U. S. DEPARTMENT OF AGRICULTURE.

OFFICE OF EXPERIMENT STATIONS—BULLETIN NO. 160.

A. C. TRUE, Director.

SCHOOL GARDENS;

A REPORT UPON

SOME COOPERATIVE WORK WITH THE NORMAL SCHOOLS OF WASHINGTON, WITH NOTES ON SCHOOL-GARDEN METHODS FOLLOWED IN OTHER AMERICAN CITIES.

BY

B. T. GALLOWAY,

Chief of the Bureau of Plant Industry.

WASHINGTON:

GOVERNMENT PRINTING OFFICE.

1905.

LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
OFFICE OF EXPERIMENT STATIONS,
Washington, D. C., July 18, 1905.

SIR: I have the honor to submit herewith for publication as a bulletin of this Office, a report upon school garden work carried on by the Bureau of Plant Industry, in cooperation with the normal and public schools of Washington, D. C. This work has been done under the direction of Dr. B. T. Galloway, Chief of the Bureau of Plant Industry, with the assistance of several members of that Bureau, and of Miss Susan B. Sipe, instructor in botany in Normal School No. 1 of this city. As a part of this cooperation, Miss Sipe visited a number of places which have become conspicuous for their school garden work, and her report on the methods pursued at these places is appended as a part of the bulletin. The latter supplements the account of school garden work in this country, published in the annual report of this Office for 1903 (pp. 573–584).

This Office has for several years past been devoting considerable attention to matters relating to the various grades and forms of agricultural instruction, and the subject of agricultural education has been made one of the special features of its work. In the classification of the subject-matter and the outlining of courses for elementary and college grades it has enjoyed the cooperation of various Bureaus of the Department, and has thus been enabled to combine in its publications the more strictly technical and the pedagogical features. There is, fortunately, a growing tendency among technical investigators to relate their work in some measure to the teaching of agriculture. These men, representing different subdivisions of agricultural science and practice, can be of great service in the development of various phases of agricultural instruction.

The interest of the Bureau of Plant Industry in the school-garden movement is naturally connected with its cultural phases especially, and is from the standpoint of work with plants as a means of instruction. With the facilities at its disposal in the way of experts, greenhouses, seeds, and other materials, it has been able to stimulate gen-

eral interest in this subject, and to contribute materially to the success of local efforts. The methods which it has followed, especially in its work with the normal school teachers, will be of widespread interest as showing the advantages of expert advice and some simple facilities for instruction.

I recommend that this account be published as Bulletin No. 160 of this Office, where it will form a valuable addition to the publications already issued on agricultural education.

Respectfully,

E. W. Allen,
Acting Director.

Hon. James Wilson,
Secretary of Agriculture.

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INTRODUCTION.

During the past few years there has been a growing interest in school garden work in this country. While the movement here is comparatively new, it has for a long time been a feature of the educational work in continental Europe. It is obvious that no set rules can be laid down for the management of a school garden. In the heart of a city the work may be an entirely different thing from what it is in a rural or semirural district. In the city the main idea may be an æsthetic one, combined with moral and physical training. The general trend of the work in this country is practical, so that its application will eventually have more or less effect on our industrial development. Manual training has been made a feature in many of our schools, and no one will deny that valuable results have been obtained from it.

Agriculture in its broadest sense is the primary basis of wealth in this country, and it seems essential that efforts should be made in our educational system to bring early to the mind of the child facts which will be of value as emphasizing the importance and necessity of agricultural work. There is no better way to do this than through a well-managed and well-conducted system of school garden training. Aside from the fact that the interest of the child is early awakened in an industry which means much to the future prosperity of this country, there is often a broader application of the work in its moral effect on the child. Then, the work is valuable in broadening lines of thought, enlarging the scope of the child's observation, and improving its physique. It has been well said that—

> In the school garden the fact should always be kept prominent that the pupil is to be the most active factor. We can put things in his way to help him develop properly and keep him from some of the things that fail so to help him, but we can not do his developing for him, and if he is to have a knowledge of the elementary principles of life, of industry, of mankind, of beauty and

justice, he must grow into these things by means of first-hand experience with them. To obtain this growth and to eliminate some undesirable things in the school, the school garden should certainly prove efficient.

The Bureau of Plant Industry naturally has been much interested in this movement through the contact of its workers with the educational movement generally. Efforts have been made to arouse interest in school gardens through various publications, but primarily through the distribution of seed. When the work of handling and distributing the Congressional seed was turned over to the Bureau of Plant Industry, four or five years ago, it was conceived that good might result from a modification of some of the methods of distributing this seed. Efforts have been made from time to time to arouse interest on the part of members of Congress who have large city constituencies and who might be able to encourage the school garden movement through the distribution of seed specially prepared for the purpose. Many million packages of seed have been distributed in this way in the larger cities, and some of these cases will be specifically referred to in the accompanying report.

In connection with the schools of the District of Columbia opportunities were afforded for putting into practice plans in reference to this work which have been under consideration for some time. Early in the work it was found that progress would necessarily be slow, from the fact that the public school teachers had never had any practical training in either horticulture or agriculture. To obviate this difficulty the active sympathy of those in charge of the normal school work in the District of Columbia was secured. Some elementary lectures were delivered by officers of the Bureau of Plant Industry to the students, and this led eventually to a broadening of the work. By direction of the Honorable Secretary, opportunities were afforded these students on the grounds of the Department of Agriculture. A small greenhouse was assigned for the purpose, and under the direction of Miss Susan B. Sipe, who has charge of the botanical work at Normal School No. 1, active investigations were inaugurated. This work has been highly successful, as shown in the report prepared by Miss Sipe.

This year the Department furnished facilities for Normal School No. 2 (colored) of Washington, D. C., to carry on the same general line of work inaugurated by Miss Sipe. This work was under the management of Miss Sara W. Brown and has been very satisfactory.

GARDEN WORK IN THE DISTRICT OF COLUMBIA.

PUBLIC SCHOOLS, WASHINGTON.

In the spring of 1902 the Bureau of Plant Industry of the United States Department of Agriculture received a request from Normal

School No. 1 of Washington, D. C., for assistance and cooperation in its efforts to introduce gardening into the course of the school. Suggestions as to methods of conducting the work, as well as the necessary seeds and plants, were sought. Flower and vegetable seeds were distributed, and Prof. L. C. Corbett, the Horticulturist of the Bureau, lectured to the students, five lectures being given on soils, germination, cuttings, grafting and budding, and the adornment of home grounds.

As there is little ground connected with the school building (Pl. II, fig. 1), it was necessary for the students to have home gardens in order to acquire the practical information needed by teachers. To see that the instructions given in the lectures were carefully followed, these home gardens were visited by Miss Susan B. Sipe, the teacher of botany at the school, and the creditable ones were photographed as an inspiration to future classes. (See Pl. V, fig. 1.)

During the school vacation of 1902 Miss Sipe was allowed free use of the gardens and greenhouses of the Department of Agriculture for practical work and study, and later when an offer of land, a small greenhouse, and a workroom was made to the school by the Chief of the Bureau of Plant Industry it was gladly accepted.

In the autumn of 1902, the students having been requested to bring on a day designated whatever their gardens produced at the time, a small but creditable exhibit was held. This included plants raised from coleus and scarlet-sage cuttings that had been rooted the previous spring in boxes of sand in the schoolroom windows, bunches of annual flowers, a few fresh vegetables, and several jars of preserved vegetables. The display showed that the effort made in the spring had not been wasted.

An elementary course in gardening was made possible by the acquisition of the greenhouse, the workroom, and the land, and this course was added to the curriculum of the second year. Its value has become so well recognized by the board of education that in the estimates of appropriations submitted to Congress for 1905 the sum of $50,958 was asked for the purchase of a site for a new normal school building, the following statement accompanying the request:

> Such a site should be large enough not only to accommodate a normal school building, including elementary practice schools, but should furnish ground for carrying on the work in school gardening, which has already become a part of the curriculum of this school and which is being developed under the personal care of the Chief of the Bureau of Plant Industry and with the approval of the Secretary of Agriculture. It is entirely feasible not only for our normal school students to be trained in the essentials of school and home gardening, but to supply from propagating plats of ground—prepared, planted, and cared for by pupils—much of the material needed for plant study in the graded schools, together with hundreds of cuttings and potted plants for schoolroom decoration. A site of the character desired need not be sought in the central portion of the

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city, where prices are so high as to prohibit the acquirement of a large tract, but could be located to advantage in one of our rapidly growing suburbs, where land is relatively cheap.

The course prescribed in the school at the present time is sufficiently elementary to be easily adapted to the schools into which the graduates are sent. No text-book is required, books being used simply for reference.

Simple experiments are performed and conclusions drawn from the results. Soils brought from school grounds are treated with different fertilizers, seeds planted in them, and the results carefully noted. The water-holding power of soils, the conservation of water by soil mulching, the essentials for germination, and the proper depths for planting various seeds are learned through experiments.

Before the frost touches geraniums, coleus, scarlet sage, and heliotrope in the park beds, cuttings are made and placed in clean sand to root, thus furnishing material for school-ground decoration later. These slips are potted and shifted into larger pots, as required, during the winter, so that by spring the greenhouse is filled with material for distribution. In the spring of 1904, 4,000 plants were sent out from this house, which covers an area only 9 by 32 feet. (See Pl. I, fig. 1.)

Besides the herbaceous material mentioned, hard-wood, permanent material is used for cuttings. Eight-inch cuttings of privet and forsythia are kept during the winter under an open shed in flats filled with sand. In March these are sent to schools, with directions for planting. The grounds of three schools are now surrounded by thriving hedges planted by children. The demand for these cuttings is greater than the school can supply. *Ampelopsis veitchii* and *Clematis paniculata* have been raised from seed and distributed to schools and to the homes of the students. Bulbs have been planted in pots for winter forcing. Lists of plants suitable for withstanding the unfavorable conditions of schoolrooms have been prepared for the use of pupils.

Much attention has been given to window-box gardening. The preparation of the soil, the suitability of plants, and their proper arrangement have been carefully studied. Special success in these window boxes has been obtained with Boston ferns.

Tree seeds have been collected in the parks of the city in the autumn and kept in sand during the winter. In the spring the ground has been plowed by the students with a hand plow, the seeds being planted in accordance with the directions given in Bulletin No. 29 of the Bureau of Forestry of the Department of Agriculture. (See Pl. I, fig. 2.) Weeding occasionally during the summer is all the work that has been required. The nursery now contains about 400 young trees.

FIG. 1.—NORMAL SCHOOL STUDENTS AT WORK IN A GREENHOUSE OF THE DEPARTMENT OF AGRICULTURE.

FIG. 2.—NORMAL SCHOOL STUDENTS PLOWING FURROWS AND PLANTING TREE SEEDS

SCHOOL GARDEN WORK AT WASHINGTON, D. C.

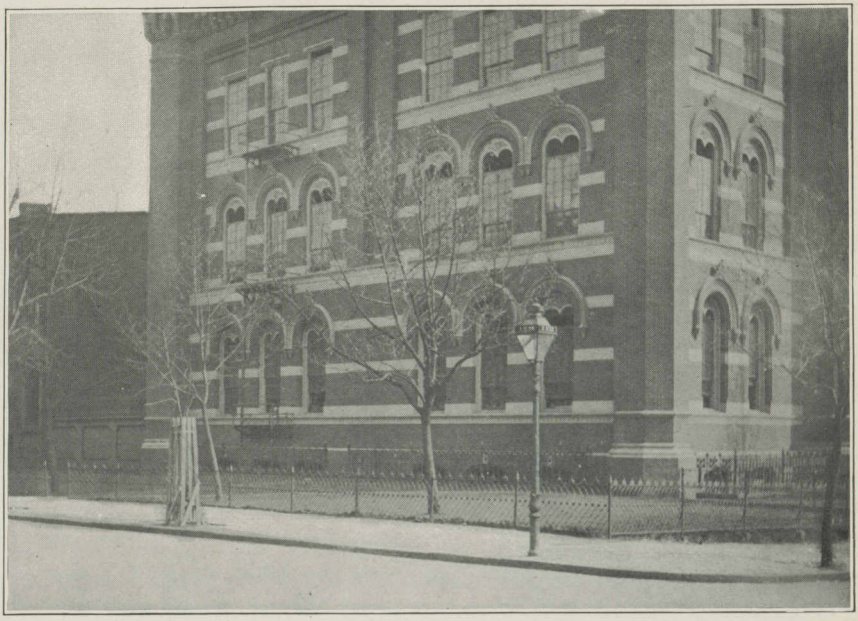

FIG. 1.—THE GROUNDS OF THE FRANKLIN SCHOOL BEFORE IMPROVEMENT BY PUPILS OF THE SECOND, SEVENTH, AND EIGHTH GRADES.

FIG. 2.—VACATION COMMITTEE AT WORK IN GARDEN OF SECOND-GRADE CHILDREN, FRANKLIN SCHOOL, FOUR MONTHS AFTER PLANTING.

SCHOOL GARDEN WORK AT WASHINGTON, D. C.

The simple principles of landscape gardening are taught—popularly known as the A B C of gardening: (A) Keep open center; (B) plant in masses; and (C) avoid straight lines.

These principles are thoroughly taught by the study of examples of good and bad planting in the city and by stereopticon slides. Each student is required to draw to a scale and submit a scheme for planting a specified school ground.

The first year's plan, by which the student did the practical outdoor work at home, was so satisfactory that no other method has been considered desirable. In many instances an entire neighborhood has been aroused to improve its back yards by the influence of a normal student. (See Pl. V, fig. 1.)

In the spring of 1903, in order to make practical application of the principles taught in regard to landscape gardening, the grounds around the Franklin School building, in which the normal school is located, were improved. The best plan of those submitted by the class was followed. The north side of the grounds had been neglected for years; so much so that not a blade of grass grew on it. (See Pl. II, fig. 1.) Two loads of manure were secured and spaded into it by the older boys with tools brought from home, and in one afternoon the spading, raking, and seeding were accomplished. The part designed for planting was apportioned among the schools. Permanent shrubbery was obtained for the background of the garden, sufficient space being left for each child to plant a seed—purple flowering bean, morning-glory, and dwarf nasturtium being chosen.

This plan has been followed successfully for two years. At the beginning of vacation the garden is so attractive that it is little trouble to form volunteer committees of children to report once a week throughout the summer to water and cut the grass and work the flower beds. (See Pl. II, fig. 2.) The attendance has been large. Each student in the normal class comes once a week for three weeks to direct the work.

The children do this work with no reward in view other than the beautifying of the grounds. Civic pride is taught and respect for the property rights of others is learned. While stealing and vandalism were weekly occurrences the first summer the gardens were in existence, not one case was reported during 1904.

The example set by the Franklin School was followed by 32 schools in Washington in 1904. Failures are reported in many cases, but they have come chiefly through lack of good soil and the indifference of janitors to the care of the beds in summer. These failures, however, have made the teachers more determined to be successful another year.

The following extract from the report made to the superintendent of schools by Mr. Charles Thompson, principal of the Smallwood

School, shows what possibilities there are in this work for those who have nothing but barren land to begin on, but who are thoroughly in earnest:

Ground was broken Saturday, April 16. Invitation was given to the children to report at 10 o'clock, bringing with them such implements as they happened to have at home. A great many came, bringing with them rakes, hoes, spades, coal shovels, in a more or less dilapidated condition, but they went to work with a will. A space 4 feet wide was dug at the rear and sides of the yard and both sides of the partition fence. Difficulties beset this stage of the work. Tools were dull and broken. The ground was hard, having been tramped on by feet of children for the past sixteen years. The soil was poor. Stones, bricks, old shoes, broken crockery, tin cans, cooking utensils, trash, and débris of all kinds were unearthed. A gentleman in the neighborhood, whose little boy is in the fifth grade, furnished a horse and wagon to assist us. The boys went in the wagon to the power house and secured 2 large loads of rich soil that is removed by the railroad company from its conduits. This, with a load of earth furnished by the District, was spread over the gardens after they had been thoroughly raked of trash. This latter the boys carted to a neighboring dump. Each grade was assigned a plat for cultivation. The total area of the garden is 1,044 square feet. Both flowers and vegetables were planted. These were obtained from various sources, but chiefly the Department of Agriculture. The pupils take great interest in their gardens, standing over and admiring their own plants and comparing them with plants of other gardens. The teachers join me in considering this little experiment profitable not only to the pupils but to themselves.

The work in the school yard has been correlated with the classroom work in nature study, reading, language lessons, composition, spelling, drawing, and paper cutting. Every child in the Franklin School planted a bulb in the garden in the autumn of 1904. The teacher of the second grade followed this planting by composition work and paper cutting of the tools used. The seventh and eighth grade teachers gave the following problems on planting day:

(1) The Department of Agriculture, in 1903, ordered 171,600 bulbs from Holland; 145,200 of these were distributed. This is what fractional part of the order?

(2) Hyacinth bulbs sell for 75 cents per dozen at the Center Market. The Franklin School bought them at $3 per hundred wholesale. What per cent was saved by so doing?

(3) The normal school has tulips for sale at 75 cents per hundred, crocuses at 20 cents, and hyacinths at $3. What will your order of 40 crocuses and a dozen each of hyacinths and tulips cost?

Plantain and dandelions have been troublesome weeds in the lawns. The older children measured the area and calculated how many flower heads, if allowed to seed, a plant must bear to take entire possession of the lawn. This, of course, has been done with the supposition that every seed grows and has a given space. This is practical, in that it teaches the necessity of preventing the ripening of the seeds of weeds.

Last spring 66,000 penny packages of seed were sold to the children of Washington for home planting. A list of easily grown, fall-blooming flowers, vines, and three kinds of vegetables was submitted to the children. Limitations were put upon their selection. Nasturtium seed only was thought desirable for the first and second grades. The third grade was encouraged to plant nasturtiums, radishes, and morning-glories. Above this grade the full list was presented: Zinnias, marigolds, petunias, lettuce, beans, balloon vine, morning-glory, and purple flowering bean, together with the seeds sown by the first, second, and third grades. No child in any grade was allowed to spend more than 3 cents. Teachers gave lessons in the schoolroom on the manner of planting and the care of the garden in summer.

An inventory of stock was taken when school opened, and, while there were thousands of mishaps, it seemed advisable to have the children bring to school on a day designated whatever their gardens produced. A half dozen remarkable flower shows resulted. These have aroused great enthusiasm for another year. At these exhibits, besides the flowers and vegetables raised by the children, the teachers have added an extra feature by exhibiting plants suitable for schoolroom culture. At one of the colored schools all of the plants used by the teachers of the building to decorate their rooms were brought together in the principal's room, where by comparison one could learn much. One of the most interesting features at all the exhibits was the seed collections. Those who had no flowers brought seeds that they had gathered from their gardens.

Every city that has done school garden work has studied its own needs in that direction and has followed the subject in the way that will be most beneficial. The point of view from which Washington approached the work has been that of arousing civic pride by giving better school surroundings, and by the improvement of back yards, all of this to be accomplished through its teachers, who should therefore have special training for this work.

Philadelphia, Boston, New York, and St. Louis, with their large foreign quarters, have felt the need of a work that will turn the children toward the country; so in those places the subject has been worked out on large areas, subdivided into many small plats, where children are taught the value of intensive farming on small tracts. But one experiment of the kind has been tried in connection with the schools in Washington, and this work has another purpose for its foundation than those mentioned, though it may be many years before its object is accomplished. The girls of the public schools in Washington have manual training in the form of sewing or cooking from the third grade to the high school; the boys are overlooked until they

are taught carpentry in the seventh grade. To test the value of gardening as a suitable form of manual training for boys below the seventh grade, a sixth-grade class of boys was selected to work the land assigned the normal school on the grounds of the Department of Agriculture.

The work began March 1, 1904. Once a week, while the girls were at the cutting and fitting school, the boys reported at the normal workroom. The same plan of objective and experimental work was followed with them as with the normal students. Study of soils, fertilizers, seed sowing, and mulching was made before the outdoor work began. Each boy was assigned a plat 10 by 17 feet, paths 2 feet wide separating the plats. (See Pl. III, fig. 1) The measuring was done by the boys and was the most difficult part of the work.

The teacher who does this work for the first time must guard against too close planting. She—for in nine cases out of ten it is a woman—will be misled by the term "intensive farming," and will plant so closely that by midsummer it is impossible to work between the rows. Except for radishes it is not advisable to have less than a foot between rows. A foot and a half is more desirable. Upon the control a teacher has over her class in the first planting lessons depends the appearance of the garden later. There is no better object lesson to a lazy or careless boy than the little plants appearing above ground. Such boys at this time will sometimes hoe up their entire plats and replant them, because of the great difference apparent between their gardens and those of the more careful pupils. All things are not suitable for such small plats. Among vegetables radishes, lettuce, onions, bush beans, and tomatoes, if trained to stakes, are the most satisfactory to children; petunias, nasturtiums, sweet alyssum, and verbenas flower all summer, so a bunch of flowers may be taken home at every lesson.

By putting in a crop as soon as one has been exhausted, on a sixteenth of an acre these sixth-grade boys raised 336 bunches of radishes, 110 bunches of onions, 368 heads of lettuce, 89 bunches of beets, 8 bushels of beans, 7 bushels of tomatoes, 7 bunches of carrots, and 1 peck of turnips, besides nasturtiums and petunias, many boxes of which found their way to the hospitals of the city. (See Pl. III, fig. 2.) At regular market prices $55 worth of produce has been gathered from this small plat. Experienced farmers sometimes fail to do as well.

The importance of thorough cultivation of the soil has been impressed upon the boys. Except for rains, no water is put upon the gardens. The soil is thoroughly worked once a week; the drier the weather the deeper the cultivation. The climate of Washington permits work upon the gardens late in the fall. In September, however, the boys are promoted to the seventh grade, where another

FIG. 1.—GARDEN PLATS LAID OUT BY SIXTH-GRADE BOYS IN THE GROUNDS OF THE DEPARTMENT OF AGRICULTURE.

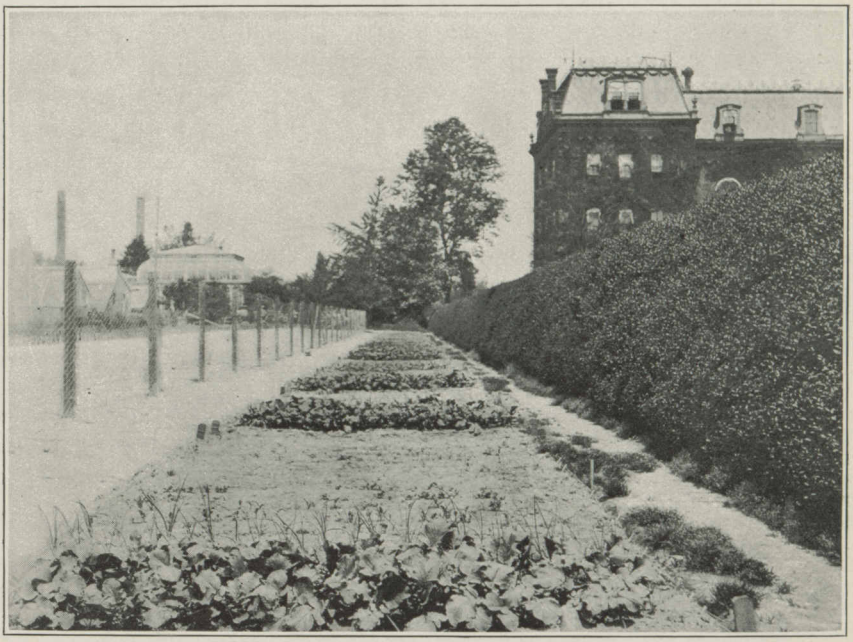

FIG. 2.—THE GARDEN PLATS SHOWN IN FIGURE 1, SIX WEEKS AFTER PLANTING.

SCHOOL GARDEN WORK AT WASHINGTON, D. C.

form of manual work is taught, so the garden work closes on October 1.

There is no question in the minds of those in charge of the value of the work. Proof was given the first season of the influence on the homes of the boys. With little expenditure for tools, fertilizers, and seeds, and in some cases renting land near schools, such opportunities could be given to every sixth-grade boy in the city.

That gardening has taken a permanent place in the schools of Washington was made very evident at a recent meeting of principals, both white and colored, called by the superintendent of schools, Mr. A. T. Stuart. Reports of successful work were read, and the superintendent expressed his desire that every school should plan work for the present year. Wherever there is sufficient ground, each grade represented in a building will be assigned a portion. This will be done not only to improve surroundings, but to furnish material for nature study. Planting vines to cover unsightly places has been strongly recommended.

The enlarged greenhouse facilities given this year to the normal school by the Bureau of Plant Industry will permit of the introduction of gardening into its first year's course, thus making a larger distribution of plants possible. Great care is exercised in the selection of the plants propagated, as it is desirable to make them serve the two purposes of decoration and material for lessons.

NORMAL SCHOOL NO. 2.

The following report regarding school garden work in connection with the normal school for colored pupils has been furnished by Miss Sara W. Brown, the teacher in charge.

The first successful attempt at school gardening in Normal School No. 2 was made in 1904. In the spring of 1903 the idea of beautifying the school grounds was seized with enthusiasm. The boys of the senior class designed and dug beds, and the class contributed to the purchase of plants. Poor soil, late planting, ignorance of the principles underlying plant culture, and inexperience combined to defeat the purpose. Some successful attempts at home gardens, however, were reported in the autumn.

The teacher of nature study, recognizing some of the causes of failure, began the garden work in the fall of 1903 by digging up the plats and dressing the soil with street sweepings. The class-room work at this time included a study of the nature and formation of soils, bulletins from the Department of Agriculture and nature-study leaflets from Hampton Institute and Cornell University being used as guides for the pupils in preparing experiments and giving lessons on these subjects.

After the Christmas vacation, lessons on seeds were given in 1905 for the first time, with the aim to grow plants which should be used in school and home gardens. The teacher supplemented her own efforts to acquire knowledge and experience in actual propagation of plants from seeds by assigning to each one of the 40 students one plant—a flower or a vegetable—which he should study exhaustively from seed to fruit, emphasizing all the facts relating to planting and cultivation. This information was sought at home, at the grounds of the Department of Agriculture, at the National Botanic Garden, in florists' catalogues, and in libraries.

Several hundred seedlings, grown in boxes as a result of these efforts, supplied plants for school and home gardens. Some plants were furnished from the greenhouse of Normal School No. 1. In September the school received special mention by the superintendent for its beautiful appearance.

In November, 1904, Mr. Brooks, of the Department of Agriculture, came to the school and directed the pupils while they prepared and planted a bulb garden. Later, Prof. Charles F. Wheeler, a specialist in the Department of Agriculture, gave a practical lecture on soils and the propagation of plants, which caused the pupils to anticipate with delight the promised greenhouse.

The first week of December, 1904, the pupils of Normal School No. 2 were given the use of a greenhouse, completely fitted for propagating plants, located upon the grounds of the Department of Agriculture. The work was inaugurated by the Chief of the Bureau of Plant Industry with an informal lecture on the importance of agricultural pursuits to the nation as well as to the individual, and on the necessity for scientific knowledge of farming. Lessons in making cuttings and in potting and shifting plants were given, and greenhouse ideals of methods in work and arrangement of cuttings and pots were presented. The work from day to day proved that the pupils realized its importance.

The spirit of industry and enthusiasm developed into a real love of greenhouse work. The students aimed to acquire accurate greenhouse methods, and in addition to the thorough and patient instruction given by the gardeners assigned for the work many visits were made to the various propagating houses on the grounds.

The work began with seeds—recognition and description of the kinds used, followed by seed planting in "flats." Next came lessons in making cuttings, all of this material being supplied from the propagating gardens, the students having started too late to get cuttings from out of doors. The effort to make a "clean cut," and later to put the cuttings in straight rows, was rewarded and called forth praise for orderly hothouse work.

In the palm house the methods of propagating and caring for palms, rubber plants, crotons, and ferns were learned. Certain insect activities directed attention to the once favorite topic of entomology, and Comstock's manual for the study of insects became a much sought book. The preparation and use of insecticides were then introduced into the course.

The lessons in grafting, accompanied by the usual number of cut fingers, came at the end of the course, and many young apple trees—some growing in the school yard and some at the homes of pupils—attest the success attained.

The pupils of the senior class in the normal school attended the hothouse in two sections, each twice a week, working an entire afternoon and always long after school hours. In the spring term the older pupils prepared simple experiments and lessons on soils to introduce the younger class to the work. The junior class took up the work as eagerly as had the seniors.

In order that the instruction given by the Department of Agriculture should be of benefit to many, the superintendent of schools arranged that the normal teacher in charge of greenhouse work should meet the principals of all the schools of the tenth, eleventh, twelfth, and thirteenth divisions. The space at the greenhouse could accommodate only one division at a time, so in four successive meetings with the principals, accompanied by the assistant superintendent of schools and the supervising principal, the work done by pupils was displayed and explained and a lively exchange of questions and experiences took place. The teachers had already developed school gardens and knew definitely what they needed, and all profited by the experiences of the others. The aim of the teacher of school gardening was mainly to demonstrate the principles underlying plant growth: The necessity for tilling the soil; proper preparation of soil; need of modifying certain soils, and the relation of moisture to soil. To understand the reasons for using the spade and the hoe endows those tools with superior merits.

These several meetings were at once most inspiring and prophetic. Fifty principals, appreciating the educational and economic value of primary agriculture, reacting on the teachers in 50 buildings and each teacher in turn influencing 50 children, surely enlarges the sphere of influence of a little greenhouse hidden in the grounds of the Department of Agriculture.

Bulletins on "The Propagation of Plants," "The School Garden," "Annual Flowering Plants," and "Beautifying the Home Grounds" were put into the hands of each principal attending the meetings.

The principals and teachers in the colored schools have sought the normal school and its pupils constantly for information on school

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gardens, and in many cases pupils have given personal assistance and direction in improving the school grounds of the city.

The pupils of the normal school, as their turn came to teach, instructed the children of the first, second, and third grades, each child planting a plat in the school garden, while many planted home gardens, which were visited by pupil teachers. With one exception every girl and boy has planted a home garden. Some of the girls grew plants at home and distributed seeds to the children of the neighborhood for their gardens. One girl has a garden 80 by 100 feet in size, in the preparation of which she was assisted by her brother, and she has already gathered pecks of peas and beans and some potatoes.

The largest available space for a school garden in the grounds of the normal school is an area 11 by 26 feet. In this, three rectangular beds were made, one for a model vegetable garden, containing plants which would serve for the fall table, and two flower beds, one consisting entirely of composites.

Clematis, climbing roses, English ivy, and the trumpet creeper, as well as moon vines and other annuals, were planted along fences and wood sheds.

The planting of 250 forsythias along the walks to the buildings will be of permanent value. These plants were made by the girls from cuttings from shrubs in the grounds of the Department of Agriculture.

In all there are about 2,500 plants in the school gardens at present, about half of them grown from seeds, the others from cuttings propagated in the greenhouse.

Sweet peas are so great a favorite that the teacher yielded to entreaties to plant them. While their cultivation has been attended with great success, the period for blossoming comes after school has closed for the summer vacation.

The terraces about the normal school building were repaired and grass seed sown in the bare places.

In summarizing the visible results of the first year's work at the grounds of the Department of Agriculture it may be said that the pupils produced from seeds and cuttings fully 8,000 plants. To make room for other plants, large numbers were used in planting window boxes and hanging baskets, which were removed to the normal school and the M Street High School.

In June, 1905, there were in the greenhouse about 300 choice roses, 300 forsythia plants, 150 begonias, 25 rubber plants, 150 choice chrysanthemums, several crotons propagated from cuttings, and hundreds of coleus, ivy, salvia, and heliotrope plants. About 4,000 plants were distributed to the schools of the city.

The members of the junior class were given young potted plants—

begonias, chrysanthemums, roses, and geraniums—to care for during the summer, with a view to their use in the rooms of the normal school next year.

Every colored school in the District of Columbia, with one exception, now has a garden, and in the particular case referred to the building has no grounds connected with it.

GARDEN WORK IN SOME OTHER CITIES.[a]

Miss Sipe's interest and experience in school-garden work led us last year to lay before the Secretary the plan of having her visit some of the more important cities for the purpose of studying the movement in those places, with a view to securing data which might be of value to others interested in the subject. This report is mainly the result of Miss Sipe's studies and investigations. The material has been largely prepared by her and the photographs from which the illustrations are made were secured in connection with her visits to the various places where school gardens are conducted.

SCHOOL OF HORTICULTURE, HARTFORD, CONNECTICUT.

In 1893 the Rev. Francis Goodwin, one of Hartford's public benefactors, bought land and established the Handicrafts School of that city. A board of trustees, of which Mr. Goodwin is now a member and for many years was both president and treasurer, controls the institution. Its privileges are offered to the pupils of the Watkinson Farm School for homeless boys. Later the School of Horticulture was established and its courses were opened to the Farm School, with the hope of turning the boys toward the country, as it was evident they were drifting toward the stores of the city as soon as they left the institution.

The school offers to children and to teachers a practical course in horticulture and agriculture. Mr. H. D. Hemenway, a graduate of the Massachusetts Agricultural College and the author of "School Gardens," a work which has made him an authority upon that subject, is the director of the school. Two hours daily are given to the course. One-half of the time is spent in the class room, the remainder being devoted to the practical work of the potting room, greenhouse, or garden.

The students are given lessons in mixing soils, sowing seeds, potting and shifting plants, transplanting, making hotbeds, repairing and painting sash, mixing and applying fungicides and insecticides, and budding and grafting. The work begins in February indoors.

[a] See also Annual Report of the Office of Experiment Stations for 1903, pp. 573–584.

In May all of the classes are assigned land for the study of the subject by actually doing the work. The plat of the first-year student is 10 by 30 feet; of the second, 10 by 40 feet; of the third, 10 by 60 feet, and of the fourth, 10 by 80 feet.

The director decides the planting for the first and second years, but allows more freedom in the third and fourth years and to teachers taking advanced work. The first year the instruction and the use of the land were free, but later the number of free gardens was limited and a small tuition fee was charged. This fee need not keep a boy from having a garden, as a hundred hours' work for the school entitles him to a free garden for the season.

The enrollment for 1904 included 121 boys from the city, 21 boys from the Watkinson Farm School, and 22 teachers.

No unnecessary display is made in laying out the gardens. Convenience for work is the chief aim, so that one is impressed with their simplicity and at the same time with the great opportunities offered. Paths 3 feet wide separate the individual gardens, and paths 5 feet wide the rows of gardens. Each boy is provided with a numbered set of tools—a hoe, a rake, a weeder, and a line the length of the perimeter of the garden. The hoe handles are marked for measuring distances between rows. The commonest farm crops are cultivated in rows from a foot to 2½ feet apart, according to the kind.

To give a general knowledge of other crops, observation plats of grains, fiber plants, and of medicinal and other pot herbs are located on the main path. Thus an observant student has opportunity to become familiar with many kinds of plants. The children are given lessons on these plats, not only on their culture but on their value to man in products and by-products. At the fall exhibition the cotton, hemp, ramie, and flax fibers are shown in different stages of manufacture.

Economy in seed planting is taught. Much carelessness among untrained teachers has been noted in this regard. As nearly as possible the correct quantity for planting a row at given distances apart is given.

Land was rented in the neighborhood of the Washington Street School, where the pupils of the sixth grade had individual gardens. These were cultivated during the summer by the children, under the direction of a student from the School of Horticulture.

The School of Horticulture has been aptly called a "classic" in school garden work. Few teachers have such opportunities as those of Hartford to prepare themselves for this educational movement. (See Pl. IV, fig. 1.) Naturally, the influence of the school is felt in the public schools of Hartford.

FIG. 1.—TEACHERS' CLASS AT THE SCHOOL OF HORTICULTURE, CONDUCTED ON SATURDAY MORNINGS.

FIG. 2.—KINDERGARTEN CLASSES AT THE WADSWORTH SCHOOL, SHOWING GARDEN CONTAINING 288 PLATS.

SCHOOL GARDEN WORK AT HARTFORD, CONN.

KINDERGARTEN GARDENS, HARTFORD, CONNECTICUT.

The supervisor of kindergartens of the south district schools, Miss M. C. Laidlaw, has accomplished gratifying results in the yard adjoining the Wadsworth School. It was originally a common, and was used as a short cut between streets. In the spring it was worked off into 288 plats, each 3 by 5 feet. (See Pl. IV, fig. 2.) Rough preparation was made by hired labor, the little kindergarten workers doing the rest. Two children worked on a plat, planting two kinds of flowers and two vegetables, one that matured above ground and one below.

Throughout the summer Miss Laidlaw met the children to give them an opportunity to gather their flowers or vegetables and to pull weeds. Their interest was intense, and so likewise was that of the neighborhood. These little ones became familiar with the names of the commonest plants and took great pride in teaching older ones who came with them.

It was necessary to pile the débris in one corner of the garden. In this the children hid morning-glory, sunflower, and squash seeds, resulting later in a very attractive mound of green, and serving as a valuable object lesson in covering unsightly places.

PUBLIC SCHOOLS, BOSTON, MASSACHUSETTS.

To Boston belongs the honor of establishing, in 1891, the first school garden, at the George Putnam Grammar School. It was a garden of ferns and wild flowers, and one that supplied the school with science material. To quote Mr. Henry Lincoln Clapp, the master of the school:

> Reasons that are good for introducing elements of science into elementary schools are equally good for supplying adequate and seasonable elementary science material to work upon.

For many years the Massachusetts Horticultural Society offered a yearly premium for the best school garden and the best use made of it. The George Putnam School won the prize every year, $5 of the amount received buying soil for enriching the land and $10 paying the janitor for summer care.

In 1900, individual plats for growing flowers and vegetables were first cultivated. The Boston Normal School in 1901 established the second garden of the kind. Eighty children of the seventh grade had beds 4 by 10 feet, the gardens being located in a crowded part of the city and every effort being made to interest the parents. Vegetables were taken home and parents were invited to visit the gardens. As a result, many home gardens were started. At the present time an

elective course in simple agriculture, including practical work in laying out school gardens and teaching gardening to children, is offered to the normal students.

Until the year 1904 the greater part of the expense of this work was borne by the Twentieth Century Club, though the school authorities made a yearly appropriation toward it. By the method pursued in 1904 the schools in which this work was conducted were enrolled as vacation schools, the children returning daily to look after their plats. Five teachers (normal graduates) at $50 a month each were appointed in the vacation schools to take charge of the gardening. The general enrollment of the vacation schools was so great, however, that it was necessary to use these teachers for other subjects, so the work planned for garden classes was not always accomplished.

The supervisor of the work, Miss A. L. Withington, who is not employed by the school officials but represents the garden committee, a consolidation of a number of clubs interested in civic improvement, is an enthusiastic believer in the influence of this work upon the future generation, particularly in relieving the congested population of cities by showing children the possibilities in the country.

Boston is endeavoring to solve the difficulty that all cities will have to meet—that of finding land to carry on this work. At the Lyman School the bricks were removed for a space of 5 feet around the entire yard and good loam was put in. The space at the front of the building was planted with shrubbery for permanent decoration. The seventh grade was given the border at the rear and sides of the yard, each child cultivating a small plat. The remaining portion of the border was planted in grains and vegetables, each product being distinctly labeled.

One interesting method of planting under limited conditions was seen at the Martin School. The classes planted tulip bulbs in the circular places left around the trees after the yard was paved. This is a suggestion many schools could follow.

The manner in which land was obtained for the Hancock School is suggestive. The claim is made that this school is located in one of the most densely populated portions of the globe. The population is strictly foreign. No land but a playground paved with bricks is connected with the school. The schoolhouse commission bought an old tenement at the rear of the school, tore it down, removed the débris, and turned the ground over to the garden committee. By herculean effort it was put into condition for planting.

In connection with the playground on Columbus avenue, the Massachusetts Civic League conducts 235 well-planned gardens, each approximately 4 by 7 feet, which border the playground, adding much to its attractiveness. The children are allowed some choice in

planting. They may plant either vegetables or flowers, but not both. After deciding which is preferred each child is given a list from which he may select two plants, and in addition every child plants scarlet runner at the rear of his plat to cover the wire netting that separates the playground from the garden.

The work begins in May. The children come once a week from the Hyde School near by, this being considered a part of their regular school work. The teacher, seeing its educational value, supplements the work of the garden teacher by class-room work. The attitude of the regular teacher toward the garden is reflected by the manner that the class does its work in the gardens. If she favors it, the classes are enthusiastic; if she sends her classes with the spirit that she is simply complying with the rules, indifferent work is the result. Two-thirds of the children who begin the work continue it to the end.

The expense of teaching—$60 a month—is borne by the league. The long hours, 9 a. m. to 6.30 p. m., are necessary, as the playgrounds are well attended. Trespassing is rare, which is remarkable when the vast numbers of children who daily visit the place are considered.

PUBLIC SCHOOLS, BROOKLINE, MASSACHUSETTS.

The Education Society of Brookline, Mass., exists to enrich school work; to suggest, and in many cases to test without expense to the citizens, some measure of popular education, and to bring to all people of its community higher ideals of education. One of its recent acts in developing its purposes was to establish three school gardens, its one object in doing so being to demonstrate the practical value of such gardens. In working out its plans it has been supported by the strong hope that the school board, in case the demonstrations were made, would either continue the experiment, or, following many other communities, adopt the garden as an approved adjunct to public schools generally.

In selecting schools to be given gardens and the grades to receive instruction, in placing the gardens and in fencing them, and in the appointment and supervision of instructors, the society has tried to suit the undertaking to actual and probably permanent conditions. The results of the experiment are for this reason particularly gratifying. They show that the school garden is not only feasible under the least favorable conditions, but also rich in uses that commend its adoption.

The gardens were conducted on vacant lots adjoining or near the schools on the individual plat method, and were worked by pupils

of the seventh and eighth grades in one school and by the primary grades in the others. The Winthrop School garden was in one corner of the public playground adjoining the school. Grass had been removed simply from the small plats, 3 by 3 feet, that the second and third grade children were to cultivate, thus leaving the turf for paths and making a very attractive garden. The main planting was generally uniform—sweet alyssum, portulaca, eschscholtzia, and centaurea.

A capable teacher was employed by the society at $60 per month. The nature-study period was employed for the work during the school session, the regular teachers making the connection in the schoolroom with language lessons, drawing, and painting. Two-thirds of the children who began the work carried it through to completion during vacation.

The gardens cultivated by the seventh and eighth grade pupils were larger than the others, and vegetables formed the greater part of the products.

The public school grounds of Brookline are among the most attractive in this country.

STATE NORMAL SCHOOL, HYANNIS, MASSACHUSETTS.

The principal of the State Normal School at Hyannis, Mass., has made a thorough study of the correlation of class-room work and outdoor work. Gardening is made especially prominent in the second and in the eighth grades.

The second-grade children measure the ground, mark off their plats, and stretch the lines for rows. As they know but little of flowers, they can not decide for themselves what to plant. To avoid leaving it wholly to the choice of the teacher, a diagram of the garden is put upon the blackboard, showing the proposed location of all flowers, grouped according to color. The children are then permitted to say whether they prefer to work with red, yellow, white, or blue flowers. In this way an effective garden is produced and yet one in which there is some freedom of choice for the children.

Language, reading, and composition lessons are based upon the daily work in the garden, including animal and insect work, as well as plant life. Celia Thaxter's "Peggy's Garden and What Grew Therein" furnishes material for garden stories and short reading lessons. The children plant many of the same flowers and at the same time have many of Peggy's experiences in their gardens so near the seacoast. The teacher of this grade, Miss C. N. Wheeler, makes use of every opportunity to teach respect for order and neatness.

The correlation in the eighth is even greater than in the second grade. The students form themselves into a corporation, assuming

the responsibility of debts. With money raised by entertainments during the winter a bank account is opened. The student corporation hires a man to plow the land and buys seeds and fertilizers. Copies of letters written to seedsmen relative to catalogues and the purchase of seeds, and copies of bills sent in and receipts given are entered in the students' diaries. As all bills are paid by checks, the students become familiar with banking methods. Crops are sold by the corporation, affording an opportunity to teach bookkeeping.

A summer normal course for teachers, with the necessary practice schools, solves the question of summer care and at the same time gives Massachusetts teachers the opportunity to study the relation between schoolroom and garden as interpreted by this school.

The accompanying table, prepared by Mr. Baldwin, will be a valuable aid to teachers in this regard.

Table showing the correlation of class-room and garden

Garden work.		Reading.	Language.		Spelling.
Outdoors.	Indoors.		Oral.	Written.	
1. Soils: Position of soils.	1. Soils: Physical properties. Formation. Moisture relation. Fertility. Characteristics of good garden soil.		Review work done in the garden preparatory to writing in the diary.	A diary.	New words when used.
2. Preparation of the ground: Fertilization. Plowing. Harrowing. Raking tools	3. Lessons on the preparation of the ground: *a.* Fertilization. Kinds of fertilizers. Time to fertilize. How to fertilize. *b.* The plow, the harrow; their uses.		Oral lessons in gardening as indicated under "Garden work—Indoors."		Do.
	4. Selection of seeds: Kinds to be planted. What are good seeds? Seed catalogues.		Do.	Letters written for catalogues.	Do.
	5. Plan of the garden: Division of labor. Rotation of crops.	Selections from "My Summer in a Garden," by Charles Dudley Warner.	Do.		Do.
	6. Ordering the seed: Seed dealers. Amount of seed.		Do.	Letters written ordering seeds.	Do.
7. Laying out the garden: Stakes. String. Use of the chain. The measuring stick.			Do.		Do.
8. Planting the seed: (1) Peas. (2) Radish seed. (3) Lettuce seed. (4) Beans. (5) Corn. (6) Potatoes, etc.	9. Review of planting the various seeds.		Do.		Do.

studies, State Normal School, Hyannis, Mass.

Arithmetic and bookkeeping.	Animals.	Plants.	Drawing.	Manual training.	Geography and history.
			Diagram of a section of a hill showing soils in position.	Boxes, if necessary, to hold soils.	
Calculate the— Amount of fertilizer. Thickness of fertilizer. Bookkeeping: Cash account. Price of fertilizer. Price of plowing.	The study of various animals as they are found: Earthworm. Toad. June beetle. Ladybug. Chipping sparrow. Robin. Crow. Goldfinch. Purple finch, etc		Sketch of a plow. Diagram of a harrow.		
Find the area of the garden and of each plat in feet, acres, etc.			Plan of the whole garden drawn to scale. Plan of individual plats drawn to scale.		
Calculate the amount of seed to order. Bill of seeds for bookkeeping.					
				Making stakes from laths. Making measuring sticks.	
			Indicate on individual plats where seeds are planted.	Making labels for planting seeds.	

Table showing the correlation of class-room and garden

Garden work.		Reading.	Language.		Spelling.
Outdoors.	Indoors.		Oral.	Written.	
	10. Germination of seeds.	Selections from "My Island Garden," by Celia Thaxter.	Oral lessons in gardening as indicated under "Garden work—Indoors."	Written descriptions tracing the development from seed to young plant.	New words when used.
11. Study of the young seedlings in their beds: How fast the seedlings grow. Any marked changes in their growth.	12. Conditions for growth. *See* under Plants.		Do.	Continued descriptions showing the growth of the plant.	Do.
13. Care of young seedlings in the garden: Hoeing. Thinning. Transplanting. Weeding. Use of insecticides. Watering.	14. Reviews of the best ways of transplanting: Weeding. Use of insecticides.		Do.		Do.
15. Care of the garden during the summer: Cultivating— Hoeing. Weeding. Watering. Planting the second crop.	16. Growth of plants: Leaves. Flowers.	Selections from other garden books.	Do.	Some descriptions of flowers.	Do.

studies, State Normal School, Hyannis, Mass.—Continued.

Arithmetic and bookkeeping.	Animals.	Plants.	Drawing.	Manual training.	Geography and history.
		10. Study of the germination of seeds: (1) Dry seed. (2) Soaked seed. (3) Sprouted seed. (4) Young seedling in the beds. (5) Several large seedlings. (6) Young plant.	A series of water-color sketches showing the development from the seed to the young plant.		
		12. Conditions for growth: Moisture. Warmth. Food. Light. Air.			Excursions to other gardens.
	14. The various insects or pests of the garden: Cutworm. Potato bug. Squash bug. Tent caterpillar.			Making a dibble for transplanting.	Foreign gardens: English gardens. Italian gardens. Japanese gardens, etc.
		16. Study of flowers: Manner of growth. Color. Form. Fertilization. Use.	16. Water-color sketches of flowers.		

Table showing the correlation of class-room and garden

Garden work.		Reading.	Language.		Spelling.
Outdoors.	Indoors.		Oral.	Written.	
17. Gathering crops: Picking fruit, peas, beans, squash, etc. Pulling plants, radish, lettuce, etc. Digging potatoes, turnips.	18. Study of— Fruits. Roots.		Oral lessons in gardening as indicated under "Garden work — Indoors."	Descriptions of fruits.	New words when used.
19. Selling crops: Preparation for market— Shaking off dirt. Cutting tops. Bunching. Packing. Taking home or to the market.			Do.		Do.
20. Collecting seed: Picking ripe fruit. Drying when necessary.	21. Preparing seed for winter: Opening fruit. Taking out seed. Washing seed. Labeling seed.		Do.		Do.
22. Clearing the garden for winter: Pulling old plants. Raking into piles. Burning brush and rubbish.			Do.		Do.

studies, State Normal School, Hyannis, Mass.—Continued.

Arithmetic and bookkeeping.	Animals.	Plants.	Drawing.	Manual training.	Geography and history.
Vegetables gathered in each garden.		18. Study of— Growth of plants. Growth of flowers. Fruit: Manner of growth. Color. Shape. Seed dispersal.	18. Water-color sketches of fruit.	Basket making.	18. Geographical study of a few of the plants, as corn, peas, wheat, etc.: Corn— History. Cultivation. Growth. Varieties. Harvesting. Distribution. Uses, food products. Industries. Exportations.
Price of crops: Amount received for crops. Bank book. Depositing money. Drawing money.				Make envelopes for seeds, if necessary.	

The school authorities of Worcester lend no assistance toward the school garden work. At the office of the superintendent of schools it was learned that $25 had been appropriated for hauling to school buildings soil that teachers might procure either by purchase or by gift.

However, much has been done through some of the more progressive teachers, assisted by a public-spirited citizen, Mr. Walter D. Ross, who has offered for the past two years to furnish seeds and fertilizers to all schools desiring them. Twenty-seven schools availed of this offer in the summer of 1904.

One of the most progressive schools is the Upsala Street School, Miss Mary C. Henry, principal, in which much of the practical work in Dr. C. F. Hodge's "Nature Study and Life" was demonstrated. A wild garden on one side of the building, a small vegetable garden on the other side, and a creditable lawn in front, bordered by luxuriantly blooming nasturtiums, make this building one of the most pleasing results of the efforts of children. A school yard planted by a gardener is good if the work can be done in no other way, but the one that best serves its educational value is planted by children, no matter how small the ground or how crude the result. It is in such a garden that moral teaching is accomplished.

The work is done in Worcester, as in many other places, in the nature-study period. The outdoor work is preceded by simple informal lessons in the class room. The children bring tools from home. It has been necessary for the teacher to buy soil every two or three years, as the steep grade of the yard causes the ground to be deeply washed. To most of the children this work is an incentive for home gardens, and the improvement of the surrounding neighborhood testifies to the value of the work at the school.

The Worcester Agricultural Society took up the matter of school gardens and at the annual fair of 1904 offered the following premiums for garden products grown by pupils of the public schools.

(1) Best collection from pupils of any one town: Prizes, $10, $9, $8, $7, $6, $5, $4.

(2) Best collection from pupils of any one school: Prizes, $7, $6, $5, $4, $3, $2, $1.

(3) Best collection from pupils of any one schoolroom: Prizes, $5, $4, $3, $2, $1.

(4) Best collection from any schoolboy or schoolgirl: Prizes, $3, $2.50, $2, $1.50, $1.

In addition, prizes were offered for the best flower displayed by children and the best display, six specimens each, of corn, radishes, carrots, potatoes, tomatoes, and beets.

The school grounds of the newer buildings of St. Louis are particularly attractive. Special mention should be made of the McKinley High School, and of the Emerson, the Monroe, and the Wyman schools. There has been ample provision made for playgrounds and for decorative approaches to the buildings. Some of the planting at the Monroe School was done by the children and some by an expert gardener, financial aid coming from an association of parents and interested persons, known as the Patrons' Association.

The janitor at the Wyman School has that inborn love of flowers that makes their care a recreation. To him belongs the credit of the magnificent lawn, stretching in three terraces from the building to the sidewalk, the flower borders and beds, and the nature-study garden in the rear of the building. This contains plats of the commonest grains and many kinds of vegetables suitable for lessons in the schoolroom. The teachers found waiting for them on their return in September sheaves of wheat, rye, and oats, cornstalks, and such vegetables as had not matured in the summer.

The school board assisted the movement throughout the city in 1904, and extra men were employed to mow the lawns on large grounds, while in some cases plants were provided. In the spring of 1904 gardens of individual plats, or grade gardens, were started by a number of schools on adjoining or near-by vacant lots. None of these, however, was cared for during the summer.

In 1903 seeds were sold to the school children at 2 cents a package. This was accomplished by the Engelmann Botanical Club. The results were very gratifying and the prospect for 1904 was encouraging, when the work was stopped by four seedsmen, who presented the matter to the school board as an interference with their business, a position which has not been taken by any other seedsmen or nurserymen in this country, the claim being universally made by seed dealers that the school garden work brings them more business.

The Civic Improvement League has been granted the privilege of using whatever land of a 160-acre tract of the Missouri Botanical Garden is needed. Five acres were used in 1904, 150 children, reporting in sections of 20 once a week, availing themselves of this opportunity. Five plats 5 by 10 feet and one plat three times as large, for corn, were assigned to each child. Instead of rows of various kinds of vegetables and flowers, as in most children's gardens, but one kind of vegetable was planted in a plat. The corn plats were kept together in one part of the tract. Prizes were awarded at the end of the season to the boys with the highest records for punctuality, attendance, good work, and deportment.

CORNELL UNIVERSITY, ITHACA, NEW YORK.

Through its bureau of nature study, Cornell University has come in touch with thousands of children of New York State, who have been urged to have gardens of their own and to further the improvement of school grounds. Nature bulletins are issued to them, giving clear directions, interestingly written, in regard to seed and bulb planting, and planning and caring for gardens. Through its efforts more than 500 school grounds in the State were improved by children in 1904. Primarily, the desire of the university is to aid the children of country schools, but its influence is strongly felt in the city schools.

DE WITT CLINTON PARK, NEW YORK CITY.

The work in New York City that has attracted attention throughout the United States is that of the Children's School Farm in the De Witt Clinton Park, conducted by Mrs. Henry G. Parsons. The school has been visited the past summer by more than a thousand persons representing educational institutions in this country and abroad.

De Witt Clinton Park is 7 acres in extent, in the heart of a tenement district, from Fifty-second to Fifty-fourth streets and from Eleventh to Twelfth avenues. After property is acquired for park purposes it usually takes several years for the park department to secure the money, make the plans, and accomplish the work of construction and improvement. During the seasons of 1902 and 1903 Mrs. Parsons conducted her pioneer farm school on the rough site of the future park, and in 1904 the work was carried on as well as it could be while the contractors proceeded with construction and permanent improvement. A suitable plat for the continuation of the farm school is included as a feature of the plans which will make De Witt Clinton Park one of the most complete small parks in the world.

Mrs. Parsons, in her report to the park board, says:

No plow in the park department was strong enough to break the ground the first year, so a city contractor was resorted to for a heavy street-breaking plow. Rags, wire, bottles, tin cans, and rocks were unearthed, as this had been a dumping ground for years. But the conquering of difficulties is one of life's most exhilarating lessons. Here was a neighborhood where the rougher element considered they owned everything in sight. They called themselves the Sons of Rest. Going to prison for ten days or six months was simply an incident in their lives, which they spoke of as "Going to Larry Murphy's farm," or "A sail up the river." The city seemed to have forgotten this section. I was desirous of trying the effect of the garden on just such a neighborhood, convinced that if the results should be what I anticipated no one need feel discouraged about starting gardens anywhere.

From the day the real work began the interest was intense. A 3-foot-high fence, on which adults could lean comfortably and see everything happening in

the garden, satisfied their curiosity, that strongest of human traits. Every one realized that only the limited space excluded the many others from the delights of gardening, so the neighborhood was led to feel that it was "our farm." Courtesy, justice, and pride in the work were stimulated to the utmost, and proved most effective discipline. The only real punishment was banishment. The children rapidly learned to answer signals, and a teacher with a whistle could handle many, and save her voice.

Seed planting was taught to the children in classes of 25. Twenty-five children at a time, with tags, the numbers on which corresponded with those on the sticks used to stake their 3 by 6 claim, were lined up and given directions, then marched into the farm, forming two sides of a hollow square around a small plat, where the gardener went through the whole process of making the furrows, describing the seeds put in, covering them, etc. The children then marched to their plats, went through the same process, making furrows with the sharp end of a stick, covering and patting down with the spatula containing the number; then right-about face and out the gate they went, faces glowing with excitement, which was not lessened when a few days later the earth began to crack open and the little plants peeped out. At the same time seeds of a like variety were planted in sawdust that the process of those underground might be watched. Seven varieties of vegetables were planted in each plat; corn in the center; on either side of this string and butter beans, peas, radishes, turnips, and lettuce. A border of buckwheat was around the entire farm.

The second summer, because of the grading for the new park, the garden had to be laid out in another place on the grounds. Again we were very late. With no thought of abandoning we made the best of circumstances. When I mention that our first year's garden was planted July 29 and the second year July 17, it is to give everyone courage to make a start, no matter how unfavorable the beginning.

Only unlimited faith in the value of what one is endeavoring to accomplish for mankind could account for adhering to it through the worst of conditions, opposition, and criticism. During the summer of 1904 the real work of construction in the park began.

Fearing she might lose ground already gained with these people should the work be discontinued during the period of park construction, Mrs. Parsons, assisted by her son and daughter, braved the discomforts and continued the work on a smaller area than formerly. At this time the permanent location of the "farms" had been graded and temporary structures for a tool house and a farmhouse had been completed. Mrs. Parsons and her helpers were to be found on the ground daily from 9 a. m. to 6 p. m., patiently awaiting the arrival of the top soil needed and receiving applications for the 4-by-11 plats. "Mrs. Parsons, may I have a farm?" was asked by more than 500 children, more than half of whom were refused, owing to lack of space.

The city has been asked to make an appropriation to carry on the work next year. If it does this, it will be possible to reach 1,000 children. The gardens will be run six months, in two terms of three months each. Five hundred will work each term, and thus two

crops will be harvested. No better vacation school could be devised for these tenement children.

New York is to be congratulated on the wisdom of its park board in incorporating the children's gardens in its general scheme for the new park. This act is unprecedented in this country.

PUBLIC SCHOOL NO. 4, NEW YORK CITY.

One other effort in New York City needs special mention. In the heart of the New York Ghetto the teachers of Public School No. 4, on Rivington street, conducted a garden on a lot 40 by 74 feet. Seeds were furnished by the United States Department of Agriculture, through Hon. Henry M. Goldfogle, Congressman for the district. The early work was a great success, radishes and lettuce maturing before the close of school. Later the garden was destroyed, as it became a part of a vacation playground.

In a recent letter Miss L. E. Rector, the principal, stated that until this work was undertaken last spring two-thirds of the 2,400 children attending the school had never seen a plant growing except in a flower pot. Almost as large a number had no idea of grass or of a tree. To attempt to teach nature study under such conditions would seem almost hopeless. This little bit of gardening has been a revelation to the children and likewise an inspiration for greater work on the part of the teachers. The care given by these nature-starved little ones to a growing plant was that one would give to a dearly loved brother or sister. The gardens received their first attention in the morning and they were the last things attended to in the evening.

PUBLIC SCHOOLS, ROCHESTER, NEW YORK.

The example set by Rochester is worthy of imitation. Schools are generously provided with land sufficient for decoration and playground purposes. The school authorities grade and sod the school yards, while the shrubbery is planted by private enterprise and by the children.

In interior planning and exterior planting the Wadsworth School, Mr. C. D. Blackmore, principal, ranks among the model schools of the country. A park, the gift of a private citizen, adjoins the school ground. Both are harmoniously planted and exceptionally well kept, but not to the deprivation of the children, who are allowed the use of the park as a playground.

At School No. 15 the children raised $600 for the improvement of the grounds. A gardener was hired for the purpose. The simple rules of landscape gardening were followed—an open space, bordered by mass planting of shrubbery, avoiding straight lines.

School No. 26 stands for progress in its district. Col. S. P. Moul-

throp, the principal, introduced sewing, cooking, and manual training into the school eight years in advance of the rest of the city. Assisted by the hearty cooperation of his teaching corps and prompted by the belief that the best teaching is that which produces self-help, he has accomplished this work by the most persistent efforts. A great lover of nature, his school has celebrated Arbor Day for many years by planting memorial trees in Seneca Park. When the improvement of the school grounds was undertaken, four years ago, to be allowed to help meant a reward for industry. Children who had done satisfactory work for a stated period were allowed a half-day holiday to work, being obliged to provide their own tools. Only a portion of the ground was improved at a time. Several weeks elapsed between the first and the second attempts, to permit the good work already accomplished to serve as an incentive. By this method the entire yard was sodded and planted with trees and shrubbery as a reward for industry in school.

The street upon which the school is located had not been graded. Through Colonel Moulthrop's influence the children aroused public sentiment to a degree sufficient to cause the city authorities to grade and pave the street and lay the sidewalk. As in many northern cities, a space between the sidewalk and curb had been left for sodding. No effort was made by the citizens to have this sodding done, so the children did it. Again came the offer of a half-day holiday and a call for tools and small handcarts. In such carts the children carry coke to their homes from a near-by gas house. Seventy carts occupied the space in front of the school that afternoon. A friend of the movement donated the sod, but it was in a pasture a half mile distant. Colonel Moulthrop states that each one of these carts was pushed to the pasture for sod or good soil ten times. As a result both sides of the street for a half mile, except a narrow strip in the center reserved for flowers, were sodded.

The several classes were assigned portions of this central strip for their gardens. Planting day saw 1,500 children at work at one time along the sidewalk. Mr. Charles J. Brown donated 70 elms and 60 poplars, which were planted alternately with a view to removing the poplars when the elms are large enough for shade purposes. The residents of the neighborhood cared for the gardens during the summer. The greater portion prospered, making the region around the school stand out in marked contrast to the adjoining district, where nothing has been done. Twelve clothes baskets filled with cut flowers and bouquets were sent to a flower show held shortly after the opening of school.

Through the Woman's Industrial and Educational Union penny packages of seed were sold in the schools last spring. The Rochester Democrat and Chronicle urged the children to send their flowers

during the summer to the city's hospitals, and a special department, called the Children's Gardening Club, was opened by the paper, in which the names of children who sent flowers were listed.

The hearty cooperation of the seedsmen, nurserymen, and florists of the city should be mentioned. This has not been the case everywhere, strange as it may seem. The movement has been entirely blocked in St. Louis by four seedsmen, so that the results of one season's work were lost by the school board of that city forbidding the sale of packages of seeds. Rochester's seedsmen must find it profitable to encourage the work, for they have been most generous in their donations.

GARDEN SCHOOL, YONKERS, NEW YORK.

The following account of the school garden work at Yonkers, N. Y., has been prepared by Miss Mary Marshall Butler, president of the Woman's Institute of Yonkers:

The Yonkers Garden School, although a private enterprise and supported by the subscription of one individual, was inspired by the interest taken in civic betterment through the Woman's Institute, and has been largely directed by the president of that organization.

In the summer of 1903 two small gardens were started in the tenement district, with 36 boys from a public and a parochial school in the vicinity. Two unsightly vacant lots were transformed into such successful little gardens that the following summer it was determined to try the plan on a larger scale, in the hope that eventually its benefit both as an educational and social factor might be so demonstrated as to induce the board of education to incorporate such instruction into the work of the public schools.

The garden school covers about 1¾ acres of land. The plat is situated on high ground, commanding a view of the Hudson River, and is very accessible to the homes of the large factory population living in the Nepperhan Valley on the east. The property belongs to an estate, and the use of it at a nominal price is allowed, subject to sale. The ground, formerly used for pasture, had to be cleared of loose bowlders and stones, plowed, harrowed, and fertilized before being laid out into plats and paths. In 1904 the plats numbered 240 and were uniform in size, 10 by 19 feet. This year there are 250 plats, varying in size, 76 being 10½ by 22 feet; 116, 10 by 17 feet, and 58, 10 by 12 feet.

The equipment of the school consists in a portable house, divided into a tool house and office; 50 sets each of stakes and measuring lines; 50 hoes, with handles marked for measuring; 50 small rakes; 20 small but strongly made spades; 50 weeding irons, and 25 watering cans.

Notebooks to the number of 250, in which to record the progress made, and membership and record cards, bearing his name and a number corresponding to his plat, were provided for each pupil.

Seeds were secured through the courtesy of the member of Congress for the district and through the Department of Agriculture, supplemented by the purchase of unsupplied varieties.

The staff consisted of a superintendent, who is not only a practical gardener but an expert photographer, who has been in charge of the work since the beginning, and to whose enthusiasm and ability are largely due its development and success; an office clerk; a laborer, and a few volunteer assistants.

After 240 plats were assigned a waiting list was kept. During the season 60 boys dropped out for various reasons, removal and the securing of work being the principal causes, and their gardens were turned over to others.

Each boy paid 2 cents a week as a membership fee, the principal object in this small payment being to instill a feeling of proprietorship, and thus stimulate interest. If a boy was unable to pay in money he might give an equivalent in produce, and at the end of the season whatever was due on any plat was secured by a sale of vegetables.

The age limit was 9 to 13 years, inclusive, although occasionally a boy under or over those ages was received for some special reason.

The instruction was largely individual. The boys were taught to prepare these plats of ground, how to plant the seed, and then how to keep the weeds out and to care for the growing plants. Facts concerning the cultivation of the soil, insect and plant life, and many other subjects were learned. Each boy was required to be at his plat at least twice a week, but visits were usually more frequent.

The produce consisted of lettuce, beets, radishes, turnips, onions, beans, cabbages, cauliflowers, and peas. The plats, which were bordered with flowers, produced two crops, and the estimated market value of the entire produce was about $1,200. Each boy, of course, was entitled to the fruits of his industry.

The beneficial effects of the work—physical, mental, and moral—can hardly be estimated, and have been manifested wherever gardening has been undertaken.

The interest, far from diminishing, has increased, and 500 applications were made for the 250 plats in 1905. Undoubtedly, were the land available and girls admitted, nearly a thousand children could be kept at work.

Besides the garden school, the Institute Civic League has provided for three small gardens, one containing 41 plats for boys and girls; another, 20 plats exclusively for girls, and a third, upward of 30 plats, on the grounds of one of the public schools. The garden

school superintendent gives some assistance in the supervision of these gardens.

The following statistics may be of interest:

Of the 240 boys, 196 were Roman Catholics, 31 Protestants, 10 Jews, while 3 were not recorded. Of the total number, 125 were from the parochial school and 115 from the public schools.

Of the 240 boys, 150 were of Irish parentage, 42 American, 26 Slavic and Jewish, 16 German and Dutch, 4 British, 1 Scandinavian, and 1 Italian. The average attendance was 90.

The total cost of conducting the garden aggregated $1,353.33, as follows:

Salaries	$756.53
Tools	87.13
Seeds	27.95
House	261.34
Lumber, water, and fertilizer	132.32
Printing, etc	38.02
Rent	35.00
Badges	15.04

The boys' dues amounted to $101.74.

HOME GARDENING ASSOCIATION, CLEVELAND, OHIO.

The Home Gardening Association, of Cleveland, is the originator of the method of encouraging home gardening by the selling of penny packages of seed. The work is not confined to children. Earnest workers of the Goodrich House Settlement started the association, which aims to reach adults as well as children, and they find the garden the readiest means of entrance to the homes. Those who buy the seeds expect and desire to have their gardens visited. An earnest worker avails of the opportunity afforded by a visit to study the needs of a family and to be of help in various directions.

The work of the association is based on the theory that by individual effort much valuable work can be done in the way of beautifying home surroundings, and that if each household performs its part in this work the beauty of orderliness and cleanliness will soon assert its supremacy over disorder, dirt, and débris. That this theory has been worked out in practical results is attested by the changed aspect of the district in the neighborhood of the Goodrich House, where, in a district of great density of population, the experiment seemed particularly unpromising. The blight of smoke and soot of neighboring factories was over all, and, moreover, while many people love flowers, few are willing to work against odds for a bloom. Undaunted by these difficulties, Mr. E. W. Haines organized a neighborhood club for the cultivation of flowers, and from this small beginning has come a widespread and far-reaching movement. Its success is due to un-

failing enthusiasm and untiring efforts in forwarding and extending the scope of the enterprise.

The association reaches the children through the hearty cooperation of the teachers of the public schools. A committee of teachers and school officers directs the work, while a committee from the association buys and distributes the seed. This is done in a systematic, businesslike manner. Envelopes containing the following list of seeds and particulars as to their distribution are sent to the schools in February:

THE HOME GARDENING ASSOCIATION.

SEEDS FOR 1904.

Price, 1 cent a packet. Mark opposite the variety the number of packets wanted. Separate colors can not be ordered.

ASTER, mixed, scarlet, white, blue, and rose, 15 inches high		NASTURTIUM, a climber, yellow, orange, and red, 6 feet high	
BACHELOR'S BUTTON, OR CORNFLOWER, blue, pink, and white, 2 feet high		NASTURTIUM, bush, yellow, orange, and red, 1 foot high	
BALSAM, OR LADY SLIPPER, mixed colors, 2 feet high		CHINA PINKS, mixed, pink, scarlet, white, and lilac, 6 inches high	
CALLIOPSIS, OR COREOPSIS, yellow and brown, 2 feet high		PHLOX, mixed, scarlet, pink, and white, 1 foot high	
*COSMOS, mixed, white, pink, and red, 5 feet high		SCARLET RUNNER, a climber, scarlet, 7 feet high	
FOUR-O'CLOCK, yellow, white, and crimson, 2 feet high		VERBENA, mixed, white, scarlet, purple, 6 inches high	
MARIGOLD, yellow, 1 foot high		ZINNIA, scarlet, 2 feet high	
MORNING-GLORY, a climber, mixed colors, 12 feet high		**GLADIOLI BULBS, red, yellow, and pink, 1 cent each	

Return this envelope to the teacher with your money. Do not put money in this envelope.

No. of packets, ——. Amount, —— cents.

Write your name here: ———.

Address, ———.

Grade, ———. School, ———.

Your seeds will be delivered to you in this envelope about May 1. Prepare your garden in April. Select the sunniest part of your yard, but avoid a place where the dripping from the roof will fall on the bed. Dig deep—a full foot. Soil with well-rotted manure dug in will give better results than poor soil.

Four-o'clock, bachelor's button, marigold, calliopsis, zinnia, morning-glory, and nasturtium are the easiest to grow successfully.

* Cosmos is not recommended for smokiest districts. Blooms in October.

** Gladioli bulbs should be planted right side up, in a good, rich soil, in a sunny situation, 6 inches deep and 6 inches apart. Will send up one stalk of bloom three months after planting. Flower stalk may need support by tying to a stick. The bulbs should be taken up in October and planted next spring. Store where they will not be frozen. Will make a fine display in school yard.

Many window boxes should be planted. Try one.

After the seeds desired by each child are indicated, the envelopes are sent by the principals of buildings to the Goodrich House, while the money is forwarded to the treasurer. A slight profit accrues from this work, but it is returned to the schools in the form of prizes or by the donation of bulbs. The seeds are delivered the 1st of May. Lessons are given in the schoolroom on the ways to plant and the care of the gardens. To supplement these lessons, the association distributes cards containing the following instructions:

The Home Gardening Association. 1904.

DIRECTIONS FOR CARE OF THE GARDEN.

Plant seeds in garden or boxes early in May.
Fill boxes with 4 or 5 inches of fine, rich soil.
Place boxes in sunny place and sprinkle every day.
Cover boxes at night if very cold.
Transplant seedlings to the garden about June 1, on a damp day.
Sow seeds of calliopsis, nasturtiums, morning-glories, and four-o'clocks in the garden, as they do not stand transplanting.

SUGGESTIONS FOR WINDOW BOXES.

Make the box 6 or 8 inches deep, 12 to 15 inches wide, and as long as the window is wide.
Fill the boxes with fine, rich soil and fasten firmly to the sunniest window.
Place similar boxes on the porch or fence.
Plant morning-glories on the side nearest the house and train up on strings.
Plant climbing nasturtiums near outside, to hang down over the box.
Plant calliopsis, zinnias, marigolds, asters, or verbenas in middle of box.
Plants should stand 4 or 5 inches apart.
Boxes need water every day.

MAKING OF YOUR FLOWER BEDS.

Select sunniest part of the yard.
Avoid a place where the dripping from the roof will fall on the bed.
Best effects are produced by planting all of one variety in one place.

PREPARATION OF THE SOIL.

Dig up the bed, as early as possible, a foot deep.
Mix with the soil some rich earth, well-rotted manure, or leaf mold from the woods.
Rake the beds and keep the soil fine and free from lumps.

PLANTING OF SEEDS.

See directions on the seed packet.

WATERING OF THE GARDEN.

Sprinkle the beds every day, if necessary, until the plants are 1 inch high.
Do not allow the soil to become dry.
Sprinkle thoroughly every few days, when the plants are 2 or 3 inches high, instead of lightly every day.
Water in the morning and evening.

THINNING OF PLANTS IN THE GARDEN.

Avoid having plants too crowded.
Thin the plants when they are 2 or 3 inches high, on a cloudy day, when the soil is moist.
Transplant seedlings pulled up to another bed, or give them to some friend.
Take up a little soil with each plant.
Use a trowel, an old kitchen fork, or small, flat, thin stick.

PICKING OF FLOWERS.

Do not allow flowers to go to seed.
Pick them every day and more will bloom.
Allow a few of the best flowers to go seed for next year's garden.
Keep beautiful, fresh flowers in your house and share them with the sick.

THINGS TO REMEMBER.

Dig deep and make the soil fine on the surface.
Keep pulling out the weeds all summer.
Sprinkle the seeds every day.
Water the bed thoroughly every few days during the whole summer.
Pick your flowers every day.
Keep your garden neat.
Flowers require attention all summer.
By attending to these things you will have flowers all summer and for the flower show in the fall.

Each school building holds an exhibit in the autumn, and the best in each division is awarded a prize, consisting either of money or bulbs. If the former, it is with the stipulation that it shall be devoted to improving school grounds. Instead of finding in the 38 exhibits held in 1904 that they were largely the result of the efforts of teachers or a small number of children, as has often been the case, a large proportion of the children contributed, and in one case every child in school brought something from his garden.

The association enlarged its work in 1904 by inducing the board of education to employ an expert nature-study lecturer, who would combine home gardening with other nature-study topics, and by establishing gardens in connection with four schools where the children were owners of plats and the products belonged to them. The work in this case was conducted after school hours. It is desirable, where it can be made a class exercise, that school time be devoted to this work, for when done after hours it is necessarily voluntary, and those who do not volunteer are often the ones it is especially desirable to reach. They may not be volunteers through lack of interest, or it may be they are compelled to add to the family support by working after school. These can only be reached by making the work a part of the regular school curriculum. Moreover, the strength of the teacher should be considered. No teacher is able, after a day spent in the schoolroom, to put into an outdoor lesson the enthusiasm necessary for its success. The closer the garden is brought to the schoolroom the more practical will the teaching of our schools become.

The results in Cleveland substantiate the wisdom of the oft-expressed idea that to gain immediate results in the improvement of home surroundings the effort must be made through the medium of the public school children.

The work of the Home Gardening Association was called to the attention of the executive body of the Slavic Alliance, an organization for the general uplifting of the Slavic race, of which, by birth or descent, there are 100,000 representatives in Cleveland. The alliance incorporated home gardening as a part of its permanent crusade

for a more beautiful Cleveland. In 1904, besides selling 20,000 packages of seed, 25,000 copies of a pamphlet on home improvement, containing hints on planting, were printed in four different languages for distribution in the Slavic quarter of the city.

PUBLIC SCHOOLS, PHILADELPHIA, PENNSYLVANIA.

Philadelphia has seven gardens conducted for school children. These owe their existence to the efforts of the Vacant Lot Association, though they are not under its care. An offer was made by it to the board of education, to the Public Education Association, and to the Civic Club to secure and prepare suitable land for school gardens if these bodies would bear the expense of teaching. The Civic Club carries the responsibility of two—one at Twenty-second and Locust streets, 60 by 100 feet, containing 54 plats planted in vegetables; the other at Twenty-second and Morris streets, containing 64 plats planted in vegetables and flowers. The board of education controls the two largest gardens—one at Fifth and Catherine streets, accommodating 250 children; the other at Fifty-sixth street and Lansdowne avenue, accommodating 268 children—and $3,500 was appropriated for the work. The salaried workers are a supervisor at $600 for five and a half months, three assistants at $300 each, and a laborer at $50 a month.

The children are divided into four classes, each attending three-quarters of an hour in the morning. They are provided with small rakes and spades, hand weeders, and watering pots. The gardens are well planned. From a central mound of flowers four wide paths divide the land into a corresponding number of sections, each class cultivating a section. An individual plat is 4 by 12 feet, separated from its neighbor by a 2-foot path. The planting is uniform, five kinds of vegetables being raised. The same rules are in operation as on the vacant lots—to cultivate well and to respect the rights of others. Neglect after a certain time causes forfeiture, as there is a large waiting list.

The afternoons are devoted to watering, finishing the morning's work, and raking paths. A large tract of land in the vicinity of the Lansdowne avenue garden serves as a playground while the children are waiting for their class hour.

The hope of those most deeply interested is that the children will acquire in these small gardens a taste for and a knowledge of the work sufficient to induce them to cultivate vacant lots in the near future.

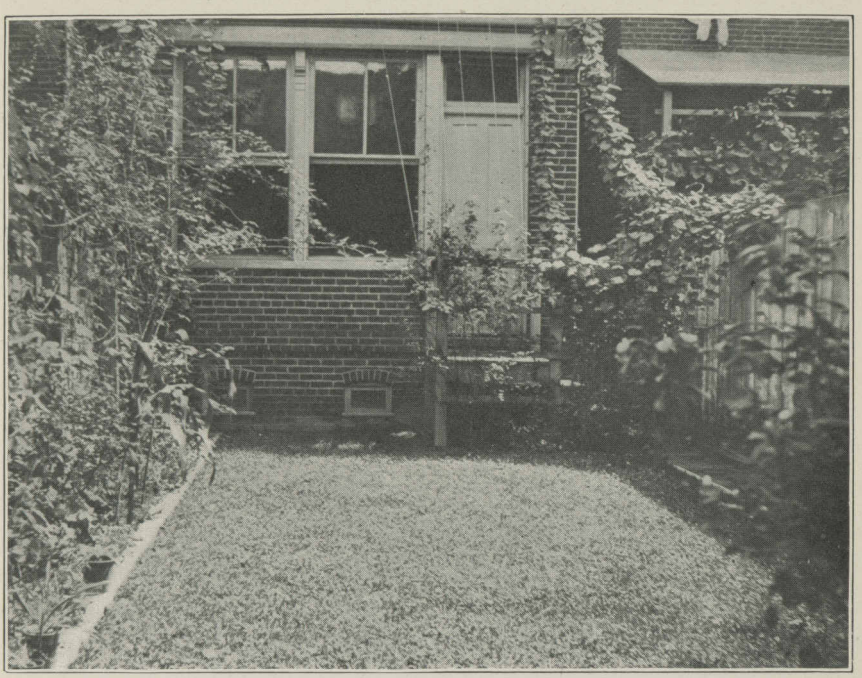

FIG. 1.—YARD OF NORMAL SCHOOL STUDENT, WASHINGTON, D. C., SHOWING OPEN LAWN AND MASS BORDER PLANTING.

FIG. 2.—CHILDREN AT WORK IN GARDEN OF THE WHITTIER SCHOOL, HAMPTON INSTITUTE, HAMPTON, VA.

SCHOOL GARDEN WORK AT WASHINGTON, D. C., AND HAMPTON, VA.

HAMPTON INSTITUTE, HAMPTON, VIRGINIA.

The following account of the work conducted by the Hampton Normal and Agricultural Institute has been taken from the reports of the institute for 1902–1904 and from the Southern Workman:

Every student in the school received last year (1903–4) some instruction in agriculture. Mr. C. L. Goodrich, whose connection with the institute has lately been severed, devoted years of study to the preparation of a course which should present, in simple form and largely by means of experiment, the rudimentary truths that have to do with soil, animals, and plants. He and his corps of assistants introduced this course into the Whittier School, and, through the Huntington and southern industrial classes, into the schools of the neighboring counties. So long as it is true that more than 80 per cent of the negro race in the South and nearly all of the Indians are dependent upon the soil for their living, it is clear that Hampton Institute should make agriculture its central study. This the school has endeavored to do. The attitude of the entire school toward agriculture has undergone an important and wholesome change in the last ten years. During the school year of 1893–94 a total of 157 students, under one instructor and two assistants, comprised the department of agricultural instruction. The year 1904 found the department with five men instructors, who devoted their whole time to agriculture; five women, who gave part of their time to it, and a foreman in charge of greenhouse and garden work, with a total of 911 students, who devoted more or less time to the subject.

Considerable progress was made in 1904 in introducing agriculture into common schools. As a result of the introduction of agriculture into the Whittier School, 200 gardens have been started by the children at their own homes. It is clear that if there is to be any interest in agriculture among the people generally, instruction must be given in the primary schools. Hampton is making every effort to bring this about. At the last session of the summer school every teacher in attendance was required to take either agriculture or nature study. The nature-study bureau promises to be of great assistance in spreading the love of nature and the study of agriculture throughout the South. Nine leaflets for teachers, two for children, and eleven for farmers have so far been published. Fifteen nature-study libraries of 12 volumes each were loaned during 1904.

The Whittier School is the practice school for Hampton Institute. (See Pl. V, fig. 2.) It is at the same time a county school, the 400 children who attend it having their homes in the neighborhood. The garden in connection with this school is somewhat unique in arrangement, following no model, but being adapted to the special needs

of the pupils. Certain definite ends have been sought, and these have determined the plan of the garden and the method of instruction. With the idea of developing a sense of ownership and with the thought at the same time of encouraging cooperation or partnership, 200 separate plats are prepared and each is given to two children, to be planted and cultivated by their own hands and the crops divided between them. To develop a regard for order, symmetry, and beauty, all the gardens are planted under the general direction of one person, the same crops being raised by all members of a class. To make gardening of permanent value the principles of germination and plant growth are taught by simple experiments in the class room.

The gardens cover 2 acres, being fenced from the road and surrounding land. The beds vary in size from 4 by 6 feet for the kindergarten workers to 11 by 15 feet for the seventh-grade boys and girls. Between the beds is a 1-foot path, and on either side of each section is a walk 2 feet wide. There are border beds for ornamental flowers along the sides and rear of the space allotted to beds. To provide for overflow work for exceptionally quick and energetic workers, the beds of each class are separated by one long plat 6 feet wide, which extends the full length of each section. In some of these overflow beds strawberries and raspberries have been raised. A man is employed to take general care of the garden plat. He mows the grass, plants the border beds, and keeps the paths in order.

When it was announced two years ago to the children of the Whittier School that they were to be taught gardening the news was received with mixed feelings. While the little ones were pleased, the older girls thought it a disgrace to work in the fields, and it was necessary to use compulsion. After two years there is no pupil in the school who does not look forward with eagerness to the work. If it is necessary to be absent from school he thinks it must not be on "gardening day."

In the autumn the six lower classes plant spinach, radishes, and kale, while the two upper grades plant onion sets in addition to these. The indoor work with the upper grades continues all winter. Toward the spring all the children sow seeds in "flats," or small boxes, and care for the plants as they appear. Cabbage, tomato, lettuce, marigold, zinnia, and nasturtium are thus treated. As soon as the weather permits, radishes, peas, and beans are sown outdoors and the seedlings transplanted from the flats. The gardening continues during vacation, 130 children having cultivated their beds the past summer.

The results of the gardening at the Whittier School have been mental and ethical, as well as material and practical. The children's powers of observation have been quickened and they have shown themselves mentally more alert. Their sense of beauty has been in-

creased; they are anxious to secure flower seeds for their home gardens, and are interested to know the names of flowers and shrubs and to have them in the schoolrooms and in their homes. More important, however, is the effect on character. In addition to the self-respect that comes from tilling the soil and the ability to produce something of one's own, gentleness has been developed in the roughest children. They have learned to love flowers and birds and insects, and to let them live. Most important of all, perhaps, it has begun to dawn upon both parents and children that land can be made to produce things both beautiful and useful, instead of being trampled down into the hard, smooth floors that form the front yards of so many cottages and cabins of the South.

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