

1875–1925

BOTANY AT WELLESLEY



By

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Professor of Botany

WELLESLEY COLLEGE

REPRINT
IN ABBREVIATED FORM
FROM THE
WELLESLEY ALUMNAE QUARTERLY
BY THE
WELLESLEY COLLEGE
SEMI CENTENNIAL FUND COMMITTEE



The new Greenhouses are located on the site where Mr. Durant hoped one day to establish a "School of Botany."

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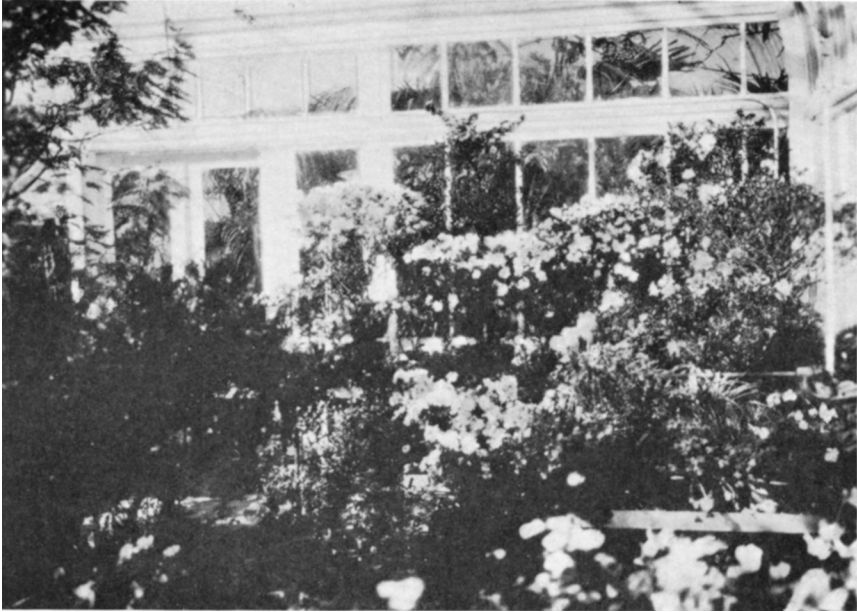
Professor of Botany

MANY times, in the years now long past, I have heard Miss Hallowell, our first professor of botany, tell of the eagerness with which Mr. Durant frequently spoke to her of his "dream" that there should sometime be located, on what we now call Observatory Hill, a "School of Botany." Mr. Durant evidently saw, what we who have come after him fully appreciate, that the college campus with its varied physiographical features, and the open country about Wellesley with its lakes, and streams, and bogs, offer an excellent opportunity for the study of plant life. But he could not have foreseen,—not even the greatest student of biology in his day could have guessed,—the extraordinary development which the science of botany was to undergo during the period that marks the first fifty years of the life of Wellesley.

In a textbook, written by an American in 1845, we read this very interesting

statement: "The study of Botany seems peculiarly adapted to females; the objects of its investigations are beautiful and delicate. An herbarium neatly arranged is beautiful." This of a science that, in scarcely more than fifty years, should be found to include within its field some of the most profound problems that have been presented to the mind of man. Such problems that only one trained in other sciences, as mathematics, chemistry, physics, has the foundational knowledge for intelligently attacking them. And as its problems have deepened, its scope has broadened. May we briefly illustrate?

Today, if the government wishes to increase the food supply of the world, it must turn to the botanist for guidance. This is not a question that can be answered, as we once thought, by simply classifying known plants as to the places on the earth where they will



Among the Azaleas are the very plants which Mr. Durant was accustomed to place in College Hall during their blossoming time.

grow, or by grouping them on the basis of the abundance of their yield as fruit or forage plants. The real solution must be found in a knowledge of the complex reactions of the cell and of the larger unit compounded of cells, the plant as an organism. The government must, therefore, call to its aid, from the ranks of the botanists, not only the trained taxonomist but also the skilled physiologist, ecologist, geneticist, and pathologist.

Again, does the sociologist seek sure foundation for intelligent dealing with social problems, he must turn to the geneticists, the students of the cell from the standpoint of reproduction and of the transmission of hereditary characters. Social problems are problems of the organism, as well as problems of society and government. In the last analysis their solution must lie, in so far as man can hope to approach a solution, in a knowledge of the cell. It matters not whether this knowledge be based on a study of the plant cell or the

animal cell, since in all essentials the phenomena of reproduction and heredity are the same throughout the entire realm of life.

It would not have occurred to one in the middle of the last century that the problem of the world's energy supply could have a special interest for the students of plants. But today, in response to the fear that has been expressed lest the supply of energy stored in the earth should be exhausted, we are turning to the plant for a solution of the problem. Accordingly, we find the trained chemists and physicists joining with the botanists in an endeavor to secure a knowledge of that process by which the green cells of plants are able, not only to make use of the energy of the sun in manufacturing the basal foods of the world, but, in addition, to so hold and store that energy that it becomes available for other purposes. It is a well-known fact today that the energy of the sun, entrapped, as it were, by the green plants, becomes the only source of



In the Cryptogam House will be grown in great profusion and beauty ferns, mosses, liverworts and fungi.

energy by which all forms of life are maintained on the earth, and the chief source of energy in the household and in the industries. When scientists have come to understand, and learned to apply, the complex process by which plants achieve this unique result, we need have no further fear regarding the exhaustion of the world's energy supply.

These are but a few of the facts evidencing the growth of the science of botany in the latter part of the last century and particularly during the years of this new century. Such a rapidly expanding science must constantly make, upon a college, corresponding demands for new equipment and for enlarged, more adequate housing facilities.

The department, as first established at Wellesley, was a Department of Biology. As the result of consultation with Asa Gray and Louis Agassiz, Miss Susan M. Hallowell was placed in charge of the department. How much of Mr. Durant's breadth of view, re-

garding this particular line of work, was due to the wise judgments of this farseeing woman, we shall never know. Professor Hallowell did not open the department to students the first year of the college; but, rather, spent her time in study and observation at Harvard, at Yale, at Washington, and at Cornell. Before the year was over she became convinced that the subject was too broad to be covered by one department. Upon her suggestion, Mr. Durant immediately divided the subject of Biology into the two departments of Botany and Zoology, Miss Hallowell choosing to take the Department of Botany. We cannot refrain from noting, in passing, the rare wisdom with which she laid the foundations of our department and built the first story of our structure.

Botany was the first academic subject to be removed from College Hall. In order that the work of the department might be more adequately provided for, Mr. Durant set aside, for its use, a certain amount of space in Stone



The Hydrophyte House contains pools for growing plants in varying depths of water.

Hall at the time this building was erected. This included a large laboratory especially provided with light, two smaller classrooms, a large room for the herbarium, a large work and stock room, a small lecture room and a room to house the botany library. He had earlier placed his own private greenhouses at the service of the department. At this time then, 1882, the Botany Department of Wellesley College became, unquestionably, the best housed and the best equipped botany department to be found in any college, man's or woman's, in the country. We do not refer here to universities. At once the department, under Miss Hallowell's guidance, became recognized throughout the country for the dignity and the scope of its work.

But time changes all things. As the years passed, the funds at the command of the college were not such as to enable the department to keep pace with the ever onward march of its subject. Every effort has been made to keep our library as complete, and representative

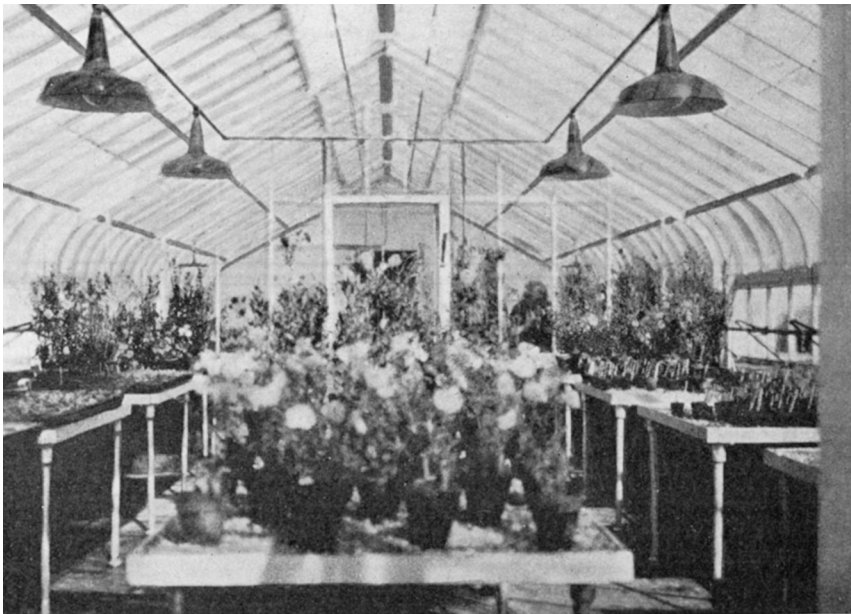
of the literature of the subject, as it was in the early years; and in this the department has been fairly successful. Nevertheless, we are today very anxious to spend about \$5,000 on our library. This would make it possible to "fill in gaps," to bind certain sets of periodicals that are now unbound, to further enrich our collection of early works, and to add new publications. The library would thus become as worthy in our day as it was in 1890. The department is fairly well provided with apparatus and illustrative material. In fact, such classroom equipment as it is possible to install and to use properly in Stone Hall and the Botany Annex, we have. We also have at Stone Hall a growing herbarium of about 60,000 sheets, and a small museum, comprising some 5,000 specimens of excellent illustrative material. Gradually the space originally allotted to the department in Stone Hall has been increased by the addition of fourteen student rooms, and a small annex has been built on the north side of the "Barn." But we would call

attention to the fact that, in this twentieth century, no department of botany can continue to carry its work worthily under the conditions imposed by modern dormitory life, and far removed from its laboratory greenhouses, "out-door laboratory," and collection of living plants. By 1908 conditions had become actually serious. Since that time it has been only through the united efforts of an able and devoted corps of teachers that the standard has been held even approximately near the high mark set by our founder. As the years have passed, the odds, against which these officers of the college have continued to carry their work, have been at times well-nigh overwhelming.

But just now a new day for the department is dawning. To a certain extent, the particular "dream" of Mr. Durant, to which reference has been made, is now being realized; and we are looking forward with confident expectation to its more complete fruition in the immediate future. Is it not very interesting that the present administration

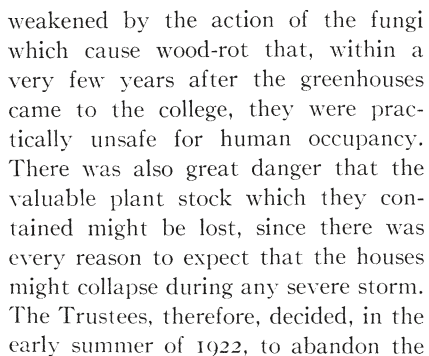
of the college should have assigned, quite unconsciously, as the new botany center, the very same section of the campus that was selected by Mr. Durant? The department takes pleasure in the opportunity, hereby afforded it, to tell the alumnae and friends of the college not only of its vicissitudes in the past but of its present hopeful outlook as regards housing, equipment and opportunity.

Upon the death of Mrs. Durant in 1917, her greenhouses became the property of the college and were placed by the Trustees under the direction of the Botany Department. These houses were built about 1870 and, as was the general practice at that time in constructing greenhouses, the framework was entirely of wood. While these houses were ample for the growth of such plant material as is essential for the use of the introductory course, they were in no way adapted to the requirements of the more advanced or special courses in botany. Moreover, the framework had gradually become so



In the Genetics House students are working on the inheritance of color in the Petunia.

WELLESLEY COLLEGE
WELLESLEY, MASS.



These greenhouses form an integral part of the projected Botany-Zoology Building, as is shown on the accompanying plan of the first floor of the building.* The department has always felt that the almost universal practice of

*Miss Helen I. Davis, Wellesley 1912, Assistant Professor of Horticulture and Landscape Gardening in the department, has very kindly prepared all the plans and photographs which accompany this article.



From the Cold Temperate House we enter the Palm House.

This range of fourteen houses was completed and accepted by the Trustees in October, 1922. We believe we have here a system of greenhouses of which every Wellesley woman may be justly proud. They are of the best steel construction, admirably placed and designed for academic purposes. The plan of the greenhouses and the adjoining laboratories is placed on the upper right-hand side of the plan of the first floor of the building.* By reference to this plan, it will be seen that the front range, facing south and running due east and west, consists of five houses. In these will be grown plants representative of the great floras of the earth. Connecting this front line of houses with the building proper are three laboratory ranges consisting each of three houses. Between the laboratory ranges and running parallel with them are the pits and cold frames. The front range is 143 feet, 5 inches long; the east and west laboratory ranges are 76 feet, 4 inches long.

*See inside of back cover.

It is our expectation that the front range, comprising the five largest houses, shall contribute to all the work of the department and to the pleasure of the whole college. But the plant material in these houses is of inestimable value to the courses in Taxonomy and Ecology. Here the students in these subjects have an opportunity to study and compare plants that are native to different regions of the earth, and others that are found growing under a great variety of habitats. They also provide living plant material for these classes during the winter months.

The small house at the southeast is designed for desert plants. Here the Night-blooming *Cereus*, secured by Mr. Durant, finds a more congenial setting than it has heretofore had. In order to supplement the small collection of desert plants which were growing in the old house, a member of the department staff spent several months, last year, in the semidesert regions of Texas and Arizona securing plants for this house. Among the interesting forms which she collected or otherwise obtained may be cited the giant columnar cactus; the ocotillo (little candle), which bears flame-like blossoms on the apex of its grey prickly stems; various examples of *Yuccas* and their relatives; and specimens of spineless prickly pears.

Adjoining the Desert House on the west is the Cold Temperate House. Here are to be seen the very *Camellias* which for almost half a century supplied Mrs. Durant with her favorite flowers, together with the *Acacias* which were in the old greenhouse from its earliest days. And among the *Azaleas* are

some of the plants which year after year Mr. Durant had placed, at their blossoming time, in College Hall center. This house is also our "display or exhibition room," since many plants will be placed here during their flowering time, because of the lower temperature of this room. For example, we have received from Mt. Holyoke College, through the courtesy of Mr. Kinney, a fine collection of chrysanthemums. These will be transferred to this house during their period of bloom.

From the Cold Temperate House we enter at the west the Tropical or Palm House. On the end walls of this house are already growing the beautiful *Alamanda* and *Clerodendron* vines which were among the chief attractions of the old greenhouse from its earliest days. The Bird of Paradise, an object of interest to students for many college generations, continues to bloom here even more freely than in its old surroundings. The largest palms are the same that year after year graced the center at College Hall. Mrs. Durant always kept two sets of palms which alternated between the greenhouse and College Hall. We, therefore, still have the set that was in the greenhouse at the time of the fire. Associated with these palms in the new center is a rather recent collection of *Cycads* which in a few years will make a fine showing.

Adjacent to this house on the west is the Warm Temperate House. A cutting of the old *Maréchal Niel* rose is getting established here. Certain of the *Acacias* and one of the

old *Hibiscus* plants have been placed in this house. We hope to associate with the latter some of the beautiful hybrid forms of the *Hibiscus* that grow so profusely on the warm islands of the Pacific.

The last house to the west in this front range is the Hydrophyte House with its pools for growing water plants in varying depths of water. Provision is made at one side of the pools for the development of a miniature peat bog with its *Sphagnum*, Pitcher plants, *Cassandras*, and other plants characteristic of peat bogs. In the years to come, when this room is fully stocked and the plants shall have had time to establish themselves, we expect this will become one of the most attractive corners of the greenhouse.

We have mentioned but a few of the



The largest palms once stood in College Hall Center.

plants in this range of houses, emphasizing especially those which have historical interest. Many of the more recent additions to the greenhouses have been grown from seed collected by members of the staff or friends of the department. These include plants from various states in our own country, from Mexico, Egypt, Australia, New Zealand, Tahiti.

The laboratory range at the east communicates on the north with the potting and work room for students. The section of the greenhouse which adjoins this potting room is assigned to the course in Horticulture. In this house the students get their laboratory practice in the propagation and culture of plants. The two houses south of this form the section in which the students in Genetics or Plant Breeding carry on their experimental work. The smaller of these two houses is for the special use of graduate students who are working on problems in Genetics. The larger house is supplied with six electric outlets, each carrying a 1,000-watt Type C lamp with a special reflector. During the winter these lights are to be turned on at 8 P.M. and off at 2 A.M. By this means it is expected to so accelerate growth and time of flowering that the class, at present working on the inheritance of color in *Petunia*, may obtain at least three generations of hybrids in a college year.

The benches are so built in this room that the student stands in a rectangular space with her plants on three sides. Light wooden trays have been made to fit exactly the inner half of this open space in the bench. By inserting one of these trays, the student always has a dry "table" on which to place her books and instruments.

The central of the three laboratory ranges connects directly with the Tropical House on the north. The room nearest the Palm House, and somewhat shaded by it, is to be known as the Cryptogam House. Here will be grown

in somewhat limited space, but we trust in great profusion and beauty, ferns, mosses, liverworts, fungi and, in the aquaria, various representatives of the algae. This is the house in which the students of the so-called "non-flowering" plants will find rich material for study.

The west laboratory range connects with the large laboratory for Plant Physiology at the north. The two larger houses of this range are to be devoted exclusively to experimental studies. The house nearest the building is to be used by the students taking the courses in Plant Physiology; the one to the south is for the special use of graduate students in this subject. In each of these houses, as well as in the smaller Genetics House, the entire floor is of cement. The tops of the benches and of the central tables are of heavy slate, and the furnishings are otherwise designed to provide the best modern facilities for work in Plant Physiology. The house joining the Physiology House on the south, and connecting with the Warm Temperate House, provides opportunity for experimental studies in Ecology. It has also two tiny compartments for isolating plants when demonstrating certain problems in Plant Pathology.

It will doubtless be some years before the greenhouses can be well "set up" with plant stock. In the interests of economy, we shall grow the new material from seeds or cuttings whenever possible rather than purchase plants. But in the meantime the front range of houses is open at all times to the college and its friends. We hope they may enjoy such plants as we now have and in imagination see the houses as we trust they will appear five or ten years hence. Because of the nature of the work, it will not be possible at certain times to open the laboratory ranges to the public.

It is well known to the college that Mr. and Mrs. Cordenio A. Severance,



To hasten the growth and maturity of the Petunia plants electric lamps of 1000 watts are lighted during the winter nights.

some years ago, established a garden at the Quadrangle in memory of their little daughter, Alexandra. It is not so generally known that, in 1921, they very generously doubled the endowment of their garden; and in response to their request the following year, 1922, the Trustees changed the name to the Alexandra Botanical Garden. It is the purpose of the department to so develop this garden that it shall offer to our students a valuable field for scientific observation and investigation. At the same time, we trust that everyone who enters it may find therein rest, and a deepened sense of beauty.

In the fall of 1920, the Trustees assigned to the Botany Department a definite portion of the campus which was to be used by the department in the development of gardens, as time and money would permit. This area is shown on the accompanying plan of a portion of the college grounds.* We hope to bring back here, and in the Arboretum to be described later, all the

wild flowers and shrubs that are native to Wellesley, and many, from other parts of the world, that can be encouraged to grow here.

In May, 1923, Mrs. Robert Shaw of Wellesley made a gift to the college in memory of her father. The income from this fund is to be used by the Botany Department in maintaining an arboretum which shall be known as the Horatio Hollis Hunnewell Arboretum. The area assigned to the Arboretum is immediately south of the Botanical Garden, as is shown on the plan. Here we hope to grow as great a variety of trees and shrubs and vines as possible, with those wild plants beneath them that naturally seek such habitats. It is the plan of the department that certain parts of the Arboretum and of the Botanical Garden shall serve as bird sanctuaries as well as haunts for the more delicate and retiring wild flowers.

In addition to the endowment fund, Mrs. Shaw also made a very generous

*See Plan of Grounds.

gift for the initial work on the Arboretum and for the development of a pool in connection with it. This pool will help to form one of the most instructive and attractive parts of the Arboretum.

On the higher ground, somewhat to the west of the pool, lies the Outdoor Laboratory. In these plots of ground the students in the introductory course plant bulbs, tubers, and seeds, and transplant various plants from the cold frames. Here are studied definite problems of plant growth, propagation and reproduction.

It will be seen from the foregoing that the department actually has today a new and highly satisfactory range of greenhouses, provision for a botanical garden, the beginnings of an arboretum, and an outdoor laboratory. It awaits, with great eagerness, the building which is to be erected on the center about which these others are already grouped. An excellent arterial system is of little avail unless connected by a functioning heart. At present the courses in Plant Physiology are given at the Botany Annex, which, as earlier stated, is attached to the north side of the "Barn." The course in Horticulture meets at the "Head House," an extension of the temporary boiler and potting rooms at the greenhouse. The rest of the courses are still carried at Stone Hall. Perhaps one ought to say, in the interests of truth, that these courses are given at Stone Hall, in the Greenhouses, in the outdoor laboratory and in passage between Stone Hall and these other points. At best our greenhouses, so admirably adapted to our needs, are of comparatively little use to us, because of their distance from Stone Hall and the Annex. The two laboratory greenhouses constructed for the use of students in Plant Physiology are at present used for storage. They cannot be used for experimental purposes until such a time as the laboratories and other rooms for Plant Physiology adjoin them.

In the winter of 1914, just before our great fire, Miss Susan Minns of Boston, herself a student of Botany and a lifelong friend of Miss Hallowell, gave the department a very substantial gift towards its new building. But with most of the departments of the college rendered homeless by the fire, the Botany Department most willingly retired to the background for a period of years. In the meantime our science rapidly advanced in scope and significance, our total equipment became progressively inadequate, and the purchasing power of the dollar shrank. Thus Miss Minns' most generous gift of pre-war days now awaits the larger gift necessary to make our building an actuality.

The plan, accompanying this article and referred to earlier, shows the first floor plan of the Botany-Zoology Building as designed by Messrs. Day and Klauder, architects. Plans for this building have been studied and restudied by the architects, by the college, and by the two departments concerned for many years. We believe that the final plan provides for a building as nearly ideal for its purpose and as attractive in design as it is possible to achieve in the location chosen. The Trustees have now accepted the plans for this building; the architects have prepared the working drawings; and the Botany Department has made drawings to scale for all furnishings to be used in its part of the building. Everything is ready to move forward as soon as the necessary funds are available.

As we look toward the larger opportunities that are being presented to us, it is our purpose that the department shall stand, primarily, in the future as in the past, for the dignity and educational value of its scientific work. At the same time we shall not fail to emphasize the humanistic aspects of our subject; and we shall endeavor to form a center that shall be of interest to all.

PLAN OF THE PROPOSED
BOTANY - ZOOLOGY BUILDING
WELLESLEY COLLEGE
WELLESLEY, MASSACHUSETTS

MARCH, 1924.

SCALE: 1 INCH = 20 FEET

SOUTH WING OF THE BOTANY BUILDING
SHOWING THE GREENHOUSES AND
ATTACHED LABORATORIES

BOTANY WING

ZOOLOGY WING

FIRST FLOOR PLAN

FROM THE PLAN BY
MESSRS. DAY & KLAUDER, ARCHTS.,
PHILADELPHIA, PA.
OCTOBER, 1923.
W. DAVIS, DEL.

MARCH, 1924.

SCALE : 1 INCH = 20 FEET

SOUTH WING OF THE BOTANY BUILDING
GROUND FLOOR PLAN
SHOWING THE GREENHOUSES AND
ADJOINING LABORATORIES

FROM THE PLAN BY
MESSRS. DAY & KLAUDER, ARCHTS.
PHILADELPHIA, PA.
OCTOBER, 1923.
H. DAVIS. DEL.

The Greenhouses are finished, the Building* will be erected when funds are available.

As the Wellesley College Botanic Gardens
embarks on the new iteration of
the Margaret C. Ferguson Greenhouses,
we are reissuing this formative writing of
Margaret Ferguson, whose words continue
to shape and inspire the work we do.

Spring 2018

