perhaps apocryphal, record near West Point, and desired from anywhere else. April.

Squirrel corn. *Bicuculla canadensis.* Much like the common Dutchman's breeches, but the spurs shorter and not wide spreading. In the Hudson valley, or from Sussex, Bergen and Passaic Counties, New Jersey. May.

Naked bishop's cap. *Mitella nuda.* A low herb with round hairy basal leaves and usually none on the stem, flower a slender spike, greenish-white. Known from the Highlands of Litchfield County, Connecticut, and from Pennsylvania, but unknown from similar places in New York and New Jersey. May.

Purple marshlocks. *Comarum palustre.* A bog herb with compound leaves and purple flowers. Unknown from New York, and recorded only from Budd's Lake, Morris County, New Jersey. Wanted from anywhere else. July.

Three-toothed cinquefoil. *Sibbaldiopsis tridentata.* A low herb of rocky summits, with compound leaves having notched prickle-tipped leaflets and white flowers. Putnam, Orange and

Rockland Counties, New York, and any of the northern tier of counties in New Jersey, where it is recorded only from the summit of High Point, Sussex County. July.

Barren strawberry. *Waldsteinia fragarioides.* Low woodland herb with compound leaves, the 3 leaflets toothed and wedge-shaped. Flowers in a small cluster, yellow. Putnam, Dutchess or Orange Counties, New York, or from the northern tier of counties in New Jersey, where it is recorded only from Sussex County. May.

Dewdrop. *Dalibarda repens.* Low woodland herb with roundish undivided leaves and white flowers. Bergen, Passaic, Morris, Warren and Sussex Counties, New Jersey, and Dutchess and Orange Counties, New York. June to September.

Wood sorrel. *Oxalis Acetosella.* A delicate woods plant with compound leaves composed of three obviously notched leaflets, and veined pink or whitish flowers. Highlands of the Hudson, or anywhere in northern New Jersey and adjacent New York. June.

Seneca snakeroot. *Polygala Senega.* An erect herb with pointed toothless leaves and a stiff spike of small greenish-white flowers. Known definitely only from Pine Plains, Dutchess County, New York, and wanted from anywhere in the Hudson Highlands or from northern New Jersey. June.

Smaller enchanter's-nightshade. *Circaea alpina.* A delicate plant of cool moist woods with opposite, stalked toothed leaves, and small white flowers in a weak terminal raceme. Putnam, Orange and Rockland Counties, New York and Morris and Bergen Counties, New Jersey. August.

Ginseng. *Panax quinquefolium.* A woodland plant with compound leaves composed of 5-stalked, toothed leaflets, and a globe-like loose cluster of greenish-yellow flowers. Common in colonial days but almost unknown today, because of its collection for export to China as a medicine. Wanted from anywhere in the neighborhood. July.

Rhodora. *Rhodora canadensis.* A low bog shrub producing showy azalea-like rose-purple flowers before the leaves appear. Hudson Highlands or from Warren or Bergen Counties in New Jersey. May.

Small cranberry. *Oxycoccus Oxycoccus.* Resembling the common cranberry but with pointed leaves and smaller berries that are not quite globose. Hudson Highlands, south of West Point, or from Morris and Warren Counties, New Jersey. June.

Broad-leaved water-leaf. *Hydrophyllum canadense.* Resembling the common water-leaf but with lobed rather than deeply divided leaves. Flowers whitish-purple. Known only from Warren County, New Jersey, and wanted from anywhere else. July.

Sharp-winged Monkey-flower. *Mimulus alatus.* A swamp herb with four-angled stem, opposite, toothed leaves and tubular, one-sided, violet flowers. In the Hudson Valley known only from New Baltimore, Greene County, and wanted from any point south of this, or from the northern counties of New Jersey. June to September.

Yellow Gerardia. *Aureolaria Pedicularia.* Tall herb with much divided sticky-hairy foliage and large tubular yellow flowers that are not quite symmetrical. Desired from the Catskills. August.

Squaw root. *Conopholis americana.* A leafless parasitic herb, looking not unlike a scaly reddish club, about 6 inches high, with showy irregular yellow flowers. It is parasitic on the roots of trees, often on hemlocks. Rare. Wanted from Putnam, Dutchess, Ulster, Orange and Rockland Counties, New York, and any of the northern counties of New Jersey. April to August.

Twin-flower. *Linnaea americana.* Prostrate vine-like herb with opposite roundish leaves, and twin pinkish flowers at the end of a slender stalk. Suggests the partridge berry. From anywhere below 1,000 feet elevation. July.

Musk-root. *Adoxa Moschatellina.* A weak woods herb with compound leaves composed of three-lobed or divided leaflets and small greenish flowers bunched in a globe-like cluster at the end of a short stalk. Known only from Arkville, Delaware County, in the Catskills, and wanted from anywhere else. May.

Tall bellflower. *Campanula americana.* A hairy erect herb, often 4 feet tall, with alternate shallowly-toothed leaves, and large terminal, rather leafy spikes of blue or white flowers. Wanted from anywhere in the Hudson Valley, or northern counties of New Jersey and adjacent New York. August.

Water lobelia. *Lobelia Dortmanna.* A water plant with a rosette of submerged hollow fleshy leaves, and blue unsymmetrical flowers in an erect spike that grows out of the water. Rockland, Dutchess and Ulster Counties, New York, and Bergen County, New Jersey. August.

Stout golden rod. *Solidago squarrosa.* A tall, usually unbranched golden rod with the tips of the bracts just below the flower head prominently recurved. From Westchester, Putnam, Orange and Rockland Counties, New York, and Sussex and Warren Counties, New Jersey. September.

Yellow leaf-cup. *Polymnia Uvedalia.* A stout rough-hairy herb with large, angled leaves and showy yellow flowers with notched rays. Known only from Weehauken many years ago, and wanted from anywhere else in the range. July.

Sweet coltsfoot. *Petasites palmatus.* Low herb with whitish flowers at the end of a scaly stalk appearing before the basal deeply-cut leaves expand. Leaves densely white woolly on the under side. Known only from Salisbury, Litchfield County, Connecticut, and to be looked for along cool shaded streams or swamps anywhere else. April or May.

The writer will be glad to supply extra copies of this list to all who write for it.

Brooklyn Botanic Garden

A New Gopherberry from the Gulf States

There has always been misunderstanding in regard to the species of *Gaylussacia* involved in the *G. dumosa* group. The main trouble has resulted from trying to associate a name—*Gaylussacia hirtella*—originally applied to a Northern shrub, with an entirely different Southern shrub. The *Vaccinium hirtellum* of Aiton was introduced into England about 1782. We are safe in assuming that the specimens did not come from Florida or the Gulf States. The specimens upon which Aiton based his species very likely came from the Northern States where forms of *Gaylussacia dumosa* occur with more numerous hirsute hairs than usual. Although the range of *Gaylussacia dumosa* extends to the Gulf of Mexico and peninsular Florida, there is no direct morphological connection between it and the species here described as:

Gaylussacia Mosieri Small, sp. nov. A shrub with underground stems, the branches erect, 3–15 dm. tall, often simple below, branched above, the twigs hirsute with silvery, minutely gland-tipped hairs: leaf-blades elliptic to elliptic-spatulate, or oblanceolate, 3–6 cm. long, firm-membranous, apiculate, sparingly glandular-ciliate, sparingly and minutely pubescent on both sides when young, somewhat veiny in age, slightly paler beneath than above, short-petioled: inflorescence branches spreading, sometimes divaricate, pubescent like the twigs, but usually more copiously so, very slender: bracts mainly elliptic to oval, minutely glandular-serrulate: flower-stalks slender, pubescent like the rachis, with 1, 2, or 3 narrow bractlets: hypanthium broadly turbinate, densely covered with long silvery minutely gland-tipped hairs: sepals deltoid, slightly acuminate: corolla white or pinkish, ellipsoid in bud, 8–9 mm. long, campanulate-urceolate, longer than wide, the lobes very broadly ovate, acute: stamens between 6 and 7 mm. long; filament fully 2 mm. long; anther between 5 and 6 mm. long, the tubular appendages much longer than the sacs: ovary depressed: style slender-columnar, slightly tapering near the apex, glabrous: drupe black, subglobose, 8–10 mm. in diameter.—Hammocks, Coastal Plain, Florida to Louisiana.—Spring.

This gopherberry usually more or less closely associated wih *Gaylussacia dumosa*, differs from that species in the habitat, the tall habit, hirsute inflorescence, the larger flowers with a differently shaped corolla, and the quite different stamens. Specimens are extant in various herbaria collected in the past century by Chapman, Rugel, Curtiss (Florida); Gates, Bush, (Alabama); Tracy (Mississippi); Ingalls (Louisiana). Specimens collected recently by the writer are: Hammock near Indian Mound, 20 miles east of Tallhassee, Florida, April 21, 1924, 11187 (type for flowers); white-cedar Swamp near Bristol, Florida, July 12, 1924, 11145 (type for fruit).

John K. Small

BOOK REVIEW

Rehder's Manual of Cultivated Trees and Shrubs*

Thirty years of painstaking research and observation lie behind this quite extraordinary book of Alfred Rehder's. It could almost be said that it could have been written by no one else,

* Rehder, A. Manual, of cultivated trees and shrubs hardy in North America exclusive of the subtropical and warmer temperate regions. pp. 1–930. New York, MacMillan, 1927. Price $10.50

and it is quite certain that only from the immense collections at the Arnold Arboretum could the data for it have been derived.

Intelligent amateurs, curators of botanical garden collections, gardeners, professional nurserymen, and landscape architects will all be forever in Mr. Rehder's debt. For there is no other book in its field, and it would be difficult to think of a better one.

It naturally invites comparison with Professor Bailey's "Manual of Cultivated Plants," issued by the same publishers. Actually the two books complement each other. One includes those garden plants relatively common in American gardens, while the Rehder book takes all the cultivated woody species within his area, excluding the tropics and warm temperate regions. The completeness of the book may be gauged perhaps by such statements as these: In the new book *Rosa* contains 72 species; *Picea*, 32; *Viburnum*, 45; *Berberis*, 49; *Salix*, 63; *Quercus*, 58; and *Rhododendron* (including *Azalea*) 62. The other genera are treated in an equally comprehensive way, and there are keys to the families, to the genera, and, of course, to the species under each genus. Notes on varieties, on hardiness within the eight different climatic zones the author recognizes, on the year introduced into cultivation, and copious citations to illustrations, together with a seventy-page three-column index make the book a perfectly incomparable store-house of information on the woody plants cultivated in America. Bibliographically the book is what one would expect from the author of the monumental Bradley Bibliography. It quite naturally follows the Vienna Code of nomenclature, and the generic and family concepts that we have come to associate with that code.

NORMAN TAYLOR

BROOKLYN BOTANIC GARDEN

PROCEEDINGS OF THE CLUB

MEETING OF JANUARY 26, 1927

This meeting was held at the Museum Building of the New York Botanical Garden and was called to order at 3:30 P. M. Mrs. Arabella Ogden McKee, 78 Morningside Drive, N. Y. C., was elected to membership in the Club. The following resignations were accepted:

Mr. Rudolph A. Konnerth, 7541—113 St., Forest Hills, L. I.

Mr. Leland S. Smith, Nevada City, California.

Mr. Wm. H. Zaun, 22 Queen Esther Court, Ridgefield Pk., N.J.

Dr. Barnhart, Chairman of the Budget Committee, submitted the following estimates for 1927:

Estimated Income	
Membership dues	$1,525.00
Bulletin	1,100.00
Torreya	150.00
Memoirs	50.00
Index cards	800.00
Interest	170.00
Advertisements	100.00
	$3,895.00

Estimated Outgo	
Bulletin	$2,000.00
Editor (Bull.)	100.00
Torreya	500.00
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As delegate for 1926 from the Club to the Council of the N. Y. Academy of Sciences, Dr. Barnhart reported that he had represented the Club as usual at the meetings of the Council.

Progress reports were made by the Secretary in the matters of proposed affiliation with the A. A. A. S. and of the revision of the Constitution.

For the scientific part of the program Dr. Bessie Goldstein of Columbia University gave a paper on "The X-bodies associated with the mosaic disease of tobacco and dahlia." Her abstract follows:

"Intracellular bodies have been found associated with a great many of the filterable virus diseases of animals and plants. Among the animal virus diseases, there are the Guarnieri bodies associated with smallpox, the Negri bodies in rabies, the intranuclear bodies in herpes, the intracellular bodies in trachoma, hoof and mouth disease of cattle, etc. Among plants, such intracellular bodies are described as associated with the mosaic disease of corn, sugar cane, Fiji disease of sugar cane, mosaic disease of tobacco, apple of Sodom, and dahlia, wheat rosette, Hippeastrum mosaic, etc.

These bodies, in spite of their large size, may very well be living amoeboid organisms which because of their great plasticity can pass through so-called anti-bacterial filters. I have found these bodies distinctly associated with the mosaic diseases of tobacco and dahlia. They occur in all the tissues of the leaf primordia, the growing points, older blotched leaves, and in tobacco I have found them in the stem, and roots. The X-bodies, as I call these intracellular bodies, give very clear evidence that they are not mere degeneration products of the cell protoplasm. They show a structure very much like that of protoplasm. They are rounded, oval, or amoeboid in form. They show a definite indication of flowing and elongation movements in the form of pseudopod-like extensions of the body surface. Structures resembling nuclei and vacuoles are present within these bodies. They are found in all stages of what appears to be division by constriction, including such interesting forms as those in which the two divided halves of the body proper have become rounded up within a clear space, the stretched and constricting portion of what appears to be a membrane remaining still unbroken between them. They are distributed to the daughter cells upon the division of the host cell, and spread through the growing regions of the plant at least, by this method."

ARTHUR H. GRAVES,
Secretary.

MEETING OF FEBRUARY 8, 1927

This meeting was held at the American Museum of Natural History and was called to order by President Richards at 8:15 p. m.

Mr. Raymond Adolph, of Interstate Park, Bear Mountain, N. Y., and Miss Clyde Chandler, of Columbia University, Johnson Hall, 411 West 116th Street, New York City, were unanimously elected to membership. The resignation of Dr. L. J. Pessin was accepted.

The secretary read an invitation from the American Philosophical Society to the Torrey Botanical Club to be represented at the 200th anniversary of the founding of the Society by Benjamin Franklin, to be held April 27, 28, 29 and 30, 1927. By vote of the Club, the president was authorized to appoint a delegate to attend.

Dr. Arthur P. Kelley, of Rutgers University, addressed the Club on "Plant communities of the Medicine Bow Mountains in Wyoming".

The Medicine Bow Mountains lie in south-eastern Wyoming, within the borders of the Medicine Bow National Forest, and are accessible by an excellent auto road from Laramie. The historic Overland Trail skirts their base, and Fort Laramie, famous during Indian days, is nearby. Rising sharply, a great meta-quartzite ridge towers to 12,000 feet elevation above sagebrush plains; in reality the great mountain mass consists of an elevated plateau or mesa upon which rises the final ridge, caused by a great fault scarp.

Upon this mountain mass are communities of plants which exist in more or less definite zones according to elevation. The elevation, of course, influences climate, for at the base the scanty rainfall supports but sagebrush and cactus while at the summit snow lies the year round. In between are two zones, the lower of which is more arid and is clothed with pines, the upper more rainy and clothed with spruce. Thus we may distinguish alpine, sub-alpine, montane and plain communities.

Within these larger communities are smaller and still smaller ones; and these go through a regular process of development or succession. Thus a lake is gradually invaded by sedges until a meadow is formed, starred with blossoms, and the lake is gone; and the meadow becomes dotted with spruce trees which grow up into a forest. In each zone which has a definite climate the plant communities go through such a succession and end with one which we might call a climax. Thus the climax stage of the alpine zone is a scrubby juniper community, the junipers being shorn by the storms to a dwarf form so thickly branched that one may walk on top of them as on a lawn. The alpine communities are especially attractive because of the curious plants growing in crevices of the rocks, quickly blossoming in the few weeks of summer. Their colorings are marvelous—blue, purple, gold, cream, and purest white.

ARTHUR H. GRAVES,
Secretary.

Meeting of February 23, 1927

This meeting was held at the Museum Building of the New York Botanical Garden, and was called to order at 3:30 p. m. with Dr. Barnhart as Chairman.

Dr. Susan P. Nichols of Oberlin College, Oberlin, Ohio, was unanimously elected to membership in the club. The resignation of Mr. Edward D. Lehrer of Brooklyn was accepted.

A report on the revision of the constitution was presented by Mr. B. R. Abbott.

As a result of this report the following committee was appointed by vote of the Club to carry through the matter of revision of the constitution in accordance with the findings of this report, said committee to report at the next Wednesday meeting of the Club: Dr. M. A. Howe, Dr. J. H. Barnhart, Mr. B. R. Abbott, Dr. Arthur H. Graves.

The scientific part of the program consisted of an address by Dr. Alfred Gundersen entitled "A visit to European Botanic Gardens."

After some weeks in the mountains of Norway, Dr. Gundersen visited eighteen botanical institutions in Scandinavia, Germany, Switzerland, France and England. The botanic garden of Oslo was founded a little more than a century ago; it contains many large trees with a considerable range of species. In the Copenhagen garden, covering about thirty acres in the city, much attention is given to systematic botany. A special section is devoted to the Danish Flora. The forest school garden at Charlottenburg, north of Copenhagen, is notable for its fine collection of evergreens. The Berlin garden was moved about twenty years ago to its present location in Dahlem. Here, numerous artificial mountains, developed as rock gardens, show the vegetation of different geographical regions. About sixty regions are represented. Another large area is devoted to the arboretum, and a third to the "Systematic Section," containing herbaceous plants only. The Munich collections were very impressive, expecially those of the conservatories. While a few other gardens had larger collections, none exceeded this one in the matter of artistic effects and beautiful arrangement. One large house was devoted to water plants. There was also a considerable collection of named liverworts. The gardens of Zürich, Berne and Lausanne were situated in the cities and of comparatively small size. Zürich has a very extensive botanical library.

The French National Arboretum des Barres at Nogent-sur-Vernisson contains extensive collections of trees and shrubs, especially a large number of evergreens, including numerous species not hardy in Brooklyn.

The Paris botanic garden, like many others, has suffered from the effects of the war. Nevertheless the collections were very extensive and of great historical interest because of the many famous botanists who have worked there. Before crossing to England a stop was made in Caen, in Normandy. In the interesting botanical institute here, special attention is given to the plants of Madagascar.

Two weeks were spent at the Royal Botanic Gardens in Kew. The numerous large trees have abundant room for development in the spacious grounds. The collections of tropical and subtropical plants give an impression of very great variety. These are supplemented by the various museums. In the herbarium the genera are arranged approximately according to the Bentham and Hooker system, the species under the genera by eighteen geographical divisions; Europe, Siberia, Mediterranean region, etc.

After a stormy passage across the North Sea the Gothenburg botanic garden was visited. This is new and situated among rocky hills well outside the city, it has an unsurpassed natural location.

ARTHUR H. GRAVES,
Secretary.

NEWS NOTES

At the recent International Flower Show at the Grand Central Palace, New York City, March 21–26 the Boyce Thompson Institute of Plant Research had an exhibit showing the results of some experimental work with plants. An exhibit showing two plants of the same kind and age, one having grown with twelve hours of light a day and one with twenty-four hours of light, attracted much attention.

An exhibition from the Brooklyn Botanic Garden of epiphytes and house plants included orchids, bromeliads, aroids and ferns.

Many of these were recommended as house plants. A leaflet descriptive of the plants exhibited and giving methods for their culture was distributed.

"The Wardian Case, a device for growing plants in the schoolroom or livingroom," is the title of a leaflet just issued by the Brooklyn Botanic Garden—a reprint of a former issue, revised and enlarged. The Wardian case, a miniature greenhouse in principle, but so arranged as to require no watering for months at a time, was originated nearly ninety years ago by Dr. Nathaniel Ward, a London physician. The leaflet gives directions for the construction of the case and includes a list of plants which may be successfully grown in it. In general, the plants must be tough-leaved and not prone to mildew, it is said.

Announcement has been made of the new school for the outdoor study of natural history to be conducted this summer at the Alleghany State Park, about seventy-five miles south of Buffalo. The director of the school is Dr. Robert E. Coker, Professor of zoology at the University of North Carolina. Field geology and physiography will be in charge of Prof. Allon C. Toster of the University of Iowa. Mr. Norman Taylor of the Brooklyn Botanic Garden will give the botanical work. Bird study will be in charge of Mr. Aretas A. Saunders of Fairfield, Conn. Nature Study instruction will be given by Mr. W. P. Alexander of the Buffalo Society of Natural Sciences. Information can be secured from Dr. Charles C. Adams, director of the New York State Museum, Albany, N. Y.

Dr. B. M. Duggar, of the Missouri Botanical Garden and Washington University, St. Louis, has been appointed professor of applied and physiological botany at the University of Wisconsin. Dr. Duggar will take up his residence in Wisconsin in September, (*Science*).

Last November a memorial window to John Tradescant, the younger, was unveiled in the Ashmolean Museum of the University of Oxford. The window is the gift of the garden clubs of Virginia. The elder Tradescant, gardener to Charles I of England, is commemorated in the familiar genus, Tradescantia. The son travelled in Virginia in 1637, collecting plants, minerals and shells with other objects of interest. His collections made the basis of the Ashmolean Museum.

The New York Botanical Garden is to receive $6,000 annually for five years from the Carnegie Foundation for educational work. This is in addition to the $1,013,000 recently raised for endowment. In view of the remarkable growth in public interest in plants and plant sciences the Garden is anxious to expand its work.

Commenting on the death on March 22nd of Professor Charles Sprague Sargent the Outlook says that "His monuments are builded, numerous and enduring. The Arnold Arboretum, The Silva of North America, Thousands of gardens in America and Europe, The wooded sides of the Adirondacks, The redwood forests of the Pacific coast, Glacier National Park, The multiplied millions of acres of National Forests." He laid the foundation of the New York State forestry work. He was the leading spirit in the saving of the redwoods. He took the lead in inducing President Cleveland to make the first reservation of a National Forest. For fifty-six years he was director of the Arnold Arboretum and for forty-eight years Professor of Arboriculture at Harvard University.

The Torrey Botanical Club

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EDITED FOR

THE TORREY BOTANICAL CLUB

BY

GEORGE T. HASTINGS

John Torrey, 1796–1873

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GEORGE T. HASTINGS
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May-June

THE FLORA OF YEZO (JAPAN)

By T. D. A. Cockerell

In the *Japanese Journal of Botany*, Vol. 2, No. 4 (1925) is an extremely interesting analysis of the vegetation of Yezo, the northern island of Japan, by Yushun Kudo of the Hokkaido Imperial University. My first thought, on reading it, was, how much it would have pleased Asa Gray. The full enumeration of species, based on many years of collecting and study. The tabulated lists showing their distribution elsewhere. The ecological details, all together give us a picture of the flora in its true relation to other floras of the northern hemisphere. Having been in the coast region of Siberia opposite Yezo, and being also more or less familiar with the boreal flora of America, the paper is doubly interesting to me, so I venture to offer a few comments.

The known plants of Yezo, including the southern Kuriles adjacent to it, include 597 genera and 1629 species. This enumeration includes only flowering plants and pteridophytes. The largest genus is *Carex*, with 107 species. In the Rocky Mountains and adjacent plains, as shown in Rydberg's Flora, *Carex* is also the largest genus, with 162 species. According to Kudo's tabulation on p. 285, *Viola* is the next largest genus in Yezo, with 32 species. There is some confusion here, as in the complete list of species, we see only 13 names under *Viola*. Turning over the page, we find the rest, catalogued by mistake as *Hypericum*. The next largest genus is *Polygonum* (in the broad sense), with 29 species; then comes *Epilobium* with 20. The grasses have the greatest number of genera, 49, and 117 species. The Compositae are almost as numerous, with 116 species. There are 85 endemic species, if we include the Southern

Kuriles. The genera with more than one endemic species are *Athyrium* (2), *Tofieldia* (2), *Salix* (2), *Cerastium* (2), *Aconitum* (5), *Thalictrum* (4), *Cardamine* (2), *Saxifraga* (3), *Spiraea* (2), *Astragalus* (2, one only in S. Kuriles), *Oxytropis* (2), *Hypericum* (2), *Viola* (3), *Epilobium* (3), *Primula* (2), *Gentiane* (3), *Adenophora* (2), *Cirsium* (5), *Saussurea* (5). The only one of these we fail to get in America is the Campanulaceous *Adenophora*, which has its center of distribution in Siberia. Of the 1629 species, no less than 1298, or 79.68%, also occur in Honshu, the main island of Japan. Considering the proximity of Sakhalin Island, and its approach to the Siberia mainland, it is surprising to learn that only 38.37% of the plants also occur on Sakhalin, and 43.65% on the mainland in the Amur, Ussuri and Manchurian area. This is especially striking when we find that 26.70% of the species are common to North America. In this class of statistics, however, there lies a fallacy which is liable to mislead. Thus, for instance, 18.83% of the Yezo species are common to Kamtschatka, 17.86% to the Northern Kuriles. Are we then to say that the flora shows more affinity with that of North America than that of Kamtschatka? The fallacy lies in the fact that the comparatively small northern peninsula has a poor flora, whereas America has a large and varied one, in which many diverse plants find a place. Thus, again, it is stated that 45.24% of the Yezo plants live in Korea a larger number than in the mainland opposite Yezo. Does Yezo, then, have a more southern type of flora than the mainland? Perhaps so, but Korea has a richer flora, and is better known to the Japanese, and hence it might be expected that more species would be found in common. The flora of Yezo certainly strikes one as typically boreal.

Comparing Yezo with the opposite Siberian mainland, certain facts are especially noteworthy. Out of 70 species of ferns in Yezo, it appears that only 32 grow in the Manchuria-Amur, Ussuri region. Ferns are excessively abundant on Honshu, as I myself observed, and they so indicate relatively warm and moist conditions. Yezo has 14 species of conifers (*Abies mayriana* is endemic) of which only four are listed from the adjacent mainland. I have, however, a list of nine species from the maritime province of Siberia. Professor A. Henry has written calling my attention to the remarkable endemism exhibited by some of the East Asiatic trees, referring especially to the genus *Larix*, the members of which have been lumped under the name *L. dahurica*. The species I saw so abundantly along the Siberian coast, a few miles from the sea, is *L. olgensis* A. Henry. Across the strait in Sakhalin is *L. Kurilensis* Mayr. I presume it is really the latter which Kudo reports from Yezo as *L. dehurica* var *kamtschatica*. It is actually unknown as a wild plant on Yezo proper, but exists on two islands of the southern Kuriles.

The actual divergence in species between Yezo and the adjacent mainland is really very remarkable, and must depend very largely on diversity of physical conditions. The Siberian coast is under deep snow all winter and the sea is frozen. In the summer, however, the climate is quite warm, and the vegetation is extremely luxuriant. In the following list of genera, the first figure following the name shows the number of species in Yezo, the second the number of these in the Manchuria, Amur, Ussuri country. *Lilum*, 6, 3; *Iris*, 4, 3; *Cypripedium*, 4, 1; *Salix*, 18, 7; *Quercus* 4, 2 (I found only *Q. Mongolica*); *Aconitum*, 10, 1; *Aquilegia*, 2, 1; *Acer*, 9, 3; *Rhododendron*, 8, 2; *Gentiana*, 11, 2. Yezo is very rich in orchids, with 61 species, of which 21 are reported from the mainland opposite.

A conspicuous feature in the forest about the Kudia River in Siberia is the family Araliaceae, formidably armed plants to be avoided in going through the brush. One I collected proves to be *Acanthopanax senticosus* (Maxim.) Harms, this and other trees having been kindly identified for me by Mr. Rehder. Yezo has similarly a group of these plants, but with two exceptions, the species are different. *Berberis amurensis* Rupr., which I collected on the Kudia R., is represented on Yezo by *B. regeliana*. The Betulaceae are represented on both sides by the same genera, *Betula*, *Carpinus*, *Corylus* and *Alnus*, but the majority of the species are different. The conspicuous *Campanula punctata* Lam. is found on both sides, and I observed it as far south as Tsuruga in Honshu. *Viburnum sargentii* Kochne, which I found on the Kudia R., is lacking in Yezo, which nevertheless has three other species of *Viburnum*. *Tilia amurensis* Kom., a handsome tree of the Kudia R., is represented by two other species on Yezo. Such examples could be multiplied over several pages, but enough has been given to show the marked diversity of species in those two lands, separated by no great expanse of sea, and nearly continuous northward.

Turning now to comparisons with the North American flora is is rather surprising to find such a long series of species (435!) in common. The number common to Europe (454) is only a little greater. When we list these species, and examine their distribution more in detail, it becomes evident that we are dealing with the circumpolar flora, certain members of which have presumably died out in Europe or America. Some of the species (as *Chenopodium album*, *C. glaucum*, *Atriplex patula*, *Rumex acetosella*, etc.) are obviously under suspicion of having been introduced into Yezo by man, though now thorougly established. In some cases it may be that more critical studies would show hitherto unobserved differences. For example, of the 29 species of *Polygonum* in Yezo, 14 are also reported from North America; but recent investigations show that there are more closely related species of this group than were formerly recognized. Twenty-three of the ferns are also North American and of these sixteen are also European. There is a separate enumeration of the species common to Yezo and Alaska (with the Aleutian Islands), but only 122 (7.49% of the Yezo flora) are listed. The flora of the interior of Alaska is, I suppose, still very imperfectly known, but one would have expected the list to be longer.

The general outcome seems to be that species of plants are little or slowly affected by mere time or space, but respond rather rapidly to new conditions of life. Or to put it another way, there is little evidence for obligatory evolution, regardless of circumstances.* The age and area postulate does not hold as a

* This statement has to do with the process of evolution, and not with the causes of mutation. Any plant population, closely studied, exhibits diversity in hereditary qualities, the material for evolution thus being everywhere present. Hybridism produces extraordinary diversity under uniform conditions. The breaking down of polyploids is doubtless an important cause of diversity in some genera. Yet the establishment of permanent species (permanent in the sense of lasting for long periods) appears usually to depend on adaptation or response to new conditions. Whether, as Harrison believes, there is a definite chemical response in the germ plasm to diverse substances in the soil, or whether changes occur in a miscellaneous manner and are merely of survival value in the presence of new conditions, the objective results are about the same.

In my garden is a briar rose (*Rosa rubiginosa*) which for several yearsh as been full of the galls of *Rhodites rosae.* So close that the twigs touch, is a *Rosa rubrifolia*, but it has remained wholly unaffected by the galls until the valid generalization. The island of Yezo, from its geographical position, is of very great interest to the student of boreal floras, and it would be a splendid thing if coöperative work could be carried on between the Japanese and American botanists. If those who have so intensively studied their floras on the two sides of the Pacific could now go over the ground in each country together, noting in minute detail the resemblances and differences, examining the critical species in the field, and joining in the search for causes, the contribution to botanical science, and incidentally to international amity, would be of considerable importance. Later perhaps, the investigations could be carried over into Siberia, with the assistance of Russian botanists. In the meanwhile, efforts should be made to increase the representation of northern plants in the large herbaria, and in view of modern requirements, collections from almost any locality are of some value.

There are reasons for thinking that botany will undergo a transformation and development not greatly inferior to that which we have all witnessed in the realm of physics. I hope Dr. C. C. Hurst will forgive me if I quote some portions of his recent letters on *Rosa*, in support of this opinion. He and his wife recently went to the Swiss Alps to study roses, and here is the outcome: "You will be interested to know that our collections in the Alps are proving to be of extraordinary interest, both systematically and cytologically. We took samples from four different Cantons of various forms described and collected by Crépin and Christ, in several cases finding the actual individual plants we believe. We took young flower buds and fixed them in Carnoy's Fluid on the spot, expecting to get about 50% of them with chromosomes dividing. We have taken them up and sectioned them this term, and much to our astonishment have found *all* in action, with good somatic counts. While no less than 90% have given us p. m. c. and e. m. c. reduction divisions or pollen grain and embryo-sac gametic divisions, and

past season, when a single gall appeared. We shall see whether, in five years time the *R. rubrifolia* is infested like the briar. If so, will it be due to its influence on the germ-plasm of the *Rhodites*, or did the *Rhodites* on the briar simply produce a mutation capable of living on the other plant? In favor of the latter supposition is the fact that the insect did get a footing on the *R. rubrifolia*, prior to any influence that could be brought to bear on it.

in a few cases actual fertilization embryo divisions. We have already mounted 400 slides for searching next term, and hope to reap a rich harvest of cytological data. Among these are various presumed natural hybrids. . . In each case we brought also a dried specimen of flower buds and leaves for comparison with the original descriptions of Christ and Crépin . . . . We have also about 150 specimens collected in other places this summer, representing as many distinct species of the systematist. These in addition to 445 forms examined and analysed during the last four years by us bring the total of individuals of *Rosa* examined cytologically and analysed taxonomically by five different observers (six with my wife) to over 1000, and since these include almost all the known species, we should soon I think be in a position to do more than state the problems of their probable evolution and classification . . . . I am quite excited to hear of your trip to Siberia, and Lake Gaikal in particular . . . This is precisely the district from which I am expecting some great things in *Rosa*, as it has been so little explored, and it is in the very heart of likely things. We do not yet know for instance how far East the European and Western Asiatic pentaploids and irregular tetraploids and hexaploids extend. Some say to Lake Baikal, while others think the Urals and the Caspian are the limits. There is however much evidence that these *caninæ* forms are more or less coincident with the European glaciation area of the Pleistocene, and if so this throws much light on their origin. It is curious that nowhere else do these so called crypthybrids exist, and they are the main *Rosa* flora in Europe today."

What would it be, now, to be young, and enter into this kingdom of marvels! But it is something to live to see the first act of the play, and perchance have some little part therein. For many reasons, it is the boreal flora which especially lends itself to these investigations, but it must be studied as a whole, right around the world.

University of Colorado,
Boulder, Col.

TIPULARIA UNIFLORA ON MONTAUK POINT, LONG ISLAND

Roy Latham

During a botanical expedition to Montauk in October 1926, I was directed to several plants of *Tipularia uniflora* by Mrs. Edward Vail of Orient and Montauk. In this colony were thirty plants in leaf, only one of which had bloomed in 1926.

The habitat there corresponds exactly with that of this species found near Greenport by the writer. Shady, moist knolls associated with *Kalmia latifolia*.

While studying mosses in the Montauk region in April 1927, the writer discovered a second colony of fifty-one plants in leaf; five had flowered in 1926. This second colony, approximately two hundred feet south of those found last fall, was in a circular bed two and one-half feet in diameter and no scattered plants were found outside. The leaves were large and healthy. The largest leaves measuring two and three-fourth by one and three-fourth inches wide with petioles three inches in length.

There was no opportunity at that visit for an exhaustive study of the vicinity and the eighty-one plants recorded here may not embrace the full number of this rare orchid in that section of Montauk.

Orient, N. Y.

LANUGIA, A NEW GENUS OF RUBBER-YIELDING TREES

N. E. Brown

A genus of Apocynaceous trees from tropical East Africa and Madagascar. The leaves are opposite, exstipulate. The flowers in axillary cymes. Calyx five-lobed, with minute scales in the axils of the lobes outside the corolla. Corolla hypocrateriform; tube constricted under the point of insertion of the anthers; lobes downy or velvety-pubescent on the inner surface, induplicate-valvate and slightly twisted in the bud. Stamens 5, entirely included in the corolla-tube; filaments nearly or quite absent; anthers sagittate, adherent in a cone around the stigma, bearded at the base of the connective on the inner side. Glands around the ovary 5, free. Ovary entire, with a single style. Follicles 2, divergent, teretely linear-lanceolate, not nodose, very firm or somewhat woody when ripe. Seeds numerous, linear or linear-lanceolate, triangular with sharp angles in transverse section, and with a sessile tuft of long, light reddish-brown or rust-colored hairs at the apex.

Known species three, the type being *L. latifolia* N. E. Br.

The name is derived from the Latin, *lanugo*, down, in allusion to the downy or velvety-pubescent inner surface of the corolla-lobes. The genus differs from *Mascarenhasia* by its smaller flowers with shorter tubes and the corolla pubescent on the inner surface, by the glands of the disk being free, the stouter, teretely linear-lanceolate and somewhat woody pods (which in *Mascarenhasia* are slender linear-terete and more or less nodose but not woody) and by the more numerous seeds.

From *Funtumia*, to which it is also allied, it may be at once distinguished by the pubescent inner surface of the corolla-lobes and by the sessil tuft of hairs at the apex of the seed (in *Funtumia* the hairs are scattered along a long beak).

The following key indicates the characters by which the three species may be recognized.

Leaves (including the petioles) 9–16 cm. long; corolla-tube 10–11 mm. long.
- Leaves 4½–7 cm. broad, very abruptly or subtruncately rounded into a short blunt point at the apex. 1. *latifolia*
- Leaves 2–3½ cm. broad, somewhat gradually (not abruptly) narrowed into a blunt point at the apex. 2. *variegata*

Leaves (including the petioles) 5–8 cm. long and 1½–3 ½ cm. broad, obtusely rounded at the apex or rarely with a very short blunt point; corolla-tube 8 mm. long. 3. *micrantha*

1. **L. latifolia** N. E. Brown. A tree about 8 meters high, glabrous on all parts except the corolla. Leaves opposite, spreading; petiole 8–10 mm. long; blade 8–15 cm. long, elliptic-oblong, abruptly rounded into a blunt point 6–12 mm. long and 7–8 mm. broad at its base, rounded in and then very shortly cuneately narrowed into the petiole, smooth and green on both sides; midrib rather deeply impressed above, prominent and rounded beneath; primary lateral veins 10–12 on each side of the midrib, widely spreading, rather slender. Cymes axillary and from one axil only, few or many flowered; peduncles 3–4 mm. long, shorter than the petioles; pedicels 7–14 mm. long. Calyx five-lobed; lobes 2½–3 mm. long, 1½ to 2 mm. broad, ovate, acute, with minute scales or glands in their axils. Corolla 20–23 mm. in diameter, five-lobed; tube 10 mm. long, cylindric, 4 mm.

in diameter at the upper part, constricted at the middle, the lower part about 3 mm. in diameter, pubescent at the throat within, otherwise glabrous; lobes 10 mm. long and 6 mm. broad, widely spreading with recurved tips, ovate, tapering into a subulate point, pubescent on the inner face, glabrous on the back, apparently white. Anthers sessile at the middle of the corolla-tube and quite included within it, sagittate, acute, united with the stigma and forming an acute cone over it. Style 5 mm. long. Ovary entire, surrounded by five rectangular free glands about 1½ mm. long, bluntly toothed at the top. Follicles 9–10 cm. long and 1 cm. thick, teretely linear-lanceolate, somewhat obtuse, not nodose, when ripe somewhat woody or very firm and when expanded flat, after shedding the seeds 25–28 mm. broad. Seeds 10–13 mm. long and about 2 mm. broad, linear or linear-lanceolate in outline, triangular in transverse section, with a sessile tuft of light rusty-brown hairs 15–25 mm. long at the apex.

Raised from seeds sent from Mozambique to the Mayaguez Agricultural Experiment Station in Porto Rico.

This is probably the same species as specimens collected in the Mozambique region about twenty three miles from Beira by Johnson, No. 275, which are quite similar to the Porto Rico plant in leaf, flower and fruit, but has leaves only 3–5½ cm. broad. Possibly the larger leaves of the plant described are merely due to cultivation.

L. latifolia is easily distinguished from *L. variegata* by the leaf characters. The flowers may also differ in the living state.

The hairs on the inner surface of the corolla of this and other members of the genus are very short and appear to have been more or less inflated when alive. They are certainly rather peculiar in character.

2. **L. variegata** N. E. Br.—*Mascarenhasia variegata* Britten and Rendle in Trans. Linn. Soc. ser. 2, vol. IV, p. 26 (1894). *M. elastica* K. Schum. in Notizblatt Bot. Gart. Berlin, vol. II, p. 269–270 with fig. and by error *M. caustica* on p. 268 (1899). East Tropical Africa in the coastal area and on Mount Milanji in Nyasaland.

I can find no difference whatever between authentic specimens of *M. variegata* and *M. elastica*, the figure of *M. elastica* is a very poor one and does not correctly represent either the leaves, which are much more pointed than shown, or the shape of the corolla-tube, according to an authentic specimen received from Berlin, and it is undoubtedly the same as *M. variegata*.

3. **L. micrantha** N. E. Br.—*Mascarenhasia micrantha*, Baker in Journ, Linn. Soc. vol. XXV, p. 335 (1890). Madagascar.

Kew, Surrey, England

A SUPPOSED FOSSIL CATMINT

By T. D. A. Cockerell

For many years I have had a peculiar little leaf from the Florissant Miocene, which I have recurred to at intervals, always with the decided impression that it belonged to the Labiatae or Lamiaceae. It was collected by Mr. S. A. Rohwer at Station 13 B. It is evidently thin, surely herbaceous, with a slender curved petiole about 5 mm. long. The blade of the leaf is about 15 mm. long and 13 wide, with a pointed apex, cordate base, and four broad dentiform tubes, not very acute, on each side, separated by deep incisions. The figure shows the character better than any description. Under a lens, I thought the apical

lobe was denticulate laterally, and carried on one side, near the base, an extra slender lobe. Under the binocular, the slender lobe resolved itself into extraneous matter, and the denticulations appeared to be due to irregular overlapping films of shale. The leaf accordingly agrees very closely in pattern and aspect with the old world genus *Nepeta*, and is provisionally so referred, as **Nepeta** (?) **pseudaeluri** n. sp. It is named after *Pseudaelurus*, a cat of the period. I had to consider whether it might be referred to *Urtica*, some species of which it much resembles, but on the whole the reference given seems preferable.

In Nature, Nov. 13, 1926, p. 696, I described a Labiate from the Eocene. Unfortunately the figure I sent was not printed, but it has been saved, and is at the British Museum (Natural History).

PROCEEDINGS OF THE CLUB

Meeting of March 8, 1927

This meeting was called to order at 8:20 p. m. in the Assembly Hall of the new educational wing of the American Museum of Natural History, with President Richards in the chair. Sixty-five members and friends were present. If the joint meetings with other societies for the discussion of wild flower conservation are excepted, this was the largest attendance of any meeting for several years. The program of the evening consisted of an illustrated lecture by Dr. Francis E. Lloyd of McGill University entitled "Two chapters in modern biology: 1. Sexual reproduction in watersilk (Spirogyra); 2. The feeding habits of *Vampyrella lateritia.*" Dr. Lloyd described the development of the sexual reproductive structures of *Spirogyra longata,* and dealt particularly with the process of union of the sex cells and the subsequent condensation to form the fertilized egg. The account was based upon the researches which have recently been carried on by the speaker. The illustrations were all made from living material by the speaker personally, and included, in addition to lantern slides, a motion picture showing the process of union of the sex cells.

A particularly interesting feature of the lecture lay in the behavior of the above mentioned sex cells compared with that of a curious non-cellular animal form known as *Vampyrella lateritia.* This little animal feeds entirely upon the water silk, and during its feeding it expands very greatly. During a brief period following the feeding, the acquired bulk is rapidly lost and the volume of the animal is restored to normal. It has been found that the process here is precisely similar to that by which the united sex cells of the water silk lose their bulk. The feeding habits of Vampyrella were shown in a motion picture in which the whole behavior of the animal was seen in detail.

Arthur H. Graves,
Secretary.

Meeting of March 30, 1927

This meeting was called to order at 3:30 p. m. at the Museum Building of the New York Botanical Garden. In the absence of the President and vice-Presidents, Dr. R. A. Harper was chosen chairman *pro tempore.* The following candidates were unanimously elected to membership in the Club:

Mr. P. Timothy Young, Furnald Hall, Columbia Univ., New York City.

Mr. John Thompson, 110 W. 71st St., New York City.

Mr. W. Lincoln Highton, 77 Roseville Ave., Newark N. J.

The Secretary announced the appointment by the President of Dr. D. T. MacDougal of the Carnegie Institution as a delegate to represent the Club at the 200th anniversary of the founding of the American Philosophical Society, April 27, 28, 29 and 30th in Philadelphia, Penn.

The report of the Committee on revision of the Constitution, appointed at the meeting of February 23, was presented by Dr. J. H. Barnhart, Chairman. The report follows:

"The Committee has adopted a liberal view of the scope of its labors. Its work has been based upon the last edition of the Constitution and By-laws as printed in May, 1889; a careful study of the manuscript and published proceedings of the Club, made by Mr. B. R. Abbott during recent months; and a personal knowledge of the current practices of the Club.

The old regulations have long been out-of-date, both legally and practically, but in revising them it has not been the intention of the Committee to introduce any novelty. We have incorporated changes as follows:

(1) All amendments legally adopted, as shown by the minutes.

(2) All amendments proposed and evidently supposed at the time to have been legally adopted, although the minutes fail to show that the proper procedure was followed.

(3) All motions adopted by the Club which were in effect modifications of the Constitution and By-Laws, but which were not put into the form of amendments.

(4) All practices of the Club, technically in violation of the Constitution and By-laws, which have continued for years without protest from any member. Such practices, although irregular, may reasonably be assumed to have acquired the force of amendments.

Guided by these principles, and introducing a few minor verbal changes which improve the form without altering the intent, we have codified the existing Constitution and By-laws as hereto appended. And in order to legalize these regulations in an unquestionable manner, we recommend that the present Constitution and By-laws be amended by the substitution of those herewith presented."

By vote of the Club the report was accepted and referred to a committee consisting of the President, Dr. H. M. Richards; Secretary, Dr. A. H. Graves; and the Acting Editor, Dr. S. Trelease, for report at the next Wednesday meeting.

Dr. Barnhart proposed the following amendments to the Constitution:

Proposition No. 1

That the article of the Constitution on "Expulsion of members" be amended by the addition of these words:

"Such expulsion shall require a two-thirds vote of the members present at the meeting, and shall not be voted unless the charges of unworthiness have been submitted in writing, and the member has been given an opportunity to defend himself against the charges."

Proposition No. 2

That the article of the Constitution on "Amendments" be amended by striking out all after the words "the next regular or special meeting" and the substitution of the words:

"The proposed amendment shall then be sent by the Secretary to each member; printing a proposed amendment in any regular publication of the Club shall be deemed equivalent to a personal notice sent to each member. The votes received by the Secretary within thirty days shall be canvassed by the President, Secretary, and Treasurer, and the result announced at the next meeting of the Club. From such announcement shall date the adoption or rejection of the proposed amendment. Two-thirds of the votes cast shall be required for its adoption."

These amendments were referred to the above mentioned committee for report.

The scientific part of the program consisted of an illustrated lecture by Dr. John M. Arthur of the Boyce Thompson Institute, entitled "Some effects of carbon dioxide and light upon plant development." A summary of the lecture, kindly supplied by Dr. Arthur, is given below:

The data presented included four different series of experiments as follows:

1. Plants grown in a greenhouse in ordinary daylight during the winter months.

2. Plants grown in a greenhouse with daylight plus six hours of artificial light from a gantry crane carrying forty-eight 1,000 watt lamps, both with and without additional carbon dioxide.

3. Plants grown entirely under artificial light in the constant light room. This room was illuminated by twenty-five 1,500 watt lamps.

4. Plants grown in a series of colored glass houses in which increasing amounts of ultra violet and blue regions of sunlight were screened out.

A series of slides showing the equipment and some of the results on the general growth habit and flowering of the plants was included.

From the data presented the following conclusions were drawn:

1. Plants can be grown under artificial light using the gas-filled incandescent type of lamp as a source. Many plants are injured by continuous 24 hour exposure to artificial light. The tomato is a good example of the maximum injury of this sort.

2. A combination of 12 hours natural daylight and 6 hours artificial light with additional carbon dioxide gas will produce apparently normal plants. Eighteen hours of continuous artificial light produces much more injury.

3. The time and amount of flowering is controlled in some plants by the length of day, using either artificial or natural daylight as a source as was first pointed out by Garner and Allard of the U. S. D. A. Long day plants are attuned to flower on the long days of summer while short day plants flower on the short days of spring or fall. Flowering in other plants is not greatly affected by the length of day. These are the so-called "ever blooming" plants. These considerations apply to both natural daylight and artificial light. The salvia was shown as an example of a short day plant; lettuce and radish as long day plants, and buckwheat as an "ever blooming" type.

4. Plants show very little difference in growth habit or time and amount of flowering whether they receive the ultra violet of sunlight or whether this region is cut off down to 390 millimicrons. Certain colors are developed to a greater degree with ultra violet light. When the blue region is screened out of sunlight the plants grow in general much taller, show a lower dry weight and less flowering and fruiting. The blue is apparently necessary for producing both the normal form of plants and in photosynthesis.

ARTHUR H. GRAVES,
Secretary.

NEWS NOTES

Stanford University is planning a large botanical garden. One thousand acres of land have been set aside for the garden, which will be both an exhibition garden and an experimental laboratory. One million dollars is to be raised for the work of making the garden and more for endowing it. When completed it will be one of the finest in the world.

The appointment has recently been announced of Dr. Orland E. White, at present curator of plant breeding and economic plants at the Brooklyn Botanic Garden, as professor of agricultural biology and director of the Blandy Experimental Farm of the University of Virginia. In connection with the work at the experimental farm, five research fellowships have been established; two carrying a stipend of $1000 each, and three $500. The holders of these fellowships will be exempt from paying tuition fees. Graduates of standard colleges who have majored in biology or agriculture will be eligible candidates. Appointees are expected to register in the graduate department at the University of Virginia and to take work leading to a higher degree. The Blandy Experimental Farm has been acquired by the University of Virginia under the devise of the late Graham F. Blandy.

Over 200 varieties of the Bearded Iris are now growing in various parts of the Brooklyn Botanic Garden. The Garden has also between 200 and 300 Beardless Iris, which are being raised under various environmental conditions to determine experimentally what factors suit their growth best. The different varieties, as they flower, are being carefully reproduced in water color by Miss Maud Purdy, with the aim of placing the whole group, in which at present considerable nomenclatural confusion exists, on a definite scientific basis. This work is in charge of Dr. George M. Reed, Curator of Plant Pathology at the Brooklyn Botanic Garden, and is being carried on in coöperation with the American Iris Society. The Society held its annual meeting at the Garden on June 3.

Non-resident members of the Club, who are scattered throughout the United States and in foreign countries, will be interested to learn of the affiliation of the Club with the American Association for the Advancement of Science. This action took place at the recent spring meeting of the executive committee of the American Association. According to the records at the time of that meeting the Torrey Botanical Club has 300 members, of whom 149, or nearly one-half, are members of the American Association for the Advancement of Science. Of these 149, 104 are fellows. The Torrey Botanical Club will accordingly have two representatives in the council of the American Association, who are to be ex-officio members of the section committee of Section G. A full report of this business will be included in the minutes of the meeting of the Club of May 25.

At Bear Mountain the Interstate Park Commission and the American Museum of Natural History are coöperating in an extensive outdoor museum. One feature of this will be a wild plant trail with all the plants native to the region labeled, with notes of interest with each. Several thousand plants have been brought in from other parts of the park and planted along this trail. Another trail will have along it all the native wild animals of the region, in cages. The work is in charge of Mr. William Carr of the American Museum.

On May 17th Mr. Barbour Lathrop of San Francisco died in Philadelphia. Mr. Lathrop was in his 80th year. He had travelled extensively collecting rare plants, many of which he sent to the Bureau of Plant Industry of the Department of Agriculture.

Dr. William P. Wilson, formerly professor of botany at the University of Pennsylvania and since 1894 director of the Philadelphia Commercial Museums, died on May 12, aged eighty-three years.

Dr. Edwin B. Payson, Professor of Botany at the University of Wyoming died on the fifteenth of May. He was well known for his contributions in systematic botany and had been very prominent in social and intellectual activities of the University. At the time of his death he was preparing to sail for Europe to carry on research work at Kew Gardens under a Guggenheim fellowship awarded him this spring in recognition of his achievement in botanical work. Dr. Payson was a member of many scientific and honorary societies. He was thirty four years old.

The Torrey Botanical Club

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EDITED FOR

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BY

GEORGE T. HASTINGS

John Torrey, 1796–1873

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GEORGE T. HASTINGS
2587 Sedgwick Ave.
New York City.

TORREYA

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July-August

NATIVE ORCHIDS IN AND NEAR NEW YORK

H. M. Denslow

At a meeting held recently in the interest of the Wild Flower Preservation Society, it was stated that several species of orchids were found in the vicinity of Inwood on Manhattan Island, sixty years ago; about the time of the beginning of the Torrey Club. Among these were species of *Liparis*, *Spiranthes* (two species), *Peramium* and *Corallorrhiza;* and the more southern *Tipularia*. Of this rarer species so few plants were growing in the one little colony, that only one leaf and one flowering scape were collected. This specimen and the other species then collected are now in the Local Herbarium at the New York Botanical Garden. It is not known when Tipularia finally disappeared from Manhattan; but this and other interesting species were exterminated by the advance of what we call civilization. The prolonging of the life of that outpost colony of Tipularia was an early instance of wild flower preservation. Collectors have not always been so considerate of the future; as witness the steady robbing of a bog in Herkimer County of its *Orchis rotundifolia*. Ignorance and tillage and commerce have contributed their full share toward the destruction, locally, of large colonies of our native orchids; as of *Arethusa* in Queens, of *Habenaria blephariglottis* in the Bronx, of *Tipularia* on Staten Island. The need of land for building purposes, a farmer's wish for a new field, grading that eliminated a swamp account for these disappearances—and make us wonder about proportionate values.

Within the limits of the greater City, in its early years, orchids might still be found; attesting specimens are at hand of the three rose-pink species from within forty years of the present date.

But these were among the few survivors of an earlier abundance. With every decade the places where they might be found became more remote. In 1841, the pink *Pogonia* flourished in Astoria; now one must go well toward Montauk to find it; or its kindred, *Calopogon* and *Arethusa*. And some of their homes are now in peril. The showy orchis was growing on Staten Island in 1907. Some less conspicuous species probably persisted longer in Kings and Bronx Counties; even yet two are known to be growing in the Bronx; but their days are numbered.

So it has come about that the orchid-lover, now-a-days, must fare farther if he would discover new localities where his friends live or visit some well-known haunts. During the last five years the writer has made occasional trips to the northern townships of Passaic County, New Jersey, and the adjacent parts of Warwick, Orange County, New York. Some of his discoveries and reflections are here recorded.

In the towns of Pompton and West Milford there are large tracts of uncultivated territory, having some diversity of soil and aspect and including three extensive swamps. Much of this territory is still uninvestigated; but in the portions visited fourteen species of orchids have been found. The commonest and most widely distributed is *Peramium pubescens*. In twenty-two trips, this species was observed in nearly every one, including one in January. Often it was found in great numbers, in both dry and moist places.

The species next in frequency, so far as observed, is *Isotria verticillata*. Two considerable colonies are known, besides many scattered plants. About 100 plants were counted on June 1, 1927. Fruiting capsules were seldom seen. Apparently it does not blossom freely or it has not the needed insect visitors.

Cypripedium acaule grows in many places, but no colony is known. *Ibidium cernuum* is fairly abundant in one wet meadow. The two coralroots are widely distributed but not abundant. *Galeorchis* is found in one wooded ravine.

The other species included in the enumeration were seen only occasionally. These are: *Cypripedium pubescens*, *Ibidium gracile*, *Liparis liliifolia* and *L. Loeselii*, *Malaxis unifolia*, *Habenaria fimbriata* and *H. psycodes*. It is noteworthy that the species most frequently seen in these two towns of northern New Jersey correspond closely with those found in upper Manhattan sixty years ago. The inference is natural that the conditions of soil and climate then and there were similar to those found in Pompton and West Milford now; though this conclusion must not be stressed, because all of these species have powers of adaptability and endurance.

A few excursions have been made into the town of Warwick in Orange County, New York, along the hills to the east of Greenwood Lake. Two interesting discoveries have been made. One is that of *Lysias Hookeriana*, previously reported from Westchester and Delaware Counties, New York, and from Sussex County, New Jersey, but not from the intervening territory. There is a small colony, near the lake level and not far from the highway, in an open wood. The other species, not observed as yet in Passaic County, is *Gymnadeniopsis clavellata*, which is infrequent in a big swamp high on the hill, in which the great rhododendrom is the chief inhabitant. In the same swamp were noticed a few starved plants of *Malaxis unifolia*.

Part of the territory in Passaic County is soon to be flooded, because of the building of a dam, to conserve the water supply for cities. Wood-cutters are doing their part, necessary but regrettable, in modifying if not destroying plant growth. Many species, even of orchids, are tolerant for years of changed conditions, but cannot survive ultimately any radical alterations of their environment. Now is the time to secure proofs, in specimens and films, of the presence, as yet, in our Local Area, of many interesting and vanishing species.

CHELSEA SQUARE, NEW YORK CITY.

CONCERNING SOME SPECIES OF MACHAERANTHERA

GEO. E. OSTERHOUT

A perplexing group of plants is comprised in the genus Machaeranthera. I suppose they have been something of a puzzle to most of those who have studied them. Many of the species seem to be closely related; and whether they are distinct species, I think is a matter of individual opinion. After a study of a number of the species occurring in Colorado I have arranged them in the following order.

I

Bracts linear, reflexed. Inflorescense viscid.

A. Green tips longer than the lower portion

1. Plants 2 dm. or more high.

M. aspera Greene
M. varians Greene
M. sessiliflora (Nutt.) Greene
(Dieteria sessiliflora Nutt.)
M. rubricaulis Rydb.

2. Plants low, 1 dm. or less high.

M. Pattersonii (Gray) Greene
M. coloradensis (Gray) nom. nov.
(Eriocarpum coloradensis (Gray) Greene)
(Xylorrhiza coloradensis (Gray) Rydb.)

B. Green tips not longer than the lower portion

M. spectabilis Greene
M. Selbyi Rydb.
M. viscosula Rydb.

II

Bracts shorter; not reflexed.

1. Plants canescent.

M. canescens (Pursh) Gray
M. superba A. Nelson

2. Plants less canescent.

M. pulverulenta (Nutt.) Greene
M. divaricata (Nutt.) Greene
M. subalpina Greene
M. ramosa A. Nelson
M. glabella Greene

I

M. aspera and *M. varians* Greene are very much alike. *M. aspera* is more hirsute on the stem; and it is the older described species. They do not differ in size.

M. sessiliflora (Nutt.) Greene and *M. rubricaulis* Rydb. are less glandular than the two preceding species; and there is little to distinguish one from the other.

Then I have listed two species which are quite unlike other species of *Machaeranthera*. They were *Aster Pattersonii* Gray and *Aster coloradensis* Gray. *A. coloradensis* seems to be related to *A. Pattersonii* and if that is placed in *Machaeranthera* I think *A. coloradensis* should also be placed there.

Of the species with shorter green tips of the bracts, *M. spectabilis* Greene and *M. Selbyi* are very similar; the characters which distinguish them are slight. *M. viscosula* Rydb. is characterized by very narrow leaves.

II

The species under my second division are equally difficult of discrimination. *M. canescens* and *M. superba* seem distinct enough; but *M. pulverulenta*, *M. divaricata*, *M. subalpina*, *M. ramosa*, and *M. glabella* are more difficult of separation. That they are related to *M. canescens* seems evident, and that they are quite closely related to each other also seems evident. Whether there are characters by which they may be separated into distinct species is rather doubtful. In the Fl. of N. Am. by Torrey and Gray the genus name for these plants is *Dieteria*, and under *Dieteria divaricata* it is observed that "these species are so nearly related that they may hereafter be found to pass into each other."

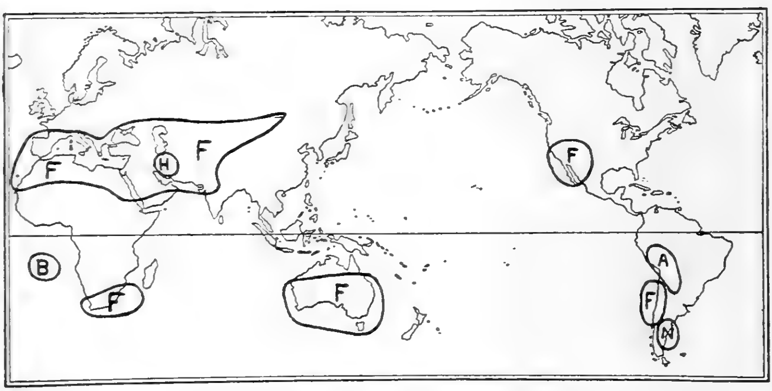
WINDSOR, COL.

THE FRANKENIACEAE AS A LINK IN THE CLASSIFICATION OF DICOTYLEDONS

ALFRED GUNDERSEN

An interesting difference between the system of Bentham and Hooker and that of Engler appears in the position of the Pink Family, the Caryophyllaceae. In the former system this family is classified with Frankeniaceae and Tamaricaceae, in the latter under Centrospermae with Chenopodiaceae, Aizoaceae and others. The many detailed characters in common between the families Caryophyllaceae and Frankeniaceae on the one hand, and between the Caryophyllaceae and Chenopodiaceae, etc. on the other, suggest that both the above interpretations may be correct. But such a double connection would require a rearrangement of other families and orders. Not only the order Centrospermae, but also probably the Polygonales and Aristolochiales must then apparently follow the order Parietales or part of it. In his Blütendiagramme, Eichler makes the statement that to place the Frankeniaceae near the Pink Family, as Bentham and Hooker do, is forbidden by the placentation; the Pflanzenfamilien by its arrangement supports this view. However, studies of the placentation in various families show that in this respect also there are suggestive resemblances.

The Frankeniaceae are mostly small plants of dry regions, the interesting distribution of the five genera is indicated by the map.



Approximate Distribution of Frankeniaceae

A: *Anthobryum* B: *Beatsonia*
F: *Frankenia* N: *Niederleinia* H: *Hypericopsis*

(In South America the Frankenia extends into the Anthobryum and Niederleinia areas).

The general outward appearance of Frankeniaceae is much like that of some of the Caryophyllaceae. In both families the leaves are opposite, with entire margins, and without stipules. The leaves are small in Frankeniaceae, often so in Caryophyllaceae. In the Frankeniaceae the usually short petioles of each pair of leaves are connected by a scarious membrane, in the Caryophyllaceae each pair of sessile leaves is similarly connected (see plate, fig. 1–2). The inflorescence in both families is usually a dichotomous cyme.

The calyx in the Frankeniaceae is tubular and usually angular (fig. 3–4). A tubular calyx characterizes the Silene sub-family of the Caryophyllaceae; an angular calyx is found in Lychnis and other genera of Caryophyllaceae. A calyx very suggestive of Frankenia is found in Plumbago; the possible relationship of Plumbaginaceae to Caryophyllaceae has been pointed out by Wettstein and others. In several Frankenia species the calyx is somewhat twisted, a characteristic of Loasaceae and of Mesembryanthemum. The petals with claw and ligule is another character very frequent in the two families (fig. 5–6); the margin is often fringed. The stamens, usually in two whorls, often have filaments broadened below and are sometimes slightly united, the anthers are extrorse in both families.

In both families, the pistil is one-celled, frequently of three carpels, developing into a capsular fruit. In numerous Frankenia species there is a slight bend at the base of the style, suggestive of the style of Viola. The placentation in Frankeniaceae varies from parietal to basal (fig. 7–10). In Hypericopsis, and in most of the Mediterranean and South American Frankenias there are 20–30 ovules on parietal placentae. In *F. grandifolia* and a number of other species only the lower parts of the placentae bear ovules. In *Anthobryum triandrum* there are two ovules just below the middle of each of the three placentae.

In the Basigonia section of Frankenia there are usually three basal ovules, in *F. Jamesii* and *F. Fischeri* three ovules basally attached almost fill the ovary. In *Niederleinia juniperoides* three ovules are attached to a single placenta. In the Silene sub-family of Caryophyllaceae, the placentation is central, in the Alsine sub-family there is usually one basal ovule. In another family of the Centrospermae, the Aizoaceae, a parietal placentation occurs in species of Mesembryanthemum. In *Lewisia Cotyledon* in the young flower the ovules appear to be in a parietal position, later with an apparently central placentation three thread-like structures continue from the funiculi to the top; in dissecting, three groups, each with about four ovules, readily separate. A very persistent character not only in the Caryophyllaceae but also in other families of the Centrospermae is the granular or pearly surface of the seed, and the same character occurs generally in the Frankeniaceae (fig. 11). Another important character of the Centrospermae is the curved embryo. While this character perhaps does not occur in the Frankeniaceae, it does occur in the nieghboring family, the Elatinaceae, and also in Cistaceae and several other families usually included in the order Parietales. However, in some of the genera apparently nearest to Frankenia, such as Dianthus and Velezia, the embryo is nearly straight (fig. 12). In sectioning a few seeds of a North African Frankenia, the embryo seems to be situated not quite in the center of the endosperm.

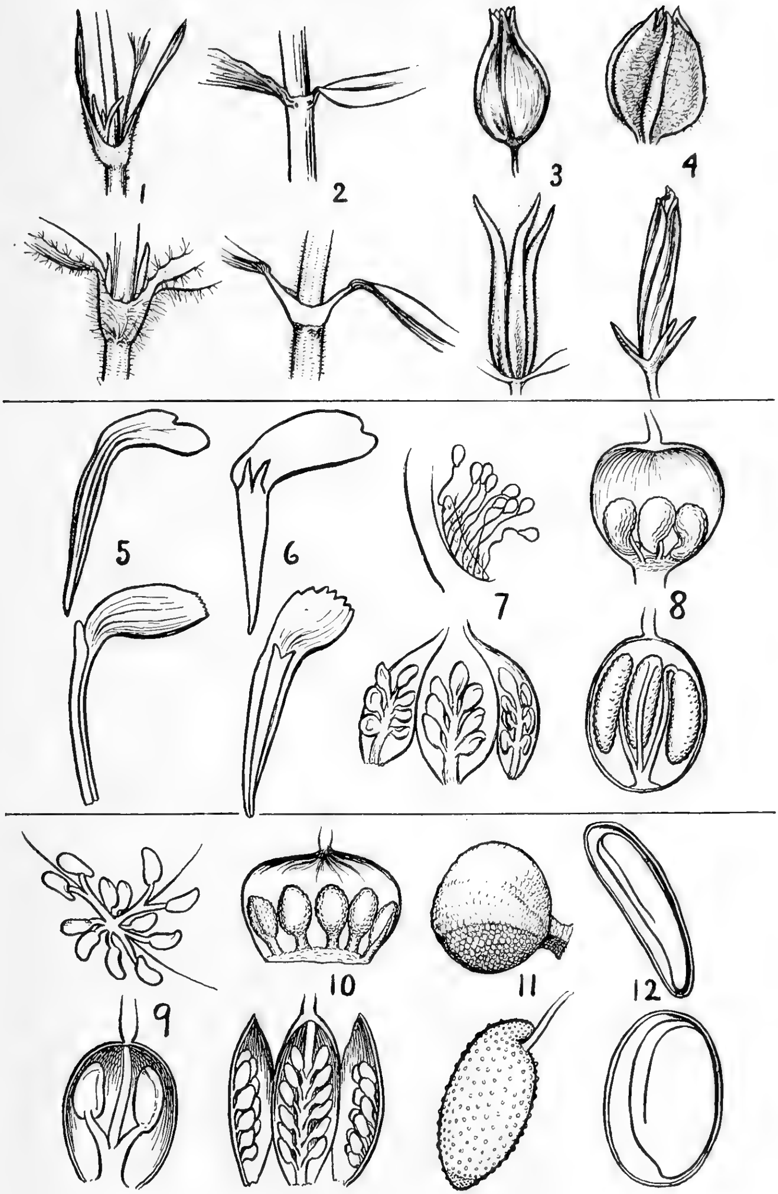
If the Frankeniaceae and the Caryophyllaceae belong together, the orders which contain them, in so far as they are natural, must also belong together. Considering only widely occurring characters in the two groups Parietales and Centrospermae, those of the former appear to be the more primitive; those of the latter the more specialized.

Parietales	*Centrospermae*
Largely woody plants	Nearly all herbaceous
Floral parts sometimes spirally arranged	Spiral arrangement rare (Chenopodiaceae)
Stamens often numerous	Stamens usually in two whorls
Placentation axile or parietal or basal	Placentation central or basal
Embryo straight or slightly curved	Embryo usually much curved

The comparatively late position in the Engler system of the order Parietales must be considered as due to the requirements of a linear sequence, for through Dilleniaceae and other families this group connects directly with the Magnolia group.

The great changes in classification which would follow from a recognition of a relationship of Frankeniaceae and Caryophyllaceae make it desirable to examine more closely the probable lines of evolution within these families.

Brooklyn Botanic Garden,
Brooklyn, N. Y.



EXPLANATION OF FIGURES

Above the numbers: Caryophyllaceae, Nyctaginaceae, Portulacaceae, Cactaceae. Below the numbers: Frankeniaceae

Leaf Attachment

1. { *Dianthus plumarius* L.
   { *Frankenia grandifolia* Ch. & Schl.

2. { *Saponaria officianalis* L.
   { *F. laevis* L.

Calyx Tube

3. { *Lychnis Coronaria* L.
   { *F. pulverulenta* L.

4. { *Mirabilis longiflora* L.
   { *F. Jamesii* Torr.

Petal

5. { *Saponaria vaccaria* L.
   { *F. grandifolia* Ch. & Schl.

6. { *Saponaria officianalis* L.
   { *F. chilensis* Presl.

Placentation

7. { *Mesembryanthemum spectabile* Haw.
   { *Hypericopsis persica* Boiss.

9. { *Lewisia Cotyledon* Rob.
   { *Anthobryum triandrum* (Remy) Surgis

8. { *Pycnophyllum molle* Remy
   { *F. Fischeri* Hicken

10. { *Pereskia aculeata* Mill.
    { *Frankenia glabrata* Phil (?)

Ovule

11. { *Silene latifolia* Poir.
    { *F. pulverulenta* L.

Seed

12. { *Velezia rigida* L.
    { *F. Aucheri* Jaub & Spach (?)

PROCEEDINGS OF THE CLUB

Meeting of April 12, 1927

This meeting was called to order at the American Museum of Natural History at 8:25 p. m. The scientific program consisted of an illustrated lecture by Dr. William Crocker entitled: The Boyce Thompson Institute: its organization and equipment for research.

Dr. Crocker spoke of the handicaps, generally existing, to the successful prosecution of research, and showed how the Boyce Thompson Institute has tried to eliminate these as far as possible. The equipment at the Institute, as well as some of the work now in progress, were described and illustrated by stereopticon slides. A more detailed account will be published later.

Arthur H. Graves,
Secretary.

Meeting of April 27, 1927

This meeting was held at the Museum Building of the New York Botanical Garden beginning at 3:30 p.m. The minutes of the meetings of February 23, March 8, March 30 and April 12 were read and approved.

The resignation of Miss Caroline G. Howe of East Orange, New Jersey, was accepted with regret.

The Committee appointed to report on the revised Constitution and By-laws, namely, Dr. H. M. Richards, Dr. Sam F. Trelease and the Secretary, reported its recommendation that the Club adopt said revision *in toto*. The Secretary was instructed to cast a ballot for its adoption.

On account of the absence of Dr. Richards due to illness, the discussion of the amendments proposed by Dr. Barnhart was postponed until the first meeting in October. It was voted by the Club that an expression of the sympathy of the Club and best wishes for a speedy recovery be sent to Dr. Richards.

The following amendment was then proposed by Dr. Britton: "Unless otherwise determined by the Club, the regular meetings shall be held on the second Tuesday and the last Wednesday of each month from October to May inclusive, except the last Wednesdays of November and December, at such hour and place as the Club may direct."

For the scientific part of the program, Dr. Arthur Hollick presented a fossil plant for examination. Dr. Hollick stated that some years ago Dr. Lester F. Ward in the "Synopsis of the Flora of the Laramie Group" published in 1885, described this fossil as *Trapa microphylla*. Many investigators have not been satisfied with this identification. The fossil is small, with a rosette formation, apparently a water plant—perhaps a floating species which became pressed out in the mud. The fossil belongs to the Fort Union Formation in Montana of the Eocene-Tertiary Age, and was sent about a year or so ago by Dr. F. H. Knowlton in the hope that Dr. Hollick would arrive at a more satisfactory identification.

Arthur H. Graves,
Secretary.

Meeting of May 10, 1927

This meeting was called to order in the main auditorium of the American Museum of Natural History at 8:25 p. m. Since it was devoted to the subject of wild flower conservation, members of the various nature and walking clubs of N. Y. City had been invited, and the attendance was about 150, the largest of any meeting for several years.

Mr. Torrey spoke of the recent article by Mr. Taylor in "Torreya," "Walking with an Object," listing the various rarer species of the flora of New York and vicinity, more exact information of whose range and distribution is desired. Copies of this article were distributed to the audience.

As part of the formal program arranged for the occasion, Dr. Barnhart made a few remarks on the history of the Club and the recent work of the revision of its Constitution. In introducing the next speaker, Dr. H. M. Denslow, Dr. Barnhart referred to him as being present at the dinner given 60 years ago in honor of Dr. Torrey, at which the Club was founded. Dr. Denslow spoke of collecting seven or eight species of orchids at the northern end of Manhattan Island about 60 years ago. His uncle lived at Inwood and devoted much of his time to a study of plants. *Tipularia discolor* then grew at Inwood, and still grows on Long Island, having been collected last year at Greenport.

Mrs. Britton, in a lecture that followed, entitled "The Rarer Wild Flowers of the Vicinity of New York", illustrated her remarks with 120 slides of wild flowers, paying especial attention to the rarer species and to those that are disappearing and need conserving. Two lanterns were used, slides of the same or allied and rarer species being shown on the screen at the same time.

Arthur H. Graves,
Secretary.

Meeting of May 25, 1927

This meeting was held at the Museum Building of the New York Botanical Garden. The minutes of the meetings of April 27 and May 10 were read and approved. The following candidates were unanimously elected to membership in the Club:

Miss Leslie Crawford, 540 West 122 Street, N. Y. C.

Dr. R. P. Wodehouse, 10 Stone Street, Yonkers, N. Y.

Mrs. William Mitchell, 54 Hancock Avenue, Yonkers, N. Y.

The Secretary read a letter from Dr. Burton Livingston, Permanent Secretary of the American Association for the Advancement of Science, acquainting the Club of its official affiliation with the American Association at the recent spring meeting of its executive committee.

On the motion of Dr. Howe, the appointment of the club's two representatives in the council of the Association and the method of their appointment in the future was left to a committee formed of the officers of the Club.

The scientific part of the program consisted of an illustrated talk by Dr. L. O. Kunkel, of the Boyce Thompson Institute, entitled "Virus Diseases."

The virus diseases of plants as a group are transmitted by insects. This is not known to be true of the virus diseases of animals. Not only are we ignorant of the cause of these diseases: we do not know what observations and experiments are necessary in order to solve the problem of their etiology.

There seems to be a specific relation between virus diseases and the insects which spread them. Only certain insects are able to transmit certain virus diseases.

Dr. Kunkel described the symptoms of Aster Yellows, the insect transmitting it (*Cicadula sexnotata*), and methods of study, illustrating his remarks by lantern slides.

Slides were shown of the same disease on lettuce, *Ambrosia trifida*, *Asclepias nivea*, Oyster Plant, Dandelion, Butterweed (*Erigeron canadense*), Sonchus sp., Paris Daisy, (*Chrysanthemum frutescens*), *Amaranthus auroro*, Gypsophila, French Marigold, *Helichrysum arenarium*, African Marigold, Mignonette, Schizanthus, Dill, Anise, etc.

In all cases the transmission of the disease was carried out by the same insect. It cannot transmit the disease immediately after feeding. An interval of at least 10 days must elapse before it becomes inoculative. This seems to be evidence that the causal agent is a living organism, and not a purely chemical substance. A certain incubation period exists here just as in the case of the malarial parasite which passes an incubation period in the body of the mosquito.

It has been suggested that the virus diseases are due to ultramicroscopic organisms. The virus diseases are very important because they attack so many economic plants and also because they are apparently closely related to certain diseases of animals and human beings; *e. g.*, rabies, foot-and-mouth disease, hog cholera, small pox, typhus fever, etc. It is believed that the discovery of the cause of virus diseases in plants would throw light on the virus diseases of animals.

Löffler and Frosch, in 1898, in studying the foot-and-mouth disease of cattle, found that the virus could be passed through a filter. In the mosaic disease of tobacco, Iwanowski saw amoeba-like bodies which, because of their large size, he concluded could not cause the disease. In 1921, amoeba-like bodies were found associated with the mosaic disease of corn. There is great uncertainty about the nature of these bodies. When fixed and stained they have a structure similar to that of protoplasm, but until they have been shown to contain nuclei, to be capable of vital movement or have been grown in pure culture or demonstrated to be related to some known organism we shall have to reserve judgment as to whether or not they represent a stage in the life cycle of a living organism.

All the evidence indicates that the causal agent is very small. Its discovery and demonstration may have to await the production of a better microscope than we now possess.

Arthur H. Graves,
Secretary.

TORREY BOTANICAL CLUB FIELD DAY

Hester M. Rusk

To celebrate the fiftieth anniversary of the joining of the Club by Dr. N. L. Britton and Dr. Arthur Hollick, a Torrey Botanical Club Field Day was held on June 25, 1927, at Bay Terrace and Great Kills, Staten Island. In the morning a party of about fifty members and friends of the Club, led by Dr. Britton and Dr. Hollick, joined in a field trip on which many interesting plants of the region were pointed out.

Addressing the meeting at the ruins of the former residence of Mr. John J. Crooke (Mr. Crooke died here on April 11th, 1911, in the eighty-eighth year of his age), near Bay Terrace, Dr. Britton called attention to the important services rendered by Mr. Crooke to science during his long life. He was a charter member of the Torrey Botanical Club and an intimate friend of Dr. Torrey; he accumulated here large and valuable collections of shells, birds, minerals and plants, and an extensive library; at about the time of Dr. Torrey's death in 1873, he presented to Columbia College, the valuable general herbarium of the Swiss Professor Meisner, and another large herbarium formed by Dr. Chapman, of Apalachicola, Florida, illustrating the flora of the southeastern United States; his own herbarium was subsequently given to The New York Botanical Garden; his collection of birds, shells and minerals passed to the American Museum of Natural History. He is commemorated in Botany by the genus *Crookea* of the Hypericaceae, dedicated to him by Dr. Small in 1903.

Dr. Britton described his boyhood intimacy with Mr. Crooke, and his visits here at frequent intervals from his birthplace and home at New Dorp, three miles away. It was this acquaintance that led Dr. Britton to prepare for the School of Mines of Columbia College, where he began his course of study in 1875. Mr. Crooke told him much about Dr. Torrey and his herbarium, and also of the organization, called the Torrey Botanical Club, founded a few years previously.

Mr. W. T. Davis added some of his own personal reminiscences of Mr. Crooke, and read aloud the biographical article which he wrote in 1911.* Mr. C. W. Leng followed with a few words about Mr. Crooke's gifts of valuable specimens to the American Museum of Natural History.

Dr. and Mrs. Britton and Miss Harriet Louise Britton entertained the party at luncheon at the home of Mr. R. H. Britton on the water front at Great Kills. After luncheon Dr. Britton read from the minutes of the Torrey Botanical Club meeting of June 26, 1877, as follows: "C. A. Hollick, C. Van Brunt, N. L. Britton were elected active members." Mr. Hollick had been nominated by Mr. G. W. Wright, Mr. Van Brunt by Mr. W. R. Gerard, and Mr. Britton by Mr. Wright. The last was principal of a school at New Brighton, and knew Dr. Britton and Dr. Hollick as boys.

The next speaker, Dr. Hollick, remarked on the inaccuracy of memory and the value of written records made at the time of occurrences, not only for facts, but also for impressions. He read extracts from his diary of fifty years ago, giving his youthful impressions of the early events of his scientific career, which was and has ever since been closely connected with that of Dr. Britton. He mentioned Dr. Britton's first published note

* Davis, William T. John J. Crooke: a Staten Island naturalist. Proc. Staten I. Assoc. **3**: 169–172. 1911.

on sedges, in the Torrey Bulletin for May, 1879.* To another, published in April, 1880,† Dr. Hollick contributed the drawings —the third plate that had appeared in the Bulletin. Dr. Hollick's second published drawing was the first colored plate in the Bulletin, an illustration of *Cerastium arvense*, for his and Dr. Britton's article on that species—March, 1887.‡ Dr. Britton and Dr. Hollick worked for several years on their Flora of Staten Island§ printed in February, 1879. Seven appendices were published in the following years. Dr. Hollick read some interesting and complimentary press notices on this early work, and announced that a joint revision of the Staten Island Flora is nearly ready for printing.

Dr. Hollick's talk was followed by a few words from Dr. J. H. Barnhart, Mrs. N. L. Britton, Mr. L. L. Tribus and Hon. H. R. Bayne, president of the Staten Island Institute of Arts and Sciences. Mr. John Enequist proposed a vote of thanks to Dr. and Mrs. Britton and Mr. and Miss Britton and Dr. Hollick, to which everyone present most heartily responded. Assuredly the day was a most memorable one to the members of the Torrey Club and other guests.

About 85 persons participated in the event, mostly from the Torrey Botanical Club and the trustees of the Staten Island Institute of Arts and Sciences. Brother León of the College of La Salle at Havana, Cuba, and Dr. J. N. Rose of the United States National Museum, were distinguished guests.

NEWS NOTES

From the Newark Museum we have learned that early in May a rare member of the Gentian family, *Obolaria virginica*, was found near Hillside, N. J. by Mr. George H. Swezey. The New Jersey State Report gives but four localities for the species, in all of which it is rare.

* Bull. Torrey Bot. Club **6**: 316. 1879.

† Britton, N. L. Note on the differences between *Cyperus ovularis* Torr., and *C. cylindricus* N. L. Britton. Bull. Torrey Bot. Club **7**: 48. 1880.

‡ Hollick, Arthur, and N. L. Britton. *Cerastium arvense* L., and its North American varieties. Bull. Torrey Bot. Club **14**: 45–51. 1887.

§ Hollick, Arthur, and N. L. Britton. The flora of Richmond Co., N. Y. Published by the authors. Staten Island. 1879.

We have received a copy of numbers 3 and 4 of the first volume of Werenda, published by Wilhelm Suksdorf in Bingen, Washington. The pamphlet, which is written in German, describes some twenty five new species and a number of new varieties of plants found in Washington. The species described belong to the genera *Panicum Corallorrhiza*, *Spiraea*, *Amelanchier Prunus*, *Viola*, *Epilobium*, *Sanicula*, *Apocynum*, *Amsinckia*, *Nicotiana*, *Mimulus*, *Symphoricarpos*, *Aster*, and *Plectritis*. In addition there is a key to the species of *Amsinckia*.

Representatives of many leading European agricultural organizations arrived at Washington the week of June 13 to study economic conditions in this country, and to make a 60-days tour of American agricultural regions. The group composed of officials from 12 European countries was escorted to the United States by Asher Hobson, Permanent American Delegate to the International Institute of Agriculture at Rome.

An international meeting of the European representatives and officials of the Department of Agriculture for an interchange of information on world agriculture was held at Washington by the Bureau of Agricultural Economics during the visit of the foreign agricultural delegates.

After a few days spent in attendance at the First International Congress of Soil Science in Washington, these delegates made a 60-days tour of the United States studying agricultural conditions, including a 2-days stop at the Institute of Cooperation in Chicago. They participated also in the Country Life Conference at East Lansing, Michigan, August 1–6.

The Brooklyn Botanic Garden announces a gift of $10,000 from Mr. and Mrs. Walter J. Cranford of Greenwich, Connecticut, formerly of Brooklyn, for the installation of a new rose garden as a memorial to a little child. The garden will cover about three quarters of an acre. The plan provides not only for the display of the so-called bedding or garden roses that will grow out-of-doors, and for demonstration of the varied possibilities of climbing roses, post roses, and standards, but also for as complete collections as can be obtained of wild or natural species of roses, showing their foliage and massing qualities. Old fashioned and historical roses will also be featured.

Following one of the provisions of the act of the last Congress establishing a National Arboretum at Washington, Secretary of Agriculture Jardine has announced the membership of the Advisory Council, which is to plan and develop the arboretum. The members are Frederic A. Delano, Washington, D. C., member of the Board of Regents of the Smithsonian Institution, Chairman; L. H. Bailey, Ithaca, New York, president of the Botanical Society of America; Henry S. Graves, New Haven, Conn., Dean of the School of Forestry, Yale University; Harlan P. Kelsey, Salem, Mass., former president of the American Association of Nurserymen; John C. Merriam, president of the Carnegie Institution of Washington; Mrs. Frank B. Noyes, Washington, D. C., chairman of the District of Columbia committee of the Garden Club of America; Frederick Lew Olmsted, Brookline, Mass., former president of the American Society of Landscape Architects; Mrs. Harold I. Pratt, Glen Cove, L. I., secretary of the Garden Club of America; Robert Pyle, West Grove, Pa., director of the Society of American Florists and Ornamental Horticulturists and a former president of the American Rose Society.

Dr. T. D. A. Cockerell of the University of Colorado, who is on a botanical trip through Europe and Asia, reached Leningrad the middle of July. Professor Komaroff, a most enthusiastic botanist, was his host in visiting the botanic gardens and library. The gardens are very fine and are being partly made over and enlarged. Palms and other tropical plants grow in the green houses, while many arctic plants are found in the rockeries.

Dr. Cockerell stopped in Moscow, then went on across to Siberia to Irkutsk and Lake Baikal. At the latter place he spent some time in the new research laboratory supported by the University of Irkutsk.

Dr. Bruce Fink, an authority on lichens and for over twenty years professor of botany at Miami University, Oxford, Ohio, died suddenly on July 16 in his sixty-sixth year.

Dr. William H. Eyster, professor of botany at Bucknell University, sailed on August 20 for Germany. He will spend a year in study there as a fellow of the John Simon Guggenheim Memorial Foundation.

Dr. E. D. Merrill, Dean of the California College of Agriculture and formerly Director of the Philippine Bureau of Science has been made Director of the California Botanical Gardens of Los Angeles. The gardens are being developed in a sheltered valley to the west of the city where there was naturally a fine growth of live oak, sycamore and other native trees and shrubs. As it will extend up the hillsides for some distance and back into the canyon, there is a diversity of environment that will make possible a great variety of plants and make possible unusual settings for them. The gardens are close to the new site of the Southern Branch of the University of California and that of Occidental College.

Ellsworth P. Killip of the National Museum and Albert C. Smith of New York have returned from a botanical trip to the Eastern Cordillera of Columbia. The party, sent by the National Museum, the New York Botanical Garden, the Gray Herbarium and Arnold Arboretum, has obtained a fine collection of specimens from a region little known botanically.

During July and August the rainfall in the vicinity of New York City amounted to 29½ inches, about half the average annual amount. This excessive rainfall has had a marked effect on plant growth.

The Torrey Botanical Club

Contributors of accepted articles and reviews who wish six gratuitous copies of the number of TORREYA in which their papers appear, will kindly notify the editor when returning proof.

Reprints should be ordered, when galley proof is returned to the editor. The Intelligencer Printing Co., Lancaster, Pa., have furnished the following rates:

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75 "	1.95	3.35	4.85	5.65	7.60	8.75	10.45	11.25	15.65	19.95
100 "	2.25	3.80	5.35	6.35	8.25	9.80	11.55	12.45	17.55	22.05
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BY

GEORGE T. HASTINGS

John Torrey, 1796–1873

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TORREYA

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September-October

A BOTANICAL RIDDLE

I

Kenneth K. Mackenzie

We are all familiar with that peculiarly exasperating form of riddle which consists in asking a victim to guess what an object with certain given characteristics is; then when the victim has given up and on being told the answer protests that the object named does not possess one of the given characteristics, he is told that this characteristic was added to make the riddle hard.

To suspect that any botanist ever knowingly did a similar thing in describing a species is not in my thoughts. But that it has been unwittingly done I believe cane be made evident.

In 1768 Miller (Gard. Dict. Ed. 8 Viburnum No. 8) gave a binomial name to a species of *Viburnum* which previously he had treated under the old polynomial system of nomenclature. The identity of this species, which he called *Viburnum americanum*, long was a source of trouble to American botanists. A few years ago Dr. S. F. Blake (Rhodora 20: 14–15. 1918) noted that he had seen a specimen of *Viburnum americanum* Miller in the British Museum and that it was *Hydrangea arborescens* L.

Blake can not however have consulted Miller's description or he would at once have noted that while the description does fully answer *Hydrangea arborescens* until near the end, yet near the end Miller added that the plant has red oval berries! How Miller came to do this is not possible to say. He placed his *Viburnum americanum* immediately after his description of the European *Viburnum opulus* L. (which has red berries) and probably either assumed that his plant must have red berries (instead of the capsule which it has), or he got some fruit of *Viburnum opulus* mixed up with it. Miller's material came from Thomas Dale of Charleston, South Carolina, the author of an unpublished manuscript listed by Miller in the list of works consulted by him as "Thomas Dale's Observations on many new Plants which he discovered in America." No American species of *Viburnum* with red fruit is found anywhere near Charleston, and Miller's description applies to no species of Viburnum.

II

Miller's description of *Viburnum americanum* is as follows:

"8. VIBURNUM (*Americanum*) foliis cordato-ovatis acuminatis serratis, petiolis longissimis laevibus. *Way-faring-tree with heart-shaped, oval, acute-pointed, sawed leaves, growing upon very smooth foot-stalks.* Opulus Americana, foliis acuminatis & serratis, floribus albis. Dale. *American Guelder-rose with acute-pointed sawed leaves, and white flower.* . . . The eighth sort grows naturally in Carolina, and some other parts of North America; this rises with a shrubby stalk eight or ten feet high, sending out many side branches, which are covered with a smooth purple bark, and garnished with heart shaped oval leaves ending in acute points; they are deeply sawed on their edges, having many strong veins, and stand upon very long slender footstalks opposite. The flowers are collected into large umbels at the end of the branches; those ranged on the border are male and barren, but the middle is composed of hermaphrodite flowers, which are succeeded by oval berries. The flowers are white, and the berries are red when ripe."

Miller Gard. Dict. (Ed. 8) Viburnum No. 8. 1768.

After reading the above let us read a copy of the original description of *Viburnum alnifolium* Marsh (Arb. Am. 162. 1785). It is as follows:

"6. Viburnum alnifolium. Alder-leaved Viburnum. This grows naturally in Carolina and other parts of America; rising with a shrubby stalk to the height of eight or ten feet, covered with a smooth purplish bark, and divided into several branches. The leaves are heart-shaped, oval, sharp-pointed, deeply sawed on their edges, strongly veined, and placed opposite upon long slender footstalks. The flowers are collected in large cymes or umbels at the ends of the branches; those ranged on the border are male, but the center is filled with hermaphrodite flowers, which are succeeded by pretty large, oval berries, red coloured when ripe."

I do not believe that anyone after reading the above two descriptions will have any doubt that Marshall's description was taken from Miller's! It may be assumed that Marshall had an earlier edition of Miller's Dictionary in which Miller did not use binomial names, and that he was not acquainted with Miller's binomial name.

How Gray (Syn. Fl. 1^2: 10. 1884) came to identify *Viburnum alnifolium* Marsh. with *Viburnum lantanoides* Michx. is not known to me. Torrey & Gray (Fl. N. Am. 2: 18–9. 1841) treated it as an unknown "obscure species." Following Gray, the name has come into universal use for the widely distributed hobble-bush of our northern woodlands. It now seems very evident that both *Viburnum alnifolium* Marsh. and *Viburnum americanum* Miller must be treated as synonyms of *Hydrangea arborescens* L. and that for the hobble-bush we must revert to the older long-established use of *Viburnum lantanoides* Michx.

NEW YORK, N. Y.

A GREEN FORM OF TRILLIUM SESSILE

LEONARD K. BEYER

In the spring of 1926 near Bethany, West Virginia, there were found one and one-half miles east of Bethany College, green trilliums growing in close association with the purple *Trillium sessile* L. Some of these plants seemed to be intermediate between the green and purple forms, having the yellowish-green petals more or less streaked with purple, while others had not a trace of purple about them. The spring of the present year (1927) the green trillium was found and studied more carefully. Fresh specimens were sent to Dr. O. E. Jennings of the Carnegie Museum, Pittsburgh, Pa., for examination. After careful measurements of all the parts had been made and all other characters noted, it was decided that the plant was a green form of *Trillium sessile* L., but one sufficiently well marked to deserve a form name of its own. The name suggested, therefore, is *Trillium sessile* forma **viridiflorum.**

This green trillium grows very closely associated with the ordinary purple form in rich soil on a moist hillside, facing southeast. The flowers of the two forms open at the same time, though the petals of the green plant remain fresh long after those of the purple forms have withered and dried.

Many thanks are due Dr. O. E. Jennings for his generous help in determining the relationship of this trillium and for assistance with the detailed description which follows.

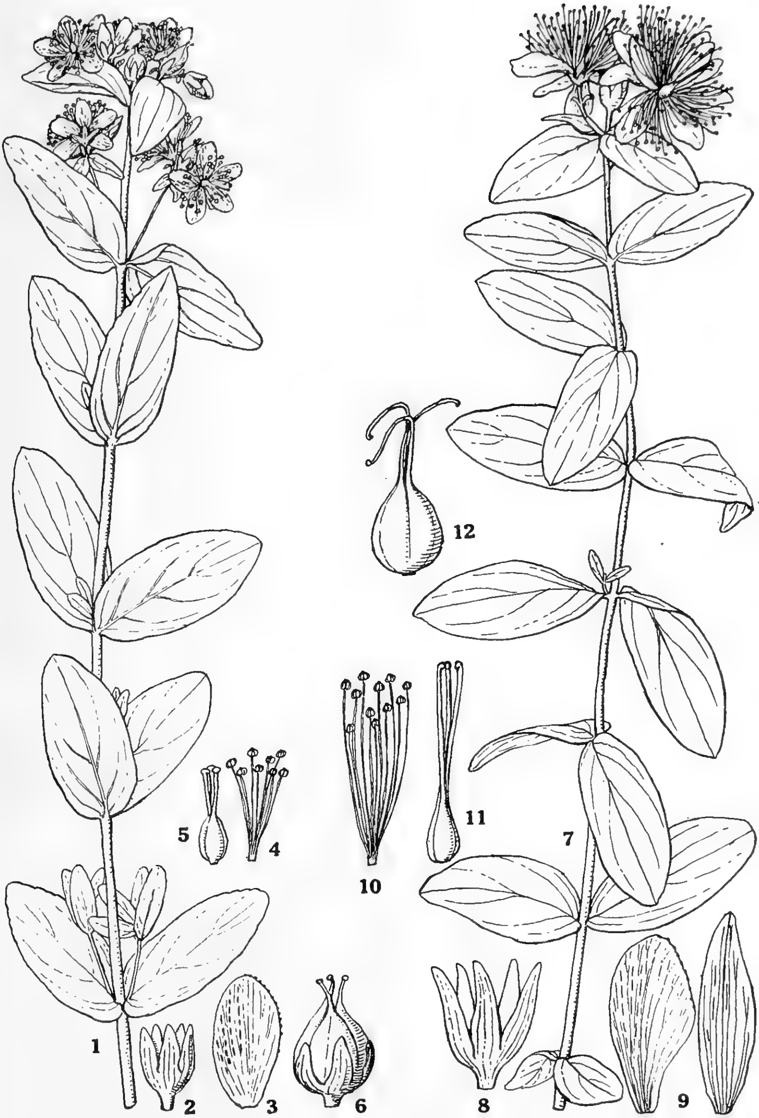
Corm 1–1.5 cm. diam., by 4–5 cm. long, strongly recurved. Stems about 2 dm. high, purplish-red below, smooth, about 4 mm. in diam. at apex. Leaves 3, about 5 cm. wide by 7 cm. long, oval to elliptic, rarely slightly ovate; at base somewhat rounded, at apex shortly and widely acute; 5-nerved, perfectly glabrous, wholly sessile. Flowers sessile. Sepals lanceolate, tapering rather evenly from a widely rounded base, smooth, about 9–10 mm. wide and 2.5 cm. long, rather bluntly acute. Petals yellowish-green with green veins, twisted-erect, paler yellow-green inside, 10–13 mm. wide, 25–34 mm. long, lance-oblong, narrowed to a base 3–4 mm. wide, bluntly acute at apex. Stamens with greenish or purplish-green filaments about 3–4 mm. long; anthers about 11–13 mm. long, 2–2.5 mm. wide, the pollen-sacs narrow and yellow, the connective wide, foliose, and veiny, the tip prolonged beyond pollen-sacs 2–4 mm. and flattish and green to contracted and purplish. Ovary in flower strongly wing-angled (6 wings), green, about 5 + 5 mm. Stigmas thick, fleshy, 8–11 mm. long, triangular in cross-section, the inner face wrinkled, greenish, the outer surfaces purplish, smooth. Flowers have a peculiar, somewhat disagreeable, oily odor. All parts of the plant are strictly glabrous.

Bethany College,
Bethany, W. Va.

NEW SPECIES FROM THE BLUE RIDGE

P. A. Rydberg

Hypericum Mitchellianum Rydb. sp. nov. A perennial with a woody cespitose caudex or rootstock; stems simple up to the inflorescence, 3–6 dm. high, glabrous, tinged with brown; leaves sessile or slightly clasping, elliptic, 3–4 cm. long, rounded or obtuse at the apex, rounded or slightly cordate at the base, glabrous, glandular punctate beneath, especially along the margins; inflorescence cymose, the flowers very short-pediceled; calyx 5 mm. long, with black gland-streaks and rarely with



Hypericum Mitchellianum Rydb. *H. graveolens* Buckley.

irregular black glands; sepals lanceolate, obtuse, petals oval, about 8 mm. long, 4 mm. wide, yellow, the half exposed to the light with conspicuous, oblong, almost black gland-dots, the other half, which in bud is covered by the adjacent petal, usually devoid of gland-dots except along the margin, which is set with numerous minute tooth-like glands; stamens many; filaments nearly equaling the petals and longer than the styles; styles 3, about equaling the ovary, but in fruit shorter than the capsule, capsule broadly ovoid, 3-lobed, 7–8 mm. long.

This species has been confused with *H. graveolens* Buckley and has the same habit and leaf-form, differing mostly in the smaller flowers, shorter stamens and styles and the more strongly developed oblong gland-streaks on the petals. In *H. graveolens* the petals are at least 12 mm. long, the stamens and styles still longer. I thought at first that *H. Mitchellianum* was the original *H. graveolens*, as it seemed to fit Buckley's description better, and that Dr. Gray had figured the wrong species. I wrote to Philadelphia for the loan of Buckley's type specimen, but it is not found in the Academy herbarium. In the drawings of the two species I noticed the difference in the length of the styles. It is only the larger-flowered plant that has the styles "nearly twice as long as the carpels," a character given in the original. The simpler habit with more congested inflorescence distinguishes it from *H. punctatum*, *H. pseudomaculatum* and *H. perforatum*. In these three species the calyx is densely sprinkled with round oil-dots and the sepals decidedly acute. *H. punctatum* has much smaller petals; *H. pseudomaculatum* has lanceolate leaves; and *H. perforatum* has narrowly oblong leaves. The species is dedicated to the venerable scientist who lost his life and is buried on the mountain which bears his name.

North Carolina: Mt. Mitchell, July 15–16, 1925, *P. A. Rydberg 9402* (herb. N. Y. Bot. Gard.), *9403;* Mt. Pisgah, *9478;* Mitchell County, *Ashe* in 1895; Roan Mountain, *Cannon* 116; *Dr. & Mrs. Britton* in 1885, Grandfather Mountain, *Huger* in 1896; *Small & Heller* in 1891; Blowing Rock, *Small & Heller* in 1891; *Heller 1018.*

Kneiffia latifolia Rydb. n. sp. Biennial or short-lived perennial; stem mostly simple, 5–6 dm. high, often purplish or brownish below, sparingly pubescent with ascending, curved hairs; basal leaves rosulate, soon withering, oblanceolate, 2–3 cm. long; stem-leaves elliptic-lanceolate or ovate-lanceolate, 5–7 cm. long, 1.5–2.5 cm. wide, acute at each end, bright-green above, paler

Kneiffia latifolia Rydb.

beneath, sparingly pubescent on both sides, especially on the margins and veins beneath, entire or undulate-denticulate; hypanthium-tube 18–20 mm. long, sparingly pubescent or glabrate; calyx lance-elliptic in bud, glabrous, 12–18 mm. long, acuminate, the free tips less than 1 mm. long; sepals lanceolate; petals bright yellow, broadly obcordate, 18–20 mm. long; filaments slender, ⅔ as long as the petals; style nearly equaling the petals; stigmas oblong, 3 mm. long; fruit (immature) elliptic, abruptly contracted at the base, emarginate at the apex, about 1 cm. long and half as broad.

The species is closely related to *K. glauca*, which, however, is more glaucous, usually entirely glabrous, with the free calyx-tips 1.5–2 mm. long, broader leaves and larger fruit more tapering at the base. Another related species is *Kneiffia tetragona* (Roth) Pennell, which has narrower leaves, with denser and more silky pubescence, smaller flowers, the petals being 12–15 mm. long, and the capsule more tapering at the base. The present species might be the same as the plant described by Spach (Hist. Nat. Veg. **4**: 375. 1835) as *Kneiffia Fraseri*, but it is not the original *Oenothera Fraseri* Pursh which was brought from South Carolina by Fraser and cultivated by him in England. The latter plant was afterwards illustrated in Botanical Magazine on *plate 1674*. The plate evidently represents *Kneiffia glauca* (Michx.) Spach.

NORTH CAROLINA: Craggy Mountains, Buncomb County, July 21, 1925, *P. A. Rydberg 9455* (type in herb. N. Y. Bot. Gard.); also The Pinnacle, Black Mountains, *9434;* Blowering Rock, *Small & Heller 262;* Carvers Gap, Roan Mountain, *Cannon 57*.

Stachys subcordata Rydb. sp. nov. Perennial with a creeping rootstock; stems 8–10 dm. high, 4-angled, and sulcate, glabrous except the sparingly hispidulous angles; petioles of the lower and middle leaves 3–4 cm. long, sparingly hirsute with reflexed hairs; leaf-blades 5–10 cm. long, ovate, rounded or subcordate at the base, abruptly short-acuminate at the apex, sparingly hirsute on both sides, the hairs on the lower sides confined to the veins, finely serrate, slightly paler beneath; calyx-tube finely pubescent, 3 mm. long and nearly as wide, pale, the teeth subulate with a deltoid base, 2 mm. long; corolla pale-lilac, 12–13 mm. long, the lower lip as long as the tube, 3-lobed, the middle lobe rounded-ovate, obtuse.

The plant resembles *S. cordata* Riddell in habit and leaf-form, but differs in the almost glabrous stem, the less pubescent leaf-blades, which are scarcely cordate at the base and with sharper

Stachys subcordata Rydb.

teeth, and the calyx-lobes which are narrower and more gradually pointed.

VIRGINIA: Southwest slope of the Peak of Otter, Bedford County, July 1, 1925, *Rydberg 9264* (N. Y. Bot. Gard.).

Explanation of Plates

PLATE 2. 1. *Hypericum Mitchellianum* Rydb. × ⅔.—2. Calyx.—3. Petal.—4. Fascicle of stamens.—5. Pistil.—6. Fruit. × 2.—7. *Hypericum graveolens* Buckley. × ⅔.—8. Calyx.—9. Petals.—10. Fascicle of stamens.—11. Pistil.—12. Young fruit. × 2.

PLATE 3. 1. *Kneiffia latifolia* Rydb. × ⅔.—2. Flower with petals removed.—3. Petal and 2 stamens. *Nat. size.*—4. Fruit. × ⅔.

PLATE 4. 1. *Stachys subcordata* Rydb. × ⅔.—2, 3. Calyx.—4. Corolla.—5. Lip.—6. Stamens.—7. Pistil. × 2.

NEW YORK BOTANICAL GARDEN,
NEW YORK, N. Y.

A NEW AND REMARKABLE HABITAT FOR THE ENDEMIC FLORIDA YEW.

HERMAN KURZ

Many botanists know that the Florida yew *Taxus Floridana* occurs somewhere along or in the vicinity of the Apalachicola River Bluffs. Very few, however, are able to lead straight to it, once they have arrived at the bluffs, so rare is it. *Tumion taxifolium* (stinking cedar) is well nigh ubiquitous along the bluffs. On the other hand, the yew, another endemic species of the same family, as Harper (2) points out is about 40 times as rare. Any new station for the latter is therefore in itself noteworthy.

In order to appreciate the peculiar or wanton distribution of the yew as shown by our recent discovery, a typical habitat for it 4½ miles a little east of south of River Junction on Flat Creek will first be briefly described. Here along the creek, but well above the water table, at least a dozen plants grow in a perfectly orthodox rich, though somewhat disturbed, mesophytic forest where one can pass freely and comfortably about. The forest soil here is a well aërated, only slightly acid (pH 6), sandy loam, supporting among others *Tumion taxifolium*, *Magnolia foetida*, *Quercus laurifolia, Fagus grandifolia, Pinus glabra, Ilex opaca, Symplocos tinctoria,* and *Vaccinium elliottii.*

Now to the new locality. On February 12, 1927, Dr. R. M. Harper and the writer were guided about ½ mile into the fastness of Johnson's Juniper Swamp by Mr. L. R. Carson of Bristol. This swamp, already described and located as 8 miles south of Bristol by Harper (3) is totally unlike the Flat Creek habitat. The waterlogged, peaty substratum is highly acid (pH 4.2–4.5). Fallen logs in all stages of decay criss-cross so that exploration becomes very arduous. The luxuriant mats of a number of species of Hepaticae and Musci attest to the very humid atmosphere of this hydrophytic forest. Among the trees and shrubs, mostly evergreen, are: *Magnolia virginiana, Cliftonia monophylla, Chamaecyparis thyoides, Pinus taeda, P. elliottii, Taxodium imbricarium, Nyssa biflora, Persea pubescens,* and now and then on the higher accumulated peat a young *Magnolia foetida.* To our amazement in this contrasting habitat and among such strange associates, we found the supposedly very "selective" *Taxus Floridana.*

This swamp projects the Florida yew's range at least ten miles farther south, significant enough when it is realized that its hitherto known distribution is within an area of only about fifteen miles along the bluffs. Of special interest is the fact that *Taxus floridana* parallels the peculiar distribution of its northern relative *Taxus canadensis* in southern Ohio and according to Tansley (5, pp. 166ff, 250) its European relative, *Taxus baccata,* in England. The latter is abundant on the chalk uplands but occurs also in acid moors. Markle (4) reports *T. canadensis* as "one of the commonest undergrowth shrubs" in a cedar swamp of Champaign county five miles south of Urbana. Very commonly *Taxus canadensis* is found in shady mesophytic habitats of canyons and even in the dunes of Michigan. Such habitats are often circumneutral or alkaline in reaction. The plant lists given for the Cedar Swamp by Dachnowski (1) and Markle indicate circumneutral peat with local acid patches. But as no hydrogen ion data are available of the peat where *T. canadensis* grows comparison with the Florida juniper swamp is impossible. The sharp distinction between the edaphic factors of the juniper swamp and all other known habitats of the Florida yew and the striking parallel shown by its other relatives make the endemism of the former still more interesting if not more confounding.

Florida State College for Women,
Tallahassee, Florida.

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A NEW NYSSA FROM FLORIDA

John K. Small

With the acquisition of another species of *Nyssa* to the North American flora, the two sections of the genus are evenly balanced with three species each. For many years the ratio was two and two. Then *Nyssa acuminata* of the coastal region of Georgia was added to the *aquatica-ogeeche* group. Three decades later the main subject of this note was added to the *sylvatica-biflora* group, which brought the ratio even again. The source of this gum is the Apalachicola River delta region where so many endemic species of flowering plants are harbored. It grows in company with *Cliftonia monophylla* and *Cyrilla racemiflora*, both of which it resembles in habit of growth. It may be named and described as:

Nyssa ursina Small, sp. nov. A shrub with much-branched stems and numerous branchlets or sometimes a small tree with a trunk a decimeter in diameter and a narrow much-branched crown: leaves numerous; blades elliptic, often narrowly so, to spatulate, 2.5–7 cm. long, coriaceous, usually rounded at the apex, entire, deep-green and somewhat shining above, much paler beneath, glabrous, at least at maturity, short-petioled: staminate racemes numerous on slender peduncles 1–2 cm. long; sepals ovate to suborbicular, about 1 mm. long, obtuse; anthers globose-ovoid to globose-reniform, nearly 1.5 mm. long, longer than the filaments: pistillate flowers usually 2 together, sessile in an involucre of several acute pubescent bracts; sepals ovate or elliptic, 1.5–2 mm. long, obtuse, shorter than the campanulate hypanthium: drupe globular, 9–12 mm. in diameter, very fleshy, black under a bloom: stone oval or nearly so, 8–10 mm. long, with prominent rounded ribs.

Pineland swamps, Apalachicola River delta, Fla. The type specimens, in the herbarium of The New York Botanical Garden were collected by the writer in a swamp north of Port St. Joe, Florida, April 24, 1924, *11233* for flowers, and in swamps near Port St. Joe, November 27, 1923, *10995* for fruit.

The habit, an intricately branched stem with numerous branchlets, and the myriad globular drupes distinguish *Nyssa ursina* from *N. biflora*. In addition the small coriaceous narrow leaf-blades are not duplicated in any of our other species.

The specific name refers to the fact that the bears eat large quantities of the fruit in the fall and winter seasons.

A NEW CHAMAESYCE FROM FLORIDA

John K. Small

The oölite limestone of tropical Florida—both the Miami and the Key West—harbors several endemic spurges of the genus Chamaesyce. Some, in habit resemble small kinds of thyme clinging closely to the rocks, others are merely diffuse, and still others are broom-like. All these kinds rejoice in the pinelands and shun the hammocks. It seems necessary to add another species, related to *Chamaesyce brachypoda*, to the endemic flora of the Everglade Keys.

Chamaesyce Mosieri Small sp. nov. Plant with several prostrate wiry, dark, partly shining stems or branches from the top of a woody perennial root, the branchlets wiry, villous-hirsutulous, leafy, irregular: leaves opposite; blades orbicular-reniform to ovate, 4–8 mm. long, acute or obtuse, entire, loosely pubescent, rounded or subcordate at the base; petioles purple or black-purple, pubescent: involucres axillary, campanulate, about 1 mm. long, sparingly pubescent, purple; glands transversely elliptic, about 0.4 mm. wide; appendages variable, some larger than the gland, others smaller, red or deep-pink, sometimes lobed: capsule about 1.5 mm. long, very broad, sparingly pubescent, the angles rather blunt when dry: seed ovoid, about 1 mm. long, the faces only slightly uneven.

Pinelands, Everglade Keys, Fla.—All year.

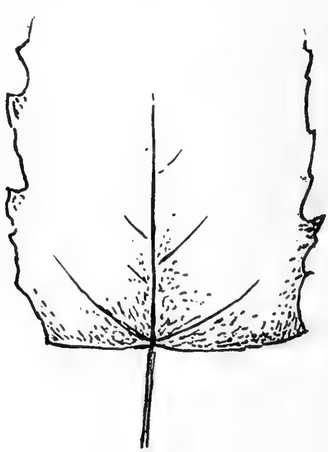
The above species differs from *C. brachypoda* in being a perennial with several wiry stems or branches radiating from the top of the root. It lacks the congested branchlets of its relative, the leaf-blades are more cordate and the capsule sparingly short-hairy. The type specimen, in the herbarium of The New York Botanical Garden, was collected in pinelands about the Brogdon hammock near Cutler, Florida, June 19, 1913, by J. K. Small and C. A. Mosier, *6347*.

A NEW OAK FROM THE GREEN RIVER EOCENE

T. D. A. Cockerell

Several years ago, at station 1 on the Ute trail, in the Roan Mountains of Colorado, I obtained a very striking and unique fossil leaf which has been permitted to remain too long undescribed. It appears black on the grey shale and shows the base and petiole but lacks the apex. It certainly seems to be a *Quercus*, distinct from any yet described.

Quercus utensis n. sp. Leaf with a slender petiole, which is 41 mm. long (style of the living Asiatic *Q. serrata* Thunberg); blade broad, broadly and abruptly truncate at base, the basal truncation 35 mm. across, not symmetrical, 20 mm. being on one



Quercus utensis

side; sides subparallel, very irregularly, not very sharply, dentate, the width of the leaf 52 mm. from base 38 mm.; the greatest width, about 13 mm. from the base, 45 mm.; basal nerves forming an angle of about 60 degrees with the midrib. Except for the long petiole, there is a general resemblance to *Q. stipularis* Humbolt and Bonpland, from Mexico, but probably the real affinity is rather with the Asiatic species.. In the figure the full length of the petiole is not shown. The only oak listed by Knowlton in his revision of the Green River flora (1923) is *Q. castaneopsis* Lesquereux, originally described from a leaf lacking the base. This differs in dentition, and yet it might have been possible to imagine our plant identical, but for the fact that Knowlton had other material and was able to describe the wedge-shaped base. The truncate base of our fossil is singularly like the base of an *Ailanthus* leaflet, but the long petiole shows that it is an entirely different thing. Curiously enough, Lesquereux describes a species from the Green River Eocene as *Ailanthus longepetiolata*, based on a leaf and a characteristic *Ailanthus* fruit. The leaf is quite different from ours, for although the margin is not dissimilar, the base is wedge-shaped and the secondary veins are much more numerous. This leaf has surely nothing to do with *Ailanthus*, but it might very well be an oak. The name *longipetiolata* has been used in *Quercus*. The samara, doubtfully referred here by Lesquereux, figured in Cretac. and Tertiary Floras, pl. XL, fig. 7, may be named **Ailanthus lesquereuxi** n. n. The type of *Q. utensis* is in the University of Colorado Museum.

UNIVERSITY OF COLORADO,
BOULDER, COLORADO

NEWS NOTES

The Brooklyn Botanic Garden is offering, as in other years, a series of courses in botany, gardening and nature study. Courses designed for teachers include, Fall garden work, Greenhouse work, Fall nature study. Courses for the public are: Gardening in the Fall; The life of plants; Outdoor course on the trees and shrubs of Greater New York; Fall flowers, fruits and seeds.

The School Garden Association of New York has published a flower study calendar for New York City schools. This is a list prepared by Mrs. Elizabeth G. Britton giving a flower to be studied each week of the school year. Those for the fall and spring are about equally divided between wild and garden flowers, those for the winter months are flowers commonly found at the florists. On Arbor Day the school children will vote for a school flower. In 1925 the children selected the Rose as a school flower. In 1926, the Cherry as a school tree. In 1927 the Robin as a school bird, each for a period of three years.

Dr. L. O. Howard has resigned from the United States Bureau of Entomology at the end of fifty years service. Dr. Howard was made chief of the bureau in 1894. In 1904 he was made permanent secretary of the American Association for the Advancement of Science and honorary curator of the United State National Museum. In 1920 he was elected president of the American Association. He plans to devote all of his time now to research work in entomology.

At the New England Conference of the American Association of Museums, Mr. William Carr of the American Museum of Natural History described the Nature Trails established this summer in the Bear Mountain Section of the Palisades Interstate Park. There were botanical, zoological, geological and historical trails, each marked with labels of different colors. On the botany trail, marked with green, all the different kinds of trees, shrubs and flowering plants were labeled and some note of interest given for each.

Professor John W. Harshberger of the University of Pennsylvania has recently returned from a collecting expedition in South America with five hundred pressed specimens for the university collection. Duplicates have been sent to the New York Botanical Garden and the U. S. National Museum,

The Torrey Botanical Club

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BY

GEORGE T HASTINGS

John Torrey, 1796–1873

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GEORGE T. HASTINGS
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November-December

INDIANS AND CONSERVATION OF NATIVE LIFE

Melvin R. Gilmore

With regard to the indigenous fauna and flora the attitude of mind respectively of white people and of Indians seems to be fundamentally different. The attitude of white people generally seems to be that the extinction of a species of plant or animal is a matter of indifference except for the consideration of its desirability for utility or for pleasure. The thought of preservation of the balance of nature does not sway the mind of most white people. But it is the consideration which, to the Indian mind, is of prime importance.

Most white men are unable to appreciate or to comprehend the grief and pain experienced by Indians when they see the native forms of life in America ruthlessly and wantonly destroyed. It was not primarily the realization of economic loss, the loss of a valuable source of food, which caused distress to Indians when, for instance, they witnessed the destruction of wild rice fields and lotus beds, but it was the sense of a fearful void in nature ensuing upon the extinction of a given species where it had formerly flourished. They were pained to contemplate the dislocation of nature's nice balance, the destruction of world symmetry.

I have been told many times, by different persons of various different tribes, of the teaching concerning the sanctity of life which they received in their childhood. They tell me that they were taught by their parents and elders that plants and animals must not be destroyed needlessly, that wanton destruction is wicked. A precept which they frequently heard was: "Do not needlessly destroy the flowers on the prairie or in the woods. If the flowers are plucked there will be no flower babies (seeds); and if there be no flower babies then in time there will be no people of the flower nations. And if the flower nations die out of the world, then the earth will be sad. All the flower nations, and all the different nations of living things have their own proper place in the world, and the world would be incomplete and imperfect without them."

I once asked an old Omaha what was the feeling of Indians when they saw white men wantonly slaughtering the buffalo. He dropped his head and was silent for a little while, seeming to be overcome by a feeling of sadness. When he spoke again it was in a low, sad tone, seeming filled with shame that such a thing could be done by human beings. He said: "It seemed to us a most wicked, awful thing."

Again I was talking with an old man of the Omaha nation. He, recalling the old days and comparing them with the present time, said: "When I was a youth the country was very beautiful. Along the rivers were belts of timberland, where grew cottonwoods, maples, elms, ash, hickory and walnut trees, and many other kinds. Also there were various kinds of vines and shrubs. And under these grew many good herbs and beautiful flowering plants. In both the woodland and the prairie I could see the trails of many kinds of animals and hear the cheerful songs of birds of many kinds. When I walked abroad I could see many forms of life, beautiful living creatures of many kinds which Wakanda had placed here; and these were after their manner walking, flying, leaping, running, playing all about. But now the face of all the land is changed and sad. The living creatures are gone. I see the land desolate, and I suffer an unspeakable sadness. Sometimes I wake in the night and I feel as though I should suffocate from the pressure of this awful feeling of loneliness."

MUSEUM OF THE AMERICAN INDIAN,
OCTOBER 7, 1927.

THE FLORA OF SIBERIA*

T. D. A. COCKERELL

After we left Moscow on the Transiberian Railroad, we crossed Russia by way of Vologda, Viatka and Perm, reaching the Sib-

* The identification of plants mentioned are based on my knowledge of the genera and some of the species, the notes from the literature I brought with me, and identifications kindly made for me at the Baical Station of the University of Irkutsk, by the botanists W. Jasnitsky and Nina A. Epoff.

erian border in the vicinity of Tyumen. It was very hot when we arrived in Leningrad on July tenth, and continued so while we were in European Russia, but as we approached the Urals it began to rain, and we had no opportunity to get a good view of the mountains. All across Siberia, nearly to Irkutsk, it was cold and rainy, the weather being (we are assured) quite exceptionally bad this year. In all this long journey two species of plants stand out as most characteristic and universally present. One is the birch (*Betula alba* or related segregates), the other *Epilobium* or *Chamaenerion angustifolium*. The latter, we thought, should be the Russian national flower. It occurs in masses in the woods, enlivening the landscape by its bright pink color. In places, I thought I could see also *Lythrum salicaria*, but could not be quite sure from the train. The landscape crossing Siberia was on the whole monotonous; open grassy country, giving place here and there to forest. The forest is called "taiga," and the station Taiga, where people change for Tomsk, is evidently so named because it stands near the beginning of a considerable forested area. We passed no desert country and it is easy to understand how the Palaearctic biota can spread east and west from Lake Baikal to the shores of Europe. Our first real contact with the Siberian flora was at Ust Balei, on the River Angara, where we went to examine the Jurassic beds which contain fossil insects. The locality is famous not only on account of the fossil insects but also for an extensive flora, described by Heer in 1878. We found the exposures on the cliffs facing the east side of the Angara, and guided by Mr. Jemchujnikov of the Geological Committee, had no difficulty in finding numerous specimens. The various kinds of *Ginkgo*, *Samaropsis*, *Phyllotheca*, *Baiera*, *Kaidocarpum*, etc. were very well preserved, as well as species of ferns. Seward has shown that the nomenclature of Heer is to be considerably revised, and I suppose that the 56 species catalogued from the Irkutsk district will have to be reduced to a much smaller number. However, the large collections already made by Jamchujnikov have been sent to Leningrad, and it is expected that a revision will be forthcoming in due course. The bank where we got the fossils was covered in large part by a growth of vegetation with many beautiful flowers. I catalogued the genera I happened to see just around me, as follows: *Trifolium*, *Lilium*, *Euphrasia*, *Equisetum*, *Rosa*, *Salsola*, *Allium*, *Galium*, *Sanguisorba*, *Artemesia* (with parasitic *Orobanche*), *Geranium*, *Spiraea*, *Cotoneaster*, *Fragaria* (wild strawberries are abundant and much used for preserves), *Linaria*, *Aconitum*, *Convolvulus*, *Scutellaria*, *Agrimonia*, *Sedum*, *Campanula*, *Thymus*, *Potentilla*, *Sisymbrium*, *Epilobium*, *Plantago*, *Achillea*. This is a very typical Palaearctic series, with no infusion of oriental elements. Returning from Ust Balei, we visited the Biological Station of the University of Irkutsk, on the western shore of Lake Baikal. This is a charming spot, with flowery meadows and pine-covered hills, and in front the great lake, with the Transbaikal Mountains on the other side appearing high and formidable. Perhaps the most conspicuous and splendid flower of this region is the magnificent blue *Delphinium grandiflorum*. According to Hans Johansen of Tomsk (1925) there is around Baikal an endemic variety, *turczaninowii* Popl. but whether all the plants belong to it I do not know. A species of *Sanguisorba* is extremely abundant throughout this country: Johansen cites a species *S. baicalensis* Popl. peculiar to the region, but the local botanists refer the common plant to the European species. The birch is considered to be *Betula alba verrucosa;* Johansen mentions a *B. baicalensis* from the vicinity of the lake. We found the yellow poppy which Johansen cites as a possible endemic variety of *Papaver nudicale*. Other local forms or species are referred to under *Polygonum*, *Elymus* and *Festuca*, but I gather that on the whole the flora is not at all rich in peculiar species. It impresses one as essentially of European type, with little in common, so far as species are concerned, with the flora of the Maritime Province, which we saw in 1923. Thus we saw no sign of the *Trollius ledebouri* and the flame-colored *Lychnis fulgens* so conspicuous in the Maritime (Primarsky) Province. On the other hand, one has the feeling that several of the species, assigned to European types, are not exactly the same and might be considered racially distinct. The *Achillea millefolium* is nearly all various shades of pink; the *Chrysanthemum leucanthemum* is variable and perhaps not quite the same as the plant familiar in England. Another *Chrysanthemum*, with pinkish flowers, is *C. sibiricum*. *Chelidonium majus* appears to be exactly as in Europe; so also *Rhinanthus crista-galli*. *Geranium* is represented by two splendid large-flowered species, *G. eriostemon* and *G.*

pratense, and the small-flowered *G. sibiricum*. A common *Spiraea* with pink flowers is referred to *S. salicifolia*. *Potentilla* or *Dasiphora fruticosa* is exceedingly abundant, looking just as it does in Colorado. *Polemonium coeruleum* represents a genus that has its headquarters in America. *Scutellaria galericulata*, in great abundance, reminds us of our Colorado *S. brittoni*. *Parnassia palustris* is everywhere in damp places. The common dandelion (*Taraxacum*) is all around the station. There is a tall light yellow aconite (*Aconitum barbatum*), and also a blue species of the *A. napellus* type. Yellow bedstraw (*Galium verum*) is conspicuous; the white species (*G. boreale*) is rather less common. *Tanacetum vulgare* shows its orange button-like heads everywhere. *Lilium tenuifolium*, with red flowers and narrow leaves, occurs here and there; a little later we found *L. martagon*. There is a blue *Lactuca*, looking like the Colorado *L. pulchella*. *Polygonum vivaparum* and *P. bistorta* are familiar plants. *Lamium album* reminds us of England; in the Maritime Province is a distinct form with pinkish flowers, considered a different species (*L. petiolatum*). I noticed, however, that rarely the *L. album* in the Baikal region was somewhat pink. *Veratrum* abounds, occupying the same ecological position as in Colorado. *Polygala vulgaris* seems to be quite the same as the English plant. *Leonurus cardiaca* has a weedy aspect, we found it also in Irkutsk where it was very attractive to wild bees. *Phlomis tuberosa* is a tall labiate with pink flowers; I also found a f. *albiflora*, with pure white flowers. *Campanula glomerata* is one of the most conspicuous elements of the flora: *C. steveni*, with long blue flowers is much less common. There are numerous umbellifers, including *Peucedanum baicalense*. The tall stems of *Hieracium umbellatum* are commonly seen on the slopes. A delicate *Zygadenus* is referred to *Z. sibiricus*. The local *Sambucus*, with red berries is referred to the wide-spread *S. racemosa*. The low-growing *Rubus articus* has large edible fruits which are used for jam. A species of azalea (*Rhododendron*) is one of the commonest bushes, but not now in flower. It is much like the one seen in New York State at Garrison. *Hemerocallis flava* is very abundant, and recalls our gardens. I have notes of many other plants, but the above will suffice to give a good idea of the flora.

At Maritne, further down the lake, I found a *Cardamine* which seemed to be *C. pratensis*. Later we went to Kultuk, at the southwest corner of the lake, and thence to Archan, 105 versts west of Kultuk. The journey to Archan was an arduous one, two days in a springless cart with a cushion of hay. The first day we started at 6:20 A.M., and reached our night's lodging at 11:30 P.M. Archan, famous for its mineral springs, is situated at the foot of a splendid range of mountains, strongly suggestive of Switzerland. The altitude is 900 meters above sea level. The flora is on the whole identical with that of the region around Baikal, in spite of the greater altitude. The lake is excessively cold, and this probably has some effect on the surrounding biota. Outstanding features in the Archan flora are a splendid pink *Paeonia* (in fruit at the time of our visit), a large flowered *Hypericum*, a handsome *Achillea* of the *A. ptarmica* type, an *Ephedra* with large bright red berries, *Pulsatilla*, with yellowish tinted flowers, at least when first opened, two gentians, one of the type of our *G. barbellata*, but larger, the other a *Dasystophana*. At Smolenschona and Kychtak, near Irkutsk, we found a beautiful red fruited *Crataegus*. There is a fine *Dianthus* very common throughout this region.

The roses, everywhere abundant, appear to me to belong to a single species, a form with densely bristly stems and red fruits, which are usually elongated, exactly like those of our *R. engelmanni*. The fruits vary in shape and are sometimes much shorter and rounder. This plant is evidently *Rosa baicalensis* Turczaninov, or *R. acicularis baicalensis*. I was very anxious to get buds for Dr. Hurst of Cambridge, so that he might study the chromosomes, these being quite unknown in Siberian roses. For a long time we could find only plants in fruit but on the high ground east of Kultuk my wife detected a plant in flower, and we got a few buds, which were preserved in Carnoy's fluid. We secured a number of seeds of different plants, including those of an *Aquillegia*, which was past flowering. This was at Archan.

Populus tremula is common at Archan, occupying the same position as our *P. tremuloides* in Colorado. No *Quercus* has been seen in the whole region. *Alnus* is common, and *Larix* is a conspicuous feature of the valleys. A large hemp-like *Urtica* abounds everywhere along the roadsides. It is appropriately called *U. cannabina*.

At Archan we met Demitri Korposoff, an illiterate peasant who seems to be a born naturalist, and knows the life of the region well. He has on his own initiative constructed an apparatus for distilling the oils of various plants, especially oil of juniper from a species of *Sabina* (of which he furnished a specimen) obtained high up on the mountains at timber line.

IRKUTSK, SIBERIA,
AUGUST 21, 1927.

A NEW PINWEED FROM SOUTHERN PENINSULAR FLORIDA

JOHN K. SMALL

Some years ago a collector resident in Florida for many years, stated that "Lecheas are scarce in this State." Such a statement indicates that at that time much of the State was unexplored, for today we know about a dozen species of the genus Lechea native within the boundaries of Florida. The following proposed species grows in the most southern island of scrub known on the eastern coast. It is now well within the city limits of Miami. A few years ago the spruce-pine (*Pinus clausa*) and the rosemary (*Ceratiola ericoides*) grew there, but frequent fires have now exterminated these prime characteristic scrub plants.

Lechea Deckertii Small, sp. nov. Plants 0.5–1.5 dm. tall, yellowish-green: flowering stems erect, bushy-branched, minutely appressed-pubescent, brown, the branchlets slender-wiry or almost filiform, evenly scarred with leaf-bases: leaves of the branchlets, linear to linear-subulate, 1.5–2.5 mm. long, acutish, glabrous, sessile: bracts of the inflorescence similar to the leaves, but smaller: flowers relatively few: pedicels about 1 mm. long, reddish, glabrous, mostly spreading at maturity: sepals of two kinds, green, the two outer ones about 0.5 mm. long, acute, the three inner, oval, nearly 1 mm. long, concave, obtuse, persistent for a time, but deciduous when the fruit is fully mature: petals oval or suborbicular, about as long as the inner sepals, obtuse, reddish: filaments slender-filiform, about 1.5 mm. long: anthers subglobose, about 0.2 mm. long: capsule subglobose, 1.2–1.3 mm. in diameter, glabrous, shining, exceeding the sepals.—Scrub, Miami (N. W. 64th Street), formerly Lemon City.

Specimens of this pinweed were first found by the writer on December 18, 1921, but without flowers or fruits. The locality was visited again last winter and early this spring (1926) but the plants were only in leaf. Early in June Mr. Richard F. Deckert—for whom the species is named—collected specimens in flower and by the last week in June sent in specimens in fruit.

Through its narrow cauline leaves and short outer sepals, *Lechea Deckertii* is related to *Lechea racemulosa*, but it differs from it in the globose and exserted capsule. The type specimens are in the herbarium of the New York Botanical Garden.

A NEW CHAMAESYCE FROM TROPICAL FLORIDA

John K. Small

Of the fifteen or more spurges (*Chamaesyce*) of the Everglade Keys of southern peninsular Florida, the great majority are pineland inhabitants. They are mostly well marked species, some of them with very characteristic habits of growth. Some are erect and single-stemmed, others are prostrate and many-stemmed. Two species—*C. deltoidea* and the one under consideration—form mats that cling closely to the limestone rocks; thus unlike any spurges of this genus in our flora. The second species just referred to may be named and described as follows:

Chamaesyce adhaerens Small, sp. nov. Perennial with a woody single or clustered tap root, the stems and branches several to many, ultimately copiously branched and forming closely prostrate mats, wiry-filiform, finely hirsutulous or villous-hirsutulous: leaves opposite, often very numerous: blades reniform, orbicular-reniform, or ovate-reniform, 2–3.5 mm. long, cordate or subcordate at the base, entire, rounded at the apex, finely gray-pubescent, often densely so on both sides: involucre broadly campanulate or hemispheric, nearly 1.5 mm. long, rather long-peduncled, closely minutely pubescent; glands transversely elliptic or semielliptic, fully 0.5 mm. wide; appendages of the glands mere pale margins to the glands or obsolete: capsule ovoid-globose, fully 1 mm. long, finely pubescent, very fragile, nodding: seed ovoid, about 1 mm. long, the faces slightly wrinkled.—Pinelands, Everglade Keys, S. pen. Florida.

In the summer and fall, when the pineland flora of the Everglade Keys is at its best, the spurge just described is very common, especially where the limestone is moist from capillary-water. It commonly covers the rocks with dense gray mats. Its nearest relative, both in technical characters and in habit is *Chamaesyce deltoidea* with which it grows. It differs from that species, however, in the pubescent foliage, stouter less wiry stems and branches, and the glabrous pods. The type specimen—collected in pinelands between Peters Prairie and Homestead, Florida, November 10th, 1906, by J. K. Small and J. J. Carter *No. 2531*, is in the herbarium of The New York Botanical Garden.

BRIEF NOTES ON LOCAL PLANTS

H. M. Denslow

There is a large colony of *Rhododendron maximum* L. in the town of West Milford, Passaic County, New Jersey. It is on a dry hillside in open woods, in and adjacent to a woodroad, long disused, and accompanied by a vigorous growth of *Kalmia latifolia* L.

A small group of *Conopholis americana* (L. f.) Wallr, was observed on August 4, 1927 near Greenwood Lake in the town of Warwick, Orange County, New York.

This past season has been favorable for many species of Orchidaceae but not always for the perfecting of their fruit. Of more than 200 plants of *Fissipes acaulis* counted in Masonville, N. Y. and Burlington, Ct. that had bloomed, only two had fruiting capsules. Perhaps their late blooming was too late for the needed insect visitors.

NOTES FROM ERIE COUNTY

Anne E. Perkins

In 1925 I found *Serapias Helleborine* L., well established and spreading in Cascade Park woods, near Springville, Erie County, N. Y. This was the first time I had seen the plant, although I had botanized often in the vicinity of Collins and on the Reservation. In the present season I have found a most amazing spread of Serapias; on the Reservation, where I have never seen it previously, in remote, swampy woods, in hillside thickets, and also in woods near the railroad, Collins. There is no possibility of transmission by human agency in most of these stations. The plant varies greatly in size and robustness, also in the beauty of its coloring. Some plants resemble a Cypripedium, stocky, with large leaves, over a foot tall, others are slender and delicate. For over twenty years I have explored the very places where it is now so plentiful, without finding it. Mr. Frank W. Johnson has seen it occasionally in other parts of the Reservation, but never so plentifully as this season.*

In a recent letter Mr. Johnson writes, of Serapias, "I mow it in my lawn. It fruits in my shrubbery and is abundant along important city streets."

He reports it in Buffalo not far from his home on Amherst Street. It is interesting to note that at times it is the only orchid in the station, again is on orchid banks where occur *Limnorchis hyperborea*, *Galeorchis spectabilis*, the Cypripedia, and *Malaxis monophylla*, which last has proved much more common than was supposed, at least three stations having been found, where it is not infrequent.

We have an abundance of *Cypripedium reginae*, *parviflorum*, *pubescens*, less of *C. acaule* (*C. candidum* was here but has not been found by me), *Galeorchis spectabilis*, occasional *Gymnadeniopsis clavellata* (3 stations in this county), occasional *Blephariglottis lacera* and *Lysias orbiculata*, considerable *Limnorchis hyperborea*, an abundance of *Ibidium plantagineum*, considerable *Corallorrhiza maculata*. Once I have found *Liparis Loeselii*, once *Malaxis unifolia*, and the present September three plants of *Corallorrhiza odontorhiza*. *Lysias Hookeriana* is well established in two places, over 50 plants in one station and about 40 in another, less than 6 in the third. *Blephariglottis psycodes* is common. Collins is credited also with having *B. peramoena* and *B. fimbriata* formerly, but I have not found them. *Limnorchis dilatata* has been found twice, but not recently, on the Indian Reservation.

Undoubtedly intensive search of the swamps would reveal much more, as to date I have found three not hitherto reported in Erie County, viz, *Malaxis unifolia*, *Gymnadeniopsis clavellata*, *Corallorrhiza odontorhiza;* and *Lysias Hookeriana* which had been lost to the County for many years.

Ibidium Romanzoffianum, *I. gracile* and *Ophrys australis* are credited to Erie County by Dr. House in his Annotated List, published in 1924.

Gowanda State Hospital
September, 1927

PROCEEDINGS OF THE CLUB

Meeting of October 11, 1927

This meeting was held in the Children's Room of the Laboratory Building of the Brooklyn Botanic Garden and was called to order at 8:20, with Vice-President Gager in the chair. The

Secretary spoke of the splendid work of the Treasurer, Mrs. H. M. Trelease, in her successful canvass for new members, which has made it possible for the Club to take a long step forward. The following candidates were then elected to membership:

Miss Rosella Ames, Marshfield, Massachusetts.

Miss Lela V. Barton, Box 238, Fayetteville, Arkansas.

Dr. F. E. Denny, Boyce Thompson Institute, Yonkers, New York.

Prof. Carroll W. Dodge, Farlow Herbarium, Harvard University, Cambridge, Massachusetts.

Dr. J. Andrew Drushel, 209 Edgewood Ave., Westfield, N. J.

Mr. Fred W. Emerson, Earlham, Indiana.

Dr. John M. Fogg, Jr., Farlow Herbarium, Harvard University, Cambridge, Massachusetts.

Dr. Eloise Gerry, U. S. Forest Products Lab., Madison, Wis.

Mr. Robert Hagelstein, 165 Cleveland Avenue, Mineola, N. Y.

Dr. L. F. Heimlich, Valparaiso University, Valparaiso, Ind.

Prof. C. H. Kauffman, 1236 Prospect St., Ann Arbor, Mich.

Prof. B. F. Lutman, 111 N. Prospect St., Burlington, Vt.

Prof. Thomas H. MacBride, The Wilsonian, Seattle, Wash.

Prof. Aven Nelson, University of Wyoming, Laramie, Wyoming.

Dr. Alice M. Ottley, 46 Dover Road, Wellesley, Mass.

Mr. Charles S. Parker, 321 11th Street, N. E., Washington, D. C.

Dr. Norma E. Pfeiffer, Boyce Thompson Institute, Yonkers.

Prof. A. Reginald Prince, Box 427, Truro, Nova Scotia, Canada.

Dr. H. E. Pulling, Wellesley College, Wellesley 81, Mass.

Miss Ethel Savacool, 155 West 65th St., New York City.

Miss Marjorie Swabey, Brooklyn Bot. Garden, Brooklyn, N. Y.

Prof. T. W. Turner, Hampton Normal & Agric. Inst., Hampton, Va.

Dr. Leva B. Walker, University of Nebraska, Lincoln, Neb.

Dr. Elda R. Walker, University of Nebraska, Lincoln, Neb.

Dr. Lewis E. Wehmeyer, 51 Prentiss St., Cambridge, Mass.

Prof. Alice W. Wilcox, Brenau College, Gainesville, Georgia.

The Secretary reported that the committee consisting of the officers of the Club appointed at the last meeting to select representatives for Section G of the American Association for the Advancement of Science, had chosen Dr. R. A. Harper of Columbia University and Dr. J. Arthur Harris of the University of Minnesota. This selection was ratified by unanimous vote of the Club.

In the discussion as to the method of selection of these representatives in the future, it was brought out that the present Constitution gives no authority for the selection of a representative in the Council of the New York Academy of Sciences. It was therefore voted that the method of appointment of all these delegates be left to a committee consisting of the officers of the Club for future report. The Secretary read the amendments to the Constitution proposed by Dr. Barnhart at the Meeting of March 30 and by Dr. Britton at the Meeting of April 27.

Miss Nicholson reported on her recent visit to Montauk Park, Long Island, and to the Arnold Arboretum. At the former place the fields were vividly colored by asters and goldenrod. Mr. Taylor spoke of his botanical survey during the past summer of Alleghany State Park, a tract of 65,000 acres south of Buffalo, New York, perhaps 75% of which is trackless forest. Very few fires have occurred here, and as a result of this combined with frequent rains, the humus is deep. The maximum temperature in July and Aug. was 76° this year in the Birch-Beech Maple forest, and was often comparatively low at night—between 35 and 40°. There is much of the Beech-Birch-Maple association with a little Hemlock intermixed. White pine was cut out years ago, but there is some fir. Many plants not found in the Greater New York region, or only rarely so, are abundant there, e. g. *Monarda didyma*, *Rudbeckia laciniata*, *Hydrophyllum canadense*. Dr. Cheney mentioned the very comprehensive collection of trees at Letchworth Park, N. Y. Near the falls there is a unique stand of timber with some individuals of great age. He remarked on the abundance of the common Forget-me-not (*Myosotis scorpioides* L.) in the roadside gutters on the outskirts of Alfred, New York. Dr. Gundersen reported on the plants on the summit of Black Dome, Greene Co., N. Y. 3990 ft., where 26 species of vascular plants were found the past summer. It is interesting to note, he said, that of the maples, only *Acer spicatum* occurs here, while on the summit of Black Head nearby and 50 ft. lower, both *A. spicatum* and *pennsylvanicum* occur. This corresponds to the general distribution of these two maples, *A. pennsylvanicum* being a slightly more southern form. The Secretary announced the presence of *Dasyscypha Willkommii*, the cause of the canker of the European Larch on European Larch at Hamilton, Mass. The fungus had evidently been present in this plantation for many years. Mr. Beals spoke of his visit to Dr. Gundersen's farm in the Catskills and also of a trip to Green Pond near Belvidere, New Jersey, to find the Showy Orchis. He was unsuccessful, but found *Arethusa bulbosa*. *Camptothecium nitens*, which grows in cold bogs, was found near Sparta, between Pine Hill and Lake Hopatcong. He reported *Tetraplodon bryoides* and *angustata* on animal dung in the region of Mt. Wittenberg in the Catskills. He mentioned the great activity of the British Bryological Society in the study of mosses and hepatics, and outlined its excellent system of exchanges.

Dr. Gager, alluding to his recent European trip, told of the subtropical vegetation at Cornwall and Devon—large Dracaenas and Fuchsias, and two or three species of palms out-of-doors, also the Monkey Puzzle tree, which is not hardy here. The moss house at Glasgow was a most interesting sight—also the fern house, founded by Sir William Hooker.

Arthur H. Graves,
Secretary.

Meeting of October 26, 1927

This meeting was held at the Museum Building of the New York Botanical Garden. The minutes of the meeting of October 11 were read and approved. The following candidates were unanimously elected to membership:

Mrs. Lewis H. Mounts, Ballard Normal School, Macon, Georgia.

Dr. Harold St. John, State College of Washington, Pullman, Washington.

Dr. Albert R. Sweetser, Botanical Dept., University of Oregon, Eugene, Oregon.

The amendment to Article XVIII of the Constitution, relating to the time and place of club meetings, proposed by Dr. Britton at the meeting of April 27, was read by the Secretary, who reported that the committee consisting of the President, Dr. Trelease, and the Secretary was favorable to its adoption. By this amendment the first part of Article XVIII, which formerly read: "The regular meetings of the Club shall be held on the second Tuesday and the last Wednesday of each month from October to May inclusive, at such hour and place as the Club may direct," is to be changed to read as follows: "Unless otherwise determined by the Club, the regular meetings shall be held on the second Tuesday and the last Wednesday of each month from October to May inclusive, except the last Wednesdays of November and December, at such hour and place as the club may direct." On the motion of Dr. Hollick it was unanimously voted by the Club that the Secretary be requested to cast a ballot for the adoption of this amendment.

With regard to the propositions of Dr. Barnhart made at the meeting of March 30, the Secretary reported that the above-named committee was unfavorable to their adoption. As a result of a separate ballot on each proposition the majority was against adoption in each case.

The Secretary reported that the committee composed of the officers of the Club, to whom the method of election of a delegate to the Council of the N. Y. Academy of Sciences and representatives on the Council of the A.A.A.S., had been referred, offered the following amendment to Article III of the Constitution: to omit the word "and" before "a Bibliographer" and add after Bibliographer, the words, "one delegate to the Council of the N. Y. Academy of Sciences, and two representatives in the Council of the American Association for the Advancement of Science." Several members felt that it was incorrect to thus class the delegates to these Societies as officers of the Club, and after some discussion it was voted by the Club, on the motion of Dr. Hollick, that the proposed amendment be referred back to the same committee of the officers of the Club with the suggestion that the proposition be placed in the form of a By-law instead of an amendment to the Constitution.

The Club then listened to an interesting talk by Mr. E. B. Matzke of Columbia University, on Cell Form.

Many of the single celled plants and animals are spherical in shape, or more or less so at least; and this form is assumed because in that way the greatest volume is attained with the least surface area. What then is the form assumed by cells in aggregates, as in tissues?

If four spheres are placed at equal intervals about a central one, so that the centers of all of them are in the same plane, and then one is placed directly above and one directly below the central one, there will be six surrounding the central one. If now equal pressure is applied to all the surrounding spheres the central one will assume the form of a cube. The familiar "cannonball" stacking of spheres, with six surrounding a central one, all with their centers in one plane, and then three above and three below, gives rise to the rhombic dodecahedron. The cube does not give economy of space per unit of volume; and the rhombic dodecahedron is objectionable because of its tetrahedral angles. Kelvin, having studied the investigations of Plateau, on soap films, decided that tetrahedral angles were unstable. To overcome this objection he described a fourteen-sided figure, six surfaces of which are quadrilateral and eight hexagonal; this he called a tetrakaidecahedron. If all the quadrilaterals are squares and all the hexagons regular hexagons, and the sides of the squares and hexagons all equal, the figure is an "orthic tetrakaidecahedron."

The recent investigations of Lewis show that the economy of surface per unit of volume is greater for the tetrakaidecahedron than for the rhombic dodecahedron.

Lewis, studying cells of elder pith, found that the average number of surfaces for one hundred cells was 13.96; and the average for one hundred cells of human adipose tissue was 14.01, suggesting very strikingly that cells in undifferentiated tissue tend to be tetrakaidecahedra.

Recent criticisms of this work, stating that orthic tetrakaidecahedra will not fill space when stacked together, can be answered first, by demonstrating geometrically that these figures will fill space—and this has been done—and secondly by making models and stacking them together.

The space-lattice concept, developed by crystallographers, can be extended to tissues and tissue systems. If cells are represented by a point or points, as for instance the center of gravity of each cell, or a similar point on each surface of the cell wall, a pattern of points is revealed, similar in many respects to the space-lattices of the crystallographers. Different tissues would in many instances at least reveal different patterns, and several tissues closely associated would show interpenetrating space-lattices.

The geometrical demonstration of the fact that orthic tetrakaidecahedra will fit together without voids has been presented by Mr. Matzke in the April number of the Bulletin, pp. 341–348.

ARTHUR H. GRAVES,
Secretary.

NEWS NOTES

Dr. Benjamin Dayton Jackson, author of the Index Kewensis and curator of the Linnean Collections died as the result of an automobile accident on October twelfth. Dr. Jackson was in his eighty-second year.

The National Geographical Society is arranging an expedition to the Pavlof volcanic group of islands off the Alaskan Peninsula for next April. The expedition, which will be headed by Dr. Thomas Jaggar of the United States Geological Survey at Mount Kilauea in Hawaii, will study the volcanology, physiography, wild life and botany of the islands.

Dr. Orland E. White, formerly of the Brooklyn Botanic Garden, has returned from Europe to begin his new work as professor of agricultural biology at the University of Virginia. While in Europe Dr. White read a paper on "Mutation, Adaptation, Temperature Differences and Geographical Distribution of Plants" before the Fifth International Congress of Genetica at Berlin. (Science).

Dr. Julia Warner Snow, associate professor of botany at Smith College and a specialist in fresh-water algae, died on October 24.

Two prizes, founded by the late Dr. William Johnson Walker, are annually offered by the BOSTON SOCIETY OF NATURAL HISTORY, of Boston, Mass. for the best memoirs written in the English language, on subjects proposed by the Board of Trustees.

For the best memoir presented a prize of sixty dollars may be awarded; if, however, the memoir be one of marked merit, the amount may be increased to one hundred dollars, at the discretion of the Walker Prize Committee.

For the next best memoir a prize not exceeding fifty dollars may be awarded.

Prizes will not be awarded unless the memoirs presented are of adequate merit.

The competition for these prizes is not restricted, but is open to all. It is nevertheless the tradition of the Society that the founder of these prizes intended them more in the nature of encouragement to younger naturalists than as rewards for the work of mature investigators.

Attention is especially called to the following points:

1. In all cases the memoirs are to be based on a considerable body of original and unpublished work, accompanied by a general review of the literature of the subject.

2. Anything in the memoir which shall furnish proof of the identity of the author shall be considered as debarring the memoir from competition.

3. Although the awards will be based on their intrinsic merits, preference may be given to memoirs bearing evidence of having been prepared with special reference to competition for these prizes.

4. Each memoir must be accompanied by a sealed envelope enclosing the author's name and superscribed with a motto corresponding to one borne by the manuscript, and must be in the hands of the Secretary on or before March 1 of the year for which the prize is offered.

5. The Society assumes no responsibility for publication of manuscripts submitted, and publication should not be made before the Annual Meeting of the Society in May.

SUBJECT FOR 1928

Any subject in the field of botany.

At Cornell University the ground was broken in September for the new building of plant industries. This building is to be connected with Baker Hall of the College of Agriculture.

Frederic S. Lee, research professor of physiology in Columbia University, has resigned the presidency of the board of managers of the New York Botanical Garden after a service of five years, in order to devote his time entirely to research work at Columbia University.

Dr. Leslie A. Kenoyer, of Western State Teachers College, Kalamazoo, has presented to the U. S. National Herbarium a collection of about six hundred plants obtained on Barro Colorado Island, Panama, during July and August. The collection contains about 190 species previously unreported from the island, four of which are new species. The collector is collaborating with Dr. Paul C. Standley in a publication of these additions to the flora of the island.

During the second semester 1927–1928, beginning Wednesday, February 8th and continuing until May 26th, the Department of Botany at the University of Illinois announces the following courses to be given by Professor W. W. Lepeschkin of the Laboratory of Plant Physiology, Charles University, Prague, Czecho-Slovakia.

Botany 35.—Physiological processes of the plant from a physico-chemical standpoint. 3 hours a week.

Botany 123.—Discussions in physiology from a physico-chemical standpoint. Once a week.

Professor Lepeschkin comes to the University as Visiting Professor, and will give half time to his work in the department. The programme has been so arranged that Professor Lepeschkin will have the beginning and end of each week free for lectures at other institutions. Arrangement for such lectures may be made through the Department of Botany.

DATES OF PUBLICATION OF TORREYA, VOLUME 27, 1927

No. 1.	Jan.–Feb.	February 24
No. 2.	Mar.–Apr.	April 14
No. 3.	May–June	June 25
No. 4.	July–Aug.	September 17
No. 5.	Sept.–Oct.	November 5
No. 6.	Nov.–Dec.	January 7

INDEX TO VOLUME TWENTY-SEVEN

The names of species and varieties described as new are in **bold faced** type.

OTHER PUBLICATIONS

OF THE

TORREY BOTANICAL CLUB

(1) BULLETIN

A journal devoted to general botany, established in 1870 and published monthly, except during July, August, and September. Vol. 53, published in 1926, contained 671 pages of text and 29 full page plates. Price $4.00 per annum. For Europe, $4.25.

In addition to papers giving the results of research, each issue contains the INDEX TO AMERICAN BOTANICAL LITERATURE—a very comprehensive bibliography of current publications in American botany. Many workers find this an extremely valuable feature of the BULLETIN.

Of former volumes, 24–53 can be supplied separately at $4.00 each; certain numbers of other volumes are available, but the entire stock of some numbers has been reserved for the completion of sets. Single copies (50 cents) will be furnished only when not breaking complete volumes.

(2) MEMOIRS

The MEMOIRS, established 1889, are published at irregular intervals. Volumes 1–17 are now completed. The subscription price is fixed at $3.00 per volume in advance; Vol. 17, containing Proceedings of the Semi-Centennial Anniversary of the Club, 490 pages, was issued in 1918, price $5.00. Certain numbers can also be purchased singly. A list of titles of the individual papers and of prices will be furnished on application.

(3) Index to American Botanical Literature, reprinted monthly on cards, and furnished to subscribers at three cents a card.

Correspondence relating to the above publications should be addressed to

MRS. HELEN M. TRELEASE
Box 42 Schermerhorn Hall,
Columbia University,
New York.