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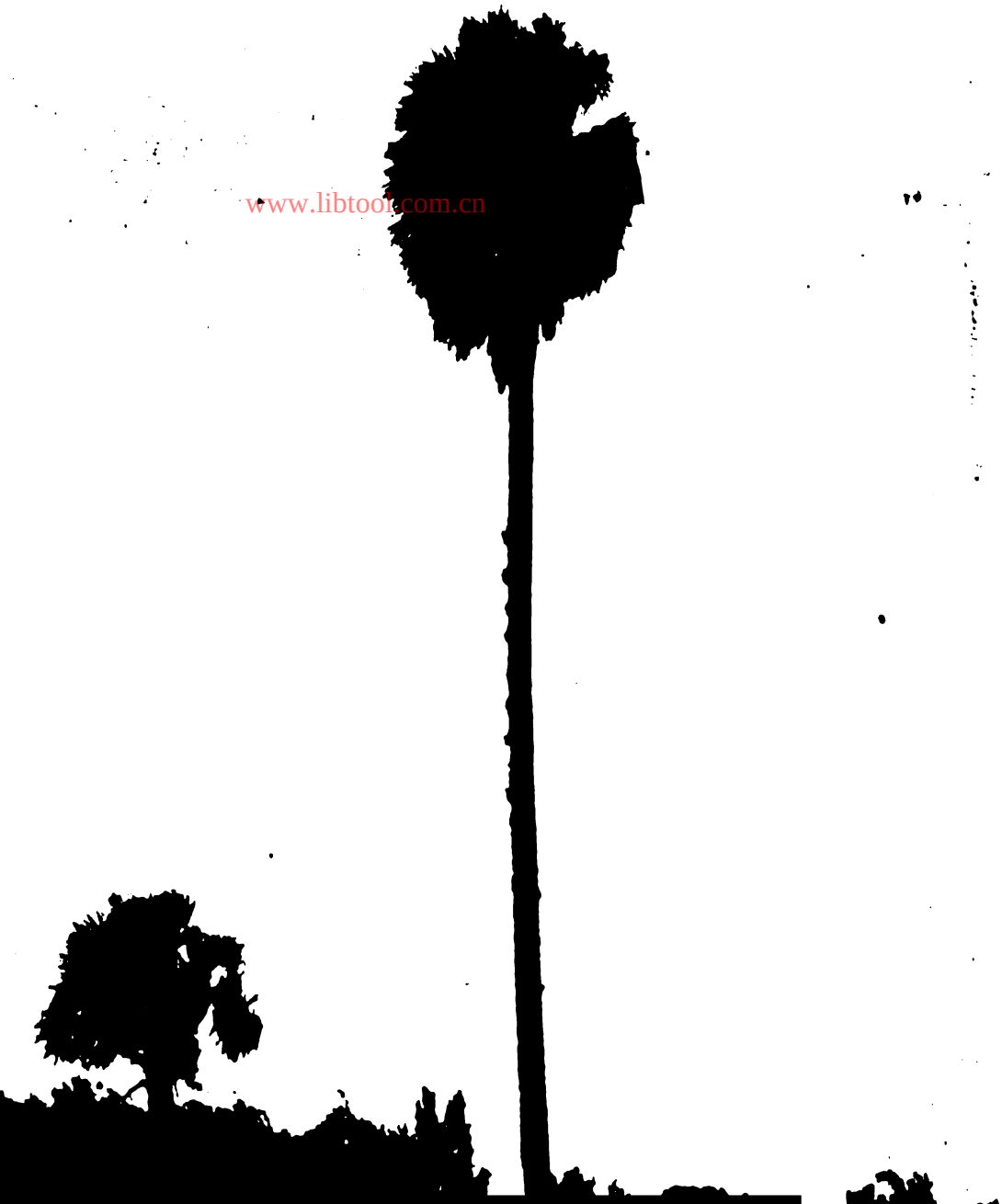

# Torreya

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A Monthly Journal of Botanical Notes and News

JOHN TORREY, 1796–1873

EDITED FOR

THE TORREY BOTANICAL CLUB

BY

JEAN BROADHURST

Volume VIII.

NEW YORK

1908

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## ERRATA, VOLUME 8

Page 25, 2d line from bottom (footnote), *for* No. 2, *read* No. 1.

Page 54, 10th line, *for* yellew *read* yellow.

Page 60, 1st line, *insert* a hyphen at the end of the line.

Page 102, 3d line, for *matricariaefolium* read *neglectum*.

Page 125, last line (footnote), *complete the brackets*.

Page 155, last line, *for* successively *read* successfully.

Page 163, 12th line from bottom, *for* The problems *read* The progress.

Page 195, 10th line, *for* others *read* other.

Page 207, 12th line from bottom, *for* Lause *read* Lancelot.

Page 217, last line, *for* ew *read* New.

Page 218, 7th line, *for* OEningen *read* Oeningen.

Page 232, 6th line, *for* Karston *read* Karsten.

Page 233, 2d line from bottom (footnote), *for* Radioactivity and Life *read* " Radioactivity and Life ".

Page 237, 2d line, *for* Linnaeus " *read* Linnaeus.

Page 237, 3d line, *for* Specific *read* " Specific.

Page 246, 5th line, *omit* comma *before* are.

Page 250, end of the 12th line from bottom, substitute comma for the period.

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JOHN TORREY, 1796–1873

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# THE PINE-BARRENS OF BABYLON AND ISLIP, LONG ISLAND

By Roland M. Harper

To the botanist who regards a habitat merely as a place where certain species of plants may be found, the pine-barrens to be described below possess few attractions, for their flora is not very rich, and nearly all the species are pretty widely distributed and well known. But to the phytogeographer every habitat that has not been too much disfigured by civilization is of interest, whether its plants are few or many, common or rare; so no apology is necessary for publishing the following notes.

The pine-barrens of Long Island are very easy of access, but they seem never to have been adequately described, chiefly for the reason given above. Brief references to them occur in some old historical works, such as B. F. Thompson's History of Long Island (1839), on page 16 of which is the following statement: "There is another extensive tract lying eastward from the Hempstead plains, and reaching to the head of Peconic Bay, composed so entirely of sand as to seem in a great measure incapable of profitable cultivation by any process at present known."

The first distinct published list of Long Island pine-barren plants seems to be that of Dr. N. L. Britton (Bull. Torrey Club 7: 82. 1880), who selected from Miller & Young's flora of Suffolk County, N. Y. (published in 1874) 46 species which he had found in New Jersey and on Staten Island to be confined to the coastal plain, or nearly so. Essentially the same list was copied by Dr. Arthur Hollick in 1893 (Trans. N. Y. Acad. Sci.

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called N rays by plants of the garden cress was reported by Meyer.[4] Their emission, he said, varies with the activity of the protoplasm, and is diminished when the plants are exposed to the vapor of chloroform, and is modified by mere compression of the tissues.

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In 1904 Russel[5] described before the Royal Society the rather startling discovery of the action of wood on a photographic plate in the dark. This property, he said, belongs probably to all woods. Conifers are especially active, and the spring wood most of all, but the dark autumn wood produced no such effect. Oak, beech, acacia (*Robinia*), Spanish chestnut, and sycamore possess this property, but ash, elm, the horse-chestnut, and the plane tree only to a slight degree. Most resins manifest it, but not so the true gums, such as gum senegal and gum tragacanth. Exposure to sunlight, especially to the blue rays of the spectrum, increases the activity. Cork, printer's ink, leather, pure India rubber, fur, feathers, and turpentine are reported to have their activity increased in the same way. Since bodies such as slate, porcelain, flour, and sugar, in which there is no resinous or allied body, do not react in this way, nor affect the plate at all, the activity of the various kinds of wood is attributed to the resinous substances in them.

Tommasina's[8, 9] papers were also published in 1904. He reported that all freshly gathered plants, fruits, flowers, and leaves possess a radioactivity which is stronger in the young and in individuals in action than in those at rest, being apparently proportional to the vital energy. For this phenomenon he proposed the term *bio-radioactivity*. Buds of lilac, and leaves of *Thuja* and of laurel were found by him to be bio-radioactive.

In the following year Tarchanoff and Moldenhauer[7] published their preliminary note on the induced and natural radioactivity of plants, and on its probable rôle in their growth. When seeds of various grains and of the pea were exposed to the radium emanation, the seedlings growing from such seeds showed induced radioactivity in their roots, but the stem and small leaves remained inactive. Also when a mature plant was exposed to the emanation the roots became strongly radioactive, the stem somewhat less so, the leaves only slightly, and the flowers not at all.

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This distribution of the radioactivity in the plant body is constant, and the authors consider that there is in the plant a special substance, sensible to the emanation, and capable of becoming radioactive under its influence. This substance occurs in the roots, but gradually diminishes up the stem. It is found also in seeds. According to this same paper plants possess a natural radioactivity, which is distributed throughout the plant similarly to the induced radioactivity. This natural radioactivity is strong enough to affect a photographic plate, and plays an important rôle in the development of the plant.

In a second paper Russel[6] gives a list of 33 native and 22 foreign woods that are active, and says that the activity of resins and gums is increased by exposure, not only to sunlight, but to the arc-light as well. Photographic plates often contain a negative of the plate-holder. That this is not a case of radioactivity appears to be proved, says the author, for a glass or a mica screen of one thousandth of an inch in thickness entirely protects the plate from being acted on.

Finally Paul Becquerel[1] undertook a careful study of "plant radioactivity." He tested pea seeds, moss (*Hypnum*), and branches of boxwood for radioactivity, but found not a trace of it manifest when the electroscope was carefully guarded from water-vapor. This explains the condition found necessary by Tommasina, that the parts of plants must be freshly picked in order to manifest bio-radioactivity. According to Becquerel, the discharge of the electroscope in Tommasina's experiments was due to the water in the plants.

From all the investigations noted above, the general conclusion seems to be warranted that radioactivity is not a property of protoplasm nor of living tissues. A clear understanding of the nature of radioactivity would lead, *a priori*, to the same inference.

## 2. The Professed Artificial Creation of Life

Radioactivity and vital activity are in two respects very roughly, but only very superficially analogous. Both radioactive bodies and living organisms are undergoing a destructive process; atomic disintegration in the one, molecular transforma-

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tion in the other; both, with exceptions, maintain themselves constantly at a higher temperature than their surroundings. These analogies have in two or three instances proven dangerously attractive.

A consideration of radioactivity led Dubois,[18] in 1904, to the view that the distinction between "matter of life" and "living matter" is superficial. He proposed the term *bioproteon*, meaning the particular state of the "proteon" in living beings, and suggested the desirability of determining the radioactivity proper of the bioproteon. In a subsequent paper[21] he says: "The unique principle of everything, of both force and matter, I have called 'proteon,' and when it pertains to a living being, 'bioproteon'." Proteon and bioproteon are only two different states of the same thing. When the bioproteon is dead it has only ceased to be radioactive and becomes simply proteon. He claimed also to have discovered the emission, from the lamellibranch mollusc, *Phaladea dactyle*, of rays that could penetrate paper and opaque substances and darken a sensitive plate.

Early in the year 1905 appeared his paper[19] on "*La création de l'être vivant et les lois naturelles*" in which he announced the formation of living organisms in bouillon gelatine by placing on it crystals of the bromide of both barium and radium. Later in the same year[20] he claimed to have secured a kind of spontaneous generation by radium. By the contact of certain crystalloids with organic colloids, there are obtained, he says, granulations, or vacuolides, possessing the optical and and morphological characters of simple life, more rudimentary than bioproteon, or living matter. These bodies arise, grow, divide, grow old, and die, returning to the crystalline state like all living things, and Dubois applied to them the generic term *eobe* (dawn of life). Eobes are held to form the transition between the organic and the inorganic world. In his essay[21] on "*La radioactivité et la vie*," he elaborates the hypothesis that the energy irradiated by living beings has two distinct origins — one from the environment, and one ancestral or hereditary. By their "ancestral energy" living beings are similar to radioactive bodies. They both give off heat rays, light, chemical rays, electricity, and possess molecular motion, and atomic and other movements.

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Leduc's[26, 27] profession to have created life was controverted by Bonnier,[10] Charrin and Goupil,[17] and by Kunstler,[25] in 1907.

The most extravagant claims made in this direction are those of Burke,[11-16] whose observations on the spontaneous action of radioactive bodies on gelatine media form the basis of a voluminous work entitled "The Origin of Life." While these experiments have little of the scientific importance they have been held to possess in the popular mind, it is desirable to state, in Burke's own words, what he did, and his own interpretation of the results.

"An extract of meat of 1 lb. of beef to 1 liter of water, together with 1 per cent. of Witter peptone, 1 per cent. of sodium chloride, and 10 per cent. of gold labelled gelatine was slowly heated in the usual way, sterilized, and then cooled. The gelatine culture medium thus prepared, and commonly known as bouillon, is acted upon by radium salts and some other slightly radioactive bodies in a most remarkable manner." [12]

When the mixture above described was placed in a test-tube and sterilized, and the surface sprinkled with 2.5 grains of radium bromide (activity not given), after 24 hours (three to four days when radium chloride was used), "a peculiar culture-like growth appeared on the surface, and gradually made its way downwards, until after a fortnight, in some cases, it had grown nearly a centimeter beneath the surface." From this growth Burke was not able to make sub-cultures. He considers them not bacteria, and not contaminations, but "highly organized bodies." They have "nuclei", subdivide when a certain size is reached, and "the larger ones appear to have sprung from the smaller ones, and they have all probably arisen in some way from the invisible particles of radium." He regards them as colloidal, rather than crystalline, "of the nature of 'dynamical aggregates' rather than of 'static aggregates'," and coins for them a new name, *radiobes*. This forms the experimental basis for a volume of 351 pages.

With reference to these discoveries, Dubois[22] claims priority over Burke, and rejects his term radiobe in favor of eobe, because these bodies may be obtained with non-radioactive substances.

A few months after Burke's announcement Rudge[28, 29] showed

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that the alleged growths were "nothing more than finely divided precipitates of insoluble barium salts." He was unable in a preparation similar to the one described by Burke, to observe anything like cell-division, and believes that an occasional grouping of the particles in pairs must be purely fortuitous. The appearance of growth of the radiobes is explained as due to diffusion of the precipitate through the gelatine from a point of concentration where the radium salt was in contact with the gelatine. Salts of barium, lead, and strontium produced effects exactly similar to those caused by radium preparations.

Again repeating Burke's experiments, Rudge[30] was unable to secure the radiobes when agar-agar was substituted for gelatine and distilled water was used. If tap-water was employed a slight growth resulted, while the addition of a soluble sulfate resulted in a very dense growth. An examination of 30–40 samples of gelatine showed that they all contained enough $H_2SO_4$ to give a distinct, sometimes a dense, precipitate with barium chloride in the presence of $HNO_3$. This precipitate was found, on analysis, to be $BaSO_4$. Gelatine was then prepared free from sulfates and gave no growth. Negative results were obtained with salts of uranium, thorium, pitchblende, and metallic uranium, thus clearly indicating that there is not the slightest connection between the formation of the rabiobes and radioactivity.

A sample of gelatine from which $H_2SO_4$ had been removed was sealed with a radium salt from June until September. At the end of that time no growth appeared, but when a soluble sulfate was added to a portion of this gelatine the growth began at once.

"The cellular form of these precipitates," said Rudge, "is probably due to the circumstance that the gelatine is liquefied by the action of the salt, and each particle of precipitate is formed about a core of gelatine, so that the layer of barium sulfate forms a kind of sac or cell which is surrounded by the solutions of the salt in the liquefied gelatine. This 'cell' may be permeable to the liquefied gelatine containing a salt in solution, which, passing through the cell-wall, causes an expansion to take place, the limit of growth being controlled by some surface tension effect."

No trace of a nucleus or of mitosis was observed under the

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very highest magnification, and "cells" under a cover-glass sealed down with cement were observed to suffer no alteration during four months.

Reference to the extreme claims noted in some of the literature above cited may be fittingly concluded by the following quotation from Lord Kelvin :[24]

"But let not youthful minds be dazzled by the imaginings of the daily newspapers that because Berthelot and others have . . . made foodstuffs they can make living things, or that there is any prospect of a process being found in any laboratory for making a living thing, whether the minutest germ of bacteriology or anything smaller or greater."

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New York Botanical Garden.

# NOTES ON FERNS SEEN DURING THE SUMMER OF 1908

By Ralph Curtiss Benedict

*Dryopteris. Goldieana* × *marginalis* Dowell.

A second locality for this interesting hybrid is to be recorded, the Green Lake region near Jamesville, N. Y., where so many ferns are found. The original collection of *D. Goldieana* × *intermedia* Dowell was made in the same region, and the trip in question had in view the finding of this fern, but it was not secured again although the parent species were seen in abundance and

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often in close proximity. Two rather small but fruiting plants of *D. Goldieana* × *marginalis* were found, evidently off-shoots of a single original plant. The plants are now growing at the New York Botanical Garden where they will not only have good conditions for growth, but will also be protected from chance injury by cattle, or careless or ignorant collectors. It is suggested that rare hybrids constitute a type of plant which it is advisable always to protect by transplanting if proper care can be given them, since otherwise a locality may easily happen to be lost or destroyed.

*Dryopteris simulata* Davenport.

Two localities are here reported which it is believed extend the range considerably, at least in New York state.

At Quiver Pond, about one quarter mile south of the central part of Fourth Lake, Herkimer County, N. Y. The fern grew here in abundance, forming dense clumps on the higher portions of a sphagnum swamp. A few scattered plants of *D. Thelypteris* were also seen, but apparently it did not thrive there as well as its less common relative.

A second locality was noted at Horseshoe, St. Lawrence County, where the fern grew in a situation similar to that at Quiver Pond. So far as the writer knows the only previous collection north of the lower part of the state is that of H. D. House near Oneida Lake, and the occurrence so far to the north suggests that the fern may eventually be found in Canada. It is likely, too, that it will prove to be much commoner than has been supposed.

*Dryopteris dilatata* (Hoffm.) Gray.

On Blue Mt., N. Y., from about 3,000 feet to the summit. This find was of particular interest to me as it was my first opportunity to see this fern in its natural habitat. Its range was overlapped for perhaps two or three hundred feet (in altitude) by *D. intermedia* (Muhl.) Gray from which, however, it could easily be distinguished in size, shape, and texture. *D. spinulosa* (Müll.) Ktze., which in this country is usually considered to include the two preceding, was not seen at all.

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The use of the binomial *D. dilatata* is in agreement with a common practice in Europe, and has been supported, and rightly as it seems to me, by many well-known fern students. *D. intermedia* (Muhl.) Gray, which does not occur in Europe, I believe to be similarly distinct, and hope later to give sufficient reason for this opinion.

*Osmunda cinnamomea* L.

Two aberrant forms of this species were noted during the summer. The first was a physiological freak, apparently a variant from the *frondosa* form which is known to occur on burnt-over land, as was the case at the locality in question, a roadside swamp in the town of Cornwall, Ct. The peculiarity of the *frondosa* form is the replacement of some of the fertile pinnae by green vegetative ones so that a single frond shows both sorts. In the present instance, the *frondosa* form was not seen but apparently the same result, an increase of the vegetative tissue, was attained. The fronds appeared strongly crested owing to a more or less irregular enlargement of the pinnulae which, besides being expanded and curled, were mostly deeply dentate. Few fertile fronds were seen.

The other form was first found by Miss Harriet Mulford near Hempstead, Long Island, where several plants were seen. Later I found two plants in the Cornwall swamp above mentioned. The peculiarity in this consisted in an excessive development of the lower basal pinnulae which in many cases were at least half as long as the pinnae themselves. As the fronds were nearly erect, and the pinnae about horizontal, the effect was to give the fronds a thick plumy appearance, making the plants exceptionally attractive from a horticultural standpoint.

COLUMBIA UNIVERSITY.

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# THE CEDAR OF LEBANON*

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By Mary Perle Anderson

Religion, poetry, and history have all united to make famous the cedars of Mount Lebanon. Again and again they have been visited by the pilgrim, by the distinguished traveller, by the man of science. Grave doubts exist, however, as to whether the tree now known as the cedar of Lebanon, *Cedrus Libani* Barr, is the one so frequently mentioned in the Old Testament, for these cedars occupy a lofty and isolated position. They are twenty miles from the coast, in a rocky mountain valley at a height of six thousand feet on the side of Mount Lebanon, and about four thousand feet from its summit. Therefore they could have been transported to Jerusalem only with the greatest difficulty and expense. The wood, too, is inferior in color and durability to the wood of the more common cypress and juniper, and it is probable that one or the other of these more easily accessible trees was used for building purposes in the days of Solomon.

The botanical history of the cedar of Lebanon is less varied than that of many humbler plants. Tournefort called it a larch ; Linnaeus, a pine ; Poiret, a spruce. Dodonaeus named it *Cedrus magna*, and in 1714, Barrelier gave the tree its present name of *Cedrus Libani*.

During the sixteenth century it became so much of a custom to make a pilgrimage to the cedars of Mount Lebanon that it was necessary to take steps for the preservation of the trees, for the pious pilgrims carried away much wood for the construction of crosses and tabernacles. In this the Maronites were more successful than we of the present day in our efforts to preserve our forests and native wild flowers. They issued an edict threatening excommunication to all who should injure the trees. Not even a branch was allowed to be cut except once a year, when, on the eve of the Transfiguration, a festival known as the Feast of the Cedars was held, and an altar was built under one of the largest and oldest of the trees.

From the middle of the sixteenth century, we have the records

* Illustrated with the aid of the McManes fund.

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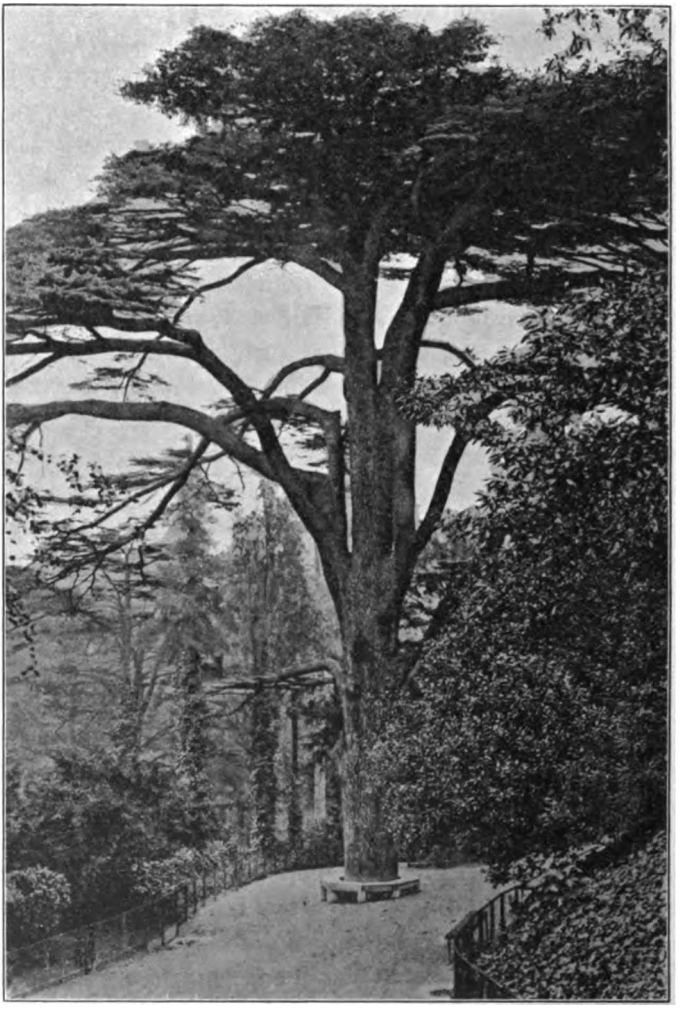
of many famous travellers and scientists who visited the cedars. In 1550, Belon reports the number as twenty-eight, and says, "No other tree grows in the valley in which they are situated;



The Cedar of Lebanon in the Jardin des Plantes, Paris.

and it is generally so covered with snow as to be only accessible in summer." In 1574, Raiewolf gives the number as twenty-six, but adds, "There are two others the branches whereof are quite

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damaged for age. I also went about in this place to look for some young ones but could find none at all." In 1655, Thévenot said that there were twenty-three trees, and a half century later a reliable witness writes of the cedars, "Here are some very old and of prodigious bulk, and others younger and of a smaller size. Of the former, I could reckon up only sixteen, the latter are very numerous."

In 1722, La Roque tells us that the largest of the trees had a trunk nineteen feet in circumference and a head one hundred and twenty feet in circumference. In 1744, Pocoke says there are "fifteen large ones and a great number of young cedars." In 1829, Pariset writes, "There are not above a dozen large trees, but there may be 400–500 small ones," and in 1832, there is a note of pathos in Lamartine's simple statement, "There are now but seven large trees."

In the autumn of 1860, J. D. Hooker visited the famous trees and in the November number of the *Natural History Review* of the year 1862, gives a fuller account of them than his predecessors. In this article, we read that on the side of the mountain, the cedars "appear as a black speck in the great area of corry and its moraines, which contain no other arboreous vegetation, nor any shrubs, but a few small berberry and rose bushes, that form no feature in the landscape. The number of the trees is about four hundred; they form a single group about four hundred yards in diameter with one or two outstanding trees not far from the rest. They are disposed in nine groups corresponding to as many hummocks of the moraine on which they occur." With regard to number, Hooker says that there were only fifteen trees above fifteen feet in girth and only two others above twelve feet. As to size, they varied from eighteen inches to forty feet in girth. He himself says that it is a significant fact that there was no tree of less than eighteen inches girth, not even seedlings of a second year's growth.

The above records seem to indicate that conditions favorable for the germination and growth of new trees come only at long intervals in this isolated valley on the side of Mount Lebanon. What the conditions are that govern the increase of population

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among these aristocratic and exclusive trees, and keep the number limited to the "four hundred" is a problem difficult to solve.

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The date of the introduction of the cedar of Lebanon into England is not surely known, but Aiton in the Hortus Kewensis of 1838 places it in 1683, the date of the planting of the trees in the Chelsea Botanic Gardens. These trees first produced cones in 1766, and since that date, the tree has been largely planted on the great estates and in the stately parks and pleasure-grounds throughout England. The English climate furnishes conditions most favorable for its growth and to-day there are thousands of noble specimens with wide-spreading branches that add a grandeur and dignity to their environment that is too often wanting in our American parks which seem young and frivolous by comparison.

At Warwick there are many beautiful examples of the cedar of Lebanon. They lend their gracious dignity to the sturdy oaks and Scotch firs about them, and even the peacocks roosting in their branches lose their vain and silly airs and become transformed birds. Within the castle, there is a great room known as the Cedar Room. It is panelled from floor to roof with the rich dark red wood of the cedars grown on the estate, and "hewn and carved by men of Warwick during the last century," according to the guide who shows one about.

The cedar was introduced into France in 1734 when Bernard de Jussieu brought from London two plants, so small, that to preserve them more securely, he is said to have carried them in his hat. Just why the simple fact that he carried them in his hat should so have taken hold of the popular imagination is hard to explain. The theme, however, has been repeated again and again and with ever widening sweeps and variations. Long since the tale escaped from the realm of fact and soared into the high thin air of fiction. Perhaps it reaches its culmination in the second volume of "The Forest Trees of Great Britain" by Johns. When we consider that the facts of the case are all presented in the few words at the beginning of this paragraph, we are prepared to enjoy the frolic that results when imagination is let loose on botanical grounds. This is the touching tale of Jussieu and his hat and the cedar of Lebanon as presented by Johns:

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"Many years ago a Frenchman, who was travelling in the Holy Land, found a little seedling among the Cedars of Lebanon, which he longed to bring away as a memorial of his travels. He took it up tenderly, with all the earth about its little roots, and, for want of a better flower-pot, planted it carefully in his hat, and there he kept it and tended it.

"The voyage home was rough and tempestuous, and so much longer than usual, that the supply of fresh water in the ship fell short, and they were obliged to measure it out most carefully to each person. The captain was allowed two glasses a day, the sailors who had the work of the ship on their hands, one glass each, and the poor passengers but half a glass. In such a scarcity you may suppose the poor Cedar had no allowance at all. But our friend the traveler felt for it as his child, and each day shared with it his small half glass of precious water; and so it was, that when the vessel arrived at the port, the traveller had drunk so little water that he was almost dying, and the young Cedar so much that, behold, it was a noble and fresh little tree, six inches high!

"At the custom-house the officers, who are always suspicious of smuggling, wished to empty the hat, for they would not believe but that something more valuable in their eyes lay hid beneath the moist mould. They thought of lace or of diamonds, and began to thrust their fingers into the soil. But our poor traveler implored them so earnestly to spare his tree, and talked to them so eloquently of all that we read in the Bible of the Cedar of Lebanon, telling them of David's house and Solomon's temple, that the men's hearts were softened, and they suffered the young cedar to remain undisturbed in its strange dwelling. From thence it was carried to Paris, and planted in the Jardin des Plantes."

The two trees brought by Jussieu from London lived and flourished. One was planted in the Jardin des Plantes, and the accompanying illustration shows it as it appears to-day, stately, symmetrical, and graceful, dominating that portion of the garden where it grows. The other tree is said to be even larger and more beautiful; it was planted at the Chateau de Montigny, near Montereau.

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In the beautiful pleasure-grounds of St. Cloud, there is a group of younger cedars that were planted by Marie Antoinette. They have not yet lost their lower branches and so present a habit quite different from that of the mature tree.

When the cedar of Lebanon was first introduced into the United States is not known. In 1849, a specimen fifty feet high in the grounds of Mr. Ash at Throggs Neck was considered the finest in the Union. Unfortunately the climate of New England is too severe and changeable, and that of the Middle Atlantic States is not entirely favorable for its growth. It is hardy only in the South and in California.

In Central Park, in the vicinity of Eighty-fourth street, there is a promising specimen of the cedar that in habit resembles the cedars of Marie Antoinette. It is by the walk along the reservoir on the side towards the bridle path. In Prospect Park, Brooklyn, there is another young tree. There are older specimens in Flushing, and in Princeton ; in Philadelphia, in the arboretum of the Painters, there is a fine cedar that was planted at some time between 1840 and 1850.

Although the cedar of Lebanon may not be hardy with us, it is a matter for regret that since some attempts have proven successful, more efforts have not been made to cultivate this tree which would add a new element of beauty to our parks and gardens.

Two closely related cedars are proving better adapted to our climate : *Cedrus Deodara*, the Indian cedar, with its pendulous branches, and *Cedrus atlantica*, the Mount Atlas or Himalayan cedar, with rather erect branches. Of the two, the latter is the more hardy in this country. While both are desirable, neither can compete with *Cedrus libani*, the cedar of Lebanon, with its wide-spreading horizontal branches weighted with tradition and poetry.

HORACE MANN SCHOOL,
NEW YORK CITY.

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# REVIEWS

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## Urban's Symbolae Antillanae

The fifth volume of Professor Urban's valuable contributions to West Indian botany, published under the above title, has recently been completed by the publication of its third fascicle, and forms a volume of 555 pages. It includes a continuation of the bibliography of West Indian botany, written by Professor Urban, a monograph of the genus *Smilax* by O. E. Schulz; one of the family Celastraceae by Professor Urban; the Sapotaceae by M. Pierre and Professor Urban; Olacaceae by Professor Urban: Erythroxylaceae by Mr. Schulz; descriptions of new Compositae, and of a large number of new genera and species by Professor Urban. The work is thoroughly indexed.

These studies are of the highest importance to American botanists, and are throwing a flood of light on the relationships of West Indian plants. A very large number of species and genera new to science have been described, and many species incorrectly understood by previous authors have been elucidated, and their descriptions perfected. Much care has been taken to consult type specimens of the older authors and the amount of close study which the investigation has called for is very great; Professor Urban has the gratitude of American botanists.

Volume 4 of the Symbolae, given wholly to the flora of Porto Rico, is as yet uncompleted, two parts having been published several years ago. It is earnestly hoped that Professor Urban will soon be able to finish this volume, inasmuch as it will form a point of departure for all subsequent work on the flora of that island. It is a list of species with descriptions only of novelties, and no keys or other methods of determination are given; but a Porto Rico flora available for use by others may readily be prepared, using Professor Urban's work as a basis.

N. L. Britton.

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## PROCEEDINGS OF THE CLUB

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### October 29, 1908

The meeting was called to order at the New York Botanical Garden at 3.30 P. M., Dr. M. A. Howe being asked to take the chair. The minutes of the meeting of October 13 were read and approved. Mr. Michael Levine was elected to membership. Mr. Percy Wilson was elected secretary.

A microscopic preparation of the red snow plant, *Sphaerella nivalis*, collected this autumn on Cape York, was exhibited by Dr. N. L. Britton, who received it from the secretary of the Peary Arctic Club. Dr. Tracy E. Hazen gave a brief description of this interesting plant and raised certain questions still unsolved concerning it.

The first subject on the published program was "A Recent Collection of Mosses from Panama," by Mr. R. S. Williams. The following synopsis of this paper was written for the secretary by Mr. Williams:

"For the time spent in the field this was much the smallest collection of mosses ever made by the speaker. It may be accounted for partly by the fact that most of the work was done in the latter part of the dry season, namely, during the last week of February, through March, and about three weeks of April, and partly because of the low level, mostly under 300 feet elevation, at which much of the collecting was done.

"In the city of Panama are a number of fine old ruins more or less overgrown with shrubs and smaller plants but not a single species of moss was observed. On going to Penonome, some hundred miles west of the Canal Zone on the Pacific coast, the conditions were found to be much the same. One species of moss, however, was found abundantly fruiting in a cultivated field of cassava. This was *Bryum coronatum* Schwaegr., a world-wide species of the tropics and occurring as far north as Florida. On going a few miles back of the town, among the foothills and low mountains, various mosses become not uncommon, growing chiefly on trees, but even here very few species were obtained in

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anything like good fruiting condition. On leaving Penonome a trip was made southeast of the canal along the Pacific coast about 100 miles to the Gulf of San Miguel, and up the Tuira river about 70 miles into the the interior to the mining camp of Cana. Here much more favorable conditions were found, Cana being situated at an altitude of 2,000 feet above the sea with the Espirito Santo mountains just back of the town, rising 5,000 feet higher. Mosses and liverworts were fairly abundant and at a more favorable season doubtless a large collection might be made.

"Of the 30 species brought back from both sides of the Canal Zone, five sixths are known to be South American. Two of these, *Pilotrichum amazonum* Mitt., collected originally by Spruce on the Amazon, and *Lepidopilum brevipes* Mitt., found by Spruce in the Andes at 3,000 feet, had not been since reported by any other collector. The five remaining species appear to be unknown outside of Central America. They are *Syrrhopodon Bernoullii* C. M.; a species belonging to the very large genus *Macromitrium*, apparently undescribed; a species of *Cryphaea*, also undescribed, and bearing numerous propagula on the stems; *Porotrichum cobanense* C. M. and *Cyclodictyon Liebmanni* Schimp., these last two being previously known only from the type localities."

The second paper, "The Morphology of *Taenioma*," by Miss Elizabeth I. Thompson, was not read, as Miss Thompson was absent.

Dr. N. L. Britton gave a brief account of *Rhipsalis*, a genus of the Cactaceae whose members are pendulous from tree trunks or rocks. Most of these plants occur in Tropical America, but a few species, strange to say, are found in tropical east Africa. Of the fifty-three species that have been recognized, the speaker discussed chiefly those of Mexico, Central America, and the West Indies, illustrating his remarks with herbarium specimens.

Dr. Tracy Hazen described in detail an interesting phase in the development of a species of *Chaetophora* found in the brook flowing through the herbaceous valley of the New York Botanical Garden. This investigation is, however, not yet complete. Dr. Hazen stated incidentally that the algal flora of this brook appeared to be considerably richer now than it was a few years

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ago; and a discussion followed as to the presence of additional forms, some attributing it to insects, frogs, and other minor aquatic animals, and others to the wild ducks that frequent this brook through the summer season.

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W. A. MURRILL,
*Secretary pro tem.*

NOVEMBER 10, 1908

The Club met at the American Museum of Natural History and was called to order by Vice-President Burgess at 8:15 P. M. About 95 persons were present.

After the reading of the minutes of the meeting of October 29, Dr. N. L. Britton delivered the lecture of the evening on "Trees of the Vicinity of New York". The lecture was illustrated by lantern slides from the Van Brunt collection and was of a popular nature. The trees were taken up in a biological order, beginning with the gymnosperms, and the photographs exhibited illustrated both the general habit of the trees discussed and details of their flowers and fruit.

MARSHALL A. HOWE,
*Secretary pro tem.*

## OF INTEREST TO TEACHERS

### THE CAMERA LUCIDA FOR CLASS DEMONSTRATION

BY ROBERT GREENLEAF LEAVITT

So far as I have seen, the use of the camera lucida for purposes of demonstration with classes, as now to be described, has not heretofore been put into print; though it is altogether likely that others beside myself have hit upon the device. The idea first occurred to me when showing visitors at the laboratory the workings of the compound microscope. The camera lucida always greatly pleases the uninitiated by its magical power of bringing the pencil into the field of the instrument, and of instantly conferring upon the novice the skill of the draftsman. It occurred to me, while exhibiting under the microscope and explaining some of the objects one usually shows to these people, such as algae or stained

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sections of vegetable tissues which are not immediately comprehended by laymen, that by leaving the camera lucida in place I could point out to the observer the parts referred to in my attempted explanations. I fixed a paper upon the table top under the camera, hastily drew faint outlines of the objects in the field, and then, as my visitor gazed through the microscope, pointed with the pencil to these outlines, or, as the observer believed, to the various details within the scope of his vision.

When microscopes are to be used for demonstrating to classes illustrative material after lectures, or for brief examination of special preparations, by students in rotation during periods of general laboratory practice, the same method may advantageously be adopted. A not uncommon custom is to supply each microscope with a rough drawing, or with an illustration in an open book or on a chart. In the present method each microscope is provided with a camera lucida. Instrument, preparation, and paper are secured in place. The instructor adjusts things, and upon the paper in their proper positions writes the names of parts to which attention is to be directed, or places marks of indication, which afterwards to the students appear as labels in the preparations themselves.

STATE NORMAL SCHOOL,
TRENTON, NEW JERSEY.

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The *Outlook* for November 28 prints the following appeal from one of its readers: "Would it perhaps be timely to ask your readers if, after the terrible forest fires of this summer and autumn, it might not be considerate to refrain from using trees for Christmas decorations? Thousands of evergreens must be sacrificed annually to meet the demands of the Christmas trade. Is it a custom worthy of being perpetuated?"

The *Boston Herald* states that one New Hampshire neighborhood is to furnish about 10,000 Christmas trees for Philadelphia. Several acres of young woodland is to be stripped of fine, young spruce trees, for which the owners will receive no more than six or seven cents each. The *Herald's* correspondent further says the "trees are sacrificed for only a few hours' enjoyment, and

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the people in this locality are deploring the denuding of the land on this account."

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The *Outlook* also prints a letter from Mr. Alfred Gaskill, state forester of New Jersey. It runs as follows:

"It is sometimes difficult to be patient with those who urge the abolition of Christmas greens for the sake of the forests. To what better use can a tree be put than to gladden half a dozen, or half a thousand, child hearts on Christmas Eve? Is the lumber from a whole forest worth one telling of the legend of the *Weihnachtsbaum?* But the hope expressed in your issue of November 28 that there may be a way to have Christmas trees and forests too leads me to say that the fears of those who love the forests more than the children, or at least seem to do so, are groundless. If every family in this land had a fifteen-year-old Christmas tree every year, they could all be grown without difficulty on a third of a million acres, or less than one seventh of the forest area of this little State of New Jersey. Of course the cutting of trees as now carried on in Maine and elsewhere looks destructive, and often is destructive, yet the trouble is not with the business but with the way it is conducted. In other words, Christmas tree growing can and should be a regular industry. The trees can come in part from necessary thinnings in lumber stands, in part from plantations made for the specific purpose. It is quite as legitimate to plant a piece of land with balsam for Christmas trees as with peach trees. Both kinds will be cut down at about the same age. Several property-owners in this State are definitely planning to grow Christmas trees on land that is now yielding no valuable crop. The planting will convert ugly brown slopes to hills of green, for some years at least, and the venture promises to be a paying one.

"With respect to greens the case is not very different. The supply now comes mainly from waste places and is gathered by poor people who get their Christmas in that way. Holly is a most beautiful tree and its wood is valuable, yet scarcely a specimen found north of Virginia would yield as much in lumber as in greens. Laurel, or Kalmia, is the most generally used woody plant, and that use, too, ought to be legitimate. There is no de-

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fense of the practice of stripping fence rows and park woods, and it should be stopped. But laurel is a forest weed; it interferes with the development of young trees and is a nuisance where silviculture is practiced. We have in this State an area of 15,000 or 20,000 acres on which 'nothing of value will grow — only laurel and scrub-oak.' I do not know who owns this land, but I do know that the glory of the flowers in June does little toward paying taxes, and I am quite sure that any one who wants to gather greens there will find little objection.

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The problem of Christmas greens, if it be a problem at all, can be solved by the simplest measures of control. Restrict cutting of trees or shrubs where the act will cause a disfigurement, but encourage the use of all the evergreen plants, and their propagation, as a means of making the earth more fruitful. Trees are for use, and those who would save every tree must be reminded that mere saving is waste. The wise, the necessary thing is to make them satisfy the needs of man; some for an hour's delight at Christmas time, some for warmth and shelter, all to delight the eye and cheer the heart until the time for sacrifice comes.

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Change of sex in plants is the subject of an article by Mr. M. J. Iorns, of Porto Rico, in *Science* for July 24. The following is quoted in part only: "While change of sex among the phanerogams is not unknown yet it is of such rare occurrence that any well-demonstrated instances as those shown by the Caricas under observation are worthy of careful study. This is especially true when that change can be brought about by cultural methods as seems to be clearly proved in the present instance.

"*Carica papaya* is a tropical, rapidly growing tree-like form belonging to the Passifloreae family. As found in Porto Rico it is distinctively dioecious, the monoecious form being very rare except when produced as were the ones under observation. The tree is non-branching, but will readily develop lateral buds if the terminal bud is destroyed." The staminate flowers "developed successively, continuing over a long period of time, so that there is no time during the year when flowers are not shedding pollen. The pistillate tree bears axillary flowers of a very different form

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from the staminate" which are borne on an unbranched peduncle usually varying in number from one to five. "Of these only one, with rare exceptions, sets fruit. It is said that the flowers are sometimes perfect, but such have not come under my notice as yet. The fruit varies in form from oval to a distinctively necked pear shape and in weight from three pounds to ten pounds or even more. The fruit in some varieties is very delicious and has many medicinal properties ascribed to it, so that the plant is of enough value economically aside from its botanical interest to be worthy of careful study.

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"The change of sex in the first tree noted was brought about accidentally. A staminate tree of some age had its terminal bud accidentally injured. The staminate flower clusters produced shortly afterwards contained pistillate flowers in the terminal group. These flowers set and developed good-sized fruits."

The natives stated that the "removal of the terminal bud in the new of the moon would usually cause this transformation. Other trees growing on the grounds were at once set aside for experimental purposes and the tops were removed at different phases of the moon to disprove the moon's having any effect and also to show, if possible, what were the necessary conditions, if any, outside of the mere removal of the terminal bud. Thus far it is clearly shown that the removal of the terminal bud does cause the change, but also that some other condition is necessary, as only a part of those thus treated have thus far developed any pistillate flowers. The moon's phase does not appear to have any control, though, strange to say, those treated at a fairly definitely recurring period are the ones that show change. It is possible that the plant has definite short cyclic periods of growth and that it is necessary to remove the tip at some definite phase of this cycle in order to produce the development of fertile flowers. If this be true and this cycle should accidentally coincide fairly well with the moon's phases, the belief in moon influence would naturally arise.

"This view of an approximately monthly periodic cycle of growth has several things to support it. The chief of these is found in continuous development of flowers and fruit. At no

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time during the year were the trees under observation without both flower and fruit. On the other hand, there are times when growth is more rapid, more flowers are developed and the terminal nodes elongate much more rapidly. The exact time of these periods has not yet been determined definitely, but data are being collected.

"The habit of the plant is being closely studied to determine the characteristics of each change and at what point in this growth the tips must be removed to produce the changes under discussion. It is possible that the power to produce pistillate flowers is inherent in the plant, being dormant unless some shock is given to destroy the equilibrium of the growth forces. This inherent quality is indicated by the fact that in some countries the plants are sometimes found naturally monoecious."

## NEWS ITEMS

Kohang Yih, of China, is investigating the tobacco industry in the United States.

Oberlin College has recently received from Mrs. Mary F. Spencer a collection of several thousand European plants.

The Yale Forest School has recently acquired a thousand more acres at the reservation near Milford, Pennsylvania.

The Transvaal is planning an agricultural college; Dr. F. M. Smith is here making a study of American management.

Dr. J. E. Kirkwood, formerly of Syracuse University, is now at the Tucson Desert Botanical Laboratory engaged in research work.

Dr. Carl L. Alsberg, of the Harvard Medical School, has resigned to conduct the Department of Agriculture investigations on poisonous plants.

Mr. W. S. Harwood, of California, the author of "New Creations in Plant Life, or Life and Works of Luther Burbank," died in November.

Dr. Shigeo Yamanouchi, assistant in botany in the University of Chicago, is spending three months at the marine biological station at Naples.

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Professor Charles R. Barnes and Dr. W. J. G. Land, of the University of Chicago, are in Mexico collecting research material, principally mosses.

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The National Conservation Commission after six months' work held a meeting in Washington early in December to prepare the report requested by President Roosevelt.

Mr. Joseph H. Painter, aid in the Division of Plants of the U. S. National Museum, met death by accidental drowning in the Potomac River, December 6.

The Bartram Association has placed in the charge of Professor Macfarlane, of the University of Pennsylvania, the annual planting of a new tree in the Bartram gardens.

An American table is again being supported by Columbia University at the Naples biological laboratory. Applications may be sent to Professor E. B. Wilson at Columbia.

Dr. William A. Murrill, assistant director of the New York Botanical Garden, sailed for Jamaica on December 5. He plans to spend five or six weeks in collecting the fungi of the island.

Dr. Roland M. Harper has accepted a position with the Florida State Geological Survey, with headquarters at Tallahassee, and will be engaged during the winter in studying the origin, classification, distribution, and extent of the peat deposits of that State.

Beginning on December 28, the New Jersey State Board of Agriculture will give a six-day course for farmers at the Agricultural College in New Brunswick. About nine lectures are to be given each day on such varied subjects as farm manures and fertilizers, stock breeding, orchard and fruit trees, injurious insects, seed testing, and plant breeding.

The New York Academy of Sciences will observe Darwin's birthday, February 12, 1909, by presenting to the Museum of Natural History a bronze bust of Darwin and holding appropriate exercises, which will include an exhibition of material illustrating Darwin's theory of evolution and also indicate the range of his scientific work.

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The Baltimore meeting of the American Association for the Advancement of Science, which begins December 28, includes, besides the sessions of the Section G, Botany, meetings of the following societies: American Federation of Teachers of the Mathematical and Natural Sciences, the American Society of Biological Chemists, the Botanical Society of America, Sullivant Moss Chapter, and Wild Flower Preservation Society.

Some weeks ago at the Chicago meeting of the board of trustees of the Marine Biological Laboratory at Woods Hole, measures were taken to institute a central board composed of representatives from the various stations engaged in marine work. Fourteen biological stations are at present included. Professor N. L. Britton (of the Torrey Club) represents the Cinchona Station of the New York Botanical Garden.

The new field organization of the Forest Service is well under way. The 377 foresters, clerks, and stenographers who are to make up the personnel of the service have been assigned to the six offices previously announced: Denver, Colo., Ogden, Utah, Missoula, Mont., Albuquerque, N. Mex., San Francisco, Cal., and Portland, Oreg. Much of the national forest business which formerly was transacted in Washington will now be handled by officers on or near the ground, which is a distinct improvement.

Mr. J. G. Lemmon, a pioneer botanist of California, died at his home in Oakland, November 24, aged seventy-six years. He served in the Civil War, came to the high Sierra Nevada to recuperate his shattered health, and under the inspiration of Asa Gray, collected plants and distributed widely his specimens, many of which represented species described as new by the botanical staff at Harvard. He was California State Forester from 1886 to 1890 and the author of numerous papers concerning west American trees.—W. L. Jepson.

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# INDEX TO VOLUME VIII.

New names and the names of new genera and species are printed in **boldface type.**





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# OTHER PUBLICATIONS

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# TORREY BOTANICAL CLUB

## (1) BULLETIN

A monthly journal devoted to general botany, established 1870. Vol. 34 published in 1907, contained 630 pages of text and 34 full-page plates. Price $3.00 per annum. For Europe, 14 shillings. Dulau & Co., 37 Soho Square, London, are agents for England.

Of former volumes, only 24-34 can be supplied entire; certain numbers of other volumes are available, but the entire stock of some numbers has been reserved for the completion of sets Vols. 24–27 are furnished at the published price of two dollars each; Vols. 28–34 three dollars each.

Single copies (30 cts.) will be furnished only when not breaking complete volumes.

## (2) MEMOIRS

The MEMOIRS, established 1889, are published at irregular intervals. Volumes 1–11 and 13 are now completed and Nos. 1 and 2 of Vol. 12 have been issued. The subscription price is fixed at $3.00 per volume in advance. The numbers can also be purchased singly. A list of titles of the individual papers and of prices will be furnished on application.

(3) **The 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

THE TORREY BOTANICAL CLUB
Columbia University
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