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THE SCHOOL OF HORTICULTURE IN PERSPECTIVE[1]

By Dr. C. STUART GAGER

DIRECTOR, BROOKLYN BOTANIC GARDEN

SIR WILLIAM TEMPLE, British statesman and author, was born in 1628 and died in 1699. Soon after his marriage, at the age of 27, he took up his residence in Ireland, where he is said to have "read a good deal and acquired a taste for horticulture."

In 1692 appeared the second part of Sir William's essays—the "Miscellanea," which included his classical essay on gardening.

"As gardening has been the inclination of kings and the choice of philosophers," said Sir William, "so it has been the common favourite of public and private men; a pleasure of the greatest and the care of the meanest; and, indeed, an employment and a possession for which no man is too high nor too low."

When Sir William died he was buried by the side of his wife in the south aisle of Westminster Abbey. But, by special instructions, his heart was buried, not by the side of his wife, but in a silver box under a sun-dial in his garden, opposite his favorite window seat. So much affection can one have for a garden!

Having learned, from this incidence, the relative regard in which Sir William held "ladies" and gardens, we may not, perhaps, be greatly surprised that he writes as follows:

"I will not enter upon any account of flowers, having only pleased myself with seeing or smelling them, and not troubled myself with the care, which is more the ladies' part than the men's." And then he concludes, "but the success is wholly in the gardiner"—who, of course, was a man. Perhaps if there had been a school of horticulture for women in Sir William's day this last disparaging sentence could, or perhaps would, not have been written.

[1] Address delivered at the twenty-fifth anniversary exercises of the School of Horticulture for Women, Ambler, Pa., May 20, 1936.

BOOKS ON PLANT LIFE FOR "LADIES"

It is interesting to note the persistence with which this idea of the study of flowers being "more the ladies' part than the men's" appears in botanical literature. As early as 1717 the great diarist, John Evelyn, published in London a book of some 200 pages entitled, "The Lady's Recreation, or the Third and Last Part of the Art of Gardening Improved."

The only work of the great French philosopher, Rousseau, devoted to plant life was entitled "Letters on the Elements of Botany Addressed to a Lady." The English translation, by Thomas Martyn, was published in 1771—54 years after Evelyn. J. Reynolds Green tells us that only the introduction and eight of the thirty-two letters were from Rousseau's pen, the remainder being original with Martyn.

Some of us will always be grateful to Rousseau for one of his statements: "I have always believed," he said, "that one could become a very great botanist without knowing the name of a single plant"!

"Before we teach our children to name what they see," says Rousseau, "let us begin by teaching them how to see. This science, which is forgot in all sorts of education, should make the most important part of it." An echo of "Emile."

As illustrating the difference in the point of view of the botanist and the horticulturist, we may note Rousseau's statement (or is it Martyn's?) in letter VII that "The double flowers, which we admire so much in our borders and beds, are but monsters, deprived of the power of producing their like. . . . Whenever you find them double do not meddle with them, they are disfigured; or, if you please, dressed after our fashion: nature will no longer be found among them."

I must confess that, while I greatly admire double roses and double peonies—when I think of double sweet peas, double daffodils and double nasturtiums, I feel more or less in sympathy with Rousseau.

Twenty years after Rousseau's work, the noted English botanist, John Lindley, published in London (1841) his well-known book, frankly entitled, "Ladies' Botany." Aside from the title, however, there is little in the book to suggest that it was intended exclusively or even primarily for ladies.

John Ruskin, in his book on botany, "Proserpina," published in England in 1878, refers thus to Lindley's work: "I return . . . to a book I gave away long ago, and have just begged back again, Dr. Lindley's 'Ladies' Botany.' For without at all looking upon ladies as inferior beings, I dimly hope that what Dr. Lindley considers likely to be intelligible to *them*, may be also clear to their very humble servant." Ruskin, contrary to Lindley, nowhere states that his book is intended primarily for ladies, but there is internal evidence that it was.

BOOKS ON PLANT LIFE BY WOMEN

I am sure it will surprise most of my hearers, as it did me, to learn that one of the earliest known manuscripts on plant life was by a woman. This was the "Physica Elementorum, fluminum aliquot Germaniae, metallorum, leguminum, fructuum, herbarum" (citing only the short title), written about the year 1180 by Hildegard of Bingen, and first printed at Strassburg in 1533. Hildegard was a Benedictine nun of great learning, and is called by Sarton "one of the leading scientists and one of the most influential personalities among Christians of her time."

It was about 550 years after Hildegard (in 1737) that another woman, Elizabeth Blackwell, who lived with her husband opposite the Physic Garden at Chelsea, England, wrote a two-volume work entitled, "A Curious Herbal." In the same year it appeared with a Latin title, and also in a German translation. This is one of the earliest modern records of a professional interest in horticulture on the part of women.

More than one hundred years elapsed before we find the next gardening book by a woman. In 1841 Mrs. Jane Webb Loudon published "The Ladies Companion to the Flower Garden, being an alphabetical arrangement of all ornamental plants usually grown in gardens and shrubberies: with full directions for their culture."

It is in this book by Mrs. Loudon that we find one of the early clear statements of the advantage of the cooperation of the landscape architect and the practical gardener. For their combined labors she adopted the term "Landscape Gardening," "because the art can only be advanced and perfected by the united power, of the *landscape painter* and the *practical gardener* . . . the luxuriant imagination of the *painter* must be subjected to the *gardener's* practical knowledge of planting, digging, and moving earth." She quotes a French couplet:

> Ce noble emploi demande un artiste qui pense
> Prodigue de génie, mais non pas de dépense.

In 1829, there was published at Hartford, Connecticut, an elementary text-book with the title, "Familiar Lectures on Botany," by Mrs. Almira H. Lincoln. Although nothing is said on the title page that the book is intended primarily for ladies, the "authoress" tells us in her preface that the book is based upon a "sketch" which she prepared for the use of her pupils in the Troy Female Seminary. This is, perhaps, the first American book on plant life by a woman.

FROM GUESS-WORK TO SCIENCE

Theophrastus (370–285 B.C.), in his "Enquiry into Plants," made a promising start toward a science of horticulture, describing cultivated (as well as wild)

plants, both trees and herbs, and giving fairly detailed instructions for planting, cultivating, fertilizing, et cetera. But his instructions were often merely the expression of an opinion, and throughout his work, we continually run across such expressions as "some say" this, but "others say" that. Thus, in Book VII, treating of pot-herbs, he notes that rain water is good for onions, but "some, however, say that rain water is not good for melons nor for onions."

The Spanish writer on agriculture, Lucius Columella, of Cadiz, flourished in the first century A.D. and was a contemporary of Nero, Seneca and Pliny, and of Diosconides, the greatest botanist of his time. In the preface to his twelve books, "De re rustica," Columella was one of the first to call attention to the general neglect of agriculture as a profession, in comparison with other human interests and arts.

> I cannot enough wonder [he says] why they, who desire to learn eloquence, are so nice in their choice of an orator, whose eloquence they may imitate . . . and they, who are desirous of some skill in dancing and music, are exceedingly scrupulous in their choice of one to modulate their voice, and teach them to sing agreeably, and no less a dancing master, to regulate the gestures and motions of their body . . . and, not to mention every particular, in that study which every one resolves to prosecute, he makes use of the wisest and ablest director he can find; finally, every one sends for a person from the society and assembly of the wife, to form his mind, and instruct him in the precepts of virtue: but Husbandry alone, which, without all doubt, is next to, and, as it were, near akin to wisdom, is in want of both masters and scholars . . . I myself have seen . . . academies . . . for delicately dressing and seasoning of victuals, for contriving and making up costly dishes . . . and I have also seen headdressers and hair trimmers [home economics and beauty parlors in the first century A.D.!]; but of agriculture, I have never known any that professed themselves either teachers or students.

And so horticulture continued to be an art without any underlying science until about the middle of the nineteenth century, when the first colleges of agriculture and agricultural experiment stations began to be established (Rothamsted, 1843).

One could not even outline the history of horticultural education in one address, but two or three high spots should be cited.

Thomas Martyn, as editor of Philip Miller's "The Gardeners and Botanists Dictionary," says that Evelyn's "Sylva Sylvarum" (1664) made a new era in gardening. He is also authority for the statement that "The first considerable treatise on ornamental gardening is Mr. Wheatley's entitled 'Observations on Modern Gardening,' published anonymously in London in 1771."

In this country, agricultural education began to be organized about the middle of the nineteenth century. One of the first steps was the giving of lectures on "agricultural science" at the State University of Michigan in 1853. The Michigan Agricultural College began to give instruction in 1857. Horticulture was first developed as a separate subject in Michigan Agricultural College in 1867. The Society for Horticultural *Science* was organized in September, 1903.

The First American Women Students of Horticulture

On August 12, 1851, the People's College Association was formed at Lockport, New York, and adopted a prospectus of studies, including "those sciences most immediately and vitally essential to agriculture and the useful arts." At one of the subsequent meetings of this association, Lucy Stone and other ladies attended in order to make sure that women should have equal rights with men in the proposed college!

In his book, "The Mediaeval Mind," Henry Osborn Taylor has tersely said: "Nothing passes away, and very little quite begins, but all things change." If we keep this in mind and are not too meticulous as to just what it was that these ladies at Lockport studied, we shall probably not be far from the truth in stating that Lucy Stone and her "female" companions were the first women students of horticulture in America—85 years ago.

What is Horticulture?

But what is horticulture? The word seems to have first appeared in 1678 in the Appendix of the fourth edition of the "New World of Words or General Dictionary," by Edward Phillips, nephew of John Milton and educated by him. The word horticulture was admitted into the French language by the Académie Française in 1835—almost exactly 100 years ago. So new are some things which seem to us to have existed "always"!

Robert R. Livingston, of New York, a member of the Continental Congress, defined horticulture as "an elegant branch of husbandry." Just as horticulture is a subdivision of agriculture, so horticulture itself, as every graduate of Ambler knows, may be subdivided into branches.

Professor Bailey, in his Standard Cyclopedia, names four subdivisions: Pomology, or fruit growing; Olericulture, or vegetable gardening; Floriculture, the raising of ornamental plants; and Landscape Horticulture, or the growing of plants for use in landscaping.

So busy were the early settlers of this country endeavoring to get a bare living out of the soil that horticultural activity was at first largely confined to pomology and vegetable gardening. It is gratifying to know, however, that the esthetic urge is so strong in human beings that plants that are "merely" orna-

mental *will* get grown. As Bailey points out, the growing of ornamentals and their use in landscaping accompanies "the deepening of the home life." How appropriate, therefore, that there should be a school of horticulture for home-makers—for women. It seems strange that the establishment of the first such school took place so recently as only twenty-five years ago.

Recalling the reputation of Americans for being "practical" even to the extent of being primarily commercial in their enthusiasms, it is of interest to note that floriculture has become the most important branch of horticulture, judged by the number of species and varieties of plants that are grown and by the number of persons interested. In this connection, there comes to mind a pertinent passage from Victor Hugo. The Bishop is conversing with Madame Magloire, in "Fantine":

> The garden, which had been rather spoiled by the ugly buildings which have been mentioned, was composed of four alleys in cross-form, radiating from a tank. . . . These alleys left behind them four square plots rimmed with box. In three of these Madame Magloire cultivated vegetables; in the fourth, the Bishop had planted some flowers . . . Madame Magloire had once remarked, with a sort of gentle malice: "Monseigneur, you who turn everything to account have, nevertheless, one useless plot. It would be better to grow salads there than bouquets." "Madame Magloire," retorted the Bishop, "you are mistaken. The beautiful is as useful as the useful." He added after a pause, "More so, perhaps."

When we consider what a major rôle garden vegetables play in our diet—for nourishment, which we tolerate; for roughage, which we need; for variety, which we crave; for calories, which we avoid; and for vitamins, which we must have, it seems strange that vegetable gardening has been the last division of horticulture to become organized and commercially important in America.

The early economic importance of pomology in America, standing easily first, in this respect, of the four branches of horticulture, is perhaps due to the fact that outstanding success with a large diversity of fruits has been insured by a diversity of favorable climates—New York and Oregon for apples, California and Florida for citrus fruits, and so on. In looking over the catalogs of our very early nurseries, one is struck at once with the great variety of fruits which were listed for sale.

The Prince Nursery, at Flushing, L. I., was established about 1727. The 22nd edition of its catalogue, published in 1823, "Practical horticulture being in that day quite a novelty in America" (as the preface states), lists 90 kinds of grapes, 114 apples, 107 pears, 53 cherries, 74 peaches, 48 plums, 55 gooseberries, 254 roses and 330 ornamental trees and shrubs.

The 1829 catalogue of the commercial garden of André Parmentier, established in Brooklyn in 1825, offers 12 kinds of table grapes, 242 kinds of apples, 190 kinds of "superior pears," 71 cherries, 64 peaches, 85 plums, 20 gooseberries, 396 kinds of trees and shrubs, besides 200 kinds of roses—a truly impressive assortment for that early date.

There is hardly a nursery in America to-day that carries a larger number of varieties. In fact, lack of variety is one of the weaknesses of present-day commercial horticulture in this country. To establish this fact one has only to compare the nursery catalogues of America with those of England and Europe. What American nurserymen seem most interested in is orders for carload lots of one or a few varieties not troublesome to grow in the nursery and easy to ship. Of course the nursery business is a business, not a philanthropy, and it must yield profits. But may we not hope that increasingly in the future we shall be finding a richer variety of ornamentals listed in American nursery catalogues, and may be able to secure them, even though we wish only one or two of each?

The Historical Setting for Ambler

It is significant that the first independent school primarily for horticulture in America is located in Pennsylvania, for that is a state where things have had a way of happening first. If we regard the Declaration of Independence as the beginning of the United States, then the United States happened first in Pennsylvania.

But, as Osborn Taylor said, "very little quite begins." It is often extremely difficult to fix upon an exact date or a definite event as the actual and clear-cut beginning of great or important movements or institutions.

However, avoiding controversial questions, several agricultural and horticultural events appear to have occurred first in Pennsylvania. In this state agriculture was first organized in America with the establishment in 1785 of The Philadelphia Society for Promoting Agriculture. (The Agricultural Society of South Carolina was organized in the same year.)

Pennsylvania is the state where David Landreth, soon after 1784, founded one of the first commercial seed establishments in America.

American horticulture appears to have been first organized in New York with the formation of the now defunct New York Horticultural Society in 1818. This was not the same organization as the present Horticultural Society of New York (1900, incorporated, 1902). But Pennsylvania was second with the organization of the Pennsylvania Horticultural Society in 1827. The Pennsylvania society of to-day is the original one, and would seem, therefore, to be the

oldest one in the country; moreover, it is to be credited with inaugurating the first annual flower show in the fall of 1830.

Not only was agriculture first organized in Pennsylvania, but the first botanic garden in America was also probably established in the same state, and not far from Ambler. Of course you are all thinking of Bartram's garden, begun in 1728. The article by Gager on "Botanic Gardens" in the "Standard Cyclopedia of Horticulture" credits Bartram's garden as the first botanic garden to be established in America. But it appears that Gager was wrong about this, for Professor Harshberger, in an article in the *Pennsylvania Magazine of History and Biography,* in October, 1924, records the fact that the first "botanic garden" in Pennsylvania (and therefore probably in America) was that of the Rosicrucian fraternity on the lower Wissahickon. This was really a medicinal plant garden. Harshberger further states that the second garden was that of Christopher Witt, at the southeast corner of High and Main Streets, in Germantown, antedating Bartram's garden by about 20 years. These two gardens, however, do not appear to have had the importance for botany and horticulture that attaches to Bartram's garden.

We can only refer to the facts that Bartram's cousin, Humphrey Marshall, established his botanic garden at West Bradford in 1773, and that William Darlington, about 1850, developed the public park at Westchester as a small arboretum of native trees.

And so we see that the School of Horticulture for Women is part of a great tradition. Environment would seem to be quite as significant for institutions as for plants.

With this historical background in mind, it has seemed to me it would be pertinent on this occasion to note a few of the horticultural developments that have taken place, wholly or partly, within the lifetime of Ambler.

Botanic Gardens

The term "botanic garden" was first applied merely to the plantations themselves—to the garden. The modern botanic garden, as a scientific and educational institution, comprises not only the plantations, with various types of gardens and horticultural collections, but includes as well a program of scientific research and public education organized around and upon these collections and plantations, supplemented with herbaria, library, laboratories, lecture rooms and classrooms, and carried on by a scientific, educational and administrative staff.

The evolution of the botanic garden from merely a plantation to such an institution has probably made more progress during the lifetime of Ambler than in any previous period of that length, and this may be considered as one of the important horticultural movements of the past quarter century. The development of an effective program of juvenile and adult education by botanic gardens is still in its infancy.

Nearly every city in the Old World has a botanic garden. America has still a long way to go before it reaches that record, but I am sure you will be as surprised as I was to learn that, if we include Brooklyn, established in 1910, there have been no less than twenty-two botanic gardens established in the United States during the existence of Ambler. Most of these came into existence during the past ten years.

Rock Gardening

The original plans for the plantations of the Brooklyn Botanic Garden included a Rock Garden. The construction work was completed and the first planting done in May, 1916. So far as we can ascertain, this was the first genuine rock garden in a public park or garden in America. By "genuine rock garden," I mean a garden of alpine and saxatile plants in proper setting and not merely a flower garden with rocks in it. The distinction between the two is not always kept in mind.

It is a pleasure to note at this time and place that this first public rock garden was constructed and developed under the general supervision of Mr. Montague Free, formerly instructor at the School of Horticulture. Ambler, therefore, shares with Brooklyn the honor of Mr. Free's election as the first president of the American Rock Garden Society, organized in 1934. Interest in rock gardening has spread and several rock gardens have been constructed during the period of Ambler.

Garden Clubs

A horticultural movement, largely within the past 25 years, peculiar to America and of special interest here, is the development of garden clubs. This is of interest to a school of horticulture for women because most of these garden clubs are of women.

For some time, it was believed that the Philadelphia garden club, formed in 1904, was the oldest one in America, sharing honors with the Minnesota Garden Flower Society, a true garden club, formed the same year. I am sorry that I can not, at this time, and place, credit the honors closer to Ambler, but Mr. Farrington, in an editorial in *Horticulture* for November 1, 1931, calls attention to the fact that the Massachusetts Horticultural Society awarded a medal to the Cambridge Plant Club in recognition of the fact that it appears to be the first, or at least the oldest, garden club in America. The first meeting of this club was held 47 years ago on January 20, 1889.

I am happy, however, to record the fact here that the Philadelphia Garden Club took the first steps in

the formation of the Garden Club of America. I quote from Mr. Farrington's editorial.

> The Philadelphia Garden Club's first meeting was held on May 19, 1904 [almost 32 years to a day], at the home of Mrs. Charles Biddle in Andalusia, Pennsylvania. Mrs. Stuart Patterson was made the first president and gave so much time and thought to the garden club movement in later years that she became known as the "Mother of garden clubs." It was she who called a meeting in 1913 [well within the Ambler quarter century] which resulted in the birth of the Garden Club of America.

The formation of the Garden Club of America gave a great impetus to the garden club movement, and soon the formation of state federations began. There are now more than 30 federations, that of Virginia, organized in 1920, appearing to be the oldest.

In 1929 the National Council of State Garden Club Federations was organized in Washington, D. C. There are now 1,980 federated clubs represented in the council, with more than 100,670 individual members in 36 states. According to a list of June, 1935, issued by the U. S. Bureau of Plant Industry, there are 281 horticultural organizations in the United States. Eight of these are in Pennsylvania.

Special-Flower Societies

Organizations based upon special interest in different animals are well known in the zoological world. A bull-dog society, an airedale club, a toy-dog association and others hold animal exhibitions under the auspices of the Westminster Kennel Club. There are bird-lovers clubs, the Audubon Society, aquarium societies, a cat society, even a reptile association.

I have been surprised to find how recent is the organization of flower lovers in America about special interest in a single genus. That the rose easily outdistances all other flowers in popular interest is reflected in the fact that the first special-flower society in America appears to have been the American Rose Society, organized in 1899—12 years before Ambler. The incorporation of this society, however, did not occur until July, 1921.

The American Peony Society, as an incorporated organization, antedates both Ambler and the American Rose Society, having been formed in 1903 and incorporated in 1904.

Among special-flower societies formed within the Ambler period may be mentioned the following: American Sweet Pea Society (1909 or 1910); American Fern Society, 1910 (previously functioning as the American Fern Chapter); Gladiolus Society, May 27, 1910; Dahlia Society, 1915; Iris Society, 1920; American Orchid Society, 1921; Delphinium Society, 1926; The Cactus and Succulent Society, 1929; Amaryllis Society, 1933.

Horticultural Periodicals

Important items in horticultural publication during the Ambler period are the establishment of *The National Horticultural Magazine* in 1921, and the transformation of the journal, *Horticulture,* from a trade paper to become the official organ of the Massachusetts Horticultural Society with its issue of August 1, 1923. The first series ceased with the issue of July 25, 1923. Later, as we all know, *Horticulture* became also the official journal of the Pennsylvania and the New York Societies.

Volume one of the *Bulletin* of the Garden Club of America appeared in 1913, and the *Garden Digest,* of the Federated Garden Clubs of New York, was launched in 1930.

Contributions of Pure Science to Horticulture

Students and alumnae of Ambler do not need to be reminded by me of the new ideas and methods of propagation and culture that have been proposed and some of which have become current practice since 1911. Three may be mentioned:

All arts and all applied sciences always benefit from the results of research in so-called "pure" science. One of the outstanding contributions of botany to horticultural practice has been the discovery of photoperiodism by Garner and Allard, as reported in their paper on the "Effect of Relative Length of Day and Night and Other Factors of the Environment on Growth and Reproduction in Plants," published in the *Journal of Agricultural Research,* March 1, 1920.

The results of research in plant genetics during the past 25 years have extended the pioneer work of Mendel and have made possible more intelligent and more efficient procedure in the breeding of new varieties of vegetables and flowering plants.

The diffusion of the conception represented by the term "clone," introduced by H. J. Weber in 1903, has also been of help in practical plant breeding.

From Amateur to Professional

American horticulture in its early stages was largely influenced by the work of amateurs, but during the past 25 years the development of the commercial side of horticulture has been accompanied by a steadily increasing amount and importance of professional scientific work. In 1927, in our state agricultural colleges and experiment stations, there were nearly 2,000 research projects devoted to horticulture. To-day, there are more than 1,000 such projects.

The past quarter century has not only seen the expansion and enrichment of horticultural work in older institutions, but also the establishment of such privately endowed institutions as the Brooklyn Botanic Garden (1910), the Boyce Thompson Institute

for Plant Research (1921), the Arthur Hoyt Scott Horticultural Foundation at Swarthmore (1929) and others. A Museum of Horticulture, as a permanent educational institution, is being established this year by the city of Dallas, Texas.

NEW VARIETIES INTRODUCED

Until our attention is called to it, we do not realize how small a number of species of wild plants have yielded horticultural forms. The actual number of species of plants is not known, but it has been estimated that more than 500,000 species of flowering plants and ferns have been described.

Since the School of Horticulture was founded, systematic botanists (in the period of 1910–1935) have described no less than 118,700 species—an average of 4,750 species each year. How many of these shall prove useful in horticulture remains largely to be seen. Doubtless some of them will.

The Division of Plant Introduction of the U. S. Department of Agriculture has brought into the United States about 80,000 kinds of plants during the past 25 years. How many of them are known to those in this audience? How many of them are now of commercial importance?

Among the more successful introductions might be mentioned the Korean chrysanthemums, dwarf Michaelmas daisies, *Kolkwitzia amabilis,* some of the day-lily hybrids of Stout and of Betscher, varieties of Japanese cherries and newly introduced Japanese iris (not yet in the trade). The first collection of bulbs of the regal lily was made in 1910, so that its actual appearance in trade falls within the past 25 years.

When we realize of how few really important new varieties the past 25 years can boast, we recall with renewed and deepened admiration the wonderful performance of the great French breeder, Victor Lemoine. Judged by the number of his novelties and also by their value to the gardens of the world, he is easily the greatest plant breeder of all time. As every horticulturist doubtless knows, it was he who produced (in 1876) the first double lilac. "Not a person who grows plants in a garden but what at one time or another has handled something that was the product of this master craftsman." Victor Lemoine died in the year when Ambler was founded.

NEW PRACTICES AND SKILLS

One would hardly think that the introduction of the automobile would influence horticultural practice; but the increase in the number of motor vehicles has been accompanied, as we know, by a corresponding decrease in the number of horses, and this, in turn, has resulted in the comparative scarcity and higher price of manure. This has been compensated for, in part, by the more general use of native and imported peat moss. Twenty-five years ago it was hardly a commercial commodity in America.

Among other new practices, perfected since the founding of Ambler, may be mentioned improved methods in stratification of seeds at low temperatures during their "after-ripening" period, to insure a high percentage of germination; the use of other media than sand for the insertion of cuttings; the stimulation of root-formation in cuttings by treatment with various chemicals; aseptic methods of germinating orchid seeds; the growth of lilies from seeds by amateurs as well as professionals; and the growth of potatoes and other vegetables as crops in aquatic nutrient solutions and in sand watered with nutrient solutions.

In 1911 the use of Terraria—glorified Wardian Cases—was almost unknown. Their general use dates from 1922, the year in which the Brooklyn Botanic Garden *Leaflet* on "The Wardian Case" was published.

FLOWER ARRANGEMENT

"Short is the bridge connecting gardening and flower arranging." So writes Mary Averill, of the Brooklyn Botanic Garden, pioneer missionary of this art, who introduced America to the methods and beauty of Japanese flower arrangement. In Japan the art is centuries old, with rigid rules and even with religious significance—something otherwise entirely unknown as a highly developed art in America.

But the introduction of courses of instruction in general flower arrangement, not restricted to the Japanese manner, falls well within the Ambler period. A course in flower judging was offered by the Federated Garden Clubs of New York State in 1931, in connection with the annual International Flower Show in New York City, and this was one of the first, if not the first, course of its kind in America. But here the emphasis was upon the judging of arrangements already made and offered in competition.

In January, 1933, the Brooklyn Botanic Garden offered a course of instruction in Japanese and other methods of flower arrangement, given under the auspices of the woman's auxiliary of the garden. The response to this opportunity was so enthusiastic that the course has been repeated every winter since, with a large registration each year.

In this connection, we may note that the first American books on flower arrangement (other than Miss Averill's books on Japanese flower arrangement) also appeared in 1933.

PLANT PATENTS

Packages for shipping plants have been patented; also fertilizers and methods of grafting and of "tree

surgery," so called. Plant patents are primarily to insure to the breeder the commercial advantages of his work. If Ephriam Bull could have patented the Concord grape in 1849, or if William Saunders, who introduced the Washington, or Bahia, navel orange in 1870, could have patented that, the financial returns might have been as great as from the invention of motion pictures or automobiles.

The first plant patented was "a climbing or trailing rose," an improvement on the "Dr. Van Fleet," characterized by its ever-blooming habit and called the New Dawn. This patent was issued on August 18, 1931.

The patents that have been issued cover almost every conceivable characteristic of plants, such as color, shape, vigor, fragrance, flavor, canning and shipping qualities, size of seed, absence of seeds, keeping quality of flowers, resistance to disease, etc., etc.

Approximately 100 plant patents, covering flowers, fruits and foliage plants, have been issued to date. So far, there is little or no evidence that the issuing of plant patents has stimulated plant breeding to any noticeable extent or has resulted in the production of varieties of merit superior to those produced before the enactment of the law. In other words, the benefits have accrued not so much to horticulture as to the horticulturist in a commercial way; and that was the primary intent of the law.

Opportunities for the Future

It might seem to be an extreme statement to say that horticulture is still in its infancy, and yet a subject that has had a continuous history, as an organized science, of not more than 100 years is certainly in its early stages of development, and, therefore, full of opportunity for those who pursue it. There are new methods to be perfected, new applications to be made, new materials to be discovered, new forms to be bred, new uses to be found and a better organization to be worked out for scientific progress and for educational purposes. Graduates of Ambler have not and will not have learned a trade, but will have acquired the fundamentals of a profession which is in all the vigor of youth and correspondingly full of challenge and opportunity.

We have been passing through one of the greatest economic depressions in the world's history. Many people have been obliged to seek a new vocation to earn a living, or a new avocation to preserve their optimism, their physical health or their mental balance. For many the solution of this difficult problem has been horticulture. It is coming more and more to be recognized for its value in occupational therapy. Educators who have watched the work of the children's garden of the Brooklyn Botanic Garden have told us that the care of a garden, from seedtime to harvest, has certain educational values and possibilities that may not readily be realized in any other way. May we not expect that, in the near future, many persons who were never meant to live in a city may be taken to village or country by their love of horticulture and thus find a happy solution of their economic difficulties?

Horticulture and Culture

A great deal has been written during the past seventy-five years about the relative educational importance of the sciences and the traditional humanities. In his delightful address on "The Old Humanities and the New Science," Sir William Osler pointed out the "grievous damage" that "has been done to both in regarding the Humanities and Science in any other light than complemental." In my address at Wellesley College, in 1928, I stressed the educational and cultural importance of knowing at least the outlines of the histories of all the subjects studied. "No man is cultivated up to the standard of his generation," said Osler, "who has not an appreciation of how the greatest achievements of the human mind have been reached."

Certainly among the greatest of human achievements, we must count the domestication of animals and the beginnings and development of agriculture and horticulture. It is a commonplace of knowledge that civilization began when man began to cultivate plants. To follow the history of agriculture and horticulture in all their fascinating ramifications is to become acquainted with the essentials of human culture.

From the standpoint of the enrichment of life, what a pity it is to learn how to grow plants but learn nothing of their history and their effect on human history; to be acquainted with experiment station bulletins but never to have heard of or become acquainted with the classics of horticulture; perhaps never to have heard of even the names of those who began to establish horticulture, first as an art, and then as a science, and whose writings illuminate not only the history of gardens, but of gardeners and their contemporaries and the age in which they lived; to use such words as *yard* and *garden* and *orchard,* and even *horticulture* and know nothing of how we came to have such words, what meanings they have conveyed through the centuries, what story they tell of social manners and customs, as well as of horticulture. It isn't so much the information one misses, but the pleasure and gratification and the sense of resource and enrichment which it always gives one to know something thoroughly and to view his calling clearly because he sees it in perspective.

Professor Gilbert Murray, the beloved classical

scholar of Oxford, said recently, in connection with the celebration of his seventieth birthday, "A society without history can not understand what it is doing; and history without scholarship can not understand itself."

With equal truth it may be said that horticulture, without scholarship, without knowledge of the history of its development, can not understand itself.

My plea is for the organization of studies in all professional schools in such a way as to give education and scholarship and culture, as well as technical skill and information.

THE PURPOSE OF ANNIVERSARIES

But what is the point and purpose of recognizing an anniversary? As I have recently stated elsewhere, it is not so much to celebrate past achievement, but to reveal to the world the nature of the institution; for those in charge of it to clarify and possibly to restate their ideals in the light of the wisdom gained by past experience, and with a clear vision of future and larger accomplishments, made possible by new conceptions, new needs, new methods and techniques, new resources and new enthusiasm.

Like every institution, Ambler is the point of apparent convergence of four parallel lines—two coming down from the past, approaching, but not quite reaching the goal set twenty-five years ago; two spreading out to the future. May the School of Horticulture for Women realize a full measure of the success which is possible only by facing always forward, along the lines that diverge into a beckoning future of greater usefulness. This is what I mean by "The School of Horticulture in perspective." "Allons, mes amis, il faut cultiver nos jardins" (Come along, my friends, let us cultivate our gardens).

OBITUARY

KURT WALTER FRANKE, 1889–1936

KURT WALTER FRANKE was born in St. Paul, Minnesota, on November 17, 1889, and died at Rochester, Minnesota, on September 15, 1936. His early education was in the St. Paul public schools. Following graduation from high school he entered the University of Virginia and specialized in chemistry, receiving a diploma in analytical chemistry from that institution in June, 1912. The following four years he spent as a chemist in a company manufacturing paper and paper products.

In the fall of 1916 he reentered the University of Virginia. During 1917–18 he was an assistant in the chemistry department and held the first du Pont fellowship in chemistry at the University of Virginia during 1918–19. During 1919–20 he held an assistantship in biology. In June, 1920, the University of Virginia awarded him both the degrees of B.S. and M.S. in chemistry.

The period 1920 to 1924 he spent in industrial work, being employed as chief chemist by a large textile manufacturing company. In January, 1925, he was appointed to a Cloquet wood products research fellowship in agricultural biochemistry at the University of Minnesota, which position he held until the fall of 1926, when he was appointed instructor in the same department. In June, 1927, he received the Ph.D. degree from the University of Minnesota with a thesis entitled, "The Measurement of Hydrogen Ion Concentration in the Control of Pulp and Paper Manufacture." Immediately following the receipt of the doctorate degree he was appointed head of the department of agricultural chemistry at the South Dakota Agricultural Experiment Station at Brookings, S. D.

Upon entering into his new duties he carefully surveyed the field in order to select a line of investigation which would be of the most importance to the agricultural constituency of the state. The selected point of attack fell upon the so-called "alkali disease," an obscure malady which had seriously affected large areas of the state from time to time. This disease, which affects horses, cattle, swine and even chickens, is characterized by a decreased rate of growth, the loss of hair and an abnormal overgrowth of hoofs and nails, followed by the sloughing off of the old hoofs, leaving raw and bleeding stumps. While the disease had been known since 1860 when it was reported as a fatal disease affecting cavalry horses, Indian ponies and mules, the etiology of the disease was unknown, although commonly ascribed to the drinking of "alkali water." Relatively little careful scientific work on the disease had been published prior to Dr. Franke's attack on the problem.

Dr. Franke's training in biology and biological chemistry promptly bore fruit. He first showed that the alkali salts of the drinking water were not the causal agents. He then demonstrated that the grains and even the forages grown in the affected region were highly toxic and that feeding such grains and forages brought on the typical symptoms. He then demonstrated that in the case of the cereal grains the toxic properties were concentrated in the protein fraction and that the starch portion was non-toxic.

At about this time Dr. Franke called the attention of representatives of the United States Department of Agriculture to the extent and importance of this problem, with the result that early in 1931 a cooperative attack began upon the problem with scientists in the