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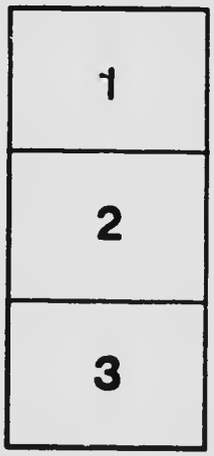

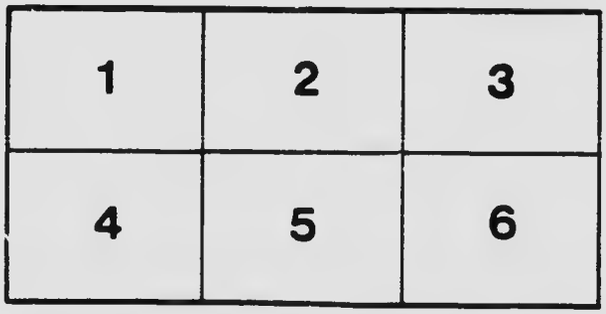

GARDENS FOR NEW BRUNSWICK SCHOOLS.

A Compilation by D. W. Hamilton M.A., Ph. D. Provincial Supervisor of School Gardens, Fredericton, N. B.

The Schools Act, Chapter 50, Section 123.

(e) Duly licensed teachers who shall have qualified for giving instruction in nature lesson in connection with school gardens, by completing a prescribed course at the Macdonald Institute at Guelph or at any other institution approved by the Board of Education and who shall thereafter give instruction in said subjects at any public school having a school garden attached, in accordance with the regulations of the Board made from time to time, shall receive from the provincial revenues at the rate of thirty dollars per year, in addition to the ordinary provincial grant provided for by section 13 of the Schools Act.

(f) There shall be granted to the trustees of such school districts as shall provide and maintain school gardens in connection with their several schools, the sum of twenty dollars per annum to assist them in caring for such gardens and improving and keeping in proper condition the school grounds.

REGULATION 50.—In order to entitle Trustees and Teachers to receive the grants provided for by Section 123 (e) (f) there must be expended under the direction of the Board of Trustees at least Twenty Dollars per annum for the purpose of purchasing necessary tools and supplies for the School Garden and Nature Study Work. The garden must be kept free from weeds and well cultivated, and must be used effectively as a means of Education. The grants will be paid on the report of an official supervisor who will visit each garden as often as may be deemed necessary. The grant may be paid in full, in part, or withheld altogether according to the report of the official supervisor.

Directions to Trustees and Teachers.

1. The School Garden should be a model of clean culture. The educational effect of a weedy garden must be bad. Frequent stirring of the soil with a hoe or rake not only kills the young weeds, but hinders the evaporation of the soil moisture which is thus conserved, to be absorbed by the rootlets and root-hairs of the thirsty plants. Little hand-weeding is needed, but what is necessary should be done before the weeds have grown large and have robbed the useful plants of much food and water. The walks and borders should be kept as scrupulously free from weeds as the plots.

2. Keep all the space intended for cultivation fully occupied. If any of the seeds first sown fail, sow others of some sort or set out young plants to fill the space. Early vegetables should be followed by a late crop of the same or some other kind.

3. Call the attention of the young gardeners to the reasons for stirring the soil, for killing the weeds, and for all the other operations in the garden. Train them to put brain as well as brawn into their work.

4. Train the children to clean their garden tools immediately after using them, and to arrange them in an orderly manner in the tool-room.

A School Garden can in this way and other ways indicated herein, be made a useful factor in establishing, by actual practice, habits of economy, forethought, order and neatness.

5. The School Garden affords a convenient opportunity for studying in connection with the regular Nature Lessons, the germination of plants, the rate of growth, pollination, storage of plant food, seed dispersal, life history of individual plants, the transformations and habits of insects, the economic relation of birds, the kinds of soil and their chief constituents, etc.

6. Work in the School Garden may be regularly correlated with the work of the class-room in arithmetic, mensuration, geometry, composition, drawing, reading, spelling, etc. A problem in surface measurement worked out practically in the garden is educationally worth many such problems taken from the text book. If the pupils are required to describe either orally or in writing the various garden operations and to express their thoughts and observations about work with which they have become familiar, it will be found an excellent method of language training.

7. In selecting flowering plants both annuals and perennials, choose mainly from those which blossom in May and June and from those which bloom after the summer vacation. By judicious selecting and planting, the garden plots and borders may show a constant succession of flowers.

Many of our native ferns and other wild [illegible] easily grown and would greatly add to the beauty and the in[illegible] the garden.

Plants of historic and poetic interest should find a place; they will form one of several connecting links between the garden work and the book studies. To children who have become students of nature, literature presents a double attraction.

8. A garden book should be kept in which to enter the dates of planting the various seeds, the time required for germination, the dates required for blossoming and maturity, the appearance of destructive insects and how they were dealt with, and other useful and interesting facts. This book may form a part of the Nature Record or Calendar which every school should keep through the year.

The people of the District will often be found willing to contribute seeds and perennial plants for the School Garden, or to germinate seeds in houses or hot-beds for early planting. At the same time the influence of the School Garden should be felt in many of the homes in the planting of vegetables and ornamental plants where there were none before, or in the better care of the home garden.

10. See that the School Garden is in excellent shape before leaving it for the summer vacation, and then place it in the care of some reliable person or persons who can be depended upon to keep it clean and well cultivated until the school re-opens. Pupils should be encouraged to visit the garden at stated times during the vacation to cultivate their plots.

11. Do not allow any of the children to waste the products of their plots; induce them to take the produce home to their parents, to give it to a friend or neighbor who would be pleased with the gift, or to put it to some other proper use. Bouquets of garden flowers may be sent to the nearest hospital or to sick people at their homes. At schools where Domestic Science is taught, the School Garden will supply the table with vegetables and flowers. The products of common plots may be sold for the benefit of the school.

12. Lists of good books on gardening and related subjects can be found in the catalogues issued free by the leading seedsmen. Much useful information may be found in the bulletins issued by the Department of Agriculture at Ottawa; these can be had for the asking.

History of School Gardens.

Long before public schools had an existence, the value of the school garden was recognized in Europe, and we are told that by the middle of the Sixteenth Century almost all of the Italian Universities and many Italian cities possessed botanical gardens. Two hundred and fifty years ago brave old Comenius said:—"A garden should be connected with every school, where children can at times gaze upon trees, flowers, and herbs, and be taught to enjoy them." As if in response to this prophetic declaration, his native country, two hundred years later, was the first to require by law the establishment of school gardens in connection with elementary schools. The Austrian Imperial School Law of 1869 prescribes that "when practicable a garden and a place for agricultural experiments shall be established with every rural school." To-day Austro-Hungary can boast of nearly twenty thousand school gardens. In one province every school has a garden. Bohemia has four thousand five hundred, and its enormous crops of fruit are by many ascribed to school instruction.

In Sweden in 1860 a royal proclamation required school gardens, varying from seventy to one hundred and fifty square rods to be appropriately laid out for the children of elementary schools. In 1876 Sweden had one thousand six hundred such gardens, and now the number is nearly five thousand.

In Belgium the school law of 1873 provides that every school shall have a garden of at least one-quarter acre, and a royal decree of 1897 requires that all teachers shall be able to give theoretical and practical instruction in botany, horticulture and agriculture.

In Switzerland the cantons have encouraged the establishment of school gardens, and ample provision has been made for suitable instruction in the Normal Schools. The results have been excellent. France has

rapidly developed the higher teaching of all forms of agriculture during the past twenty years, and now has at least one hundred institutions for this purpose, among the finest in the world. In 1882 the teaching of agriculture in the public schools was made obligatory. To-day France has thirty thousand elementary school gardens, and no new school can receive governmental aid without such equipment.

In Germany thousands of schools have gardens. Even Russia, with all her inherent barbarism, is making great headway in school instruction in gardening. In a single province in Southern Russia 257 out of 504 schools have gardens. In 1895 these gardens contained, among other things, 110,000 fruit trees, 240,000 forest trees, and more than 1,000 bee hives. Almost every form of economic gardening is carried on. During the last twelve years many gardens have been introduced into England, chiefly in connection with supplementary schools. The children not only receive instruction but do practical work, the aim being agricultural education.

In 1891 the first school garden was started in the United States and now there are thousands. Winnebago County, Illinois, alone, has school gardens in 73 districts. Gardens have been established in the West Indies, and in 1905 there were thirteen at Grenada.

In 1904 the Sir Wm McDonald school gardens were established in all the Eastern Provinces of Canada, and now Canada can boast of hundreds of gardens. Even before 1904 there were 52 school gardens in Nova Scotia, where for several years Dr. A. H. McKay, Chief Superintendent of Education, has ably advocated Nature Study and school garden work. Nova Scotia now has about one hundred. Even the little Province of Prince Edward Island has nearly half a hundred gardens.

In New Brunswick progress has been slow. We have not over a score but we hope to see many more gardens in the immediate future.

The vast majority of European school gardens look to utility. Of the few that recognize the importance of the educational end, nearly all stop short at the acquisition of a certain amount of scientific information and the habit of careful observation. The Macdonald school gardens of Canada, while designed to encourage the cultivation of the soil as an ideal life-work, are intended to promote above all things else symmetrical education of the individual. They do not aim at education to the exclusion of utility, but they seek education through utility and utility through education. The garden is the means, the pupil is the end.

SCHOOL GARDENS.

I. GENERAL AIMS.

To stimulate interest in rural life;

To provide healthful exercise for body and mind, and to afford to the pupil an opportunity to direct his activities along useful lines;

To develop at an early age habits of industry, respect for labor, and a love for productive and constructive work;

To impart useful information in agricultural subjects ;

To give facility in the handling of tools and in the practice of garden craft ;

To promote the desire to improve home surroundings and to train boys and girls to do such work with efficiency ;

To promote the qualities that make for good citizenship, such as the responsibility of ownership, respect for public property, consideration for the rights of others and the principle of co-operation in seeking the common good ;

To encourage careful observation of nature ; thus enabling the pupil to understand his environment and to appreciate more fully the beautiful in nature ;

To promote a spirit of independent investigation in other branches of study ;

To bring the life and interests of the school more closely into touch with the home life of the pupils.

II. ORGANIZATION.

Location of the Garden.—So as to be easily accessible, the garden should be convenient to the school room. If possible, it should be situated in a part of the grounds that can be seen from the windows of the Principal's class-room. The safety of the garden as well as the convenience of the pupils should be kept in mind. Accordingly, the garden should not in any way interfere with the usual outdoor games. Accordingly, also, either a strong hedge or a woven-wire fence should divide the garden from the play-ground. If the garden has a southern exposure so much the better ; if not, protection from storms and cold north winds may be secured by planting along the north and the west sides a wind-break of evergreens. Such planting should not be allowed to shut out a fine view from the school building ; but, in some cases, it might be used to advantage to shut out unsightly or objectionable features of the grounds. When practicable, the garden should be placed where it can be seen from the street or highway. It should be in harmony with the natural features of the grounds ; or, in other words, it should occupy that place in the grounds where it will "look best."

Size of the Garden.—No school is too small to have a garden of some kind. The area of the garden does not determine its success. The best garden is the one the teachers and pupils have been most interested in making.

The area of the garden will depend largely upon the area of the available grounds and upon the number of pupils taking part in the work. In a large graded school where the size of the garden is limited it may be arranged that gardening be taken up in certain grades only. The area will also be determined in part by the nature of the work carried on. Individual plots of flowers or vegetables require least space and are the all important feature. Larger class plots may be added for the growing of vegetables or grains that cannot conveniently be cultivated in small plots ; and, if the garden is large enough, experimental plots in connection with farm crops, as well as forestry and fruit plantations, may be included.

A school ground 1½ acres in extent might be divided up as follows: Boys' playground, ½ ac.; girls' playground, ¼ ac.; front lawn, approaches, etc., ¼ ac.; pupils' plots in vegetables and flowers, ¼ ac.; field experiments, fruit and forestry plantations, ¼ ac.

Size of Plots and Paths.—The size of school garden plots will depend very largely upon the character of the work carried on and the age or ability of the pupils. For pupils in primary classes plots 3 ft. x 5 ft. are very satisfactory; for intermediate classes 3 x 10 ft.; and for seniors 3 ft. x 20 ft. (or 6 ft. x 10 ft.). It will be noticed that the above plots have one dimension in common, viz., 3 ft. wide—this provision becomes more important as the plots are increased in number. If they are of the above size, each pupil should manage two, one for flowers and the others for vegetables. The flower section of the garden may be separate from the vegetable section. For pupils in the Primary classes one plot may be considered sufficient, and in this case, both flowers and vegetables might be grown side by side. Class plots should not be smaller than 20 ft. x 20 ft., and plots for field experiments with potatoes, roots, grains, fodder crops, grasses, clovers, etc., might be 1 rod square, or 1 rod by 2 rods, or 10 ft. 5 in. x 20 ft. 10 in. (1-200 of an acre). A walk at least 4 ft. wide should surround the garden. Paths 3 ft. wide should run between class or experimental plots and between rows of individual plots. Narrow paths (1½ ft. or 2 ft. wide) should separate individual plots in the same row. When once the paths and plots have been made and the corner stakes (2 ft. x 2 in. x 2 in.) driven, they should not again be moved. The plots should be spaded, both in the autumn and in the spring, no horses being needed in cultivating the garden after the first year.

Garden Plans.—When the extent of the space available for the garden has been ascertained it is advisable to prepare a plan of the garden on paper which will show the exact size and location of the plots required. Such plans should be made with deliberation early in the spring before planting operations begin, and the pupils should be allowed to co-operate in the work. In addition to this general garden plan each pupil should make a plan of his or her own plot or plots, showing where the different varieties of plants chosen are to be grown. This exercise may form a suitable introduction to map drawing. Each pupil should have a garden note-book in which to record work done and observations made day by day. Such garden diary should contain a plan of the pupil's plot drawn to a scale and showing the arrangement of the plants in each plot.

Laying Out the Garden.—The chief requisites for laying out the garden are a tape-line, a long garden line, a supply of small stakes 1 in. square and 1 ft. long, and a hatchet or mallet. The stakes for the large plots might be larger than these, and might be made by the boys at home or in the school work-room, if the school is fortunate enough to have such a room. The outside corners or main boundaries of the garden should first be located and marked with strong stakes. The outside walks should then be staked off, space for a border of flowering perennials

measured off, and then the individual plots, class and experimental plots, etc., in the order mentioned, the stakes being driven at the points which are to be the corners of the plots.

Preparing the Plots.—The planning and staking out of the garden will, of course, be done by the teacher and the pupils. The making of the paths and the preparation of plots in a large garden, however, will usually necessitate the services of a competent man. Most of the boys and many of the larger girls will prepare their own plots with ease and despatch when they have once been shown how to do the work. The smaller boys and girls will need some assistance. In an ordinary garden the older boys may help the girls, and the smaller boys and hired help will not be needed. The plots should be made the exact size indicated by the four corner stakes. Subsoil cultivation should be followed if the soil is very sandy. Otherwise it is desirable to raise the plots by removing a couple of inches of soil from the paths and placing it evenly upon the plots, which should be made of uniform height, raked level and all edges carefully trimmed with the rake and garden lines. If some well rotted manure is spaded into the plot before raking down, so much the better. Refuse in the form of hard lumps of earth, etc., should be raked out of the paths and removed in a wheelbarrow or used to fill up holes in the garden. In this as in all parts of the work the teacher should insist on care and accuracy. Nothing but the best efforts of the pupils should be accepted in the making, planting, and care of garden plots.

III. DETAILS OF WORK.

Notes on Planting.—Teachers with limited experience in gardening will find some difficulty at first in making a selection from seed catalogues for the school garden. To allow the pupils as much freedom as possible in choosing their own plants and at the same time safeguard them from possible failure and consequent disappointment may become one of the most difficult school garden problems. A few general rules and suggestions will prove helpful. Beginners should choose the more familiar plants, especially those that do not require more than ordinary treatment. Young pupils should plant seeds that are easily handled, quick to germinate and sure to grow under ordinary conditions. These seeds the teacher should select. Pupils should not attempt to grow too many varieties in one season. Primary classes might try two varieties of flowers and two of vegetables, intermediate classes three or four varieties of each, and seniors up to six of each. A pupil might be allowed to cultivate only one variety if he so wished, but the tendency is to err in the other direction. After the first year the pupils should be encouraged to try at least one new variety of flower or vegetable each year and thereby gain a wide and practical knowledge of varieties. They might, however, be allowed to cultivate the same varieties year after year if they so desired. The older pupils should choose part of their varieties from the list of plants that require to be started early in hot-beds or window-boxes, so that they become familiar with the work of transplanting.

Plants that grow very tall (corn, sunflowers, etc.), should not be put in small individual plots, as they tend to interfere with the light supply to low-growing plants near them. Vines also (squash, cucumbers, etc.),

should be grown only in large plots, or in border plots, as they obstruct the paths and interfere with plants in neighboring plots. Different varieties of corn should not be planted side by side, as the wind will carry the pollen of one variety to the pistils of the other and mixed varieties will result. When planting in rows, the rows should run north and south as the plants will get most sunlight evenly distributed when so planted. If the rows are short and must run east and west, the tall-growing plants should be planted at the north side of the plot.

The older and more experienced pupils should be encouraged to work out color schemes in planting. Flower designs afford scope for the imagination and tend to encourage originality. Only low-growing plants of fairly compact habit should be chosen for flower designs or border work. Mass effects which result from growing only one variety of flower in a plot, add to the attractiveness of the garden. Some flowers, like the poppy, verbena, portulaca, or petunia, make a fine display when so grown Every school garden should have a visitor's plot of fine flowers from which interested visitors would feel at liberty to "take one." The picking of flowers or of vegetables from plots by persons other than the owners of these plots should be strictly prohibited.

Flowering perennials should be planted in borders along the front and sides of the garden, along walks, fences, etc., and late flowering annuals may be transplanted into the perennial borders to provide bloom late in the season. Perennials started from seed in August, protected throughout the winter by a light covering of leaves or straw, and transplanted to permanent positions in the spring, will bloom that year. Ornamental shrubs (chiefly native) should be planted along the sides and in the corners of the grounds—never in the garden nor out in the open grounds where they would interfere with the playing of outdoor games.

The same may be said of shade trees. Each pupil should know what he is to plant before planting day comes, and should submit a plan for his plot for the teacher's approval or for re-arrangement. To avoid confusion in the garden not more than a dozen pupils should be engaged in planting at one time. If the flower or vegetable seeds are to be planted in rows, the rows should be kept in perfect line across the garden, and if possible be a uniform distance apart. A garden line and a rule are needed for this purpose. A twelve-inch board about 6 ft. long will be found very useful in planting. It can be used as a straight-edge in making the drill for the seed, is convenient to stand on when sowing the seed, and lastly, for firming the soil over the seeds when planted. It is very convenient to have the rake handles marked off in feet and inches.

When the plots are ready and the drills made for the seed the teacher should place in the left hand of each pupils just enough seed to plant the row, giving at the same time a word of instruction as to how thick the seeds should be planted and how much earth should be put over them.

Care should be exercised to prevent needless waste of seed. The seed should be taken between the thumb and index finger of the right hand and spread thinly and evenly along. The finer and weaker the seeds the less covering they should have. If the soil is very dry it should be thor-

oughly watered the day before the planting is to be done. This is a much better practice than to sow seeds, and especially fine seeds, in a dry seed bed and then to water with the sprinkling can. The latter practice invariably causes a hard crust to form over the top, through which the young plants come up with difficulty, if at all; free access of air is prevented and the moisture necessary for growth is allowed to escape.

From one to three weeks after the seeds have been planted and when danger of frost is past, the transplanting from hot-beds or cold-frames may be done. If possible it should be done on a moist or cloudy day, otherwise it will be necessary to shade the plants with papers or shingles for a few days and to water them frequentky. Water from a well should be allowed to stand in a tank or barrel for a few hours before being used on garden plants. The holes for the plants may be made with a transplanting trowel, or, if the plants are very small, with a sharpened stick. Before the plants are lifted they should be thoroughly watered to prevent the breaking of the delicate rootlets. They should be placed in the holes, using water if the soil is very dry, and the earth then firmly pressed around their roots. When set, they should be slightly deeper in the soil than before transplanting.

Care of the Garden After Planting.—When once the planting is done, two half-hours' work per week is sufficient to keep the garden in good condition. The prevention rather than the eradication of weeds should be aimed at. If cultivation is carried on regularly and systematically from the first, the weeds will all be destroyed in the germinating stage and will give no further trouble. Mere weed killing is not the greatest value to be gained by cultivation, however ; for if the soil is thoroughly stirred around the roots of the plants a couple of times every week, the necessary supply of air in the soil for rapid growth will be ensured. In many cases the top soil forms into a hard crust, especially after a heavy rainfall, and in this hard soil are many little channels through which moisture escapes into the air by evaporation. This soil should be finely pulverized to a depth of two or three inches, thus forming an earth mulch which prevents the rapid escape of moisture from the soil. If mulching and cultivation are thus carefully attended to, the difficult problems connected with the weeding and watering of the garden are incidentally solved. The garden rake should supersede the sprinkling can under ordinary circumstances. Of course it is necessary to water plants after transplanting, and there are certain soils that need watering occasionally during a dry season, but such cases are not common. If artificial watering is needed it should be done in the evening and a plentiful supply should be given. Merely wetting the surface soil encourages shallow rooting and is injurious to the plants.

Care should be taken not to have the plants much crowded in the rows or the rows very close together. The ideal condition would be to have the plants so far apart that they would completely cover the ground without crowding when full grown. When the plants have reached this stage of development, if cultivation has been thoroughly and carefully done there will be no further danger from weeds, as weeds will not grow in such deep shade.

PUPILS WORKING IN GARDEN OF MACDONALD CONSOLIDATED SCHOOL, KINGSTON, N. B.

The detection and the treatment of garden pests is a matter of increasing importance to all gardeners, but it is especially important in connection with school gardening. Nature study with insects can be carried on to greatest advantage in a school garden. An insect at work in its own natural environment is immensely more interesting to the child and is of far greater importance from the Nature study point of view than an insect impaled upon a pin in a glass-covered box. The life history of some of the common garden insects can be studied, their feeding habits noted, and suitable insecticides used on the injurious ones. Fungus diseases of plants such as the potato blight and the tomato rot should also be studied and the pupils made familiar with the nature and use of such fungicides as Bordeaux mixture.

The blooming period of flowers can be prolonged by keeping the flowers closely picked. Seed should never be allowed to ripen unless wanted for subsequent planting, in which case only that from the finest blooms should be preserved. Such selection of seed can best be done by tying strings or labels around the flower stems before the bloom is gone.

Constant care should be exercised in keeping the garden tools in their allotted places. They should never be left out in the garden. All garden refuse, such as weeds, dead plants, etc., should be kept out of the paths and placed in a refuse or compost heap in the least conspicuous place in the garden. When decomposed it produces a valuable humus for potting plants or for use in flower borders. Early in October the plots should all be cleaned off, spaded, and left in readiness for planting operations the following spring.

The produce from the individual plots should become the property of the respective owners and should be removed by them. The produce from each class plot should be divided amongst the members of the class interested, and that from general experimental plots might be sold by the pupils, the salesman in each case to get a commission of say 10 per cent. on his sales, and the balance to be placed in a general garden fund and used to defray expenses or to purchase tools, pictures, apparatus, etc.

The pupils should be encouraged to give liberally of their flowers to churches and charitable institutions, and every sick-room in the community should be brightened continually by flower bouquets from the school garden. The surplus of plants or the seeds of good varieties should be distributed amongst the people of the section.

Care During Summer Holidays.—Much depends upon how the work has been done before the holidays begin. If all of the above suggestions regarding cultivation and care are faithfully carried out, when the summer holidays arrive the weeds will have been pretty well conquered for the season and the garden plants well advanced. If, however, the best results are to be obtained some attention is necessary during the summer holidays and the pupils should be given to understand at the beginning of the season that they alone are responsible for the care of the plots which have been assigned them. It should be understood also that they will visit their plots once every week during the holidays, or, if absent,

they will make arrangements with other pupils to do so. If the work has been conducted in such a way that the interest has been keen throughout the term, the pupils will cheerfully give their plots this necessary care. If the teacher is a resident in the section, he will be able to meet the pupils at the garden occasionally after school closed in June. In a case of large gardens it may be found necessary to arrange with one or two of the older boys or with some suitable man to do extra work in the garden, the cost to be paid by the School Board from such funds as may be available for garden purposes. General care of the garden rather than care of individual plots should be provided for in this way.

Co-relation.—The extent to which school garden work may be co-related with the ordinary school studies depends largely on the resourcefulness of the teacher. He should take advantage of the garden and of the garden exercises in adding freshness and in giving a practical bearing to subjects which are intrinsically uninteresting to children. Garden work and garden observations afford interesting subject matter for exercises in drawing and composition—interesting because so closely associated with the pupil's own experiences and life interests. Many of our foremost authors and nature poets have idealized the plants of the garden as well as those of the wild wood, so that children's gardening experiences and their own first hand knowledge of plant and animal life, may serve to bring them into a fuller enjoyment of the literature of nature. Many practical problems in arithmetic are suggested, and even demanded, in connection with school gardening. The keeping of garden accounts, for example, may be made a valuable training in bookkeeping and in commercial arithmetic. Weights, measures, values and mensuration are all more or less involved in school gardening. For more advanced classes the study of botany with garden plants, and of zoology with garden insects, etc., can be carried on to very great advantage.

The Cost of a School Garden.—Extract from a Report of the Principal of the Macdonald Consolidated School, Kingston, N. B., (Jan. 1st, 1907):

"During the past season it was satisfactorily demonstrated that a School Garden, after the initial expense, can be made a source of financial, as well as educational profit to the gardeners. Last spring the pupils provided fertilizer and seeds for their plots. Each of the older pupils made a specialty of one vegetable, and many interesting experiments were made in the individual plots. A record of the number of hours spent on each plot was kept, and the work of each pupil valued at so much per hour. Notwithstanding the extreme dryness of the summer, and the partial neglect of the plots during the long summer vacation, nearly all the plots yielded abundantly: and after the produce had been sold, the account of each pupil showed a net gain of a few cents. The pupils were more interested in the school garden work because of the attention given to the financial aspect, and the greater liberty allowed

each pupil. During the summer vacation nearly all the gardeners returned often enough to cultivate their plots. The janitor of the school building had a general care of the lawns and gardens. His salary for the vacation period was only nine dollars. If this amount had been a direct school garden charge, a few cents from the profits of each plot would have met the expense. Thus it has been shown that a creditable school garden can be maintained without any expense to a district."

The garden mentioned in the above extract was a large one—over one-half acre in area. In connection with small rural schools one-quarter or one-eighth acre of land would be sufficient.

SAMPLE ILLUSTRATION PLOTS.

		FIRST YEAR	SECOND YEAR	THIRD YEAR
ALL MANURED ALIKE	1	GRASS OR CLOVER	POTA ES SPRAYED	WHEAT SELECTED GOOD SEED, WITH CLOVER
	2	GRASS OR CLOVER	POTATOES NOT SPRAYED	WHEAT SELECTED POOR SEED, WITH CLOVER
	3	POTATOES SPRAYED	WHEAT SELECTED GOOD SEED, WITH CLOVER	CLOVER
	4	POTATOES NOT SPRAYED	WHEAT SELECTED POOR SEED WITH CLOVER	CLOVER
	5	WHEAT SELECTED GOOD SEED, WITH CLOVER	CLOVER	POTATOES SPRAYED
	6	WHEAT POOR SEED, WITH CLOVER	CLOVER	POTATOES NOT SPRAYED
NO MANURE	7	OATS, WITH CLOVER	BARLEY, WITH CLOVER	WHEAT, WITH CLOVER
	8	OATS, WITHOUT CLOVER	BARLEY, WITHOUT CLOVER	WHEAT, WITHOUT CLOVER

BEAUTIFYING SCHOOL GROUNDS OR OUTDOOR ART.

ARBOR DAY.

Regulation 20.—Arbor Day : With a view of encouraging the improvement and ornamentation of School grounds and thereby of cultivating on the part of pupils, habits of neatness and order, and a taste for the beautiful in nature the Board of Education makes the following provision :

Arbor Day will be regarded as duly observed when the following conditions are complied with :—

(a) That the Friday in May or June which the Inspector shall from year to year recommend to be observed within his Inspectoral District is set apart as Arbor Day.

(b) That Teachers who observe Arbor Day make within five days thereafter a report to the Inspector of their District, which report shall state the name and number of District, the date on which the day was observed, what improvements were made to the School grounds, the number of trees planted, number of shrubs, or number of flower beds made. Unless a report is made to the Inspector, the School must be kept open during both sessions.

(c) That the Inspector forward to the Chief Superintendent a tabular synopsis of the reports of the Teachers within his Inspectoral District not later than June 30th.

In the country we do not yet appreciate fully the educational influence of environment. We rely too much upon books and do not pay enough attention to things. It is not strange that when a boy reaches the age of fourteen he refuses to associate longer with the old schoolhouse with its blank walls and desolate yard. He feels the restraint of his environment. The secret of keeping more boys satisfied with the farm rests primarily with the character of the country schoolhouse and its surroundings. Why do not trees and shrubs grow in many country school yards, when they thrive with great vigor around the farm home a few rods away? Scientific agriculture tells us that soil may be inoculated so that clovers will grow luxuriantly and produce abundant crops. Some one will do a great service if he will tell us of the particular microbe, and its method of culture, that will correct the unproductive character of the soil in so many school yards, with especial reference to trees, flowers, vines, shrubbery, etc. The peculiar kind of bacteria needed is the

one that will induce the average school patron or director to connect himself gently but firmly with a spade and do some excavating in the hitherto unexplored country surrounding the crossroads temple sacred to the "three R's."

Let us observe Arbor Day in every school with appropriate songs and exercises; but let us not forget to plant when planting needs to be done. For schools whose premises are treeless the proper thing to do would be to dig rather than sing. What is the use of singing and reciting about trees when planting and caring for trees is needed?

In this article we will have in mind the improvement of school grounds where all the conditions are at zero—where the building would be a discredit to any owner, where the ratepayers are very indifferent, and the only resource is to awaken a public spirit on the part of the children. The first step should be the development of local pride. Something may be accomplished among the parents, but to the true teacher the pupils may be counted upon as the mainstay in such an undertaking. To such a teacher I should say, do not for a moment believe that the improvements seen about the school grounds will be all the good that is wrought. Fifty years from now there will be a few gray-haired men and women who take more interest in the appearance of their "front-door-yard," who give their children and their grandchildren encouragement in having a garden "all their own," and extend sympathy and service to the better appearance of the school grounds, because of your altruism when you taught the district school.

"Who does his duty is a question
Too complex to be solved by me,
But he, I venture the suggestion,
Does part of his that plants a tree."

LOWELL.

Observance of Arbor Day.

About the time you hear the first spring notes of the Robin or Song Sparrow, prepare public opinion in your school community for a spring cleaning. By this time the ground will be bare of snow and it will be soft. Ask some of the pupils to bring rakes, and have them gather up the rubbish. You can all play gypsies when you gather about the bonfire. This will be a favorable time to sow grass seed, for no doubt the school lot will need it. Your pupils can at least get chaff from a hay mow. It will be a mixture of grass and weeds but the latter can be pulled out after germinating. It is possible that some farmer may give you some clover and timothy seed, and this will be still better.

Before any planting of trees or shrubs is done the school grounds should be enclosed by a neat fence. If you can't induce the trustees to do this, get up a concert or basket social and raise enough money to pay for fencing the grounds—"Where there is a will, there is a way."

Good results in landscape gardening depend on observing certain principles. Among the first and most important efforts is to make a frame or setting for the house by planting around the borders of the place. The trees and higher shrubs are planted first, with shorter shrubs and flowers in front of the trees. If the area be ample let the edges be irregular; but if very limited, straight lines become necessary. The open space within the boundaries should be a mat of green carpeting, for nothing is more beautiful than sward. Do not plant anything in the centre of the lawn or playground. Certain small shrubs, ferns and flowers may be planted along the walls of the building, particularly in the angles. When the buildings are unsightly, cover with vines and plant bushes against them.

The amateur planter should select native trees and shrubs which take care of themselves under adverse conditions. The common Sumac is one of them—others are lilacs, cranberry bushes, mountain ash, willows, etc. Willows will do very well in any kind of soil. It is reasonable to suppose that poor soil goes with most school buildings, and a refined tree would probably find life hard in such a place. In any case plant a willow. If the soil is good enough plant maples, oaks, elms, birches, beeches, cherries, poplars, conifers, and other trees. Plant trees in clumps if possible. The most common mistake made in the selection of trees is in taking those that are too large. For the conditions under consideration a tree no larger than a broom-handle, and not over ten feet high should be chosen. Select a low, bushy, symmetrical tree that has been growing in the open, rather than one from the shade. I know that the common feeling is "we will have to wait too long for our shade"; but, if the larger tree is not in the hands of experts, the smaller will be the more desirable at the end of five years.

In removing the tree or shrub from its native home, spade around the tree at a distance of a foot or more from the trunk, thus cutting off all long roots. Then pry out the tree—avoid pulling it out if possible, leaving as much earth on the roots as possible. Never allow the roots of a tree to become dry. Wrap a wet sack about the roots or stand it in water until planted.

Before the removal of the tree, the roots probably found pasturage in a cart load of soil. After planting the root pasturage is not more than half a bushel of good soil. What follows when the forces of plant growth begin? A demand for soil products, with a very much restricted means of supply. The top must be cut back to match the shortened root system. The amount necessary to cut back differs with different trees and shrubs. No hard and fast rules can be given. With willows and sumacs one-third to one-half of everything bearing leaf buds can be cut away. With a maple having a diameter of one and a half inches at the butt, about one-third of the branch area should be left to grow. Don't make the mistake of cutting off all the branches and leaving the bare trunk. The tree or shrub must have leaves as soon as possible in order that it may get food from the air, since the greater part of the food of every plant comes from the air through the leaves. You should prune so as to allow the limbs of the tree to start low and those of shrubs to begin as near the ground as possible.

In taking the tree from the ground only a fraction of the original roots go with the tree and these are badly bruised at the point of cleavage. These ragged ends should be dressed smoothly by means of a slanting cut with a sharp knife. All mutilated roots should be removed.

The hole in which the tree is set should be large enough to accommodate the roots without cramping them out of their natural positions. It is important that the earth used for filling shou! be fertile, and it is doubly important that it should be fine, even superfine. Clods, even small clods like marbles, will not snuggle up to the small roots as closely as it is absolutel necessary. Set the tree about an inch deeper than it originally stood so that when the earth settles it will be at the original depth. All the earth should not be dumped in at once and then "trumped" with the feet. This method will leave many roots in tiny caverns. It is important that fine soil should be pressed close to each little rootlet, not for warmth but for moisture. Fill the hole by instalments, tramping the earth down firmly at each filling. At the beginning sprinkle the fine earth about the roots. Then pour in some water. This will give the roots much needed moisture and ,best of all, will wash the earth about each root fibre.

Do not use any sods. Leave a layer of fine loose earth on top as a mulch for the tree—that is, to keep in the moisture. Water the trees every day until they have obtained a root-hold in the soil. Drive two or three long stakes near the tree, and with soft cords or strips of cloth tie the tree to the stakes. This will prevent swaying and the consequent breaking of the fine rootlets. For a season or two at least , the soil about the trunk of the tree, for a distance of a foot or more, should be stirred frequently in order to keep a mulch over the root system. Give the soil about the tree a good dressing of well rotted manure every fall. As a final but very important word of advice—see to it that all animals, not excepting boys and girls, are kept away from the young trees and shrubs until the latter have become firmly established.

In conclusion let me say to teachers, in the words of Prof. Bailey, of Cornell, "Begin ! head end, tail end, in the middle, but begin ! There are two essential epochs in any enterprise, to begin, and to get done."

Directions for Arbor Day Gardening.

Plants seeds in garden or boxes early in May.
Fill boxes with four or five 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 1st, on a damp day.
Sow seeds of Nasturtiums, Morning Glories, Sunflowers and Four-O'clocks in the garden, as they do not stand transplanting.

Suggestions for Window Boxes.

Make the box six or eight inches deep, twelve to fifteen 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 Zinnias, Marigolds, Asters, Phlox or Verbenas in middle of box.
Plants should stand four or five inches apart.
Boxes need water every day.

Making of 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 mould from the woods.
Rake the beds and keep the soil fine and free from lumps.

Watering of the Garden.

Sprinkle the beds every day, if necessary, until the plants are one inch high.
Do not allow the soil to become dry.
Sprinkle thoroughly every few days, when the plants are two or three inches high, instead of lightly every day.
Water in the morning and evening.
If the soil is raked often between the plants they will not require as much watering.

Thinning of Plants in the Garden.

Avoid having plants too crowded.
Thin the plants when they are two or three 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 or old kitchen fork or a 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 to seed for next year's garden.
Keep beautiful, fresh flowers in your house and share them with the sick.

The Lawn

Take care of the lawn all summer
Water well, when needed, and do not allow the surface to become dry.
Keep the lawn neat by cutting the grass when two or three inches high.
Pull out the weeds.

The Vegetable Garden.

Select a sunny place in the back yard. Dig up the bed and thoroughly enrich the soil. Crisp tender vegetables must be grown quickly. Keep the ground well stirred and free from weeds. Plant lettuce, onions, spinach and beets as soon as the ground can be worked.
Allow space for a succession of plantings during the summer.

THINGS TO REMEMBER.

Dig deep and make soil fine on 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.