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BOTANIC GARDENS IN SCIENCE AND EDUCATION[1]

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ONE could hardly expect to find an intellectual climate more salubrious for discussing things botanical and horticultural than that of the environs of Swarthmore. It is located in the only state of our union that has any reference to plant life in its name.

Whether it was something in the name, "Penn's Woods," or something in the blood of the early settlers—or a combination of both—I am unable to say, but the fact remains that botanic gardens and arboretums just naturally came into being in this region like mushrooms after a rain, springing up here and there over a period of some 200 years.

The Rosicrucians apparently came first with their medicinal plant garden on the banks of the Wissahickon in the very first years of the eighteenth century. Then came, in succession, the botanic garden of Christopher Witt in Germantown, in 1708; Bartram's famous garden in 1728; Humphrey Marshall's garden at West Bradford in 1773; John Evans's arboretum, near Bryn Mawr, in 1828; the Painter Arboretum, established by Minshall Painter and his brother about 1835; William Darlington's arboretum, laid out as part of the public park at Westchester, about 1850; the old botanic garden of the University of Pennsylvania, initiated by Professor McFarland in 1892; and then the Arthur Hoyt Scott Foundation here at Swarthmore, beginning in 1928 and antedating by four years the Morris Arboretum in Philadelphia, which is the youngest offspring of botanical interest in this region.

[1] Founder's Day address, delivered at Swarthmore College on October 31, 1936.

One feels almost out of breath by the mere recital of names and dates. I know of no other region of similar size in America that can boast of so many botanic gardens. In a very real sense Swarthmore is at the American center of distribution of botanic gardens, for the idea spread from this region to New York and elsewhere throughout the nation.

But, for some reason or other it did not spread very fast. Almost every city of any considerable size in Europe has its botanic garden and has had for a generation or more. The same is true of the Old World universities—Pisa, Padua, Paris, Oxford, Cambridge, Berlin, Munich, Amsterdam, Copenhagen and others.

In America municipal botanic gardens are rare, and as late as 50 years ago only a few American universities had botanic gardens. Only about fifty American cities out of some 980, having a population of 10,000 or more, can now boast of a botanic garden, and 22 of these were established during the past 25 years—most of these 22 during the past ten years.

It is significant to see these institutions coming into being at the rate of nearly one a year during the period of a world war and a world-wide economic depression. Probably no other kind of scientific or educational institution has multiplied so rapidly during the past quarter century. This is only one of numerous evidences of an expanding and deepening interest in botanical and horticultural science during this period. The establishment of the Arthur Hoyt Scott Foundation places Swarthmore College in the vanguard of educational progress in this important field of knowledge.

The promotion of gardens and of gardening has by no means been limited to gardeners. It has always been a concern of great philosophers and great rulers. Pliny tells us, in his "Natural History," that Epicurus, "that connoisseur in the enjoyments of a life of ease," was the first to lay out a garden in Athens, where he met his students and did his teaching; "up to his time," says Pliny, "it had never been thought of to dwell in the country in the middle of the town." When Epicurus died (in 270 B.C.), he left his garden, known as the "Gardens of Epicurus" (Κῆποι Επικούρου), and some funds to two trustees, who devoted the garden to the school of Epicurus.

Charlemagne established gardens by royal edict, and even prescribed what plants were to be grown in them. It is of profound significance that a man who had such tremendous administrative responsibilities as did Charlemagne should consider that the establishment of gardens merited his personal attention.

Cosmo de Medici (1555) and King Henry IV of France (Montpellier, late sixteenth century) were also among the great rulers who established gardens. One of the great botanic gardens of the world—that at Kew, near London, dates from the appointment of William Aiton to organize a physic (or medicinal plant) garden for the Princess Augusta, Dowager Princess of Wales. These gardens remained a private possession of the crown until as late as 1840, when "Kew" was made a public garden.

Perhaps the outstanding instance of the founding of a botanic garden by a great scholar is the garden established at Athens by Aristotle, who is said to have endowed it from his wealth and made his pupil, Theophrastus, the "director" of it.

History tells us that Theophrastus conducted this garden for some 50 years. When he died, in 285 B.C., he left it to a group of his intimate friends—perhaps a kind of board of trustees. It appears to have functioned as a center of botanical study for about three generations. Of special interest, at this time and place, is the fact that the Athens botanic garden quite probably partook largely of the nature of an arboretum. This is suggested, in part, by the fact that of Theophrastus's book, "Inquiry into Plants,"[2] five books out of nine and 426 pages out of 476 are devoted to trees and shrubs. He describes 183 kinds—an unusually large number for that day.

By the generosity of another wealthy friend, Theophrastus was enabled to improve the Athens botanic garden on an extensive scale. The name of this early patron and benefactor of botany, the spiritual ancestor of Mrs. Arthur Hoyt Scott and Mrs. Owen Moore, was Demetrius Phalereus; it should be remembered and perpetuated, as theirs will be, wherever botanic gardens and arboretums are established and maintained.

Theophrastus, as we all know, was not only a botanist but a philosopher—an early "encyclopedist" of learning. There have been preserved the titles of more than 225 books which he wrote; and besides this productive scholarship, he directed a school of some 2,000 students in which he also taught.

With all these duties how could Theophrastus acquire the vast knowledge of botany which is revealed to us in his two-volume treatise of nine books? For there were in classic Greece, as here and now, only 24 hours in a day, and Theophrastus, like modern professors, had to devote some hours each day to eating and sleeping.

Theophrastus traveled little, yet he gives accurate information about the wild and cultivated plants of Greece and other countries. This was largely made possible by the existence of the Athens botanic garden, where Theophrastus had his home, took walks and studied and thought. It was his first-hand observations in this garden that enabled Theophrastus to lift the study of plants out of the limbo of myths and

[2] English translation by Sir Arthur Hort, London, 1916.

fables, which cluttered up the writings of his predecessors.

Moreover, the books he wrote on plants are the only definite source of information as to what trees were known to the nations of antiquity prior to the Greeks.

We have in this fascinating story, of which the students of the old classical curriculum of American colleges appear to have been generally indifferent, a "random sample" of the contribution of botanic gardens, from that day to this, to the advancement of science and education.

It was the *greatest* intellects of the *greatest* civilization the world has ever known that considered the study of plants important and laid the foundations of botanical science, to the immeasurable advantage of succeeding generations. The Arthur Hoyt Scott Foundation has not only made possible here a future development along modern trends, but has placed Swarthmore College, in a new way, in the line of descent from one of the glories of ancient Greece.

This gradual penetration of the botanic garden idea from Greece and Italy up through France, Germany and England to Sweden is an interesting special case of the general principle that while humanity, throughout European history, has migrated from north to south, culture has migrated in the opposite direction.[3] It is encouraging and reassuring, in this connection, to note that learning and culture tend to diffuse themselves among the people; they have had a vitality and a momentum that have helped to carry them over a wider geographical range than the reach of physical migration of the human race. If this diffusion of learning and culture should continue, we might, in time, become really civilized. Who can tell!

A recent writer has compared 300 years in the life of a university to 25 years in the life of a man. On that basis here is Swarthmore College in "manhood's prime vigor," with its roots and its branches and its background in a soil and air and tradition of botanical science. What a logical event in its history, therefore, was the establishment of the Arthur Hoyt Scott Foundation, as stated by Mr. Wister in his first Report, "for the encouragement of horticulture in its broadest sense." Should not every educational institution whose primary aim is to promote knowledge and culture recognize in its curriculum, as one of the new humanities, the study of that science whose field is the fundamental art of civilization?

I speak of the natural sciences as "new humanities" because, if they are rightly taught, they not only keep us abreast of the most recent advances of knowledge and the method of knowledge, but they carry us back to the fountain head of modern learning as surely as did the study of Homer and Aristotle and Virgil and Livy.

Much time was given in the old classical curriculum to Aristotle, and yet how rarely was any time devoted to his scientific writings and how few realized that his scientific work had meaning for moderns. It is he, said Osler, who "speaks for the first time the language of modern science, and indeed he seems to have been first and formost a biologist . . . the founder of modern biology."

The tragedy of the shelving of the classical curriculum has not been the elimination of a general knowledge of the Greek language, great as that loss may be; it is the severing of our vital connection with the great thinkers of classic Greece while advancing the sciences *they* found by the method in which *they* were the pioneers. From the standpoint of scholarship and culture, it is almost like trying to turn on the electric light when the wires from the dynamo are cut.

I am not intending to read a belated obituary of the classical curriculum, in which I am a firm believer (for some!), nor to pronounce a panegyric on the ancient Greeks, but to point out how close we have come to overlooking one of the great cultural and liberalizing advantages to be derived from botanical science when studied and taught in historical perspective.

A few moments ago I referred to the fact that Epicurus established his "Gardens" in Athens as an *educational center*. Herein lies a fundamental distinction between a botanic garden or arboretum and a park. A public park is intended to serve hygienic, esthetic and recreational ends. So may a botanic garden. No one ever thinks of a public park as an educational center; but that is precisely what a botanic garden or arboretum essentially is. It is, in effect, an outdoors museum of plant life, about which (as in the case of a modern museum) is organized a program for the advancement and diffusion of knowledge.

To illustrate briefly: In planting a park the main consideration is beauty. No attention whatever need be paid to the botanical affinities of the trees and shrubs and herbaceous plants; the only important consideration is a beautiful landscape effect.

Beauty is equally essential in a botanic garden, just as it is essential in every aspect of life. Nothing is ever right unless it is as beautiful as we can make it. But there is one handicap in laying out a botanic garden, for some regard must always be had to botanical considerations. Our problem is to make the botanic garden or the arboretum as beautiful as we can with necessary regard for these other essentials.

Then, after the planting is done, the plants are to be labeled. This *may* be done in a park; in a botanic garden it *must* be done, for it is the primary purpose

[3] A. Wyatt Tilby, "The Distribution of European Genius. The Nineteenth Century and After," January, 1936, p. 47.

of the plantations to be educational. And then comes the organization of scientific research, growing out of, furthered by and enriching the collection of living plants; and the program of lectures, classes, field study, technical and popular publication and other educational techniques by which a botanic garden fulfills its mission and justifies the ability and effort and financial support which made it possible.

One can hardly overemphasize the importance of a study of trees. They make the beauty of our landscapes; they make possible our parks; they supply the shade and beauty of our streets. It was Loudon who declared that, next to buildings, trees and shrubs are "the most important ornaments which can be introduced into a country." The mere mention of the word "wood" suggests the innumerable ways in which trees are essential in our daily lives. Surely we ought to be interested, not only to use and enjoy them, but to know all we can about them; and whatever man is interested to know, about the world in which he lives, is worth finding out—if we can.

Of course, the ideal of the modern botanic garden and arboretum has been a gradual evolution; and yet the germ of this ideal—the essential conception—was present almost from the first. We have noted this for botanic gardens in general; the fact stands out in bold relief for arboretums.

The word arboretum, as an English word, is not quite 100 years old. It appears to have been first used by John C. Loudon, the English botanist, in his eight-volume work on "The Trees and Shrubs of Britain," published in 1838. In the body of the text he uses it freely, for example, "collecting trees from a distance . . . to assemble them in one plantation or arboretum."

The Latin dictionary, after defining *arboretum* as "a place grown with trees," gives this quotation from the Roman historian, Quadrigarius: "arboretum ignobilis verbum est, arbusta celebratius." This "ignoble" word, however, has come to designate a very noble institution.

The conception of an arboretum as a scientific center is at least as old as 1627, when the first edition of Lord Bacon's "New Atlantis" was published. The "Head of Solomon's House," describing the intellectual condition of the country, states that "The End of our Foundation is the Knowledge of Causes." Enumerating the "Preparations and Instruments" for accomplishing this end, he says:

> We have also large and various Orchards and Gardens, wherein we do not so much respect Beauty, as Variety of Ground and Soyle, proven for diverse Trees and Herbs. . . . In these we practice all Conclusions of Grafting, and Inoculating, as well of Wilde Trees, as Fruit-Trees, which produce many Effects. And we make (by Art) in the same Orchards, and Gardens Trees and Flowers to come earlier, or later than their Seasons; and to come up and bear more speedily than by their Naturall Course they doe. We make them also by Art greater much than their Nature; and their Fruit greater, and sweeter, and of differing Taste, Smell, Colour, and Figure, from their Nature. . . . We have also Meanes to make . . . one Tree or Plant turn into another.

A remarkable forecast of the program of plant propagation, plant breeding and experimental evolution in our modern institutions, which has not only advanced our knowledge of plant life, but has done so much to add to the health and pleasure and wealth and enlightenment of the world. The report of the British Parliamentary Commission, appointed about 1838 to report on the question of continuing the Royal Botanic Garden at Kew, speaks of it as "one of the first proofs of wealth and civilization."

It was more than one hundred years after Lord Bacon's prophecy that Duhamel du Monceau, a Frenchman prominent in the scientific and cultural life of his time, formed large collections of trees and shrubs on his two estates, devoting special attention to the rarest and finest, as Arthur Scott did here. Duhamel's collections appear to constitute the first arboretums developed primarily for the purpose of promoting the scientific study of trees. The results of Duhamel's studies based on this arboretum were published in 1755 under the title "Traité des arbres et arbustes qui se cultivient en France," and this is probably the earliest modern scientific work on trees.

Those who realize the civic and economic importance of arboriculture, silviculture and scientific forestry have always recognized the great advantages of an arboretum in promoting those sciences.

When the subject of forestry was just beginning to take shape as a major division of botanical science, in the last quarter of the nineteenth century, James Hutton Balfour, who became keeper (director) of the Royal Botanic Garden at Edinburgh in 1845, organized a portion of that garden as an arboretum just before he retired in 1879. The stated purpose of this was to facilitate the work of students of forestry in the University of Edinburgh. This is an early, if not the earliest, instance of a modern botanic garden developing an arboretum as one of its main divisions.

And now, what are the results of the scientific and educational work, made possible or promoted by botanic gardens and arboretums? It would not be possible, in one lecture, to enumerate all of even the more important results. They are published in books, reports and magazine articles that would make a large library. But two or three cases may be mentioned.

(1) For reasons of sentiment let us take a case near home. I have already spoken of Bartram's Garden. In the fall of 1765 John Bartram and his son, William, made a botanical reconnaissance through the south,

including Georgia. Near Fort Barrington, on the Altamaha River, they discovered a beautiful tree or shrub, hitherto wholly unknown to botanists. They named it *Franklinia altamaha,* after the great Philadelphian and the river on whose banks it grew. By the laws of nomenclature it should, perhaps, be called *Gordonia.* In 1777 William Bartram, traveling alone, visited the same locality, rediscovered the tree and secured either cuttings or seeds, which were brought back and planted in his garden, within a dozen miles of this spot. The tree had never been found wild before nor has it since. Apparently it has become extinct, except as a cultivated plant (like the Ginkgo). It is an old story in this vicinity. Within five years the trees in Bartram's garden were producing seeds. Not only was a wild species saved from extinction (a most valuable service to science), but our gardens and parks have been enriched with a new and beautiful shrub.

(2) The modern science of Genetics is scarcely forty years old. Its foundation was laid in 1866 by the publication of a paper on Plant Hybrids by the Austrian Monk, Gregor Mendel. Mendel's laws were based on his breeding experiments with the garden pea. Plant breeding was made possible by the discovery of the nature and functions of the organs of a flower, and that plants could be artificially hybridized.

These discoveries were all made by the experimental study of plants *in botanic gardens.*[4] Centuries of study of plants growing wild had not revealed these fundamental conceptions. The existence of a great collection of trees and plants in a botanic garden or arboretum facilitates and stimulates the study of plant life.

(3) The enrichment of American horticulture by the plant explorations of the Arnold Arboretum is well known throughout the world. To this arboretum we are indebted for Thunberg's barberry (*Berberis Thunbergii*), the paniculate clematis (*C. paniculata*), the tree lilac, the Katsura-tree (*Cercidiphyllum*), the climbing hydrangea, the evergreen bittersweet, the Amur cork-tree (*Phellodendron amurense*), and other woody plants, now among the most prized materials for ornamental horticulture.

In Loudon's extended account, in his book just cited, of the exchange of ornamental, timber and fruit trees between different countries—a matter of the highest importance—we learn that this took place largely between private and public arboretums.

Says Loudon, speaking in 1838:

> It would doubtless contribute to the spread all over the world of the trees and shrubs of North America, if one part of them could be seen in a grand national garden at New York, and another in a garden or arboretum at Charlestown; or if the whole could be assembled in one grand park or pleasure ground at Washington.

And then Loudon indulges in a reflection not strictly horticultural:

> If it is desirable for us [he says] that we should assemble in our country the trees and shrubs of every other similar climate, it must be equally desirable that the inhabitants of every other similar climate should possess all those species for which their climate is adapted. . . . The time for believing that the exclusive possession of any benefit contributes to the prosperity or happiness of nations is gone by [a little prematurely optimistic!] the principles of free and universal exchange and intercourse are found to constitute the surest foundation for the happiness of nations.

It took 75 years for Loudon's hope for arboretums in New York, Charleston and Washington to be two thirds fulfilled; how long will it take for his principle of the free interchange of commodities and courtesies between nations to be realized?

It is one of the glories, as well as advantages, of science that it must be international. There is no such thing as American chemistry or American physics or American horticulture—nor French nor German nor English. If horticulture, or any other science, had tried to be 100 per cent. American or 100 per cent. any other country, it would have been a miserable failure, and we should all have been intellectually and spiritually impoverished. Civilization is, after all, an international and inter-racial achievement.

But what opportunities for arboretums lie ahead? Three instances, only, may be cited to illustrate the extent and importance of the problems that confront arboretums in forest pathology only, not to mention other aspects of forestry and arboriculture.

(1) In 1904 a new tree disease known as the chestnut blight appeared in New York City. Within a short time it had destroyed practically all the chestnut trees within a radius of 200 miles. Scarcely a mature tree is now standing; all that are left are threatened with extinction. The financial loss for the entire United States is more than $50,000,000, and the once greatly valued chestnut lumber is no more available. In the face of this calamity foresters are helpless. The only control measure is to cut down all infected trees. The state of Pennsylvania alone has expended hundreds of thousands of dollars in fruitless endeavor to stop the spread of this disease.

(2) In 1909 the white pines of America were threat-

[4] The fact that plants have sex was proved experimentally in a botanic garden by Camerarius, director of the botanic garden at Tübingen, about 1691–94, but this fact was first glimpsed ten years before Camerarius by Sir Thomas Millington, professor of natural philosophy at Oxford University. He suggested that the stamens were the male organs of the flower, and this inference was based on his observations of the flowers growing in the Oxford botanic garden. Likewise, Koelreuter, who produced the first plant hybrids, conducted his experiments in a botanic garden—at Karlsruhe, where he was director.

ened with extinction by the "blister rust," a disease also imported from Europe. The value of the timber-stand that was threatened was estimated at more than $400,000,000. The only way yet known to keep this disease in check is to destroy all the currant and gooseberry bushes within a radius of many miles of any white pine—a drastic and difficult procedure, and only partially possible.

(3) At present, another priceless possession—our American elm, is threatened with extinction by the Dutch elm-disease. The only known way to check the ravages of this menace is to cut down and burn all infected trees as soon as they are discovered. We are as helpless in this respect as the dentists were in the medieval period of dentistry, when the only known remedy for a diseased tooth was to pull it out. The money value of the threatened elms—many millions of dollars—is perhaps exceeded by the esthetic value of these trees in field and park, on street and campus and dooryard.

Surely here are needs not yet adequately met and challenges to any arboretum for a service of the highest scientific and economic importance.

The study of forest pathology is, of course, only one of the opportunities and responsibilities of an arboretum. By cooperating with garden clubs and other horticultural organizations it can render services that are important in fostering a general public interest in all aspects of plant life.

At such an arboretum as this there might, in time, be developed a training school to prepare young men for practical work in dendrology and arboriculture, with special reference to work on college campuses, private estates and the park departments of our cities.

An arboretum also serves to exhibit a rich collection of trees and shrubs, so that people may become acquainted with such material, develop their taste and improve the planting and beautifying of their own grounds. And (of special importance for a college) the presence of an arboretum, like this one at Swarthmore, not only facilitates and enriches the formal instruction in botany, but in a more passive way contributes to the educational atmosphere of undergraduate life.

Sir Frederic Kenyon, in his Romanes Lecture at Oxford, spoke of museums as an integral part of the system of national education, "a part of the nation's contribution to civilization," "a part of the response to the need that man has for quality in his life as well as quantity." And arboretums, being a highly specialized outdoor museum, may make the same kind of contribution to the life of the spirit and the promotion of general culture.

We are living in troubled times. Forces are at work that aim to introduce a new order of things into human life. Their program for realizing Utopia appears to involve the abandonment or destruction of much of the precious heritage of freedom and liberty of life and thought for which the human race has struggled and fought for many generations. No one could seriously question the fact that the content of college education should enable young men and women to understand the pressing problems of the moment, to view them in perspective and to consider dispassionately the possibilities of solution.

But, urgent as these subjects are, they are not the only matters that should be brought to the serious attention of college students. The spontaneous interests of thousands of students are outside the realm of the practical affairs of politics and social science, and the most important problem of our colleges and universities is to help students discover what their major interest in life is and to provide the richest opportunities possible for the cultivation of those interests.

Aside from all questions of the practical aspects of arboriculture and forestry many students will discover in the environment of an arboretum the major enthusiasm of their lives. From the standpoint of education, that is more important than any information that may be learned about trees and shrubs—or economics and history.

The establishment of this arboretum is, *ipso facto,* an enrichment of the cultural opportunities of Swarthmore College.

Some years ago, in another address, I noted how seldom our colleges have utilized their grounds for educational ends. There is no inherent reason why our college campuses should be only parks where the educational plant is located. They might just as well be an integral part of the educational plant—an outdoor extension of the laboratories of botany and horticulture.

And things may be educational without the aid of formal instruction. It is an education in slovenliness to live in an environment of disorder, just as it is an education in esthetics to be surrounded by beauty; lectures on art may help, but they are not essential. If students pass daily through a campus with the trees and shrubs grouped on a botanical basis and attractively labeled, many of them will incidentally, and more or less unconsciously, *absorb* a certain amount of information, and have aroused within them a certain amount of interest in plant life. More than one scientist has received his initial interest and urge by merely strolling through the halls of a museum as a boy.

The idea of an arboretum-campus has been struggling for realization in America for nearly 300 years —from the first decade of Harvard College. Harvard has just celebrated its three hundredth anniversary.

How small the beginnings may be that eventuate in great accomplishment is illustrated by the fact that the second president of Harvard, Dr. Dunster, in his first years, on a salary of £55 a year, was not only charged with all the duties of administration but gave all the instruction. For five days in each week he was occupied with lecturing from 8 A.M. to 5 P.M. His lectures were on such diverse subjects as arithmetic, astronomy, divinity, politics, rhetoric, Aramaic, Syriac, Hebrew and Greek.

His program recalls that of Theophrastus. When did President Dunster prepare his lectures, read examination papers, attend to administration? And *when* did he do his research!

For our purpose this afternoon we note with interest, and perhaps with some surprise that on every Saturday during the spring and fall quarters of the year, from 2 to 3 P.M., President Dunster conducted a botany class, lecturing on the "Nature of Plants." "This," says the historian of Harvard College, "signalizes the inauguration of Botany; a light subject, suitable for hot Saturday afternoons in July and August. . ."!

We are familiar with the opinion, commonly held a generation ago, that botany was largely a subject for girls' finishing schools, but this is the only time I ever saw it characterized as "a light subject," suitable for hours of languor on hot summer afternoons.

Morrison thinks that the phrasing of the title of Dunster's course—"Nature of Plants"—indicates that the teaching consisted in reading to the students some abbreviated edition of Aristotle's *De Plantis,* or possibly Theophrastus's book of similar title.

Morrison also thinks it would be rash to assume that President Dunster adjourned his botany class to the Harvard "Yard" in order to study nature at first hand. Perhaps it would be, for one to whom scientific method was doubtless a closed book, and who had such a heavy schedule of teaching and administration as Dunster had.

However, Dunster's teaching must have been very inspiring, for the laws of Harvard College forbade any student to show a light in his study *before* four o'clock in the morning.

In 1672 Dr. Leonard Hoar became president of Harvard, and is said by Morrison to have had a "broader purpose" for the college than any other president before Eliot. President Hoar referred to himself as an amateur botanist. In a letter to the great chemist, Robert Boyle, he enumerates some of his ambitions for Harvard, and specifies, "A large well-sheltered garden and orchard for students addicted to planting."

Now, after nearly three hundred years, Harvard has the Arnold Arboretum, one of its most important and best known departments. Smith, Wellesley, Mt. Holyoke and several other colleges now have botanic gardens on their campuses; Michigan, Cornell, Pennsylvania and some other universities have arboretums that do not include the campus; but only a few institutions —the University of North Carolina, the Friends School at Westtown (Pennsylvania), and now Swarthmore—have developed their campuses as arboretums or as integral parts of an arboretum.

The advantage, for studying botany or horticulture, of having at hand such a plantation as a botanic garden or arboretum hardly needs to be further emphasized. There is assembled, in small compass, a collection of plants from all over the world—material that could not otherwise be seen except by extensive travel, prohibitively expensive for most students of plant life. Moreover, the plants, trees and shrubs have been arranged in systematic sequence, or on some other botanical basis, and they have been identified and labeled, all of which facilitates the use of the collection for study and instruction.

Such a collection, supplemented by a suitable herbarium and library, and administered by a competent staff of investigators and teachers, with the *esprit de corps* of a body of students, and surrounded by the academic atmosphere of a great educational institution like Swarthmore, can not help but be a stimulus to delightful and profitable study and an important factor in preparation for life work in the field of one's greatest enthusiasm.

These, and more, are the advantages that have been made possible at Swarthmore by the Arthur Hoyt Scott Foundation. It is a wonderful educational opportunity, and I hope that funds will become available with increasing abundance to make possible in this center, so rich in botanical tradition and achievement, the development of a scientific and educational program correlated with a campus-arboretum, and preserving the high standards of scholarship that have always characterized the various departments of Swarthmore College.

This foundation, commemorating the worth-while interests and high ideals of Arthur Hoyt Scott, lover of trees and of Swarthmore, may be made not alone to enrich the undergraduate curriculum of this college, but to serve botanical and horticultural science and education on a national and international scale, to foster a love of beauty, to emphasize the importance of a study of plant life, and to promote an interest in the conservation of our natural resources. The foundation is laid; the superstructure has been begun; the vision, the enthusiasm and the will to accomplish are here in full measure. To paraphrase St. Paul: This college has planted, your Apollos has watered; may God give the increase in full measure of abundance.