



Photograph by Katherine McClellan.
William Francis Ganong with a botany
class in 1910, in the Physiology House,
Lyman Plant House, Smith College

THE PLACE OF BOTANICAL GARDENS IN COLLEGIATE INSTRUCTION

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The splendid gardens under the direction of my predecessors in this discussion are well known to everybody, but this can not be true of the modest one of which I have charge. It will therefore be fairer to my comments on the subject if I say that it has been my duty, during the past fifteen years, to develop at Smith College, with due regard to reasonable financial restrictions, a garden which should be as well adapted as possible to collegiate instruction. It now includes these parts. First, there is an arboretum and fruticetum, of some 500 species, distributed, with regard partly to scientific arrangement and partly to pleasing landscape effects, over a campus of some thirty acres. Second, there is an herbaceous garden of some 700 species, arranged on the Engler and Prantl system. Third, there are three natural gardens, a rock garden, water garden and wild garden, the last as yet too young to be effective. Fourth, there is a range of well-built and suitably stocked greenhouses, nine in number with two attached laboratories. Upon the development of this garden rests my qualification for the part I have in this discussion. Naturally, it approximates to my idea of what a college botanical garden should be. I wish to ask you to bear in mind that I speak upon gardens in collegiate instruction, and I shall keep strictly to that subject. Many of my conclusions do not apply at all to gardens of a different type-public, university or other.

Colleges differ much from one another in many features, but from our present point of view have these in common: First, they have only an undergraduate constituency, with

practically no graduate work. Second, they have extensive grounds, usually of a rural character, which it is desirable to make as beautiful as possible. Third, they have a long summer vacation, with no summer schools or other instruction in that time. Of these conditions, to which collegiate botanical gardens must be adjusted, I shall speak in reverse order. The long summer vacation is even longer, from the present point of view, than its number of weeks implies, for most of our students do not know enough to make profitable use of the garden at the opening of college, while the great number of social and other distractions at the end of the college year, not to mention the attractions of the native flora, seriously shorten its period of usefulness in the spring. Consequently the part of a botanical garden of most use in a college is that in which plants are alive and at work during the winter months, viz., the greenhouses. There is no question that, so far as scientific instruction in a college is concerned, suitable greenhouses are far more valuable than any outdoor garden.

Yet the long summer vacation does not by any means empty a college garden of its utility or desirability. The part which the vacation renders least useful is the herbaceous garden, arranged on the systematic plan, and I am not sure but that, if I were starting all over again, I would omit this part, closely identified though it is with the very idea of a botanical garden. Another kind which the long vacation would render of slight use is an ecological garden, that consisting of beds designed to illustrate types of structure, of dissemination methods, of cross-pollination

mechanisms, and the like, for these would be well-nigh useless in early spring and late fall. Indeed, such observation and limited experimenting as I have been able to make on such beds leads me to disbelieve in their value aside from this limitation. It is impossible to have many of the forms illustrative of a certain idea in good condition at the same time; many of the forms best illustrating an idea are otherwise very unattractive and often difficult to grow; and even when such beds are developed, there are few people who can understand them unless they already know the subject with some thoroughness. I think it is usually true that gardens prepared to illustrate any artificial plan or idea, whether ecological, historical (e. g., plants mentioned by Shakespeare) or other, are very unattractive in appearance and difficult to maintain effectively. These objections do not apply to natural gardens, viz., rock gardens, water gardens, wild gardens, in which plants are grown in natural surroundings; for these plants and places can be made so attractive as to draw appreciation and notice from all, and when suitably labeled, as of course all parts of the garden must be, they are decidedly instructive. We have at Smith College a very attractive rock garden, with a variety of exposures, containing many kinds of plants, from cliff dwellers to shade-loving ferns, and it amply repays its cost in the pleasure and the instruction it gives to its many visitors.

Another part of the outdoor garden that is well worth while despite the long vacation is the collection of trees and shrubs, especially as these are needed for the beautifying of the grounds, which must receive attention whether a true botanical garden is developed or not. And this brings me to the second of the three conditions which must be met in collegiate gardens. All colleges desire to have their grounds as beautiful as possible, in order to create attractive surroundings for undergraduates, pleasing memories for graduates and favorable impressions for parents and benefactors. Now, to this end, the extensive use of trees and shrubs is indispensable. It would seem at first sight possible to combine a good landscape use of these with a systematic arrangement to illustrate relationships, but I have found, as no doubt have many others before me, that this is only partially

possible. Thus, some families contain far more plants of attractive form than others. Imagine confining Coniferae strictly to one section! Again, the proportion of trees to shrubs is so different in the various families that if these were confined to special areas some sections would have few or no trees and others no shrubs. Thus Leguminosae have several ornamental trees, but hardly any ornamental shrubs, while this case is reversed in Rosaceae, reaching an extreme in Caprifoliaceae, which has no ornamental trees at all. Hence a strictly systematic arrangement can not be combined with good landscape results, and the best that can be done is to make sure that representatives of a given family are present in the appropriate area, even though not confined thereto. But on this plan, a very good collection of trees and shrubs, both pleasing to the eye and useful for study, can be assembled on a college campus. Moreover, trees and shrubs are in condition for study earlier in spring and later in autumn than herbaceous plants, and besides can be studied to considerable advantage all through the winter when herbaceous plants are not visible at all.

Hence my experience has shown that of the outdoor garden, the trees and shrubs are far and away the most valuable part; next come natural gardens, and last of all the systematic garden. There is one other matter worth mention in this connection. The absolute necessity which colleges are under to keep their grounds attractive in any case, makes it possible to develop them as a botanical garden with comparatively little additional expense, for the extra cost of the other features is not relatively great. This applies in part also to the greenhouses, because where these are developed it is possible to give profitable and congenial employment to a good gardener during the winter, and consequently a more competent type of man can be kept, to the great advantage of all the interests involved.

Another matter which I am finding important in connection with the outdoor garden, but which applies equally to the greenhouses, is this. It is far better to concentrate upon good effects with a few things rather than upon the collection of many. In my own garden, we are reducing the number of species, but are giving better massing and surroundings to those we retain, which include

especially the kinds the observer is likely to meet with again. Primarily this is in order to conform to an educational principle of which the importance steadily grows upon me, viz., that the scientific merits of a garden, or of anything else, are not of themselves sufficient to attract persons to their study, but attention must be paid to the peculiarities of human nature which demand that things shall be made attractive also. I therefore consider it important to so arrange plants that they will evoke attention and admiration first, on which basis instruction is far more easily given. And as the human capacity for attention and absorption is strictly limited, it is no use to try to produce many such pleasing effects. A few very pleasing trees appeal more to human nature than do many only moderately pleasing. This principle fits perfectly, also, with my first condition of college instruction above mentioned, that only undergraduates make use of the garden, and the number of kinds they can utilize is not very great. In all scientific institutions, whether gardens, museums, or courses of instruction, we seem to pass first through an accumulation stage, in which completeness is the ideal and we try to collect all the kinds we can. Later we pass to a selection and individualization stage, in which we pick out the most essential objects and give each an ample and distinctive setting. We have passed into the second stage in our museums and to some extent in our instruction, but hardly yet in our botanical gardens.

I pass finally to the greenhouses, the importance of which I can not too strongly emphasize. These should be arranged, for convenience of both use and management, upon a climatic basis, including cool temperate, warm temperate, desert, stove and palm houses at least, furnished with a selection of well-labeled plants of the chief scientific interest, and with room for the growing of class material and for horticultural and physiological experiment, while the closer the attachment of the greenhouses to laboratories the better. I am here, as you may suspect, outlining the arrangement of the range developed under my charge, the practical working of which is extremely satisfactory.

The educational advantages of good greenhouses are too well known to all to need comment, but I may add another advantage not

so obvious, viz., that they provide an extremely attractive and instructive place for visit in winter, not only by students but by their friends and visitors; and this is something of marked advantage in rural communities. Indeed, the instruction and enjoyment derived by the public from outdoor gardens as well as greenhouses constitute no small reason for their development. For not only do they attract attention and sympathy to a college, but they are also a wholly appropriate and serviceable form of college extension.

There are two warnings I would sound in connection with the greenhouses. First, they should be kept free from all entanglements in connection with the supply of ornamental plants for college functions. Such a use is bad for the plants, subversive of a scientific interest in them by the gardeners, and derogatory to the reputation of the greenhouses. The respect of the college community is far greater for a collection of plants kept exclusively for educational purposes, and for the scientific interests involved therein, than for any collection at their beck and call for social purposes. Second, they should be kept free from any attempt to make them help pay their own cost. The florist business is a highly specialized one, conducted, as a rule, on a narrow margin of profit, and no range of college greenhouses can earn any considerable amount without devoting thereto an amount of space and gardener's time wholly incompatible with any considerable attention to educational objects. Moreover, the feeling of local florists is quite sure to be aroused against an institution conducting a competition which they are sure to regard as unfair. These objections do not apply to the greenhouses of agricultural colleges; where the problems are different, and where it is essential that the students learn to raise plants for profit.

So, I may summarize my ideal botanical garden for a college by saying that it consists first of a good range of greenhouses, second of a collection of trees and shrubs, primarily grouped artistically and secondarily on a systematic plan, third of natural gardens, and fourth of a limited systematic herbaceous garden. In all, selection and attractiveness of setting should be controlling principles.