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SY WOMAN'S GARDEN BOOK

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THE BUSY WOMAN'S GARDEN BOOK

An outside window box that harmonizes with the general architectural scheme

THE BUSY WOMAN'S GARDEN BOOK

BY
IDA D. BENNETT

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INTRODUCTION

This little book has a very definite aim—a big aim too, though two little words or even one will serve to define it—To help, or better still, perhaps—helpfulness. It does not aim to tell everything there is to tell about gardening; that would be encyclopedic and quite out of the scope of a small, practical work on gardening, but it does aim to give, in plain, everyday language sufficient and clear directions for caring for an ordinary kitchen garden in a way the least exhausting of time and strength and with all unnecessary expenditure eliminated. It covers all necessary detail except that of personal equation; that—Dear Woman, when the spring time calls and you go forth full of enthusiasm, is, in the language of the day—"Up to you." Your garden will give back to you just what you put into it—no more, and the more you give to it the less it will exact of you; neglect it ever so little and it will

prove a hard taskmaster indeed, or a living reproach—a reproach that will burgeon and bloom in noxious weeds and sickening plants, a garden where the worm dieth not and the aphis and grub revel undisturbed and unchecked.

There is nothing so easy as to keep a garden in perfect order, free from weeds and pernicious insect life, nothing easier than to have the reverse of this. One cannot garden successfully on the principle that one can work in the garden when there is nothing else to do, no one to play with, nowhere to go. The garden should be first to a certain extent, and this is not an arbitrary or exacting condition for the toll exacted is paid for many times over in the peace of mind that comes from work well and conscientiously done, to say nothing of the economic value of thrifty vegetables.

There are always critical times in the life of the garden;—the gardener must recognize these and be prepared to give just the assistance the condition requires at just the time it is required; if this is done promptly it will surprise one who

has had no system heretofore in the garden work to see how little time is really required to care for a garden successfully. The failure to co-operate with nature at the right time may result in many hours of wearisome work.

Take the matter of weeds;—if the planting is closely watched and the weeds cut off as quickly as they show a seed leaf above ground, and before they have stuck their roots deeply enough into the ground to make more than a mere stirring of the soil necessary, an entire week's crop of weeds will be destroyed with one stirring of the soil. Weeds come in relays a week or ten days apart, come not at all if the soil is kept properly stirred —which should be after every rain and between if the rain is infrequent, and it is well worth one's time to exercise a little self-denial and give this cultivation even though it may mean letting something else go that one would like to do.

And one need not worry too much about being scientific in one's gardening; insecticides, fungicides and the like are the allies of the careless gardener, but the wide awake, industrious gar-

dener has little need of them. Healthy, vigorous plants are not especially susceptible to insect attacks and with the exception of potato bugs, squash bugs and cabbage worms the danger from them is merely negligible, but the careless, slovenly gardener is a real and pestilential danger.

There is much in choosing the right time of day for work in the garden; it is delightful to wield the rake and hoe in the cool of the afternoon, but where the object is the destruction of weeds the morning hours of a sunny day will give permanent results as the weeds will be killed by the hot sun, while those hoed up in late afternoon will often be revived by the coolness and dew of night and be ready to withstand the morrow's sun, so take the morning hours for destroying weeds, and the cooler hours for planting seeds, staking up plants, thinning out plants and the like but always the bright, dry sunny hours for tying up such vegetables as need blanching: cauliflower, endive and the like. This will make for success in the various operations and comfort in working.

Where it is necessary to water the garden this should if possible be done after the sun has nearly or quite gone from it in order to reduce the loss of moisture by evaporation; this is especially desirable in city gardens where the water is metered and always, if possible a night's watering should be followed by shallow cultivation the following forenoon to restore the dust-mulch and necessitate as little watering as possible. These are a few of the little attentions which make for success in the garden and minimize the sum of the season's work.

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CHAPTER I

PLANNING THE GARDEN

THE favorable location of the garden is the initial step in its planning. The kitchen garden—always an important auxiliary of the kitchen—is now, in these days, something more; it is becoming more and more a part of the domestic routine; it is a woman's garden, to be planned for and cared for by the women of the family, and in that relation must be considered from all its points of view. Location, then, becomes of first importance. It must be accessible, that its care may demand as little extra work as possible, and that little be given to the actual cultivation and care and not to going back and

forth. If one can run out and cultivate a row of lettuce or train up a row of peas while waiting for the irons to heat or the kettle to boil, then one will find the sum total of the garden work far less onerous than where one must calculate on going over the entire plat, or a stated portion of it, at one operation.

A location close to the house, more or less secluded, that one may work free from interruption and espionage and where the vegetables may bask in the sun from early morning till late afternoon, is desirable, and this is best achieved in a southern exposure with the garden rows running north and south.

If the garden plot is protected by buildings or a high fence, or a wind-break of evergreen on the north it will afford a favorable position for the necessary hotbeds and cold frames and the close relationship of the two will work for efficiency in handling.

A warm, mellow, sandy loam is the ideal soil for the vegetable garden, but even a poor soil may be so built up and redeemed by proper cultivation

and fertilising as to make the quality of the soil of secondary consideration, but if one can have both at once then one is happy indeed. Tenacious, clayey soil or newly broken sod ground should not, however, be undertaken by a woman, such ground is a man's job.

But it is the warm, sunny location that is vital to the successful cultivation of the garden. All the early vegetables—peas, lettuce, endive and the like—call for abundant sunshine in the cool days of early spring, and, as the season advances and the fall chill is in the air at nightfall, then the warm sunshine will hasten the maturity of such late comers as tomatoes, winter squash, citron and any late-sown vegetables that are used to succeed the earlier growths. Again in the late days of winter or early spring those vegetables that were left in the ground for early use—the parsnips, and salsify, will be available much earlier if given a warm location where the ground thaws readily, rather than a cold exposure that holds frost late in the season.

A piece of ground adjoining other cultivated

areas is far preferable to an isolated plot as it may be ploughed in conjunction with the larger piece and so kept in a better grade and condition. An isolated garden plot, which must be prepared separately necessitating a dead furrow in the center, becomes, in the course of a few years a dish shaped area very disagreeable to cultivate; an open area, on two sides at least, obviates this in a measure and renders the ground more level and easily prepared.

Any garden spot, however, should always be ploughed rather than spaded and as deep ploughing as possible should be the rule. If the soil is good go as close to the bottom of it as possible, the shallow ploughing so universal—seldom more than six inches in depth, does not give a mellow bed for any but shallow rooted vegetables. Carrots, salsify, parsnips and similar long-rooted things must fairly drill their way into the hard ground below the shallow cultivation, this resulting in deformed, stunted or many twigged roots, unsalable and of little value for the home table. The long, smooth, beautiful bottoms are only pro-

duced by deep cultivation to start with and, of course, the subsequent cultivation must efficiently supplement this. A very excellent method of preparing the ground would be to turn a deep furrow with the plough and follow this with the subsoil plough, stirring up the subsoil, but not mixing it with the top soil; this would give several inches of loose soil beneath the first furrows that the roots could readily penetrate. So many consider that all the fertility in a soil is contained in the few top inches of soil, and in a measure this is true—the available fertility is right there—but there is a wealth of unused fertility in the lower strata, but lack of cultivation, lack of moisture and most of all, lack of the humus which makes the soil retentive of moisture, render it unavailable, but if it is broken up and gradually mixed with the humus of the upper soil it becomes available and the soil is increasing in fertility instead of growing thinner and poorer year by year.

Following the ploughing comes the smoothing and leveling of the ground by dragging with a

spiked or spring tooth harrow; this part of the work should be very thoroughly done; too fine a seed bed can never be produced, whatever the means employed and the use of drags and harrows by no means spells the whole operation of fitting a garden for planting. After the dragging the garden rake is in order and the ground must be raked over and over until thoroughly fine and free from roughage of sticks, stones, clods and the like. If any weeds have been drawn to the surface in dragging they must be pulled out and thrown aside. If there is a dead furrow in the middle of the plot then the raking should be towards that from both directions so as to fill it in as much as possible and so restore the level of the ground.

It is not necessary to rake the entire garden at once if time and strength are at a premium. One may rake a space sufficient for the first planting and when that is done rake another space and so equalize the labor, but it is easier to rake soon after the preliminary fitting is done than to leave it until a rain has packed the earth and made it

heavy to move. A good rain, however, should always precede the planting, if possible, as newly worked ground is not sufficiently settled for sowing seed and not so desirable for setting out of plants.

The arrangement of the vegetables in the garden has much to do with the convenience of caring for it. It is always a good arrangement to plant the early vegetables, such as lettuce, radishes, beets, endive and onions at the end of the garden nearest the house where they are most easily available as one has occasion to use them in preparing a meal. Then, too, all these small things are planted a standard distance apart—usually twelve or fifteen inches,—twelve if the gardener is addicted to trowsers, fifteen if skirts are in evidence, for it is difficult to work in a narrower space, especially among the tender tops of seedling onions, in petticoats. So, with the rows running north and south, that the vegetables may receive the greatest possible amount of sunshine, and the vegetables planted in consecutive rows of increasing distances apart, one has a

planting schedule economical of space and labor.

This order of planting should also be made to include height as well as distance apart of the rows of vegetables. Low growing things should always occupy the front rows of space and not be overshaded by tall growths. For this reason the planting of sweet corn in the garden plot is not desirable; it is best to give this a space by itself—preferably on the north side of the garden. Vine vegetables, too, have little place in the garden proper—a place for them on the south side of the garden should be reserved if possible, for with the best of management they will break bounds and encroach on other plants. I recall a planting of English marrows which were placed in the garden next to a row of red peppers. They were bought for bush marrows but proved to be the vine variety and in a month's time had practically taken possession of that end of the garden; peppers and tomatoes were smothered under a luxuriant growth of squash vines whose luxuriance was only equalled by the astonishing amount of fruit they bore. In desperate

effort to check their encroachments great lengths of vines, bearing half grown marrows, were ruthlessly removed with no more apparent result than to encourage a still more luxuriant growth and to increase the gardener's knowledge of the amount of pruning a really ambitions, vigorous vine will stand.

The bush varieties of many vegetables are a great boon to the small home gardener as most of them are prolific bearers and require no more room than a hill of potatoes or an egg plant. Squash, melons, lima beans—all have dwarf forms that are preferable to the usual vine varieties.

The home garden should not be too large—a plot forty by eighty feet will grow all the summer and winter vegetables a small family can make use of and a considerable surplus for sale, especially is this the case where the corn and vines are planted outside the garden proper. Potatoes, too, are excluded from this estimate, though a few rows of early potatoes may find room available.

The accompanying planting table, while in-

tended to be merely suggestive will be of use as indicating the amount of room required for the several varieties of plants and a convenient arrangement. The amount to be grown of any one variety however, must be decided by the individual gardener and it will be time well spent to make a diagram for one's self, based on the amount of various vegetables that experience shows to be needed. To those vegetables to which the family are most addicted should always be added a few that are grown with the occasional guest in mind and the few things that one likes to try from season to season, and that add zest to gardening but should never be allowed to occupy space needed for more standard sorts.

PLANTING-TABLE FOR A SMALL GARDEN APPROXIMATELY FORTY BY EIGHTY FEET

Lettuce—May King, 1 row. Transplant from hotbed to 9 in. apart.
Onions—Transplanted seedlings of Prizetaker, Ailsa Craig or Silver Skin, 1 in. ..... 1 oz.
Parsley—Dwarf Perfection. Transplant to 9 in. apart.... 1 Pkt.
Endive—One row, Giant Fringed. Transplant to 9 in. apart ..... 1 Pkt.
Beets—Two rows, Crosby's Egyptian. Thin to 3 in. ..... 2 oz.
Carrots—Two rows, Danvers Half Long. Thin to 3 in. .. 1 oz.
Parsnips—Large Sugar or Hollow Crown. Two rows. Thin to 3 in. ..... ½ oz.

Salsify—Two rows, smooth, Mammoth Sandwich Island. Thin to 3 in. ..... 1 oz.
Spinach—One row, All Season. Thin to 8 in. ..... ½ oz.
Lima Beans—Fordhook Bush. Thin to 6 in..... 2 lb.
String Beans—Wardwell's Kidney Wax, or Navy Beans. Two rows ..... 2 lb.
Peas—Double rows, Senator, Gradus, Telephone. On wire netting ..... 2 lb.
Peppers—One row, Ruby Giant, Bull Nose, or Pimento. 12 in. apart ..... 1 Pkt.
Bush Muskmelons—Three ft. apart ..... 1 Pkt.
Okra—Perkins' Long Pod. Half row, thin to 1 foot..... ½ lb.
Egg-Plant—Black Beauty. 18 in. ..... 1 Pkt.
Early Potatoes—Dreer's Perfection, Early Ohio. Fifteen inches apart ..... 1 Pk.
Cauliflower—Early Snowball. Twenty in. apart ..... 1 Pkt.
Cauliflower—Dry Weather. Twenty in. apart ..... 1 Pkt.
Cabbage—Late Flat Dutch. 2 ft. apart ..... 1 Pkt.
Squash—Delicious, Burbank's Hubbard. 6 ft. apart each way ..... 1 oz.

CHAPTER II

HOTBEDS, COLD FRAMES AND FLATS

SO important is the preparatory work performed by a well started and conducted hotbed that its use cannot be too insistently recommended. The smallest, least ambitious home garden is dependent upon the use of artificial heat in the starting of such plants as cabbage, cauliflower, peppers, tomatoes and the like, either in hotbeds on the home grounds, flats in the windows or plants grown in commercial greenhouses; these, owing to the long season required to bring them into bearing, cannot be started in the open ground; especially is this true of such heat loving things as peppers and tomatoes.

Owing to the quite general practice of buying these plants of the commercial gardeners or florists a much smaller area of ground is devoted to their growth than would be the case were the plants grown in one's own hotbeds where the

initial cost would have been that of a few packets of seeds. Purchased plants are by no means immune from late frosts or the assaults of cut worms and not infrequently demand successive replantings before a satisfactory stand is secured. With a well stocked hotbed this does not spell so great a disaster, as only the labor of resetting is demanded and this is not of much moment as the lines and points of setting are already laid down and the hills of tomatoes, egg plants and peppers already supplied with their spade full of manure. In a generous sized garden where perhaps a hundred plants of a kind are grown the saving in the cost of plants will cover the construction and maintenance of an ordinary hotbed and the cost of a bed of the best concrete construction, which will last almost a lifetime, will be covered in a reasonably short time.

There is nothing about the construction or care of a hotbed that offers any obstacles to its possession and I have about come to the conclusion that the only reason more gardeners do not have them is because they cannot borrow them; they are the

only thing about a garden that some one can't and doesn't borrow and if some one would invent a portable one it would undoubtedly become popular.

The requirements are simple:—A sunny location, protected from prevailing winds—usually from the west, and on the north by a wall, building or fence. Being started in the early days of spring—from February, in the vicinity of the Ohio river, to late March or early April in the vicinity of the Great Lakes; they require a background that will hold the heat of the sun instead of allowing it to escape.

A well-drained position should be chosen and it should be as handy to the house and garden as practicable, especially the former as, once it is planted and plants up and growing, it will require frequent supervision in the changeable weather of early spring. Under a bright sun the temperature rises very rapidly in a glass-covered hotbed and it is necessary to see that it does not rise high enough to injure the plants; equally the temperature falls rapidly in an open bed when

the sun goes under a cloud, and the sash must be adjusted to meet these deviations of temperature; often a moment's work in raising or lowering the sash will spell success or failure in the conduct of the bed.

A pit or excavation in the ground for holding a supply of fermenting manure to furnish heat for the bed is the first step in the construction of the hotbed; the size and depth of this will depend somewhat upon the number of plants it is desired to produce and upon the rigors of the climate and the prevalence of late springs and frosts. As a general thing, for the ordinary home garden a bed three feet by twelve is sufficient, but the added expense of a few additional feet is so slight and the use of a bed so appeals to one once one realizes its convenience, that it is seldom a mistake to make it too large as, aside from the sowing of seed, it may be used for starting roots of bedding plants, cannas, dahlias, begonias, tuberoses, caladiums; the striking of cuttings and many garden operations that have formerly been done in a bungling, cumber-

some way in the house or with the costly assistance of the florists.

The depth of the pit should not be less than three feet and four, from the top of the frame, is better, as it is upon the depth of the manure that the length or duration of the heat depends. A shallow pit will give a quick heat which soon gives out, usually when most needed, during a sudden cold wave, and as the expense of a foot more or less counts for little it is best to be on the safe side and have sufficient heat.

If economy must be observed or the bed is for temporary use, a rough frame of boards will answer every purpose; it need not even extend below the surface of the ground, but merely rest upon it, but such construction is not to be recommended except for temporary structures or where it is desired to remove the frame as soon at it has served its purpose in supplying plants for spring planting; but a well built, permanent hotbed has by no means served its mission with the passing of the spring months, it may be profitably kept in commission the year around.

If, however, the construction must be along economical lines waste lumber and old window sash may be employed very satisfactorily. Having dug the pit of the required depth and width and length—three feet if old sash are to be used will be the best width and is desirable anyway as it can be easily reached across and can be placed close to a building and so occupy much less ground than where the usual florist sash is used, a frame consisting of four upright posts two by four inches and six feet long for the two rear posts and five feet long for the front, to give the necessary slant to the frame, should be used; on these the boards for the sides and ends should be nailed, the end boards sawed to a true slant that the sash may rest evenly upon them; the frame is then lowered into the pit and the soil leveled off around it and made firm so that no cold air finds entrance. To such a frame the sash may be hinged at the back and notched sticks adjusted to hold it at any desired angle.

In the permanent cement hotbed the pit is dug as before, then interlined with boards to form

a mould and the space filled in with a good cement mixture, paddling it smooth on the side next to the boards and allowing the boards to remain in place until the cement has hardened.[1] Before the cement has set, however, a frame of two by four must be fitted on top of the cement to receive the sash. Long spikes should be driven through the timbers at intervals to be pressed into the cement to insure a good joint. It is also an advantage to arrange for partitions through the bed by nailing cleats of wood on the inside of the wooden form at points where the sash will meet. This will form slots in the concrete into which thin boards can be slipped to separate such plants as require much heat from those requiring less heat and much air. The partitions should not extend much, if any below the surface of the soil so the slots need not extend

[1] Or a trench as deep as the completed pit and as narrow as can be handled may be dug to outline a pit of the required dimensions, and filled with grout, well tamped down; when this has had time to harden sufficiently, the earth may be removed from the center and the cement given a finishing coat, and the wall brought to the required height above ground by the aid of a frame of boards.

below the top foot of wall. These partitions are not really necessary but often come in very handy and are so easily arranged for that their occasional use justifies their presence. Where they are employed the sash can be left open where required far more safely than if they were not in use. Cabbage and cauliflowers do best if given plenty of air and even a tinge of frost will not injure them, while it would be fatal to such heat loving plants as tomatoes, peppers, egg plants and many tender flowers and bulbous plants.

The double sash is a great protection for hotbeds started very early, but as a rule there is little occasion for starting the beds before the middle of March or early April in the northern states as it is only necessary to give the plants about six weeks' start of open ground operations. Usually we make our out-of-door planting about the twentieth of May at the north and correspondingly later as we go south, but if we count back six weeks from "Corn planting time," the country over we will have reliable data for starting the hotbed. Plants left too long in the bed deteriorate

and should be scheduled to be got into the ground as soon as they are fit; if this is done they will not suffer from over crowding nor will it be necessary to transplant; though this is always an advantage with certain plants. If to the hotbed is added the convenience of a cold frame to which the cabbage and cauliflower can be transplanted as soon as they show rough leaves it will be a decided advantage and the room thus secured in the hotbed can be used to transplant tomatoes, peppers and the like, thus giving better rooted, stockier plants.

Fresh horse manure is used for heating the bed and must be procured from stables where a number of horses are kept that sufficient may be obtained at one time. It is not necessary for the small hotbed to pile the manure and turn it over two or three times before putting it into the pit; much time and labor is saved by putting it at once in the pit, tramping it down as filled in until it is within five or six inches of the level of the ground outside. Care must be taken that it is tramped down evenly, especially in the corners,

or it will settle unevenly and cause the soil to sink in places. The earth may be placed on at once if the manure is steaming when put in the pit. Good, mellow loam, containing a portion of humus or leaf mould is the best hotbed soil and it should be fine and free from all roughage of sticks and stones and hard lumps of soil. Putting the top inch or two through a sand screen is a good practice as this gives a fine soil suitable for the finer seeds.

Usually the bed will be in condition for sowing in twenty-four hours, if the manure is heating well—and this can be ascertained by thrusting a fork down into the bed and leaving it a few moments, withdrawing and feeling of the tines, when the temperature can be quite accurately gauged—or a thermometer may be forced down through the soil upon the manure for a test. From four to five inches of soil will be sufficient if the season is late—slightly more if the season is early and the plants likely to remain long in the beds, and it must be leveled off as flat as possible so that in watering the water will

not run and wash the seeds out of the ground.

The sowing of the seed is one of the fascinating phases of gardening that every born gardener enjoys and the watching for the breaking of the soil with the tiny green seed leaves is a joy indeed. Unlike open air planting, there is rarely a failure in seed germination if good seed is used. The ideal conditions of warm soil, mellow, moist soil of just the right consistency; protection from changes of weather all make for a high per cent of plants from the sowing, and the chief difficulty is often an embarrassment of plants—that is they come up too thickly, a trouble that is easily obviated by sowing quite thinly, holding back a portion of the seed for later sowings if needed, or for a later crop.

Each variety of seed must be given a little plot of ground by itself and should be separated from its neighbor by thin strips of wood pressed into the soil; this not only helps in identifying plants of similar appearance, but also prevents the washing together of the seed when too much water is applied. Where two or three different varieties of

the same plant—as Early Dutch Cabbage, Danish Roundhead, Early Summer, etc., are sown it will be well to alternate the plots with some other vegetable so as to leave no chance for mistakes in setting out the plants later on. A row of lettuce or radishes may be interposed if desired; at any rate the presence of the strips of wood will aid greatly in keeping them distinct.

Each plot of seeds must be plainly labeled with thin strips of wood marked with the name of the seed and the date of sowing. If seeds of certain plants have been purchased of different seedsmen it will be well to indicate the source on the labels, in this way one can compare the fertility of the two purchases of seed and decide which is the more desirable.

There is a great difference in the germination of different garden seeds, certain varieties appearing in from three to five days—as cabbage, radishes, etc. Others—like peppers, parsley and the like—require from two to three weeks to appear above ground and one should not lose faith in the "Quickness" of the seed until a reason-

able time has elapsed, nor will it be desirable to dig them up every day or two to see if they are growing; this will discourage rather than accelerate the process.

If the soil in the hotbed appears dry when sowing the seed it should be carefully watered by means of a fine-nosed watering pot or a whisk broom dipped in water, care being taken that not enough water is used at a time to wash the soil or disturb the planting. If any seed is uncovered it must be recovered. Seed sown under the protection of sash, either in hotbed or cold frame, does not require to be covered as deeply as when in the open ground, often about as much soil as will entirely cover it is sufficient, always so in the case of fine seed which should be sown broadcast in sections and covered by sifting fine soil or clean sand over and pressing all down firmly with a piece of board. Larger seeds may be sown in drills, opened a quarter of an inch deep and the earth drawn over them and pressed down.

Plants that make a rather high growth, even in the hotbed, like tomatoes, should not be planted

in front of lower growing things, but should be in the rear or extend entirely across the bed; tomatoes, for instance, are apt to overtop such plants as peppers, which grow quite slowly in the hotbed. Endive, parsley, lettuce and onions, all are plants which do not assert themselves very strongly at first and should not be crowded for room or sunshine.

When all the planting is in and the soil watered, if necessary, newspapers should be spread over the soil and the bed closed and germination awaited. If the sun is very hot it may be necessary to raise the sash before the plants appear, but where this is done care must be taken that the papers are not disturbed by the wind, as if blown about the soil will dry out and check or kill germination.

As soon as a plot of seeds breaks ground the little seedlings will need air and light and the paper should be removed from this portion and replaced on top of the glass, held in place with pieces of wood or anything that will prevent its blowing about; this will only be necessary until

the plants are able to stand full sunlight, which will be as soon as they have grown their first pair of real leaves. As the young plants increase in size more and more air and sunshine should be given them and due attention to watering must be carefully observed. Lath screens to temper the sun will be necessary and will be needed to replace the sash when the plants are large enough to dispense with it during the heat of the day; these, in turn, may be replaced by wire screens if there is any danger of predatory cats, chickens or children, for it is the work of but a few moments for an entire planting to be destroyed by any one of them. Puss likes nothing better than to get into that nice warm hotbed and roll on the soft warm ground and as for Biddy!

It is surprising the number of things that may be started in the hotbed and transplanted into the open ground as soon as the weather permits, thus gaining at least a month's start in the garden. A great many of the vegetables that are always sown in the open ground—beets, string or lima beans, endive, lettuce—all may be started in the hotbed

and planted out and will give one very tender and succulent vegetables to use while the main crop is maturing from open ground sowing. Once one has acquired the hotbed habit one will never have quite room enough for one will always be wanting to try something more. One of the most satisfactory pushing forward of vegetables is achieved in planting melons and cucumbers and squash on pieces of sod in the hotbed. Of course cucumbers for pickles should always be sown rather late in the open ground but fruit for slicing for the table may very profitably be started on sod and transferred to the open ground when all danger of frost is passed and so be ready a good month sooner and what is, perhaps, quite as important, escape the ravages of the striped cucumber beetle, that exasperating foe to vine culture.

A cold wet spell at planting time often results in a loss of the entire planting of Lima and string beans, but if one has taken the precaution of planting a half pint of seed in the hotbed and transplanting them along about the twenty-first of May, one can wait until the first of June, if

necessary, to plant the main crop and be assured of a successful stand of plants which will bear quite as early as if planted in unsuitable weather and soil; this is of especial moment owing to the high price of this class of seed; all varieties of seeds have advanced in price but the difference is most marked in seeds of the various legumes—peas and beans, of all varieties which command a price that makes especial care in their planting advisable.

Cold Frames

Supplement effectively the hotbed or, in mild climates, take their place. They are, to all effects and purposes a hotbed—minus the heat—and so do not require the excavation of a pit. The part above the ground is similar to that of the hotbed, being supplied with sash and given the same slant to shed water and concentrate as much sunshine as possible. For spring use it should front the south and occupy a well-drained position, but for mid-season use an east exposure is often

desirable. If one wishes to use it to transplant things from the hotbed, then a temporary frame of boards made to bolt together may be constructed that may be taken apart and stored away when no longer required; if used for transplanting the sash should be in a position a week before it is needed so that the soil may become warm and friable, then the little plants of cabbage, cauliflower and the like may be transferred without any appreciable check in the growth and what there is will be advantageous as it will result in the formation of a mass of fibrous roots which will give them an additional chance in the struggle for life in the open. Even screens of cheese cloth will give sufficient protection in any but frosty weather and blankets may supplement these on cold days if glass is prohibitive on account of its excessive price.

A well-spaded bed of good soil, enriched with a little well decayed manure—that from last year's hotbed will answer, or bone meal may be used or a commercial fertilizer, for the plants will

need food at this stage of their growth, should be prepared and the frame set on this or sunk a few inches into the ground to insure warmth and prevent the ingress of small rodents which somehow show a peculiar penchant for hotbeds and cold frames and have been known to destroy a whole planting of seeds in a single night. A little nitrate of soda scattered between the rows of cabbage and cauliflower will work wonders in the growth of these plants and is to be recommended at this stage of their growth and again when transplanted into the open ground.

Other forms of plant protection are found in the frameless beds protected by lath screens; these are used mainly during the summer months and are especially adapted for growing pansies from seed to be transferred to cold frames in the fall and grown on until time to plant out in permanent beds in spring; for growing violets in like manner and also for starting cabbage seed to be held over winter in cold frames for early spring planting.

The Sand Box

Is used as an auxiliary to the hot bed for a nursery for those plants which are to be used in the house or conservatory during winter and must be kept in a growing, but not blooming, condition during summer and shifted from pot to pot as occasion requires. Though mainly essential in the growing of house plants it is often found of much use as a place to carry on such vegetable plants as one may desire to pot off for sale or for stockier growth, previous to setting in the open ground. The sand box consists of any shallow box of sufficient size to hold a considerable number of two to four inch pots. It should not, preferably, be over three feet wide but may be of any desired length. Five inches is a good depth. It should be elevated on some kind of support, at a convenient height to work at when sitting on a stool or box. When used for growing house plants it is usually placed in a rather shady spot on the east side of the house, but if used for vegetables it may be given a more sunny, exposed

position; it should be filled with clean sand into which the pots are plunged to their rims and the sand is kept constantly wet. The pots should be turned around in the sand every day or two to prevent the roots, which escape through the hole in the bottom of the pot, growing in the sand; to prevent this also place a piece of broken crock or glass over the drainage hole. In potting off plants from the hotbed use a small thumb-pot at first and re-pot in one a size larger as soon as the roots form a network around the outside of the ball of earth: this condition may be ascertained by tapping the pot against the side of the box which will loosen the ball of earth and allow it to drop out on the hand. Plants that are to go into the ground in late May will probably not require re-potting, certainly not more than once, but this treatment makes stocky, well-rooted plants that command a better price than the untransplanted plants from the beds, though there is always an excellent market for all the products of the hot-bed.

Sowing Seed in Flats in the House

Is the simplest, and least satisfactory form of advance work in the garden; it belongs in the class of being "better than nothing," but for some plants is quite as successful as a hotbed, unfortunately that particular class is not embraced in a book on vegetable gardening, but belongs particularly to flower gardening and the special sorts dedicated to the warm conservatory and window garden.

However, if one has not, and cannot achieve, the advantage of a hotbed then one must make the most of what is attainable and resort to flats. These may be of any shape or size, but the usual florists' flats—about fifteen inches wide and twenty long and not over five inches deep—are of a practical size for general use; narrower ones which may be set on a window sill are also useful but will not give a large number of plants. Very convenient plant boxes which simulate a miniature hotbed, being about six inches high in the back and about four in front, of the usual flat

size and supplied with a hinged lid of glass, are sold by the florists but are easily manufactured at home and are better than the open flats as they enable one to regulate moisture, the principal trouble—owing to the dry air of the living rooms, the shallowness of the soil, in growing plants in flats.

Several holes for drainage should be made in the bottom of the boxes and these covered with pieces of shard or glass and the boxes filled to within a half inch of the top with a good compost consisting of fibrous loam—that shaved from the bottom of sods—leaf mould, clean white sand and a little well-rotted manure, all thoroughly mixed and free from roughage.

The seeds should be broadcasted, if fine, drilled in if coarse, and the soil pressed down snugly over them. In the case of fine seed it is a good idea to cover with fine white sand instead of soil as this is less subject to the minute fungus which causes the deadly "damping off" so destructive to plant life and especially troublesome in growing plants in the house.

As in the planting in the hotbed, the seed plots should be carefully labeled with name and date of sowing. After planting the seeds the flats should be set in a pan of water until the surface looks dark but not wet. They should then be covered with a sheet of white paper and glass and set in a warm, sunny window until germination takes place. Then the glass should be raised sufficiently to admit air and the paper removed and placed between the box and the window or a width of cheese cloth may be interposed between the glass and the box to temper the sunlight until the little plants have acquired their first pair of true leaves when they will be able to endure more heat and air which should be steadily increased until on mild days the window may be opened that they may benefit by full sunshine and air. As soon as the little plants are an inch high, transplant into other flats, setting an inch or more apart each way, and grow on as before or until they again crowd each other, when they may be transferred to small two or three inch pots and the sand box until time to go into the ground.

CHAPTER III

PLANTING SEED IN THE OPEN GROUND

IS important for it is just the form that most of the garden sowing will take. The sowing of seed in hotbeds and flats in the house is of much interest and importance, but the garden, for the most part, will go directly into the open ground, and upon the care and judgment with which the planting is done will depend the success of the season's work.

The ground should be in as good condition for sowing as possible—neither too dry nor too wet. It should, and this is of much importance, be warm. The best of seed will not germinate if sown in wet, cold soil, especially is this true of peas and beans, failures with these being almost invariably due to too much haste in planting or unfavorable weather immediately following. It is no unusual thing in a cold, late spring for these

legumes to require repeated replanting and with the enormously advanced price of all kinds of seeds it will not pay to take too long chances by undue haste in planting. Usually it is quite safe to plant nearly all of the garden truck by the tenth of May at the north but the weather for the recent seasons has been unusual and much loss was occasioned by adhering too closely to an established schedule; so, if the season promises to be in any way, except for earliness, abnormal, it is best to go slowly and not trust all one's seed to an initial planting but to hold a little in reserve to replant unfilled areas. Cutworms, too, have caused much devastation the past few seasons—usually these are troublesome to transplanted things, mainly cabbage, peppers and tomatoes, but last year they destroyed beans and other plants impartially, causing much loss.

In planting a seed drill attached to a hand cultivator will be of great assistance as seed may be drilled in rows or dropped in hills at different distances apart so rapidly that the entire garden may be planted in little more time than it takes

to do an hundred foot row by hand, and the drill will do it better, opening up the rows, sowing the seed and covering all in one operation. If, however, one is not possessed of this convenient implement one can do very well without by removing one hoe of the hand cultivator, or by reversing both hoes and bringing the points together and opening a drill to receive the seed and covering it with the hoe or rake, or it may even be opened with a trowel, which though laborious, is a very effectual way.

The soil must always be firmed above the seed after sowing, either by means of a flat piece of board, with a handle on one surface or, in the case of large seeds by tramping the rows with the feet; this firming of the soil is most important, it brings the soil close about the seed so that the first little root—a very tiny, delicate little root, feeling its way about in search of nourishment can come at once into contact with the warm soil and obtain the food and moisture so critically needed at this juncture of its little life. The firming of the soil conserves the moisture, pre-

venting the entrance of dry, hot air, and to obtain this further the ground after being tramped down should be gone over lightly with rake or trowel and a dust-mulch produced. In fact, all through one's gardening processes one must keep the dust-mulch in evidence for it means conservation of moisture and fertility and freedom from weeds.

Seeds of different sizes, hardness and germination qualities, require different treatment; fine seeds may be sown in shallow drills, scattering seeds whose germinary power is known to be low or questionable quite thickly in the drills; beets are usually sown quite freely, while radishes—nearly every seed of which may be trusted to grow—may be scattered at about the distance they are wanted to stand in the rows; beans, too, may be dropped at about the distance they will require—six inches or more apart for limas, and as these seeds are sensitive to cold and dampness it is a wise precaution to set them on edge, eye down, in the drills. Seeds that germinate slowly, like peas, are hastened considerably by

being soaked over night in warm water, and many seeds that require considerable time to start are hastened if warm water be poured into the trenches before the soil is filled in; this is especially beneficial in very dry soil where germination might otherwise be delayed until after a rain.

It is not necessary that new seed be purchased every spring; if one has seed of his own saving so that its age is known one can use it with confidence. Seed purchased of the seedsman is more or less problematical, but is usually supposed to be of the previous season's crop, especially is this true of those seedsmen who produce their own seed on farms located in different sections of the country, and whose seeds are usually very reliable. However there are many seedsmen, or jobbers, who purchase the bulk of their seeds in the open market and cannot guarantee the quality in any way. It is always a great mistake to purchase cheap seed; it is better to buy seed of a reputable seedsman who puts his name and reputation back of it, though the price may be consid-

An orderly arrangement of garden beds

erably higher than one would pay for the same seed of the local store or seedsman.

Where one has sufficient old seed of different kinds it is a good idea to test them out during the late days of winter and so ascertain their fitness for use. The testing is a simple matter, warmth and moisture being all that is required. A long tray covered with an inch of sand kept moist may be marked off in squares and the seed it is desired to test scattered evenly over the surface, labeling or numbering each square, then a thick piece of flannel should be wet in warm water and placed snugly over all and the tray put in a warm place—back of the furnace, over a radiator or on the back of the kitchen reservoir if a fire is kept there all the time, until the seeds germinate; it will then be seen what proportion germinate and how freely one will need to sow in order to obtain a good stand of plants. If the supply of seed is large a germination test of seventy-five per cent. will justify its use but if there is only a limited supply it will be better to

purchase fresh seed or at least sufficient to supplement the home supply. It is always worth while to save one's own seed if the vegetables have exceptionally good qualities; this insures trueness to name and often an improvement over the parent stock; it is not, however, desirable where a number of varieties of any vegetable is grown in the same garden as the seed is quite certain to be mixed and the good qualities of the parent stock to be lost.

In sowing seed in the open ground cultivation should begin as soon as the seed is sown and covered. In the case of large seed which is tramped down in the rows and covered an inch or more it is not always necessary to rake over the rows for a dust-mulch, rarely if it is likely to rain immediately. Under this condition the rows will be quite distinct and as soon as the rain is over and the ground slightly dried off the scuffle-hoe may be run along the rows restoring the dust-mulch, or creating one. Where the planting is shallow it is an excellent plan to drop radish seeds at intervals along the row as these will

appear in from three to five days, thus marking the rows so that there will be no difficulty in following them. When this is done it will not be necessary to use ground especially for planting radishes so that there will be a saving in room that may be utilized to advantage for other vegetables. Lettuce, too, may be grown to advantage by planting a short strip of seed at the end of rows of other vegetables, where full rows are not required, as this saves space in the garden and the lettuce if placed at the ends of the rows nearest the house is easily accessible and does away with the necessity of walking on the garden after it has been cultivated, a thing the careful gardener avoids.

With the intensive gardening practised on the small plot where the vegetables are planted in close rows from a foot to two feet apart, the ground should be at all times in a fine tilth, free from unworked strips and trodden paths. It is of little value to cut off the weeds with the hoe or cultivator if they are to be trodden back in the ground and so given a new lease of life. The

scuffle-hoe is a real boon to the gardener in obviating this difficulty as in using it one walks backwards, pushing the hoe from one instead of drawing it towards one as is done with the common garden hoe; this leaves a beautiful, clean tilth, absolutely free from trampled areas and nothing cut off by the hoe will take on a new lease of life over night. More real work can be accomplished by the use of the scuffle than with any other tool in the garden; it does not supplant altogether the wheel cultivator but does its work when used alternately with it; the cultivator breaking up the soil to a greater depth, and more rapidly than the scuffle, but the latter destroys far more thoroughly all weeds and reaches closer to the plants, slipping underneath the leaves and close to the stems and routing out any and all weeds lurking there. The cultivator leaves the ground in ridges and aerates it, the scuffle levels it again and produces a fine dust-mulch which will preserve the moisture until another rain calls for the use of the cultivator.

Unless the season is a very rainy one, one good

cultivation a week, either with scuffle or cultivator, will keep the garden in excellent shape, but every rain MUST be followed by cultivation of some sort, for there is great loss of moisture if this is not done and weeds follow quickly after rain.

The various weeds with which the garden is afflicted come at separate intervals—not all together, and when one has eradicated one set of weeds there is usually a brief interval before the appearance of the next detachment. But one must have them continually in mind and keep a sharp lookout for the first tiny seedlings and destroy them before they have made even one pair of true leaves. Working around individual plants with a trowel or hand weeder has this advantage that it spies out the enemy before it would attract attention if the rows were worked with hoe or cultivator. The severe thinning that such plants as beets, carrots, endive, salsify, onions and the like require clears the rows of weeds and helps materially in general cultivation. This thinning out should always be done prior to cul-

tivating between the rows, then the paths are left clear and untrodden and the garden is a delight to look upon. A basket should be carried along the rows to drop the plants removed so that they may be out of the way when ready to run the cultivator. Nearly all plants which require thinning may be used in setting out fresh rows of vegetables and where there are vacant places in the rows the spaces may be filled up with plants removed from too crowded areas.

The first weeds to appear in the spring are the chickweed and the malice [1] that has remained over from the previous year, being a perennial and a very hardy and persistent one; these two are ploughed under and give little or no trouble if the work has been well done. The new crop does not appear until late in the season—usually in July. Purslaine comes along in June and soon after appears that particular pest of the garden —red root. All these are very easily eradicated when small but the red root is an exceedingly

[1] Common name "malice" from its bad reputation; properly, mallow (*malva rotundifolia*).

hard weed to pull once it has got a grip on the ground and it must be taken out root and all or it will come up again with not one but several stout stalks, and a more tenacious hold than ever on the soil; it is one of the weeds which are constantly eluding detection until they have gained several inches in height when they defy the hoe and cultivator and call for strenuous hand work!

Many of the garden weeds may be utilized for feeding stock. Belgian hares are fond of the fresh green leaves of malice and pigs enjoy both that and the purslaine and as the former comes at a time when there is little green feed available for the hares it may be pulled and fed rather than turned under. Ragweed is relished by horses and they will frequently go into a patch of it and eat it in preference to good clover growing near by.

CHAPTER IV

TRANSPLANTING

TRANSPLANTING is one test of a good gardener, another is the care of the plants after they are gotten into the ground—the careful cultivation that forbids a weed to show its head above ground, or a crust to form on the soil after a rain; these two successful operations spell success in the garden—their absence failure.

For several days before the young plants in the hotbed are to be put into the ground they should be hardened by leaving the sash entirely off and by occasionally withholding water that they may be accustomed to the irregular water supply of the open ground, but the beds should be well watered the night before transplanting that the plants may absorb enough moisture to carry them through the ordeal of transplanting and that the soil may have sufficient moisture to adhere to the roots.

Transplanting

The planting lines in the garden should be drawn and the holes for those plants which are to stand some distance apart—such as tomatoes, peppers and the like, should be already dug and, where extra fertilizing is called for, the hills enriched with a good spadeful of well decayed manure and the ground all ready for the plants. In this way transplanting will go forward with the least possible delay and the plants will suffer little, if any, from the change.

It is not at all necessary to wait for a rainy spell as so many think desirable; the most successful planting can be done on a clear, bright day if the work is handled properly; indeed this is just the weather that gives best results, a period of rainy weather with cloudy intervals between is also favorable except for the discomfort of working in the wet but when planting time comes one must not think too much of one's personal comfort,—it is up to one to get things into the ground and growing; we can be comfortable later on when there is time for it.

A rainy spell, broken by hot, sunshiny, muggy

days is of all times the worst for transplanting; plants wilt and die in spite of one, fairly cooked by the hot steam engendered by the rain and sunshine, and such planting weather should be avoided unless the season is late and the planting urgent. Only as many plants should be lifted at one time as can be put into the ground before they wilt. Do not try to lift plants separately but lift them in clumps, pressing the trowel well down below the roots and lifting the plants with as little disturbance as possible—never pull up the plants by the tops as one sometimes sees done; this strips off the tender, fibrous roots on which the plant depends for gathering its food. The tap root which remains has little foraging value, it serves, principally, to hold the plant in the ground while the fine, lateral roots are busy collecting food to feed the growing top; if these little feeding roots are destroyed the plant must make a new supply before top growth can be resumed.

Do not attempt to separate the plants at once but carefully release each plant as it is required;

in this way they retain their freshness and loss from wilting is minimized.

Make a hole large and deep enough for the roots, setting them deeper than they were in the hotbed, and fill in part of the earth, pressing it down firmly, fill in the hole with water and when it has seeped away fill in the remainder of the earth, leaving it dry, fine and smooth about the plant. Each of these three operations may be completed for the entire row of plants before going on to the next: the plants set in the hole and the first earth drawn up, then all the holes filled with water and by the time the last hole is filled the first will be ready for final filling in with earth. This is a more efficient method than to complete one hole at a time and keeps the plants in better shape.

When the whole planting of one variety of vegetable is completed go over them carefully, noting any wet spots that may appear on the surface and cover them with more dry earth. Remember that it is upon the integrity of the dry mulch that the success of the planting de-

pends. Do not try to protect the plants in any way; if sufficient water has been placed in the hole, the earth firmed sufficiently and an efficient dry mulch provided the plant will be much better off than if protected in any way. Do not water after transplanting until the plants have become established and need it. If for any cause some of the plants show signs of wilting while the dust-mulch is still perfect a hole should be made at one side of the plant and water poured in, recovering the spot with dry earth. If it rains immediately after planting, clearing off with fair weather, the beds must be gone over with the scuffle-hoe to replace the dust-mulch as soon as it can be worked to advantage. One has only to bear in mind that the secret of successful planting is moisture at the roots and dry earth above to succeed.

CHAPTER V

GARDEN TOOLS

ARE so important in the proper care of the garden and for the ease with which it may be worked that only the best should be considered; the best, however, need not be the most expensive, but they should be the best adapted to the work to be attempted. It is not necessary that their number be large, indeed, the number of tools really indispensable is relatively small, but definite. A good steel garden rake will be one of the first tools required and this should be of the steel variety, neither too light nor too heavy. Get a good spade with a "D" handle that fits the hand and foot. A wheelbarrow of the wooden sideboard construction will also be required; to these will be added a garden line and a hand cultivator and as this is the most expensive and important tool its selection is of much moment. There are

three forms of wheel hoes on the market: the high single wheel, the medium wheel and the low double wheel made to straddle the rows. The double wheeled machines have the advantage of working each side of the row, close to the plants as well as between the rows and if the hoes or cultivator teeth are properly adjusted will do twice the work of a single wheel. Some of the double wheeled cultivators are readily changed into single wheels by removing one wheel. Too high a wheel is not desirable, and as the wheel is the part of the cultivator that bears most of the strain it should be of substantial construction. Most of the machines on the market have as attachments a set of plough blades, four harrow teeth and hoe. My own—a Planet Junior, two-wheel cultivator has also an attachment for creating a dust-mulch, similar to a scuffle-hoe, but this was made especially for the machine by a local blacksmith and is a very useful addition to the outfit.

If one does not object to the extra expense a seeding attachment can be added that will min-

imize the work of planting the garden. A good machine with seeder that will plant in rows and with all the attachments can be purchased for $16.00 or the same machine which will sow in rows and also in hills 4, 6, 8, 12, or 24 inches apart can be purchased for $19.00 and is a good buy, for a good machine of this kind, if properly cared for, kept under shelter when not in use, oiled occasionally, the attachments kept sharpened and given an occasional coat of paint as required is good for twenty years at least. There are still cheaper machines on the market, single wheel implements with the usual attachments, that will do good work, for as little as $5.25 and $7.50, and two wheelers at $10.00 and one single wheel that is especially designed for wear, with an iron instead of wire wheel, built for service at $7.00.

To this assortment of tools should be added a straight edged garden hoe, or any preferred shaped edge, and a scuffle-hoe. This last is obtainable in 6, 8, 9, and 10 inch blade and costs ninety cents for the 6 inch and $1.00 for the 9 inch size; the ten inch does more rapid work

and can be run between rows planted twelve to fifteen inches wide, clearing the entire space between in one operation so that one goes over the ground very rapidly. Useful in any one's hands it is preëminently a woman's tool, no lame and aching back accompanies its use as one does not lean over in hoeing as with the common garden hoe. If I could have but one tool to garden with I think it would be a scuffle-hoe, for no other tool will keep the garden so free from weeds. With the common garden hoe my paths through the garden are usually marked by the wreckage of plants, for use as much care as I can sooner or later I get to hoeing too vigorously and off goes a cabbage, tomato or onion. The scuffle-hoe does not seem to arouse an excess of energy; one goes along smoothly and serenely, leaving clean tilth and undepleted rows of vegetables in one's wake and looking back at the end of each row sees that it is good.

A trowel—or a number of them is better—is a very necessary implement and because one is prone to mislay trowels, or leave one at the hotbed

when going for plants it is well to have one for each place and either to attach it to a string to one's belt—if only one is possessed, or to attach a bright red cloth to the handle that it may be identified if dropped among weeds, loose earth or grass for the trowel seems to have a chameleon like nature and takes on the color of its surroundings and becomes invisible to the eye once it has left one's hand. The bright color will save many moments wasted time in looking for it and has proved its worth on more than one occasion. In purchasing a trowel selection should be made of the sort that has the blade and handle in one; this construction, if of steel, will insure a tool that will last until worn out by use, the trowel with a wooden handle has usually a flimsy blade and a handle that is not dependable.

A garden line and reel that may be purchased for $1.75 is a convenient thing to have when laying out lines for planting, but a very good substitute can be produced from an old broom handle and a ball of butcher's twine by sawing the handle into two eighteen inch

lengths, boring a hole in one end of each piece and sharpening the other end, passing the ends of the cord through the hole and making a knot too large to slip through the hole, makes the line more convenient to handle than if tied around the stick, as it cannot slip in winding, or any ingenious boy with simple tools can copy the regular reel in a short time. A very simple, home made tool for marking rows equal distances apart consists of a straight pole of wood with a cross piece at one end, fifteen, eighteen or twenty-four inches on each end from the center pole and provided with triangular pieces at the ends and in the center for markers, or wooden rake teeth may be set in holes provided for them. This is drawn along the ground and makes one, two or three rows at one operation. The construction of two or three of these markers is a short job and they save a considerable amount of time in laying out the garden. The twenty-four inch marker can also be used for marking the twelve inch rows by adjusting the pegs. The hand cultivators with seeding attachments have also a marker

which while seeding one row marks out the following one.

A watering pot and some kind of spraying apparatus for the use of insecticides will also be needed. A rubber bulb with perforated metal top and bent neck, such as is used for spraying house plants is an excellent thing to use where the use of wood alcohol in indicated. Paris green may be applied from a fine-nosed watering pot if liquid form is used or if a dry application is preferred a common mason quart can with the porcelain lining of the top removed and the latter punched full of holes makes an effective distributor when filled with dry lime or flour and Paris green or hellebore. I have never seen a hand atomizer or spray pump or powder blow gun that was a particle of use; the tyrian sprinklers, however, are practical and useful for spraying in a small way for aphis, red spider and for squash bugs. A knapsack or auto-sprayer with galvanized iron reservoir can be purchased for $6.25, with brass reservoir for $9.50 and is a good investment where there are small fruits—currants,

gooseberries, and small trees—and is profitable for a neighborhood garden investment if one does not wish to go to the entire expense for a small garden. Something of the kind is indispensable where potatoes are grown, though for a small patch hand picking of bugs is preferable. A garden fork will be needed in the fall when the potatoes, carrots, parsnips and other root vegetables are to be dug and as wide a one as available should be purchased as the more roots one can lift at a time the more quickly the work will progress. A spading fork is very useful in the garden in loosening the earth about plants, planted a considerable distance apart, when heavy rain has beaten the earth down hard and is especially useful for cultivating about berry plants, young fruit trees and grape vines, where the use of a spade would injure the roots of the plant.

A manure barrel, while not a tool, is a valuable accessory of the garden and its use will notably increase the yield of certain vegetables. A large lard barrel is a good sort to use and it must be prepared by burning out the lard which will

likely adhere to it, or it may be washed out with strong soapsuds or lye—a more tedious process. A hole large enough to receive a wooden spigot should be bored a couple of inches above the bottom of the barrel. The barrel should be placed on a firm support—a heavy wooden box answering the purpose, high enough to allow a watering pot to stand beneath the spigot; three or four inches of straw are then placed in the bottom of the barrel for drainage and should come well above the spigot hole; the barrel is then filled full of manure and water turned in until brimming full; a close cover to exclude flies completes the preparation. When the manure liquid is required it is only necessary to place the watering can in position, open the spigot and allow the liquid to run until the can is full. After drawing off a supply of liquid an equal amount of water should be returned to the barrel to keep it always full and ready for use. When first established the liquid will be very strong and it will be best to dilute it, using half water and half liquid, and liquid manure should never be used when the

ground is dry, but always after a rain or artificial watering.

A barrel once filled can be used over and over again until the liquid begins to appear pale in color, when the manure should be removed from the barrel and fresh supplied. If there is only a limited demand for this fertilizer, one filling will last out the summer, but where there are a number of uses for it it will need one or more renewals. Any kind of animal manure may be used—that from the horse stable being usually the most available but use may be made of the manure from the cow stable, the sheep pen or the rabbit hutches, but not from the poultry houses as this form is too strong to be used in liquid form, though its use in dry form is excellent for many vegetables.

Tomato supports are among the useful adjuncts of the garden and very good home made ones can be provided by utilizing the wire hoops that come around barrels, stapling them to four stout stakes; by their use a considerably larger

number of plants can be grown in a given area and the care and gathering of the fruit will be far pleasanter than where the vines are allowed to lie on the ground.

CHAPTER VI

HOLDING AND INCREASING THE FERTILITY OF THE SOIL

THERE is no one thing that the gardener so needs to keep always in mind of more importance than that the soil needs additional fertility; it does not matter how good it may have been originally or how good it was last year; this year it must have returned to it the food that was taken from it last year by the crop that was grown upon it. Any soil that is not virgin soil—soil that has never been used, and that sort of soil is not available in towns and villages if, indeed, it is anywhere in an old, settled country like ours—must have returned to it, year after year, an equivalent of the fertility extracted from it in growing the previous season's crop. It may be that the loss of many seasons must be made good, it may be that the soil was originally deficient in many, or only one, of the elements that make fer-

tility; probably it will lack that most important element of productive soil—humus. Humus, be it understood, is that element in the soil that causes it to appear dark. What it really consists of is decayed vegetable matter and it is always found forming the top soil of virgin, or uncultivated land. It is present in large amounts in woodlands where the falling leaves and surface growth lie on the ground, year after year, and decay and form what is technically known as leaf mould. We know how admirably it is adapted to the growing of house plants, and its value is often erroneously attributed to the plant food it is supposed to contain, but its great value is not so much in its food content as its influence on the soil with which it is combined; by its presence it makes the soil retentive of moisture and this moisture in turn unlocks the chemical elements of the soil so that they become available for food. Soils that are deficient of humus, though otherwise fertile, dry out so badly in summer that unless artificially watered, they will produce little, and even where a sufficient water supply is avail-

able the result will fall far short of what would have been produced were the supply of humus sufficient.

Fortunately there are ways of restoring the humus to worn out soils and on the small area of the kitchen garden the process presents little if any difficulty. The most readily available source of humus is found in a liberal application of barnyard manure; this for the quickest and most satisfactory results should be well rotted, but not fired or leached—that is, it should have been saved in such a way that the rain has not washed the fertility out of it in the form of liquid manure, or lack of moisture caused it to heat and burn. The most satisfactory method of handling manure is under shelter in a cement bottom pit with a depression or well for the liquid contents to drain into; this is seldom available in the town or city garden, but an enclosed pen for the manure, where it can be kept in a compact pile and where water can be turned on often enough to prevent firing, answers very well; better still is it to draw the manure on the land as it

is produced; this, too, is seldom practicable in the small garden, but a heavy dressing of manure can always be applied in the fall, spread evenly and allowed to lie and rot over winter and be turned under in the spring while it is wet. The rapidity of decay, and hence the availability of the plant food it contains of any vegetable matter turned under in a garden is greatly increased if it is turned under wet, dry material turned under rots very slowly and may be a detriment rather than a help to the crops that are grown over it that season. If a plant sends its roots down into a mass of dry leaves, straw or other material it has no chance to gain either moisture or nourishment and must exist on what little its surface roots can extract from the top layer of soil.

In spading manure into a small strip of land or a bed I usually allow at least one large wheelbarrow to a square yard and this proportion should be observed for the whole garden. Practically about twenty tons of manure per acre will be required for good results, market gardeners often use far more, or a large, two horse load

for a strip of land fifty feet square. If the land is light and sandy the manure should be well rotted but on clay or heavy tenacious soil fresh manure gives better results as it breaks apart the particles of the soil, by the expansion caused by heating, and adds sand, which is also a mechanical disintegrant, permanent in effect.

There is another way in which humus can be immediately supplied and that is by applications of woods earth or marsh earth-muck, directly to the soil. Where a supply of either form of humus is available it pays well to employ it. For a number of years I made a practice of keeping track of available sources of humus, noting as I drove about the country where new land was being broken up and especially where marsh land was being ditched and drained; then in the spring I would engage the owner to haul me as many loads as I required, but as the time passed it became necessary to go farther and farther afield until the cost of hauling became prohibitive.

There has been considerable discussion of late

in agricultural papers as to the value of raw muck when applied to the land. Muck in its unsubdued state is more of a fuel-peat than a fertilizer; it needs to be subdued by lying out over winter so that the frost may disintegrate it and make it available for plant food, but I have found that it may be made immediately available in its raw state by burying or covering it with a layer of soil to exclude the air and retain moisture; in this form it gradually changes to humus and plants grown in it do exceedingly well. Among interesting experiments conducted to test its use was this conclusive one: deep holes were dug in beds that were to be planted to bedding plants—cannas, salvias and the like; these holes were filled with the raw muck and covered with the soil of the garden and into this the plants were set and the usual culture followed; the results were surprising; salvias, that ordinarily made a growth of about thirty inches reached the astonishing height of nearly five feet and were a mass of blooms; still more astonishing results were discovered in clearing the beds in

the fall when it was found that the muck had practically disappeared, the plants having literally consumed it. Left on the surface of the soil the muck would have dried into a hard, intractable mass, fit only for fuel.

If one had a supply of raw muck available and wished to apply it to the garden it could be handled by following the plough and shovelling the muck into the open furrow; the next furrow turned would cover it. It would be of much benefit and would be turned to the surface again in the following spring ploughing. This should not be expected to take the place of barnyard manure, as it would lack some elements contained in that but it could be combined with such commercial fertilizers as the condition of the soil might suggest—lime, for instance, might be indicated by the sourness of the soil. If sorrel is plentiful on the ground it is a pretty good indication that lime is in order, but one need not depend upon its presence for data as these may be quickly attained by the use of blue litmus paper which may be obtained of any druggist. Its use is simple; if the soil is very wet, simply pressing a strip

of litmus paper down into it and examining it in an hour's time will indicate, according as it retains its color or turns pink—the acid reaction —the presence of acidity in the soil, or a cupful of the soil may be mixed with water to a thin paste and the paper inserted with the same diagnosis.

Lime is more in the form of a stimulant or indirect fertilizer than a real plant-food; it is in a medical sense an alterative, changing the nature of the soil. It not only sweetens, but mechanically, it binds loose soil, but flocculates or opens up tenacious clayey soils, affording freer passage of air and water and lessening the tendency to wash. It should be applied, on light, sandy soils at the rate of about five hundred pounds per acre or twenty-five pounds to every fifty square feet of garden plot; ten times this amount can be used on a heavy clay soil, but liming of the soil is not necessary every year, about once in five being desirable, so that considered as an expense it is nearly negligible. Slaked lime is best, and wood ashes, which contain about thirty-four per cent. of lime, are valuable aids in building up the fertility of the soil. They should not, however, be

mixed with the manure or applied at the same time as they tend to release the ammonia contained in the manure and as ammonia spells nitrate—the most costly of all our commercial fertilizers—the ashes should rather be broadcasted over the ground after the manure is turned in and then mixed with the soil by dragging and harrowing.

There are fourteen different chemical elements that are necessary for plant growth—carbon, hydrogen, oxygen, nitrogen, phosphorus, sulphur, chlorine, silicon, calcium, iron, potassium, sodium, magnesium and manganese; the first four are derived directly or indirectly from the air, the remainder from the soil. Virgin soil contains all these soil-derived elements in available form and in sufficient quantities for plant growth, and it has the power to absorb the elements which are derived from the air, but our short sighted methods of soil cultivation, or robbery, deplete the soil of some of its elements faster than it can convert them into available food for the plants. Liberal applications of manure replace the loss more quickly and economically than any other

treatment and if this is supplemented with such chemical elements as the soil may seem to be particularly in need of the fertility of the soil will be assured.

The most economical and practical treatment of the soil would be through the analysis of the soil by a soil chemist; this can readily be done by sending a sample of the soil to your state agricultural college which will analyze and advise as to its requirements, or a sample can be given to your county agent who will attend to it and advise you. In this way one works intelligently and wastes neither time nor money in experiments with no definite aim.

Not all of the fourteen different chemical elements required for plant food need to be artificially supplied; there are but three important elements which we need to consider in this connection—nitrogen, phosphoric acid and potash and only one of these may be lacking; a soil analysis will indicate which one. Nitrogen is the most expensive of the three; it is available, commercially, in three forms—organic nitrogen, ammonia and nitrates. The organic nitrogen is

commonly and most economically derived from tankage and dried blood—by-products of slaughter-houses—dried fish, and refuse from fish canneries and cottonseed meal; they contain, approximately—in dried blood, ten to fifteen per cent.; tankage, seven to nine; dried fish, seven to eight; cottonseed meal, six to seven per cent. These decay rapidly when added to the soil and are particularly valuable when applied to light soils, where nitrates or ammonia leach too rapidly and should not be applied until the crops are up and growing. They make available during their processes of fermentation the phosphoric acid and potash already present in the soil. Sulphate of ammonia, containing about twenty per cent. of nitrogen is a valuable chemical form in which to secure nitrogen as it does not leach from the soil as nitrate of soda does and so can be made available by the plant without loss.

Phosphoric acid is found commercially in the form of superphosphates; these come from phosphate rocks and are first ground, then treated with sulphuric acid. Bone is rich in phosphoric acid and is a very excellent form in which to sup-

ply this element to the garden, as it is obtained in several forms—raw bone, coarsely ground, fine ground and bone meal. One may by applying two or more grades secure the fertility of the garden for several years as raw bone decays slowly and will give results for a period of four years while bone meal is immediately available. Potash is most economically supplied by applications of wood ashes. But it must be borne in mind that the use of commercial fertilizers is not intended to replace that of barnyard manure, but rather to supplement it until the soil has regained what it has lost by poor management. Commercial fertilizers will of themselves produce a crop, but it is at the expense of the after-fertility of the land, just as the application of the whip will spur a jaded horse to one more final effort. Liberal applications of manure, leaf mould or muck and bone meal will bring any land that has soil at all, up to a satisfactory condition of fertility in a very few years.

Nor is it necessary to go far afield for the humus for so small a piece of land as a kitchen garden for the material for the finest kind of

mould lies right at hand in every bit of outdoors. What nature does in a field and woods she will do in one's dooryard if one will only watch her methods and co-operate with her. In the woods, for instance, she shakes down the ripe leaves from the trees, cuts with frost and age the undergrowth and sends the wind to drift them into piles where she waters and compacts them until in process of time they lose their identity as leaves and plants and become a fine, black mould, fine and warm to the touch and blended with a clean, sharp, white sand, or silicate. To imitate her methods successfully we have only to collect the dead leaves in the fall instead of wastefully burning them, pile them in a heap in some convenient place; surround them with a frame to keep them from being distributed about the premises by fowls or wind and to the nucleus thus formed add any waste matter—animal or vegetable—that will decay, about the place—the weeds from the garden, the wastings from the house and laundry. It is amazing, once one has started to conserve fertility, how much one can find to add to this compost heap; I recall that one spring,

from a well-tended compost heap and one horse stable, I had hauled on to the garden ten large, two-horse loads of fertilizer, and put the garden in excellent shape, and not only this,—it had kept the premises tidy as nothing else would have done. The gatherings of the summer and fall will, by spring, have rotted down into available form and the action of the soil, sun and rain will complete the process.

The growing of pet stock on a place adds so greatly to the upkeep of the land that it constitutes an object in itself. Poultry is an abundant source of manure which may be composted in barrels with alternate layers of soil, of lime or of any absorbent material or may be piled on the compost heap and mixed with the vegetable matter. To this will be added the litter from the hen house floors which is rich in droppings and full of earth and ground up leaves and straw. But another source of manure, not enough considered, is found in the droppings from the rabbit hutches. If one raises Belgian hares, as every one who wishes to conserve meat, should, one will find that, in addition to a supply of delicious

meat, one has also produced a valuable garden asset in the form of a highly concentrated manure; one will also find that one has practically done away with all waste from the garden as the hares will have consumed all the unusable parts of the vegetables—all such early things that run to seed, as lettuce, endive, swiss chard and the like. A large part of the weeds incident to a garden will also be consumed if pulled and offered them, thus minimizing the weed growth for the coming year, as every weed consumed means just so many less to appear the following year. It will be many years before the lesson of the home garden so insistently brought before us by the war will be lost, but we shall not have gained the full measure of its lesson if we do not realize that the critical shortage of meat is not up to the farmer and stockman altogether, but is a matter for each individual householder to adjust by producing, as far as his environment will permit, his own meat supply, by raising chickens and hares if only room for small stock is available, and pork if it is possible to find room and feed for a pig—and a pig does not require

a great amount of room—a six by eight pen will do and a paddock, with grass and fresh water, which need not be more than two rods square, and reasonable attention to sanitation will render him a contented and unobjectionable member of the family and a very savory and profitable member, too, come butchering time. These three things should go hand in hand;—A garden to produce vegetables for the family; live stock to consume the waste from the garden and live stock to furnish fertility for the garden; these three spell fertility for the soil and prosperity for the family.

Where the supply of manure is limited so that the entire garden area cannot be covered, quite as good returns may be secured by following the plough with a load of any manure available, and dropping it in the furrow that will correspond with the planting row—if for corn, every three feet of furrows, setting stakes to indicate the fertilised strips. In a small garden fertiliser may be trundled along in a wheelbarrow and shovelled in with fork or spade. This is an excellent plan in preparing ground for peas.

CHAPTER VII

ASPARAGUS

IS one of the garden assets. Once established an asparagus bed is good for a lifetime, almost; certainly it is a permanent feature of the garden, showing little if any deterioration if well cared for and kept free from weeds.

The starting of an asparagus bed is not the serious undertaking it was a few years ago, as the deep planting then thought so necessary is seldom practised now; instead it is thought sufficient to open a furrow—with the plough, if the planting is large, with the spade, if small—set the plants and fill enough earth to cover the crown of the plant, and, as growth starts, to gradually fill up the furrow until the ground is level. The ground should be of the best and heavily fertilised before planting, for asparagus is a gross

feeder and an additional application of coarse ground bone in each hill is well worth while as it furnishes food for two or three years independently of such annual dressing as the bed may receive.

For garden culture where hand cultivation is to be practised, the plants may be set in hills two or three feet apart each way, leaving room to cultivate between each way for the first few years. Two year old roots are the best to use and in planting a little mound of earth should be made in each hill, the roots of the plant spread out around this so that the earth will fit in beneath, close to the under side of the crown, then the earth should be firmed about the roots, a handful of bone meal sprinkled over the soil and the remainder of the soil filled in. Asparagus beds may be set in spring or fall; good results follow either setting. The asparagus bed must be kept free of weeds and grass from the start as once allowed to become infested with foul seed and grass it is a very discouraging proposition. One of the worst weeds to combat is the young

asparagus plants which come up every year from self-sown seed; to avoid this the tops should be cut, as soon as the berries are red, and burned. If the tops are burned on the bed the resulting ashes will be of benefit. It has been my observation for many years that the spots where the tops were burned always gave finer stalks than the rest of the bed; this suggests the application of wood ashes as a top dressing after the dressing of manure, which should be applied every spring, has been worked into the soil. A heavy covering of barnyard manure may be applied in the fall and spaded under in the spring, or it may be applied in February; if this is not feasible it is an excellent plan to spade into the space between the hills any available manure—poultry, rabbit or sheep or stable manure that is well rotted. The space between the rows, or paths, should not be broken up when this is done as, if unbroken and hard, it is easier to keep the beds clean and an application of some good herbicide may even be used to keep down weeds here. When the bed has been thoroughly spaded and

enriched in this way in the early part of the season I have found the after care of the bed very much more successful than when all over culture was attempted.

The variety to plant is largely a matter of taste—some prefer the green, some the white grasses. Lately a preference is being shown for the green. These will always be preferred by those who like a tender asparagus. The white sorts—Bonvilete and Argenteuile—are unbelievably tough as they appear in the market though beautifully white and of mammoth proportions that make them very attractive; possibly if cut, as the green grasses are, just below the level of the ground they would prove more edible. All asparagus is tough below the ground, green as well as white, and, for this reason, should not be cut much lower than the surface.

Of the green grasses Conover's Colossal and Dreer's Eclipse are excellent sorts, and Columbian Mammoth White is a white variety that is good.

If one wishes young plants for setting one can

obtain them very easily by cutting the tops of asparagus when the berries are nearly ripe and piling them in some convenient place where the ground is mellow and free from weeds and grass and leaving them undisturbed for a year; the seeds will germinate and produce a large quantity of thrifty young plants that later may be taken up and set where desired, and all without any care or labor further than the cutting of the tops.

One may begin cutting the asparagus when the bed is two years old, though small stalks will be produced at that age. Cutting at this age should not extend over a period of two weeks and in an established bed should be limited to four. All small stalks should be cut and not allowed to grow during the cutting period as they would exhaust the plant if allowed to grow, but when the cutting period is over they should, of course, be allowed to grow.

Salt was formerly considered essential to successful asparagus culture and certainly does no harm, but its chief value is in keeping down weeds and this can be quite as successfully done by

hand cultivation; this is better than to form the habit of depending on some quick, laborless road to clean beds—in the annals of gardening "There ain't no such animule."

CHAPTER VIII

EARLY SPRING VEGETABLES

MAY be classified under two heads: those that remain in the ground over winter and are ready for use as soon as the frost is out of the ground and those vegetables that, owing to the short time required to bring to maturity, are first available from the present year's planting; among the first may be cited such forms as asparagus, parsnips, salsify, parsley, kale, onions and a few others.

The latter class include such vegetables as beets, lettuce, radishes, endive and early peas, all of which may be planted as soon as the ground can be worked in spring, but for very earliest results use should be made of the hotbed, sowing the seed in February or March according to the latitude and transplanting as soon as the ground can be worked in spring. By doing this from three to six weeks' time may be gained. At the same

time that plants from the hotbeds are transplanted seed may be sown in the open ground in adjoining rows or as a continuation of a short row of transplants, to come into use about the time the first planting is exhausted; in this way a succession may be maintained and the ground made to produce a more profitable amount of vegetables as seed may be sown where the transplanted vegetables were grown as soon as they are removed.

BEETS

Which may be planted in open ground as soon as it can be worked in spring, do best on a fibrous loamy soil, but any good, warm, rich loam will grow them satisfactorily; the cleaner the ground and the more thorough the cultivation, however, the more uniform the crop which will be produced. Sow the seed in drills fifteen to twenty inches apart and about ½ inch deep, covering and tramping down the rows. It is customary to sow the seed rather freely when sown by hand, but if the seed is good rather better results follow

sowing with a seeder, owing to the more even distribution and the lessened amount of thinning required; if vegetables of this class did not need thinning their cultivation would be robbed of its chief burden; unfortunately they do need it and quite drastic thinning at that; thinning should commence as soon as the beets are large enough to handle, leaving them standing about one inch apart. In about two weeks another thinning may be given. By this time the young beets will be large enough for greens and they may be thinned to stand two inches apart in the row; a third thinning will be final and should leave about four inches between the beets; this will allow room for full maturity and perfectly formed roots. Beets are at their best when about an inch to an inch and a quarter in diameter and this is the size which is utilized for canning; when used of this size about an inch of the top may be left on and they are served whole, dressed with butter and seasoning.

The old Egyptian beet has long been acknowledged as standard, but Crosby's Egyptian is a

distinct improvement upon the old form. It is earlier, the color fine and the quality very sweet and tender. Early Model beet is a new comer with an excellent reputation and both are good selections for the home or the market garden.

In sowing in the hotbed it is not necessary to cover more than a fourth of an inch; scatter the seed thinly and transplant in about three to four weeks from the sowing of the seed, or when the plants and weather make the successful planting most assured; set the plants about an inch to an inch and a quarter apart and in using remove every other one; this leaves abundant room for them to develop and makes cultivating and freedom from weeds more assured.

A light application of nitrate of soda will work wonders in growing early beets; scatter the nitrate thinly along the rows and cultivate in, or the nitrate may be dissolved in water and applied from a watering can, care being taken to apply to the soil only and not to the plants. A handful of nitrate, about the usual quantity applied to a two-gallon watering-pot of water, will be

sufficient, or a hundred pounds to the acre—this would amount to about twenty-five pounds to the ordinary garden.

Beets may be sown for succession up to the middle of July and will mature a crop for winter use. Late sown beets are less care to cultivate owing to the fact that the season's crop of weeds is by that time pretty well under control.

SWISS CHARD

Has been for several years much exploited by seedsmen as the one indispensable vegetable for the city garden. It is no doubt a dependable source of greens, making a rapid growth of succulent leaves and is one of the showy, effective things in the garden that gives an air of abundance and successful gardening unsurpassed by any other vegetable, but, in my opinion, its merit ends right there and if it were not for its value in furnishing green food in the greatest quantity in the least time I should not give it space in the garden; the mid-rib, so much recommended for cooking like asparagus, has an unpleasant, earthy

taste that, to me at least, is very disagreeable.

Its culture, however, is so easy that it is worth while for any one who likes it to grow it. It can be planted in the open ground as soon as the ground can be worked in the spring, or sown in the hotbed and transplanted, thus gaining three weeks or more; sow in drill, scattering the seed thinly and thin out the plants to stand six inches apart in the rows. A light dressing of nitrate of soda will hasten the growth and render the leaves more tender and succulent. This plant does not need to have successive sowings made as by cutting down to the ground it will make a new growth, and the outside leaves may be gathered, the same as is done with spinach, and so produce a continuous growth of tender, crisp leaves.

There are two varieties of the chard, the Giant Lucullus and the Silver Beet; the latter variety being more delicate in flavor, having less of the earthy taste. A novel variety—a cross between the Swiss Chard and the table beet—is now offered by Luther Burbank which combines with

the usual chard qualities, much beauty of foliage, the leaves being gorgeous in pink, yellow, green and white and it would certainly add to the joy of gardening to have so beautiful a thing to tend, for this reason and because the bunnies must have food, I am growing it in my garden this year.

CHINESE CABBAGE

Though not a spring vegetable it is so similar in some respects to Swiss Chard that it may well be a companion vegetable. It much resembles the Romaine or Coss lettuce in its lush, upright leaves. It should not, however, be planted until about the first of July as early plantings run quickly to seed and do not develop the fine big leaves of the type. It may be planted in short rows and transplanted to about nine inches apart when large enough to handle. Nitrate is again indicated for this quick-growing, succulent plant and as soon as the leaves have attained considerable size they should be confined by tying with bast or strips of soft cloth, to prevent their falling

apart rather than to blanch them. The outer leaves may be gathered as they mature, leaving the inner leaves to grow and be gathered later. It is eaten raw or cooked like cabbage, being more delicate in flavor and without the objectionable cabbage odor when cooking. The large, fleshy midribs, stripped off the leaf, may be eaten raw with salt like celery or cooked like asparagus. When tied up the plant much resembles a very large, handsome stalk of celery, but with big, broad leaves instead of the feathery fronds of the latter plant.

ENDIVE

Classes with the foregoing vegetables, requiring practically the same treatment. It should be started in the hotbed for early use, transplanting to the open ground when the weather is favorable. As it does not make very rapid growth at first it may as well remain under the favorable guardianship of the warm hotbed until the middle of May, when it should be transplanted in rows, setting the plants six inches or

more apart. When the plants are about two-thirds grown they must be drawn together and tied for blanching, without which they are unfit to use; this must be done when the plants are perfectly dry—in the middle of a bright, sunny forenoon, being the best time for the work, otherwise they will rot as they are very sensitive to moisture and prone to decay—as a Japanese friend said of chrysanthemum seed;—"They are very corruptible."

They are a most acceptable addition to salads and combine acceptably with lettuce having a tangy bitterness very piquant, but it is as a garnish that they excel; the fringed and curled fronds, pure white or tinged with green in the less well-blanched specimens, are beautiful indeed and they may well be grown for this alone.

Covering with boards is sometimes resorted to instead of tying, two boards being laid along either side of the row to form a cap. It takes about three weeks to properly blanch endive and the plants should be used as soon as ready. If desired plants may be taken up in the fall and

planted in pots or boxes and placed in a light warm cellar or an upstairs window for winter use. As the endive makes a mass of fibrous roots it can be lifted without in any way checking its growth.

The Giant Fringed Endive is one of the best kinds. The Self-blanching Endive is not a satisfactory sort as it lacks the beautiful color of the blanched sort and is more prone to run to seed; either sort when running up can be cut and fed to the rabbits and so turned to good account, in fact I consider it worth planting for this purpose alone. The Staghorn Endive is an excellent sort for spring growing as, started in the hotbed and transplanted, it does not run to seed—a fault most other varieties are addicted to; this sort may be planted for early salads and the Giant Fringed later for fall and winter. Like all plants which depend upon rapid growth for crispness and flavor an application of nitrate is beneficial to endive and mellow, rich soil should be selected for its growth.

LETTUCE

For the very earliest use plant seed in hotbed and transplant to open ground about the middle of May, setting the plants about a foot apart if head lettuce is desired and, of course, no one who is acquainted with the superior excellence of head lettuce over the leaf variety will care to grow the latter. There are so many excellent varieties of lettuce on the market that one hesitates to recommend any special sort but some are more reliable headers than others. One of the surest headers and an excellent sort to plant in summer as it is more resistant of heat than most sorts, is the Improved Hanson; this variety makes a large, globe-shaped head, so compact that the inner leaves are beautifully blanched and the quality is excellent. For those who like a brown-leaved lettuce and in my opinion this sort excels in flavor all others, the old May King is one of the best and should always find a place in the garden whatever other varieties are grown. It is not as large as lettuce and permits of closer

Gratifying evidences of your own care and industry

planting than Hanson or All Season—another most excellent head lettuce—a sure header and slow to run to seed; it makes an immense head—almost as large as a Flat Dutch Cabbage, with beautifully blanched inner leaves and a fine, buttery flavor.

Of the loose-leaved lettuce the Grand Rapids Forcing Lettuce is the best known. This is a good sort to grow in the hotbed and may be allowed to remain after the other vegetables are removed, resetting to stand a few inches apart. The leaves are upright and loose, beautifully green and curled and the flavor crisp and delicious. It may be grown to use while the other sorts are heading.

Romaine or Coss Lettuce is the sort served in the big hotels as Romaine salad. It requires transplanting either from the hotbed to the open ground or from the seed row in the open ground to another row. It should stand about four inches apart in the row as the growth is upright, rather than spreading, and when of sufficient size the leaves must be tied together to blanch.

It is very crisp and delicious lettuce when quickly grown by the aid of much fertilizer, good culture and moisture, but lacking these is rather tough and bitter. Nitrates may be used to advantage, applied along the rows after the plants are transplanted.

All lettuce is at best in spring and early summer. It is very difficult to grow good lettuce in hot weather. If a width of cheese cloth is stretched over the row and the soil kept moist much better results can be secured. Leaf lettuce is more easily managed in mid-summer than head lettuce and unless one can give special attention this is a better sort to sow for succession.

ONIONS

Are an all-the-year-round vegetable and belong to each season according to how they are handled. For green onions, early in spring, the White Potato, or Multiplier, Onions are deservedly popular; these are usually raised from sets planted in drills where they are to form a permanent bed and cultivated during summer; they

form a clump of tender shoots which are ready for use in May. If, however, the bed is neglected and allowed to form sod or weeds the onions deteriorate and become tough and woody; their principal merit consists in their earliness. For first class bunching onions, however, onions with bottoms, one should sow seed in August in a fine, clean seed bed that has been heavily manured, scattering the seed thinly in drills one foot or fifteen inches apart and thin the plants to stand two inches apart in the rows. Onions are quite hardy and will usually winter without protection but in severe climates a light covering of straw or of evergreen boughs will be beneficial; this practice gives very fine green onions early in the spring.

Another practice, very satisfactory for the home garden, consists in planting in early spring the old onions placed in storage for winter use; usually these will have begun to grow by March and are useless for cooking, but if pulled apart and each shoot planted out in good garden soil they will start at once into growth and in a few

weeks' time produce a delicious green onion, sweet and of the utmost tenderness. I have found it a good thing to spade the flower beds intended for the growing of annuals and bedding plants early in the season and plant the onions in these, thus saving room in the garden and getting a greater use of the flower beds.

Unlike many vegetables the onion can be grown year after year on the same ground, providing it is well fertilized each year with barnyard manure, so that the humus content of the soil is not depleted. Clean tilth is essential, so that as little hand work as possible may be required for onions tops are exceedingly tender and injury to them checks the growth of the bulbs. The garden overalls adopted by many women for working is a distinct advantage in the onion bed. For onion sets sow seed in drills early in spring; gather the sets when ripe and store in a dry place till spring; slight freezing will not injure them but they must be protected from thawing and freezing.

But for winter onions of notable size and qual-

ity the New Onion Culture should be adopted:— This consists in sowing the seed in the hotbed in early spring and transplanting to the open ground when the weather is suitable. Set the tiny plants an inch apart in the rows, thin when big enough to use as green onions, removing every other one leaving them standing two inches apart, thin again to stand four inches apart and grow on until fall. If seed of Prizetaker or Ailsa Craig are used onions quite the equal of the fancy Spanish onions sold in the fruit stores will be produced. The soil must be more than ordinarily rich; besides the spring dressing given the garden before ploughing the space selected for the onions should have well-rotted manure trenched in at the rate of a wheelbarrow load to every square yard: in trenching lay back a spade's depth of soil across the end of the onion bed; fill this space with manure, trench a second row, throwing the soil on top of the manure, fill the fresh trench with manure and continue till the whole bed has been worked over. Rake the bed until the surface is perfectly fine and smooth and sow the

seeds in drills fifteen inches apart or set the plants as directed.

Onions are occasionally attacked by root lice which if not at once exterminated will quickly destroy the plants; the lice work on the roots of the onion and the first evidence of their presence is a sickly yellowing of the tops; if an onion is pulled up and examined the presence of the tiny white lice will at once be evident: the remedy is salt and the method of applying is to open a shallow trench beside the rows and scatter salt quite plentifully along it, filling in the earth again; one application will exterminate the lice. Attacks of root lice are by no means common, but the fact that they do occur and are very deadly should make one watchful for the first sign of discoloration in the tops.

When the onion tops show signs of ripening they should be broken down; this is sometimes done by rolling a barrel over them. A light home-made roller may be easily constructed by taking a length of nine inch stove pipe, fitting a

piece of wood in each end with a hole through the center to admit a bar of wood or iron which should be attached at the ends to a handle adjusted so as to allow the cylinder to roll; this being light can be rolled over the bed, leveling two or more rows at a time according to the length of the cylinder; it can be quickly constructed of waste material about the place and any piece of wood of suitable length—a couple of lathes, even, will answer, will do for handles. It is a good idea when it is found necessary to employ help in cultivating the garden to have a few little jobs like this on hand in case rain interferes with the work; in this way neither the time of the help nor the money of the employer is wasted and I have found that it gives far better satisfaction to the help if there is something of the kind for him to do so that he need not lose his day's or forenoon's work. Sharpening tools is another job that it pays to remember in the odd moments. A memorandum of things that can be done when it rains, tacked up in a conspicuous place in the

work room, toolhouse or barn is a very useful reminder and avoids an awkward delay while one tries to think of something to do.

If possible onions should be dug on a warm, bright day and allowed to lie on the ground until dry and clean; they should then be stored in a dry, airy loft or on a scaffolding. On the hay in a barn is a good place for onions and they can be left there until freezing weather, for the shorter time they are in a warm house the better they will keep. If the temperature drops suddenly a little hay can be thrown over them. Slight freezing does not injure onions, but repeated freezing and thawing does. An upstairs room is better for storing than a cellar unless the latter is unusually dry and not too warm. Onions will, usually, keep in perfect condition until the middle of February or the first of March, when they will begin to grow and should be sorted out, and the sound ones given a cool, dry place and sold or used as quickly as possible and the remainder saved for planting in the open ground.

PARSLEY

So universally used for garnishing and for flavoring soups and salads is of very slow germination and for that reason is more successfully grown when started in hotbeds and transplanted into the open ground in May. The ancients held that parsley should never be sown as they claimed that the seed had to make a journey to Hades and remain six weeks; when sown in the open ground it seems to bear out that theory, so slow is its appearance above ground. In the hotbed it requires about three weeks. England, too, has its superstition of the parsley, believing like the ancients, that it should be planted, not sown, that it must make the long journey to the infernal regions and return and that there the devil takes his tithe of it, for proof of which they point to the fact that a small part only of the seed comes up. A better explanation would be found, I think, in the quality of the seed, the home grown seed coming up quite as well as other seed, the boughten seed sometimes proving unsatisfactory.

The Greeks held the plant in great respect. A crown made of dried and withered leaves was given to the victors in their games. A crown together with a bunch of laurel was dedicated to the god of banquets while all the guests at these feasts wore crowns of parsley under the impression that the herb created quiet and promoted appetite. The Romans also decked themselves in like manner upon similar occasions because they believed that the plant had the power to absorb the fumes of wine and thus prevent drunkenness.

It was parsley that Hercules selected for the making of his first garland of victory. Greek gardens were bordered with parsley and rue, giving rise to the saying, "Oh, we are only at the parsley and rue." As these ancients used the plant in their rejoicing and merrymaking, so, too, it was brought into use in their funeral decorations. Sprigs of the herb were strewn over their dead. According to old folk lore parsley should be sown on Good Friday.

Parsley is a biennial plant, making a fine clump

of edible leaves the first year which in mild winters or protected positions survives the winter and starts into growth the following spring. It soon, however, runs to seed and is of no further value except to produce seed. If, however, one wants a small supply of parsley without the annual trouble of sowing and transplanting a small bed of it may be allowed to go to seed and self-sow, when it becomes, practically, a perennial but does not attain the fine quality that the specially grown plant does. A single row through the garden will furnish parsley for an entire neighborhood as the older leaves are gathered as needed and the crown allowed to produce new leaves; this should be done whether the leaves are needed or not as the quality of the new growth will be finer in every way, for leaving the old leaves to mature checks the growth of the crown leaves. Nine inches at least should be allowed between the plants and twelve is better, though when the tiny plants are first transplanted it may seem a long and lonely distance between them, but the plants soon fill up the space.

Very little cultivation is needed between the plants when once they attain full size; the plants are so dense and spreading that they effectually choke out the younger weed growth, but the space between rows should be kept clean.

Of the varieties to plant, only the fine moss curled should be selected. The Champion Moss Curled is a standard sort and one of the best, rich green in color and so crumpled and curled as to have the appearance of moss. Nearly all florists or seedsmen have their own especial brand of seed and one can select those which promise the best product. If desired bunches of the parsley may be lifted in the fall and potted or planted in window-boxes for winter use. They make a most attractive plant for the window and a pot of parsley, one of well-blanched endive and one of red celestial peppers make a most cheerful window decoration for the kitchen or dining-room, as well as furnishing crisp decorative material for the table.

PARSNIPS

May be classed among the early spring vegetables as they are planted as early as the ground can be worked in spring and are likewise ready for use as soon as the frost is out of the ground so that they may be dug; like all root vegetables they require rich, deeply dug or ploughed land. Not less than twelve inches in depth is required for successful cultivation; with shallow cultivation crooked and many branched roots are produced which are unsalable and of little value for home consumption. The long, smooth, beautifully white roots—two inches or more at the crown, are only produced in well-prepared soil.

Parsnips are planted directly in the open ground as soon as the ground can be worked in spring, sowing the seed in drills an inch and a quarter deep, covering and tramping down the rows if the weather is dry. They should be thinned to stand from four to six inches apart in the row that the roots may make perfect development. The rows should be eighteen inches

apart and the ground kept loose and clean throughout the growing season.

The usual practice is to let the parsnips remain in the ground over winter, taking up and storing in boxes of slightly moist earth or sand, in the cellar, a supply for winter use. The parsnip is improved in quality by a touch of frost but must be dug before growth starts in the spring.

Parsnips are eaten quite readily by Belgian hares and imperfect or small roots may be sorted out and fed to them, avoiding any loss in grading.

PEAS

Of the very earliest kinds, and that is distinctly the smooth peas, should be gotten into the ground very early in spring. Most of the early sorts will stand considerable cold, but the wrinkled sorts are tender and should not be planted until the weather and soil are warm and reasonably dry. More failures in growing peas come from planting in cold, wet soil, in a mistaken hurry to get early peas than from any other cause.

Ground for peas should be very rich; it is not sufficient that the garden plot has been well manured before ploughing;—the strip allotted to the growing of peas should have additional fertilizer trenched in, especially is this necessary in growing the wrinkled sorts and especially the dwarf peas, such as Nott's Excelsior and the like. These dwarf peas cannot bear a big crop on their abbreviated tops unless forced to production by heavy feeding, but as the wrinkled, medium early and mid-season peas are the most delicious of all in quality, the extra care required is well repaid. Another object in heavy fertilizing is that by this means a succession of peas may be grown on the same ground. Personally I prefer peas that require support to the very dwarf sorts; in the first place you have more vine for the production of pods. You cannot, with the best intentions, get as big a crop from one foot of vine as you can from three, all things being equal. Again, the labor of gathering pods from upright growing vines where the pods are easily seen and reached is far less than from the

prostrate vines which must be lifted or looked under in search of pods. Wire netting furnishes a better support than brush and where the gardener is a woman is much pleasanter to work about. Brush has an unpleasant habit of catching on the clothing and twisting around, often to the injury of the vine, but the netting gives a firm support, to which the vine readily attaches itself.

In the home garden the best way to plant peas is in double rows a foot apart, making the trench about three inches deep and dropping the peas as evenly as possible. Early sown peas do not require as deep planting as the wrinkled sorts which may be planted four or five inches deep to avoid blight. As the wrinkled sorts are very tender they should not go into the ground before corn planting time and not then unless the nights and soil are warm.

An excellent arrangement for a succession of peas in the home garden is to prepare the rows by trenching in manure and then make two furrows a foot apart and in one furrow plant the

earliest peas and in the other a second early pea, stretching a four or five foot width of wire netting between the rows; this extends the bearing season a couple of weeks. When all the pods have formed on the earliest varieties of vines a second furrow may be opened beside it and a wrinkled sort of medium earliness be planted; these will be ready to climb about the time the first vines are turning yellow when they may be pulled up, leaving their place for the new vines. This system of succession of planting may be repeated on the other side of the netting, thus giving four sowings of peas to one strip of netting and a succession of peas for several weeks.

The germination of the seed may be hastened by soaking the seed over night in warm water and when sowing unsoaked seed, in dry weather, germination is hastened by pouring hot water into the trench before covering the seed.

The experienced gardener will have his pet variety of peas but the amateur will be somewhat afield in selection so I would suggest as a desirable early sort the Gradus or Prosperity Pea, a

delicious sort of the tall kind that has much to recommend it. American Wonder is another extra early pea of a wrinkled sort that appeals to those who prefer a dwarf pea, being but a foot in height and compares in general excellence with Nott's Excelsior. On the same trellis with Gradus may be planted the Senator Pea; this is a number one pea in every respect—quality, quantity and appearance; following these one may plant more Senators and the Telephone; these will give a succession of peas for several weeks.

So many enemies conspire against the pea that close watch must be kept from the planting of the seed until the plants are well above the ground. Usually the chief depredation comes from moles which run along underneath the seed and destroy it; poisoned bait placed in the trench along with the seed often destroys the moles before much damage is done. A mole trap set at each end of the row or at the point where the mole enters the run will often prove effective.

A very successful home made trap consists of a large can or crock—a lard can is good, sunk in the ground and a trap consisting of a long, endless box with about a third of the bottom sawed apart and pivoted on nails driven through the side, so that anything entering at one end will drop through the swinging trap into the can beneath, which should be kept full of water; this arrangement will catch more moles than any steel trap with which I am familiar, and as the presence of the moles in the garden threatens other vegetables as well as the peas it will be time well spent to prepare one or more of these traps for use when occasion arises; the making of these traps may well be put on the list of rainy day tasks.

Cutworms sometimes take the peas as fast as they appear above the ground; poisoned bait along the rows before the peas break the ground will dispose of this enemy. Blackbirds often destroy a planting of peas before their presence is suspected and English sparrows have been

known to do much damage, so if one would enjoy fresh, home grown peas one must exercise due vigilance.

The use of Mulford and other cultures for inoculating peas is growing in practice among the most progressive gardeners and is a very wise precaution to take; especially is it desirable in intensive culture suggested by growing two crops of peas on the same strip of land. Peas, like all legumes, are nitrogen feeders and gatherers and the use of the culture supplies the young plant, at the start, with nitrogen and puts it in shape to begin the accumulation of nitrogen from the air by its own efforts. The nitrogen gathered from the air is stored up on the roots in the form of nodules or bunches, and it is for this reason that the growing of all legumes is so beneficial to the soil. If when the first planting of peas is matured and gathered the vines are cut or broken off close to the ground, instead of being pulled up, root and all, this supply of nitrogen will remain in the soil and be available for the succeeding crop.

The inoculating of the seed is very simple: the small bottles, which, by the way, cost but twenty-five cents for garden size, are only one-fourth full; simply fill up the bottle with water and moisten the seed before planting; this is all, and the same bottle will supply inoculating material for the beans which also being legumes respond favorably to the treatment.

RADISHES

A few radishes may be grown in the hotbed for very early use, but the main planting should be in the open ground. It is hardly worth while to devote any definite part of the garden to radishes as room can be found for them among the other vegetables. An excellent way to grow them is to drop seeds at intervals along the rows of beets, carrots, parsnips and salsify. All these seeds are slow in germinating and by dropping in occasional radish seeds which germinate in from three to five days the rows will be marked so that they may be kept cultivated without waiting for the plants to appear and indicate the rows.

A surprising amount of radishes will be grown in this way, without any special labor and loss of ground; and they will be out of the way before the ground is needed for the permanent occupant of the row.

The turnip rooted sorts are the most quickly and easily grown, the Twenty Day as its name indicates being ready for use in twenty days and the French Breakfast and Improved Breakfast Radish being ready in twenty-five; both of these are very tender, crisp and mild sorts and beautiful in appearance, white at the base and scarlet above, making a beautiful appearance when prepared for the breakfast table with a bit of the green top for contrast. For those who prefer a white radish the Icicle Radish is a fine sort, crisp and tender and does not grow coarse or pithy until quite large.

If one wishes to devote a definite space to radishes and maintain a succession of plants it will be a good plan to drop a seed in the ground for each radish pulled; in this way there will be a constant supply of young, crisp radishes all summer.

Where only a few are desired it is a good plan to plant a short space of the rows devoted to other vegetables to radishes and lettuce and perhaps a few plants of endive and parsley next to the path and near the house so that they may be easily got at without walking on the newly cultivated ground.

SALSIFY

Is another plant that is started very early in the spring and eaten as soon as the frost is out of the ground. It is one of the most useful and delicious of this class of plants and is not nearly as much cultivated as it should be. Sliced and cooked tender it makes, when combined with milk, seasoning and cracker crumbs, a most acceptable substitute for oyster soup or, cooked, mashed and mixed with a little flour and seasoning and butter, dipped in egg and bread crumbs, it makes delicious little cakes when fried. Its culture is simple, any good, light fertile soil producing a good crop, but to produce clean, smooth roots it should be deeply dug and well cultivated.

Sow the seed in shallow drills early in the season; thin to stand six inches apart in the row. It is hardy and may remain in the ground all winter, but a supply for winter use should be dug at the approach of cold weather and stored in boxes of sand or earth in the root cellar. As soon as the frost is out of the ground in spring and before growth starts they must be dug. If it is desired to grow seed the plants should be set out again, or may be left where they are if the ground is not needed for other vegetables, and cultivated the same as seedling plants.

SPINACH

The most important of the vegetables grown for greens, should be sown in the open ground as early as the ground can be worked if wanted for early spring and summer use. For fall and winter use sow in September. For a succession sow every two weeks. Sow in drills one foot apart and one inch deep, in soil as fertile as one can compass; the soil cannot be too rich for spinach, as upon the rapidity of its growth depends

the tenderness and succulence of its leaves; in poor soil, especially if allowed to suffer for water, the leaves will be tough and ill-flavored. Light applications of nitrate of soda have a magic effect on spinach and should be applied lightly every two weeks.

The Round Seeded Savoy is a standard sort, with thick, fleshy leaves, curled and crinkled; the New Zealand is a good sort for summer as it withstands heat well and is slow to run to seed. In gathering the spinach the entire top may be cut off a bit above the crown; this induces a new, quick, tender growth of leaves.

In planting for spring and winter use the beds should be covered with straw at the approach of cold weather. Spinach often self-sows and gives a volunteer crop the following spring. When the spinach begins to send up seed stalks it may be cut and fed to the rabbits and so waste that would otherwise ensue may be avoided.

CHAPTER IX

MID-SEASON VEGETABLES

BEANS

BEING somewhat tender, should not be planted until the ground is warm in spring. Corn-planting time will do for the field and navy bean, but the white podded string bean and the lima bean should not go into the ground until all danger of frost is past and the ground is in growing condition. At the present advanced cost of seed—fifty-five cents a pound for the string and lima sorts with postage added by some dealers, it will not do to take any chances by being in too much of a hurry to get seed into the ground; neither will it pay to buy seed of any but reliable dealers. There has never been a time when so much importance attaches to choosing one's seed merchant wisely. Cheap seed never pays, for the time lost in replanting seed

of poor germination, or, worse still, that comes untrue to name, giving one inferior or mongrel vegetables, offsets, many times, the amount saved in money.

String beans are the first form in which this favorite vegetable appears on the table and a very delicious and attractive dish they make when such white wax or golden wax as Wardwell's Kidney, Davis's Kidney Wax, Improved Golden Wax are selected; well grown plants of these varieties, well laden with their long, wax-like pods are a joy to the gardener; and if the pods are gathered as fast as they mature, and this may be done as soon as they whiten, up to the time they are fully grown, when they will still be sweet and tender, the bushes will continue to bear heavily until cut down by the frost; this should always be done whether the beans are wanted for use or not; they can be canned, sold, or given away or fed to the pig—anything rather than to check the vines' bearing. If one wishes to save seed for the next year's planting, and this is worth while when such high prices prevail, it will be well to set aside

a row, or portion of a row, for seed, allowing the first pods to ripen as this establishes the early bearing characteristic of the plant.

In planting beans good soil should be chosen, but beans do not need rich soil as many other garden vegetables do. It is said that beans will grow on soil that will not grow anything else; this is rather an extreme statement, but it is a fact that they will thrive where more exacting plants will languish; this is accounted for by the fact that the bean is a legume and so empowered to draw an important part of its nourishment from the air in the form of nitrates, which it stores in little pockets or nodules on its roots and so has a larder of its own to draw on.

Open a drill a couple of inches deep and drop the beans at regular intervals two or three inches apart, or they may be planted three or four in hills, six inches apart; cover and tramp down the rows and draw the rake lightly over them. Except for the distance at which they are planted, all beans require practically the same treatment; they should never be cultivated when wet or gath-

ered or handled in any way; the rule should be to give them a wide berth in wet weather; working among them when wet is the cause of the disfiguring rust that makes them unsalable and in bad cases uneatable. Wardwell's and Davis's Kidney Wax are as free from rust as any of the white podded varieties and are the best selections the amateur gardener can make.

For those who like a green podded bean the Stringless Green Pod is a fine variety and very popular with gardeners. Giant Stringless, Green Pod and Longfellow make up a trio of beans hard to beat.

Boston pea bean or navy bean is the best selection for baked beans; these should be allowed to ripen their pods until quite dry. The usual method of harvesting is to wait until all the beans are ripe in late summer and harvest by pulling the vines and piling in heaps until dry; this is not an economical way, however, nor specially adapted to the small home garden; a better way is to gather the pods as fast as they ripen, storing them in a dry, airy place until ready to shell

easily; if this is done many more beans will be produced and there will be no loss from the earlier beans shelling out on the ground as they will when the vines are left for the entire crop to ripen. Usually it will be necessary to go over the vines about four times but the result will be a much greater quantity of beans and all in the finest possible condition; when left until all are ripe it will be found that there is a considerable amount of mouldy or injured beans.

Lima beans require somewhat different treatment from the string or navy bean; to begin with they require a much richer soil and the ground should be well manured and a supplementary dressing of hen manure, rabbit droppings or ashes about the plants when well established will be of much benefit; they require more room in the row than the string beans, not less than eight or nine inches with the rows two feet apart; the beans should be planted about two inches deep, setting the seed with the eyes downward and covering and tramping the rows. Rather late planting is advisable for limas than

for string beans and for very early beans a few may be started in the hotbed and transplanted in the open ground about the twentieth of May at the north—add or subtract a week for each hundred miles north or south. The bean, having no tap root and a broad spread of lateral roots, is one of the easiest plants to transplant and by starting a hundred plants in the hotbed a much earlier crop will be obtained; that will be filling up the time while the open air planting is coming forward.

Another very important advantage in starting seed in the hotbed is the larger per cent. of plants obtained; if good seed is used every one may be depended upon to grow. The hotbed also affords protection from the enemies that destroy the lima, one of the most destructive being hens, and it will be wise to assure Biddy's absence from the garden until the beans are showing their first leaves as the succulent looking white seeds that first break through the ground have an irresistible attraction for her and she will walk along the rows, nipping off every pod as it appears;

this seems to be due to curiosity as she does not eat, but drops them on the ground; I have seen whole plantings of lima beans destroyed in this way. English sparrows also are known to destroy the tops. String beans do not offer the temptation that the limas do so are seldom molested.

For the home garden the bush limas are to be preferred as they take less room and are easier to handle. The Improved Fordhook Bush Lima is one of the best varieties if not the best. The New Wonder Bush Lima is highly recommended. Beans may be planted every two weeks for succession up to August. Dry limas that remain on the vines in fall may be used for cooking in winter. Limas are not injured by light frosts as much as the other varieties of beans; the pods cuddling under the thick foliage are protected and one can frequently gather a mess after the frost has cut everything else in the garden; the thick pods, too. are a protection to the beans inside.

If it is desired to grow pole limas set the poles

four feet apart each way and plant five or six beans to each hill and thin to three when the plants are up; when the plants have reached the top of the pole pinch out the top; add a spadeful of well-rotted manure to each hill before planting, mixing it thoroughly with the soil. Carpenteria is about the best of the pole limas and Early Leviathan Lima is another good sort. Wire netting may be used in place of poles and will be found more convenient and economical. Treating the beans with farmogerm, Mulford or other culture is advisable.

CABBAGE

For early cabbage sow seed in the hotbed or in flats in the house and transplant to the open ground in May. Cabbage are not injured by light frosts and can go into the ground earlier than most other garden stuff; usually the early sorts are selected for first planting but the late and winter sorts will, if started in heat, do about as well as the early; it is largely a matter of handling. The Late Flat Dutch is an excellent

sort for the first planting as it is a very sure header, giving large, flat heads of the best quality. In twelve years' experience in growing this variety I have never found a diseased plant nor, except in a year of very exceptional weather, a soft head. They keep well over winter and are altogether a very satisfactory all round cabbage.

In transplanting the plants from the hotbed to the open ground all but the upper pair of leaves should be removed and these may have the upper half clipped; this gives the roots a chance to establish themselves before they are called upon to support top growth. Set the plants about two feet apart each way, or the rows two feet apart and the plants twenty inches; the nearer distance is tenable if one raises rabbits as the lower leaves may be removed and fed to them, thus giving the plants more room; they should close up the gaps between them when fully grown as this shades the ground and conserves moisture—an important feature in a dry season. The ground should be kept well cultivated and free from weeds as long as work can be carried on

among them and when the cultivator can no longer be used the scuffle-hoe can be introduced under and between them without injury to the leaves. In hoeing or cultivating draw the earth up towards the plants.

When the heads are filled out and hard and it is not desired to gather them they may be kept from splitting by pulling the roots loose on one side and bending them over.

The principal enemy of the cabbage is the white butterfly and its offspring—the green caterpillar. There are many ways of combating this pest; the most effectual way, early in the season is dusting with Paris green mixed with flour. A convenient way to apply is to take a quart Mason jar, take the lid, remove the porcelain lining and punch the top full of holes, fill the can with flour mixed with one teaspoon of fresh Paris green and sift over the plants while wet with dew at the first appearance of the pest; this should not be used after the heads have formed; after this sprinkling with salt and working it in between the loose leaves of the head is

often effectual. Dusting with dry earth sometimes has a deterrent effect on the worms.

The grey aphis is another most troublesome pest; this comes so insidiously that the plants are well infested before their presence is suspected. Spraying with kerosene emulsion is sometimes effectual if the heads are not too far advanced. Spraying with zenoleum—a tablespoonful to two quarts of water—will kill every louse it touches and by its odor discourage any intending arrivals, but this should not be used where the heads are at all advanced, though a hard rain would rid the plants of the odor of both zenoleum and kerosene. Soapsuds, especially whale oil and nicotine, are suggested and hand picking of worms is not without its value. Spraying with hot water 140° is effectual and safe and cleanses and stimulates the plants.

Cut worms are very destructive to cabbage when first set out; their depredations may be guarded against by enclosing the stem of the plant in a band of stiff paper when planting; this

should go into the ground an inch and extend up the stem two or three inches. Strewing poisoned bait along the intended rows for a night or two is suggested but this is a dangerous practice where there is poultry at liberty; baiting after the plants are set is often successful, too, but the best safeguard is to have a good supply of surplus plants in the hotbed. The rows should be looked over the first thing in the morning after planting to discover what plants have been cut and wherever a plant is missing the worm should be looked for, and when found killed; this is really the most satisfactory way of eradicating the pest. The worm never goes more than two or three inches from the plant and will be found somewhere just below the surface of the ground, usually under some bit of roughage that makes a little hollow. If there is a piece of sod or clover-land near the garden the cut worms will usually begin their work from that side and if a planting of cabbage is made a few days in advance of other plants this will serve as a trap for the worms and

hunting and killing them for a few days will make the planting safe for the tomatoes, egg-plants, and peppers.

A little nitrate of soda sprinkled around the plants is a great incentive to growth.

For winter cabbage sow seed in the open ground in May and transplant into permanent rows as soon as large enough, giving the plants more room than early cabbage. Late Flat Dutch, Wakefield, Danish Roundhead and Dutch Winter or Hollander are all good sorts which will prove good keepers and sellers.

If in setting out plants of winter cabbage it is found that there are more plants than are needed, they may be allowed to remain where they are and given a little protection, such as boards, cornstalks or evergreens, and can be used for setting out the following spring.

CAULIFLOWER

Require the same general treatment as cabbage. They are set somewhat closer in the rows and cultivated the same as cabbage; however, for the best

results it is desirable to transplant the cauliflower from the hotbed into cold frames as soon as they have their second pair of leaves, setting three inches apart each way and as soon as they resume growth giving a light application of nitrate of soda, then transplant when the weather is favorable. Cauliflower are quite hardy and not injured by early fall frosts, making steady growth until severe cold weather and many heads that have failed to fill during the fall will fill out finely in November.

As soon as the curd, or head, forms and has made a little size the leaves must be drawn over it and tied to exclude rain and light; this must be done when the plants are perfectly dry and the weather clear, a sunny day about noon is the best time for the work. If tied up when wet or damp the heads will rot. If not tied up growth will start in the heads, they will turn purple and green and be unfit for food. It is upon the successful tying up of the cauliflower that its successful culture depends; like the cabbage it requires a rich, well fertilized soil and

applications of nitrate of soda once a week during the growing season will hasten the development of the head; wood ashes, too, are beneficial.

The insect enemies of the cauliflower are those of the cabbage, but they molest it in a somewhat lesser degree. The remedies to be employed are the same.

There are two important varieties of cauliflower—The Snowball and the Dry Weather. The former is a poor cropper in dry seasons unless artificial irrigation can be supplied. The Dry Weather Cauliflower, on the other hand, seems to be at its best in a dry season and will give fine heads when the other fails. As one can not forecast what the rainfall of any given season will be it is well to be provided against any contingency by planting both varieties of cauliflower; by this forethought one will be assured of a crop whatever the weather and the snowballs that failed to head during August and September may come on in October and November and give a late crop for pickling.

In the majority of gardens cauliflowers are

grown exclusively for pickling; this is a mistake for there is no vegetable more delicate and toothsome than this; it outclasses cabbage and when fried in batter or breaded with egg and cracker crumbs, it affords a most excellent substitute for meat, indeed, it is really more acceptable when no meat dish accompanies it; for this reason—its desirability as a table vegetable—special pains should be taken to produce early heads, by starting in hotbeds, transplanting into cold frames, fertilizing with nitrate and giving special attention to thorough cultivation throughout its growing period. If water can be supplied, a thorough drenching of the roots once or twice a week, followed by a cultivation the following morning to restore the dust-mulch, will be of much benefit.

The green cabbage worm is sometimes very troublesome on the heads and leaves of cauliflowers and one should watch for the presence of the white cabbage butterfly as this will indicate whether one may expect an attack of caterpillars. If once the worms have become established spraying with hot water of from 130° to 140° will ex-

terminate all with which it comes in contact, as worms are far more sensitive to hot water than are the plants which they infect.

CORN

Is one of the most profitable of the garden's offerings; there is, practically, no loss connected with it; a delicious vegetable for the table in its green state, fresh from the stalk; it is equally welcome when it appears sweet and toothsome from the can in winter or, conserved in a dried state, is soaked and cooked the same as fresh corn. There is no waste in the unused corn that remains ungathered on the stalks for it may be saved for seed another year or fed to the poultry, while the stalks, cut and cured, make excellent feed for cow, horse or rabbits. Cut while green and made into ensilage it is the best substitute for green feed in winter for any animal that eats green food. Much green feed for stock may be secured from the corn patch in summer by removing all the side shoots that do not bear ears and feeding them to the pigs or rabbits. This

is of benefit to the corn as it allows all the strength of the plant to go into the ears instead of being wasted in growing useless foliage.

Corn is a gross feeder and requires a deep, mellow, fertile soil, well enriched with barnyard manure. Clover sod well manured and ploughed will give the maximum amount of corn, but any good soil if fertilized will produce good corn.

Corn is somewhat tender and should not be planted until the ground is warm, but in the small home garden where a small amount of seed is required a little risk may be run by planting early in May and replanting if an early frost catches the crop. It is not, as a general thing, the spring frost that does the most damage, especially with field corn, it is the late frost that catches the corn still in the milk that does the damage, so that anything that pushes the crop along to maturity before danger of fall frost is of moment. This is one reason why heavy fertilizing is so important,—it speeds up the maturing of the corn and gets it beyond the danger line in time.

Sweet corn may be planted in drills or in hills,

but I prefer the hill method. Even in a small patch that can be worked but one way with a horse or cultivator—there is always a hoe to take care of the space between the hills.

The rows should be three feet apart and the corn in hills three feet apart, or if planted in rows make the rows four feet apart and the corn twelve inches apart. Drop several kernels in each hill and thin to three plants to a hill when the corn is up and danger of frost is passed. One pound of seed will plant a hundred hills or from one hundred and fifty to two hundred feet of row. If hard frost threatens just as the corn is coming through the ground, throwing earth over it with a hoe will often afford sufficient protection to save it.

In a small garden patch it is not much work to stick a mark of some kind in the center of each hill and if this is done cultivation can commence at once and a hard crust be prevented from forming; this will hasten the germination of the seed and insure the elimination of weeds at the start.

There are many varieties of sweet corn adver-

tised, each seedsman having his own favorite specialty, but there are really but two that one need take into consideration—the old, reliable Stowell's Evergreen and the new Bantam Evergreen—a cross between that exceptionally sweet corn, the Golden Bantam, and Stowell's Evergreen, and combining the great qualities of both parents, the delicious sweetness and tenderness and earliness of Bantam with the more generous size and more tender skin of the Evergreen. Plant these two varieties and have the best to be obtained in sweet corn. One planting of Evergreen will give big generous ears of late corn, while for succession the Bantam may be planted every two weeks up to July.

When the corn is a couple of feet high it will be well to go through the patch and remove all suckers or barren stalks so as to conserve all the food and moisture for the production of ears.

In addition to barnyard manure, wood ashes is an important fertilizer for corn, supplying the potash so essential to its growth; this may be put in the hill at the time the corn is planted or may

be scattered about the plants after they are up and hoed into the soil; it should not be applied in connection with manure as it has a tendency to release the ammonia content of the manure, but should be applied independently. Droppings from the poultry house may be used in the growing of the corn crop, placing about a teacupful in a hill, but not in contact with the seed. Several barrels of dry droppings should be saved during the winter for just this extra fertilizing in the kitchen garden.[1]

[1] Corn should not be planted in single rows for this reason:—when the corn blooms the pollen is carried from ear to ear, and from plant to plant. If a single row is planted broadside to the prevailing wind, the pollen is dissipated and the corn remains unfertilized and produces no ears. Three or more rows insures against this loss of pollenization. If only a limited number of hills are to be planted it will be better to plant them in blocks rather than in one or two long rows. Corn that matures at different seasons should not be planted in parallel single rows as the result would be the same as one single row—the corn not blooming at the same time. Again, corn of two different sorts should not be in adjoining, parallel rows, rather should each kind be planted in blocks to avoid hybridizing. Where it is necessary to give a long strip of land to the sweet corn it may be divided into blocks, especially if the strip extends from north to south, as the prevailing winds are quite uniformly from east or west and there is little trouble with cross pollenizing from south to north.

Corn is very easily transplanted so that where there is a failure of the corn to germinate in some hills and an over supply in others, the extra plants may be lifted carefully with the spade or trowel and slipped into holes prepared for them where wanted. Last season I had an interesting experience transplanting an entire row of corn, over a foot high. A row of okra had been planted across the garden but failed to appear on schedule time and was finally given up and corn planted in its place; the corn came up and had made several inches of top when to my surprise the okra appeared. It was evident that the two robust plants could not occupy successfully the same ground and I did not wish to sacrifice either, so an equal number of hills were prepared in another part of the garden, fertilized with poultry droppings and ashes and the hills of corn, then over a foot high, lifted, one hill at a time, on a spade and carried and slipped into their holes, and not a plant seemed aware that anything had happened to it; certainly there was no check to the growth, but, by

lifting on the spade with plenty of soil adhering, the roots were not disturbed in the least.

Corn has so few enemies that it is scarcely worth while to consider them, the principal one being earworm—a small worm that eats out the tip of the ear; they can be poisoned by dropping Paris green in the axils of the leaves when the plants are young.

CUCUMBERS

For slicing for the table should be planted as soon as the ground is warm or a few seed may be planted on pieces of inverted sod, or in pots or paper bands in the hotbed and transplanted into the open ground about corn-planting time or when the danger of frost is past; this will give several weeks' start on outdoor planting and will also make the plants practically immune from attacks of the striped beetle. Bettles will of course appear, but by the time of their arrival the plants will have attained sufficient size to withstand their attacks, particularly will this be the case if protected with dry earth, sifted over the

leaves to roughen them or the application of tobacco tea or tobacco stems or leaves about the plants.

Pieces of sod, about four inches square, should be cut and placed earth-side up close together in the warmest part of the hotbed and several seeds planted on each piece and the whole covered with a fourth of an inch of earth. When ready to transplant lift the pieces on to a flat board or carrier and slip into a hole prepared for them with as little disturbance as possible and press the soil firmly about them so that the air will not get underneath and dry the roots.

There is not too much room for vine vegetables of any sort in the small kitchen garden and if desired the early cucumbers for table use may be grown on netting. The Japanese cucumber is a climbing sort especially addicted to this manner of growth, bears fine, large fruit of most excellent quality and the position on the wire, away from the soil and damp ground, produces a most attractive fruit, free from the yellow blanching that is present on the cucumbers grown on the

ground. Last year among a number of these Japanese plants there occurred one or two plants of a snow white cucumber that I found very superior in crispness and flavor to the green fruit. Owing to early frost I was not able to secure seed of this interloper. Mr. Burbank's cucumber seed did not produce a single white seed. This is not, however, a climbing sort, but all vines which have tendrils can be grown on netting. Squash even will grow, bear and seem to enjoy the experience.

Cucumbers when grown for the table should be gathered as soon as of slicing size, whether wanted or not, as allowing the fruit to ripen on the vine stops production; this is especially imperative in the case of pickles which must be removed as soon as of sufficient size to use. The small pickles of an inch and a quarter or less should be gathered first and larger pickles left until the latter part of the season as gathering the cucumbers while very small increases the vine's productiveness and there will always be enough overlooked to supply the larger sort of pickles.

Cucumbers for pickling should not be sown before June and may be planted at any time after that up to mid-July. Plant in hills from four to six feet apart spading in a spadeful of manure in each hill; thin out to three or four plants in a hill when danger of bugs is past; spray with Bordeaux Arsenate of Lead three ounces to a gallon of water, when in danger of beetles or blight; the combination of lead and Bordeaux mixture covers both emergencies.

Keep the ground well cultivated as long as the vines will allow; pinch off the ends of all the vines when about a foot long to induce branching; when the plants begin to bloom notice the presence or absence of bees. Some years the curcubita family fails signally in setting fruit and this is usually caused by lack of pollenization by the bees. On a small patch one may substitute cross-pollenization by carrying pollen from one blossom to another with a camel's hair brush or by shaking the blossoms against each other, but a preventative measure would be to raise a colony or two of bees. Sometimes the presence of some

plant especially attractive to bees will lure them away from the melons, cucumbers and like plants. Two years ago the presence of a patch of vetch proved so attractive to the bees that it was not until late in the season that the flowers of a near-by patch of winter squash and citron received sufficient attention to set any fruit. The air was resonant with the hum of bees, but not one was to be seen on the vines.

There are any number of good cucumbers to choose from for general crop. Early Fortune has proved a favorite in my garden. It is a good bearer and quality and appearance are all that could be asked. The Davis Perfect, Arlington White Spine, and Westerfield's Chicago Pickle are all satisfactory sorts to grow.

EGG PLANTS

Are very tender when small, so they should be started in the warmest part of the hotbed, or in a warm, sunny window in flats. When they have grown their first pair of true leaves they should be transplanted—if at all crowded, into

other flats or other rows in the hotbed, setting them two inches apart each way and grown on, given sufficient water and occasional cultivation, but not sufficient to disturb the roots, until time to plant out in the open ground; this should not be done until the nights and soil are warm as a check at this time will mean a late setting of fruit.

Egg plants are considered one of the difficult things to grow; personally I have seldom lost a plant except at the hands, or mouth rather, of cutworms, but I have frequently gotten an unsatisfactory setting of fruit. However, one must have certain standards to adhere to in their culture, the first of which is heat in all the early stages of their growth, the second, rich soil, with occasional supplementary dressings of nitrate of soda, and thorough cultivation.

The plants require considerable room when mature and should not be set closer than three feet each way.

The principal enemy of the egg plant is the potato beetle which is quite as partial to egg

plants as to potatoes. Spraying with Paris green or arsenate of lead is effectual before the fruit has formed but hand picking is more satisfactory and where only a few plants are grown for family use, quite as practical. It is not the mature beetle that eats the leaves but the young beetles that hatch from the mass of yellow eggs laid on the under side of the leaves, so at the first appearance of the old bugs search should be made for the mass of eggs and these as well as the parent beetle destroyed; by this means no beetles can get a start. It is always good practice to avoid, as far as possible, the use of poisonous insecticides in the kitchen garden; while their use may do no harm on vegetables that have not set their fruit, there is always a tendency to grow careless in their use and to continue it after the safety zone has been passed.

New York egg plant is the standard variety for all but the northern states; it is of the highest type, spineless and of a rich, purple color, large and borne in abundance; it is not as early as Black

Beauty, long a favorably known sort, which is about twelve days earlier; Very Early Dwarf Purple is still earlier and Black Pekin is another good sort. In the northern states the earliest variety should be planted, but the egg plant has one remarkable characteristic—for a plant so tender in its early stages it seems, when fully grown, almost immune to cold and early frost, and I have often gathered unharmed fruit after severe frost had cut most everything else in the garden. Throwing some loose stuff—clover hay, corn fodder or weeds—over the plants on a cold night will usually save them and a spell of warm weather that usually follows the first hard frosts may bring on immature fruit to a usable size. It requires about five months from the sowing of the seed to produce usable fruit so it will readily be seen that it is important to start the seed in the hotbed, greenhouse or in the house and to take every precaution to grow them on rapidly without any check.

OKRA

So well and favorably known in the southern states, is practically unknown in the north, except as its acquaintance is made in the chicken gumbo of the commercial soups and a few other vegetable and meat preparations. It should, however, form a staple vegetable of the kitchen garden and, once its merits are known, would, doubtless, become as popular north as it is south. Though its use is chiefly associated with the preparation of soup it has other, equally acceptable, uses. It is an excellent addition to hash, adding both richness and flavor; added to tomatoes it imparts a fuller, richer flavor and used alone, fried, is excellent. A small amount of meat, with the addition of potatoes, okra and onion, the last two fried tender before adding the meat and potatoes, makes a most satisfying one-dish meal.

It is one of the easiest vegetables to grow, requiring the same culture as corn; making the rows three feet apart, and planting the seed in drills

and thinning to ten inches apart in the row. Perkin's Long Pod is the best general variety and the pods should be gathered when half grown, whether needed or not, to prevent checking the production.

PEPPERS

Like the egg plant require much heat in starting and should be given the warmest posistion in the hotbed—about the central sash, towards the front—so that they may not be overtopped by other, taller growing plants, for the pepper grows but slowly for the first few weeks of its existence.

The seed germinates slowly, taking from two to three weeks to appear; it may be sown thinly in drills, or broadcasted, covering sufficiently to conceal the seed and placing paper over the plot to prevent drying out. If started in flats in the house the plants may be transplanted into other flats when they have made one pair of true leaves; if not crowded in the hotbed they may be al-

lowed to remain where they are or be transplanted into fresh rows, setting them a couple of inches apart each way.

They should not be planted out in the open ground until the soil and nights are warm as a check at this time will mean late fruiting and failure to ripen. Make the rows from twenty-four to thirty inches apart and set the plants eighteen inches apart in the row. Before planting spade a forkful of old manure or henhouse droppings into each hill for the pepper is a heavy feeder and requires good soil.

Protect the plants on cold nights if frost threatens and keep the ground well cultivated.

If the peppers are to be grown in the north such varieties as mature their fruits early should be selected. Crimson Giant is about the earliest; the plants are large and bear abundantly. The Upright New Sweet Pepper is also early, a good bearer and its habit of fruiting—holding the fruit erect instead of drooping—makes it very easy to gather; it is a medium-size pepper, just right for stuffing for mangoes and a desirable size to

pickle for winter use in salads; if the top and bottom are removed it leaves a broad ring which is very lovely when filled with salad and garnished with parsley and well-blanched endive; the parts removed may be used as pickles or added to mixed or chopped pickles.

Magnum Dulce is an excellent sort for baking when stuffed with meat or force-meat or fried. Pimento is a new salad pepper very attractive in shape and form but does not do so well in the north as some of the older sorts; however, some seasons it can be successfully grown and a few plants set out will be well worth taking pains with. In the warmer sections and in favorable seasons at the north one can grow the fiery Tabasco Pepper from which the Tabasco sauce of commerce is made and so prepare one's supply of this expensive relish; it requires early planting and great attention to heat and sunshine to succeed.

The little Celestial Peppers are so very attractive when grown in pots that florists offer them along with other greenhouse stuff; they can

just as well be grown in one's own hotbed or house and make welcome gifts to the young housekeeper or the city dweller who does not have the advantage of a country garden to furnish condiments and relishes. The little plants can be grown in pots from the start or small plants in the garden can be taken up and potted and will hold their tiny scarlet fruit all winter, producing more as the first is removed. For the sunny kitchen or dining room window nothing is prettier or more ornamental than a window box filled with these little red peppers, parsley and endive.

Cayenne peppers can be grown for the making of pepper vinegar; the seeds are used for this, being separated from the husk when dry and put into quart bottles filled with white wine vinegar; in a few weeks the vinegar will be ready for use. The hulls may be saved and put in cans of mixed pickles, a few hulls adding a piquant hotness; they may also be added to pickled onions and to cauliflower.

As peppers are extremely sensitive to frost every effort should be made to bring them along

rapidly so that they may mature their fruit in season; light application of nitrate will assist and the use of poultry droppings in preparing the bed will be of use; in dry weather a wetting with water from the laundry will do much good. If it is possible to pipe or carry water with hose to the garden a shallow trench may be made along the pepper rows and water turned in as required. Protecting with papers or other covering on frosty nights may save a crop but the covering should not rest on the plants as the frost will likely strike through; hay or corn fodder would be likely to give better protection.

TOMATOES

Are one of the most important vegetables of the home garden not alone as a summer vegetable, but also as an important part of the winter cuisine, more tomatoes being canned for winter use than all other vegetables.

Tomatoes require no expert care to grow; they are one of the easiest managed of vegetables, but they do require heat for starting if they are to

be got to bearing in season to give a bountiful crop before frost. It takes about four months from the time the seed is sown to produce a crop of the main crop tomato. Some of the very early sorts will come into bearing early in July; unfortunately, however, these very early varieties lack the full, delicious flavor of the later fruit.

The tomatoes should not be set in the open ground until all danger of frost is over; they should be given rich soil and a spadeful of manure added to the hill in which they are planted. If the plants are allowed to lie on the ground make the hills four feet apart each way, but if they are to be staked or trained on a trellis three feet will give sufficient room; both methods of culture have advantages; the latter keeps the fruit up off the ground, makes pickling easy and perhaps produces more perfect fruit; less room is required for growing the same number of plants than would be required for the former method. The first method has this advantage,—the plants suffer least in a dry season as the vines shade the ground, and prevent the excessive evaporation

of moisture and require, accordingly, less cultivation; then the branches will root wherever they touch the soil and so draw moisture and nourishment fro mit; a much larger amount of fruit is produced from plants allowed to rest on the ground, and if straw is laid under the plants it will keep them from getting soiled and rotting if the season is wet.

Where the plants are to be staked a six foot stake should be set at each hill at the time the plant is set and the plant tied to it at intervals as it grows. Pinch off the top as soon as it reaches the top of the stake and remove all but a few of the side branches, pinching in those that remain to make a shapely plant. I think the rack system of training is preferable to the stake.

A long trellis or rack, about eighteen inches or two feet high and two feet wide, is constructed of narrow strips of wood and placed over the tomato rows, the plants growing up through the center of the frame and spreading out on top of it. This gives more bearing surface and the vines do not need to be tied to the wood; such a trellis

can be used for several years in succession if stored away in a dry place when not in use. The wire tomato supports on the market are good but costly and quite as satisfactory ones can be made at home from the wire or wooden hoops from barrels, stapled to stout stakes sharpened at one end. About three hoops should be used and three stakes. These, too, can be stored away for future use so that the first outlay is the last for a number of years.

In setting out the plants from the hotbed select those with the stoutest stalks; it is not material whether they have grown tall or keeled over in the hotbed or not if the plant appears vigorous with a robust stem. If one has a good supply of plants to draw from one can discard all but the best.

Prepare the hills in advance by forking in a forkful of old manure; if the plants are long, make a trench two-thirds the length of the stem with a deeper hole at one end; place the root in the hole and bend the top carefully into the trench, turning the tip up straight so that it stands four

The reward of your hours of pleasant labor

or five inches above the ground, draw in a part of the earth and fill the trench with water, fill in the remainder of the soil, pressing snugly, make a fine dry mulch about the plant and the work is done. The long stem buried in the trench will send out roots all its length and will have a much greater root system than a plant set with just a few inches of stem in the ground; such a plant set in such a way, invariably lives and makes a strong plant, but to plant it with only the root part under the ground would only invite the loss of the plant.

The plot should be looked over the following morning to see if cut worms have cut off any of the plants during the night and to restore, if necessary, the dust-mulch.

Plants grown on stakes or trellises are more susceptible to frost than those grown on the ground as the soil holds the heat and it is an easy matter to cover a considerable number of plants at one time with tarpaulin or even newspapers and this should be done when there is even a slight prospect of frost. The thermometer should be

watched in the late fall and if it is going down towards nightfall those plants which one wishes to save should be protected.

After the first three hard frosts there are usually two or three weeks of fine weather and it is at this time that tomatoes and other perishable garden stuff command the highest price and those who are fortunate enough to have a surplus to sell can realize a neat little sum that will more than pay for the trifling trouble involved.

I am often asked which is the best tomato for the home garden and have no hesitation in saying that, all things considered, there is no better tomato raised, for an all season crop, than the Dwarf, Improved Stone. There are earlier tomatoes and larger tomatoes. The Early Detroit is earlier, but not very much so, and it does not compare in size and quality with the Stone. Ponderosa is a much larger tomato but the quality is not up to the Stone nor is its freedom from cracking and irregularity to be compared to the Stone. Then the Stone is such a satisfactory plant in the way of foliage and stem, so heavy and rugged,

the thick, crumply leaves are very distinctive and the plants always command attention even when not in fruit. The fruit is quite as large as best requirements demand and it slices beautifully for the table and canned is entirely free from that peculiar taste that characterizes the commercial tomato.

Earliana is the earliest and the most popular sort of the extra early tomato and a few plants for early use will be worth while. There is also a new ball-shaped tomato, New Globe, that is good for slicing as it gives a number of fine slices just alike instead of the three usually obtained from a flat tomato, only one—the middle—being perfect. So if one wants a variety in the garden one may plant with entire confidence the Dwarf Stone and Vaughan's Improved New Stone and add for variety the Earliana and the New Globe.

SQUASH

ENGLISH MARROW

In sections where the egg-plant does not do well, or where one lacks the skill to succeed with

it a very satisfactory substitute will be found in the English marrow; this is a bush form of the vegetable marrows and occupies about as much ground as an egg-plant. The vine sorts are such rampant growers that they require a garden to themselves or at least a walled enclosure, but they are very profitable to grow as they produce enormously and the fruit is excellent fried like egg plant; few, if any, persons would be able to distinguish between them and the difference, if any, would be in favor of the marrow.

Rich warm soil is required for all the squash family and the bush varieties are no exceptions. Give in addition to the usual manuring of the garden a good forkful of manure in each hill. Space the hills four feet apart each way and plant several seeds in each hill to provide for the appetite of the squash bugs which make no exception in favor of bush varieties; when danger of bugs is past the plants should be thinned to three or four plants in a hill.

To repel the squash vine borer scatter a hand-

ful of tobacco dust about the plants and at the first appearance of wilt in the leaves examine the stems carefully for the point where the worm found entrance and either slit the stalk sufficiently to uncover the worm or run a wire up the stalk until he is encountered and killed; then if possible, bury the wound in soil so that the branch may be saved; if, however, there is too much injury done or the wound is too high up it will be best to remove that part of the branch; at the same time the rest of the plants should be carefully examined for other signs of injury, and the ground inspected for larvæ. For yellow striped beetle and blight spray early and repeatedly with Bordeaux arsenate of lead mixture.

The marrows are finer eating when only two-thirds grown. They should be peeled, sliced and covered with salt for an hour, then rinsed and drained and breaded and fried the same as egg-plant, or, if preferred, may be cooked and mashed like summer squash. They are good either way.

TURNIPS

Have an important place in the garden as they may be used as a catch crop almost any time during summer. Wherever vacancies occur in rows of early vegetables and it is inconvenient owing to lack of seed or other reasons to replant with the same vegetable, then one may have recourse to the ever useful turnip and fill in the hiatus with that. Turnips are at their best when young and tender, about three inches in diameter, and a constant succession can be assured by planting in this way or where the first crop of vegetables has been removed. For fall and winter use sowings may be made in July and August. Success frequently results from sowing among the sweet corn just before the last cultivation; with favorable weather a crop will mature before severe freezing weather and turnips are the better for a touch of frost.

Open a shallow drill with the hand plough or by dragging the corner of the hoe along the row and scatter the seed very thinly. If the planting

is in full rows make them a foot or fifteen inches apart. As soon as the plants are large enough, thin to stand three or four inches apart; this is important as fine, smooth roots cannot be produced if crowded.

The turnip maggot is the greatest enemy the turnip has and it sometimes appears in gardens that have been entirely free from it and I think is brought in in the seed. It is the same little worm that works its tortuous way through and around the radish and, although I have never grown a wormy radish, still last season an entire planting of turnips were ruined by this pest, so as I was quite sure it was not previously present in the soil I am forced to the conviction that I bought and planted it together with the seed. Moral—Buy seed of reliable dealers and examine carefully for worm holes before planting.

The Purple-top White Globe is a most popular market sort. Snowball is a white variety of fine appearance and early maturity and if used young is very tender and sweet. Early White Egg is another good early sort and for those who

like a yellow turnip the Yellow Globe is a satisfactory sort. It makes a larger root than the others and is excellent both for table use and for feeding stock. It is a dependable root for feeding Belgian or other hares as it keeps well, buried in earth in a frost-proof cellar, and when gathered for winter use the tops can be piled in a cool place and fed to the bunnies. Of course this applies to all turnips which are grown for winter use.

The planting of turnips, radishes and cabbage should be watched closely for signs of the root maggot. The presence of a little, dark-colored fly about the plant is always cause for suspicion and when seen it will be well to take precautionary measures. As tobacco in any form is obnoxious to most insect life, the strewing of tobacco dust on the ground will usually drive these flies away and prevent the laying of eggs, but the trouble is that they may have already laid eggs before being discovered. Hot water poured around the plant in sufficient quantity to soak the soil an inch or so will often destroy the

eggs and larvæ too. Soaking the ground with Paris green solution—a teaspoonful of the poison to a large watering pot of water is sufficient and the solution must be kept stirred to prevent its settling—will destroy the maggot, but it may also poison the turnip so is not to be recommended; also, if the worm has attacked the radish or turnip and rendered it unsightly and unfit for the table, tobacco and hot water then are the two safest and most reliable applications and the hot water over the tobacco is especially effective.

Disks made from heavy tar paper are sold for the protection of cabbage and cauliflower plants and may be cheaply made at home and though a little more trouble to apply about turnips and radishes still are practical and better than losing the crop. The disks may be either round or square and should be about three inches in diameter with a hole the size of the stem in the center and a slit extending out from the hole on one side to the edge; this allows the disk to be slipped around the stem of the plant. A leather punch

which will cut a quarter of an inch hole may be used and the slit made to the center of the disk and the hole then cut. The disk lies flat on the ground and prevents the entrance of the fly to deposit the egg and the tar paper repels.

CHAPTER X

VEGETABLES OF THE VINE FAMILY

CUCUMBERS

FOR main crop or pickle cucumbers should be planted in the open ground from June until the middle of July; at this season there is less danger of damage from the striped cucumber beetle and the stink bug, both serious enemies of the vine family; but even so late in the season it will be well to take the easy precaution of strewing tobacco stems or dust on the hill about the plants.

For pickles plant in hills four to six feet apart each way and keep the entire surface of the ground clean with frequent cultivation. Hoeing about the hills and running the hand cultivator with the scuffle-hoe attachment between the hills will be sufficient, but no weeds should be allowed to make a start, as once the vines have begun to

cover the ground it will be difficult to eradicate the weeds and the vines must not be tramped on or handled unnecessarily. When the plants are a foot long pinch out the ends of the branches to induce branching and check too rampant a growth. Pull up all but three or four plants when all danger of bugs is past. Keep a close watch for root maggot, borer, and wilt. Spray with Bordeaux arsenate of lead mixture at the first appearance of wilt, and continue once a week until the fruit appears; after that it will not be safe to use the poison.

Gather the pickles frequently—every other day if bearing well; do not allow fruit to grow large or ripen on the vines if grown for pickles as this will check production.

One of the best table varieties is Early Fortune —also a desirable pickling variety. Arlington, White Spine and Davis's Perfect are excellent table sorts and Chicago Pickle—a standard pickle sort—and Long Green, or Jersey Pickle and the Westerfield's Chicago Pickle are all excellent types for growing for pickles.

CITRON

Used for preserving and for sweet pickles, require the same treatment as melons and squash. Seed may be planted directly in the open ground or started on pieces of sod in the hotbed; this is preferable as the fruit sometimes fails to ripen in a short season and unless fully ripened on the vine the preserves have a watery taste, no matter how carefully prepared. Citron make about the same length of vine as the watermelon so should be planted from five to six feet apart, and when the vines are a foot in length the tips should be pinched off to induce branching and check too straying a habit. Keep cultivated, remembering that the dust-mulch is the best garden insurance and spray with Bordeaux mixture against blight and use tobacco dust liberally as a preventive measure against the yellow striped beetle and the squash bug.

MUSK MELONS

In securing seed for growing musk melons one should take into consideration the climate and

the length of the growing season. Certain varieties of melon require certain climatic conditions and will not give satisfaction if these are lacking. Melons that are adapted to the climate of Colorado—like the Rocky Ford, the Honey Dew and the like seldom do well in the east and middle west where early frosts are apt to find the fruit still immature, but there are many other excellent varieties well adapted to these sections. The Extra Early Hackensack, the Osage, the Irondequoit and others can be grown with satisfaction and all are especially fine and large.

As a general thing I think a large melon, sweetness and flavor being equal, preferable. One of the sweetest melons with which I am acquainted is the old Cassaba; this is the largest musk melon grown—a perfect specimen being from twelve to fifteen inches in length and as much as one wishes to carry up from the garden, but the delicate green flesh is melted sugar, nothing less, with a flavor all its own.

For an early crop of melons one should start the seed in the hotbed on squares of sod, using

plenty of seed so that one will have an assured stand, and transplant when all danger of frost is past. If one only grows a few hills it will well repay one for the extra trouble to cover the hills with shallow boxes, covered with wire netting or mosquito netting. The boxes should not be more than four inches high and about twelve inches square, or thereabouts; if removed as soon as danger of bugs is past and stored in a dry place they will last for a number of years. Empty biscuit boxes sawed in two make good frames or strips of three inch lumber can quickly be converted into frames by any one handy with hammer and saw.

Dry weather is one of the serious drawbacks to melon culture as the drought usually comes just as the fruit is setting. Sinking tin cans, with holes punched in the sides near the bottom, to the top in the soil in the middle of the hill and keeping them filled with water will be of much assistance in bringing the fruit on to maturity. Occasionally too much rain interferes with the ripening of the fruit; in such cases the empty can

will act as a drain pipe by accumulating water from the surface soil. The glass plant protectors used in early spring are helpful in concentrating the little sunshine cloudy weather affords and where these are not available old window glass may be used to afford protection from rain and wind for a few days. This should be supported on the north side by a frame or stout stakes, their lower edge resting on the ground.

The best soil for melons is a warm, sandy soil well enriched with barnyard manure and a supplementary shovelful should be placed in each hill. Make the hills about six feet apart each way, and thin out to three plants to a hill. If desired such small sorts as Rocky Ford, Paul Rose, Hoodoo and the like may be grown on netting; they will not, perhaps, bear as freely, but the fruit will be more perfect than when grown on the ground, and there is this advantage that the fruit drops when perfectly ripe so that there is no uncertainty about gathering it. Where there is only a small garden spot available the growing of melons, cucumbers and the

like on netting is a distinct advantage; the cultivation then becomes as simple as that of a row of peas and can be continued throughout the season; gathering the fruit is much simplified as there are no vines to be trampled on and if water is needed it can be quickly applied along the row. Melons grown on netting are easily protected from early frost, but it is difficult to cover any considerable area on the ground.

WATERMELONS

Require the same treatment as musk-melons except that it is all right that they should be started in the open ground, spacing the hills from eight to ten feet apart each way; giving a spadeful of manure in each hill. Spray with Bordeaux arsenate of lead mixture once or twice, using a much weaker dilution than for other vines. Pinch out the ends of the vines. Keep cultivated and free from weeds. Avoid stepping on the vines or handling them unnecessarily.

Cole's Early, Kleckley Sweet and the new melon—Tom Watson—are all good sorts of much

sweetness and crispness of flesh. The first is well adapted to the northern states, the Kleckley a few days later than Cole's Early. A few Winter Watermelons will extend the season long into the winter as this variety may be gathered at the approach of cold weather and stored in a cool, frost-proof cellar and will retain its delicious flavor and sweetness for weeks. Unlike the other melons mentioned, which are oblong and green, and very tender of rind, the Winter is round, nearly white-skinned and of a hardness approaching the citron. The flesh, however, is red and very firm. It must not be concluded that the Winter is a late season melon, for it is one of the earliest, continuing to bear until frost cuts the vines, so that it may be grown for a single melon crop if desired.

SQUASH

Winter squash are an important garden product, not much appreciated during the flush times of summer but coming into its own at the approach of cold weather; the culture is prac-

tically that of all vine products. Starting seed on sod in the hotbed and transplanting has much to recommend it as the squash seems to attract more than a fair sort of attention from striped cucumber beetle, squash bugs, stink worm and blight. The vine borer also takes its tithe of the plant and a sudden wilting of the leaves is indication that he is at work; he should be hunted for and killed. Usually there is little hopes of saving the injured branch; if anything will do it it will be burying the wound in earth and keeping it moist for a time until it either heals or sends out roots at the nearest joint and so becomes an independent plant.

As a rule squash, melons, cucumbers and the like will not transplant. It often happens that about all of the seed planted in some hills will germinate and make strong plants while other hills will have but one or two plants and it is desired to transplant some of the extra plants into hills where they are needed; attempts to do this with a trowel invariably fail; it is possible, however, to transplant an entire hill—or a part of one

if spaced far enough apart, by passing a spade down into the ground at a sufficient distance from the plant to avoid disturbing the roots and lifting a large spadeful of earth with the plants. The hill that is to receive them should have been prepared in advance so that the earth may slide off the spade into the hole without disturbing or breaking it in the least; the soil should not be pressed down as this would have a tendency to crumble, but any space about it should be filled in carefully and water poured around it. Squash or other vines moved in this way invariably live and go on growing without any appreciable setback. A considerable patch of winter squash —the Delicious—was entirely secured by taking up plants that had come up self sown in various places; somewhere some immature squash were left in the garden the fall before; some came from the frame around a standpipe in the barnyard which was filled with coal ashes. How the squash came to come up in that unusual place is unknown, but there were a number of nice plants and these were lifted on the spade and carried—

a spadeful at a time—and planted where they were wanted and the entire patch was very thrifty and bore abundantly.

Spraying, hand picking and attention to cultivation are essential in growing squash as with other garden crops. The dust-mulche is the one certain assurance against failure.

The Hubbard Squash, both Golden and Warted, have long been standard sorts, but both have lost, through much careless breeding, the qualities which distinguished them—dryness and sweetness. It is practically impossible of late years to find an individual of either variety that is really dry or sweet or that has keeping qualities equal to the early sorts. In the Delicious we have a much superior squash whose dryness is notable and sweetness all that one could desire, even small, immature specimens possess the quality in high degree. Unless one has home grown seed from a Hubbard that was perfect in these qualities I should advise planting the seed of Delicious and saving one's own seed from the best specimen of that.

SUMMER SQUASH

Then there are all the varieties of summer squashes—Summer Crookneck, Giant Summer Crookneck, the Vegetable Marrows, and the several bush forms, which are a boon to the small kitchen garden as they take little room and are always within bounds; they include the Bush Fordhook, used as a summer squash when green, or ripe, a good keeper, often lasting until the next season's crop is ready. The Mammoth White Bush or Patty Pan, Early Yellow Bush, Early Golden Bush and Bush English Marrow are all good sorts—either cooked and mashed or egged and fried like egg plant. All require the same general treatment and all bear heavily and early. The summer squash are planted in the open ground any time that is suitable for planting corn. To guard against loss by seed decaying in the ground if the season is wet, set the seeds on edge, instead of laying them flat; this is advisable with all flat seeds of pronounced size; cover half an inch and mark the hills so that cultivation can

commence at once. Covering the hills with frames will save much work in combating insects or a cap of window screening will be effectual; this is made from a round piece of netting with a slit on one side from center to edge to allow its being bent in a tent shape. A stick should be fastened to it to hold it together and anchor it to the ground; this can be easily arranged by taking a piece of wood four or five inches longer than the cap and splitting it half its length, inserting the wire where it laps into the split and thrusting the free end into the ground. These little caps are very practical as they can be flattened out and laid away when no longer required, occupying very little space to store and for that reason are preferable to the boxes.

Squash vines may be kept from growing too rampant by shortening the branches. They should always be pinched back as soon as they have made a foot, or less, of growth and when fruit is well set on the vines the ends may be severely cut back to insure the early maturity of the fruit already set. I have removed branches

several feet long and bearing half-grown squash from vines of the English marrow without the least ill effect and have no doubt that similar treatment would be well borne by the Hubbard or other winter squash, and so save much useless growth and conserve the strength of the vine for the main crop of squash and, perhaps, induce a dryer, sweeter product.

SWEET POTATOES

The easiest way to raise one's own sweet potatoes is to buy already started plants of the market gardeners who make a business of starting them for sale; but if one prefers to plant the tubers and raise one's own plants, and the potatoes are available—which seldom is the case unless one has kept them over in a warm cellar buried in sand—then the potatoes are cut the same as Irish potatoes, one eye to a piece, and started in a warm hotbed in April. Before planting the pieces of potato it is a wise precaution to dip each piece in sulphur to protect against black rot. The plants should not be set out in the

open ground until the nights are warm and all danger of frost is passed. The hills should be three feet apart each way at least as the vines make quite a rank growth. Warm, sandy soil, well fertilized, is necessary and a trowelful of poultry droppings may be added to each hill for good results. Cultivate thoroughly and often and when the vines become too long to make cultivating convenient they may be lifted and coiled around the top of the hill, the hill, by the way, not being a hill at all in the common acceptance of the term but merely a level space devoted to the growing of the potato. It is quite important that the ground immediately about the plant be kept clean, so that when the vines are coiled up they need not be again disturbed to remove weeds.

The space between the plants should be kept mellow and free from weeds throughout the growing season. Sweet potatoes are quite as easy to grow as Irish potatoes, easier, in fact, as they have fewer enemies and are not attacked by the potato beetle. They are more difficult to keep, however, and should be stored in boxes of dry sand in a warm, dry cellar over winter.

CHAPTER XI

VEGETABLES LESS COMMONLY GROWN

THERE is a considerable number of vegetables that are seldom encountered in the general garden, many of which are well worthy of acquaintance. Many of them are familiar to the city housekeper through the medium of the fruit stores and the delicatessen stores; more of them appear in the gardens of the foreign residents and might be adopted for general cultivation with good results.

ARTICHOKES

Which appear as an especial delicacy on the menus of the big hotels and restaurants on special occasions only, are not difficult to grow in sections of the country where the winters are not too severe. They will not stand the winters of the northern states, however, and in any longitude north of the Ohio, are better for winter protec-

tion. Given a mild winter climate they are as easily raised as a cabbage or an ear of corn and are far more ornamental, indeed so striking and handsome are the plants that they may be grown for their effectiveness alone.

The plants are grown from seed started in a hotbed in March or earlier and planted out in rich mellow soil when the weather is suitable. Set the plants three feet apart each way. The plants do not bear until the second year, but they may be had in cold sections by purchasing the plants of the florist at any time after the middle of April. As many undesirable sorts are often obtained from seed it is a more certain way of getting good varieties to purchase the plants. They are, however, more expensive than other vegetable plants and where they can not be carried over the winter are somewhat expensive, costing one dollar and fifty cents a dozen. However, a dozen will be ample for a small family.

The unopened flower head is the part eaten and it is served raw as a salad or cooked in various ways as an entrée.

They should receive the same culture as okra or corn, thorough cultivation and water if the season is unduly dry. At the approach of severe weather the tops should be cut off close to the crown and the plants banked up with coal ashes, which should be removed in the spring before growth begins.

ARTICHOKE, JERUSALEM

Though sometimes used as a vegetable and for pickling is especially valuable for feeding stock, especially swine which are allowed to harvest it by rooting it out of the ground. It is claimed that an acre of ground planted to artichoke will keep from twenty to thirty hogs from October to April. They have a special value as a means of clearing a piece of land of undesirable weed growths—like Canada Thistle, quack grass or locust sprouts, as the hogs in rooting for the tubers will destroy the weed roots, thus redeeming a piece of land that may be utilized for garden crops or fruit.

In planting the tubers are cut and planted the same as potatoes and cultivated in the same way until the crop is matured sufficiently to turn the hogs on it or they may be harvested to feed during winter to any stock which needs a succulent winter food.

BROCCOLI

A vegetable similar to cauliflower, but of somewhat coarser flavor. It is hardier than cauliflower and will do well in sections where cauliflower is not successfully grown. For rapid growth it should receive frequent cultivation and be grown in rich soil. Sow seed very early in greenhouse, hotbed or warm window and set out as soon as the ground can be prepared in spring, setting the plants the same distance apart as cabbage and drawing the earth up about the roots when hoeing. White Cap is about the best variety, making fine, large, compact heads of a creamy-white color, of good flavor.

BRUSSELS SPROUTS

These little miniature cabbages, growing closely together on a stalk, are delicious boiled like cabbage or used as a salad. The culture is the same as that accorded cabbage. The seed should be sown in the hotbed in spring and set out in the open ground in May in rows three feet apart and about twenty inches apart in the rows. Cultivate to keep down weeds and maintain a dust-mulch. By fall the little heads will be fully developed. The delicate flavor is improved by a touch of frost. For late use sow seed in June.

CHICORY

Sow seed in the open ground early in spring as for parsnips, thinning to stand three inches apart in the rows and making the rows fifteen inches apart. Dig the roots in the fall and store in a dark cellar where the temperature can be controlled. Cut the leaves off a little above the root crown and place them in horizontal layers with the crowns outward covering each layer, excepting the tip of the crown, with earth. Each

layer should be a little narrower than the one beneath so that they form a sloping bank. It is the tender white leaves produced in the dark that are used for salad. Another form of Chicory, the Large Rooted, is used to mix with or substitute for coffee, being sliced, dried, roasted and ground.

Witloof Chicory, or French Endive as it is sold by dealers in fancy fruits and vegetables, is sown in June in drills a foot apart and cultivated until frost, when the plants should be taken up and trimmed to an inch and a half from the neck and replaced upright in trenches about sixteen inches deep, setting the plants about an inch and a half apart. The trench is then filled in with soil and covered with manure to hasten growth. The tender, white tops will be ready for use in about a month and are eaten raw, like celery, used as a salad or cooked.

CELERIAC

Or turnip-rooted celery is grown for its bulbous root, which has a distinct celery flavor and in

gardens where celery will not succeed it makes a very good substitute. It is used, cooked, either as a salad or as a vegetable. It is cultivated much as celery is, only it does not require the banking so necessary with that plant. It may, however, be blanched and is said to be very fine that way. Delicatesse is a fine sort with perfectly smooth root, free from side rootlets, pure white, tender and excellent in quality. Giant Prague is another fine sort. Earliest of All is ready for use in June and is a good sort.

CHERVILLE

Resembles parsley and is used for garnishing and for seasoning. Cultivate like parsley, making the rows a foot apart and thin to six inches.

COLLARDS

Grown at the south as greens and as a substitute for cabbage. Plant seed in rows, thinning or transplanting to a foot apart in the row. It is improved by a touch of frost.

CORN SALAD

Sow in spring in drills a foot apart. For winter and spring use sow in drills in August and September and cultivate like lettuce or other salad stuff.

CRESS

Upland Cress, which has the flavor of water-cress, can be grown in any good garden soil without the presence of water. The seed should be sown very freely in rows one foot apart, making repeated sowings for succession as the plant soon runs to seed. Water-cress can be grown about a water hydrant if the soil is clayey, or can be underlaid with a few inches of clay. Water-cress sown at intervals in such a position will give a supply of the pungent green that will be a very welcome addition to lettuce, corn or other salad. Remove a foot or eighteen inches of the soil for a square yard of space and in the excavation thus formed lay a few inches of clay, tamping and puddling it down until it makes a continuous

layer, then apply a few inches of earth rich in humus or marsh earth, leaving the surface slightly lower than the surrounding soil and scatter the seed broadcast and keep free from weeds until up and growing. Allow the hydrant to drip sufficiently to maintain sufficient moisture. Continue to scatter seeds at intervals for a succession of cress.

DANDELION

For those who love the bitter tang of the dandelion as a green, the cultivated affords a much finer dish than the wild as the leaves are double the size of the wild dandelion. The seed should be sown in drills, covering very lightly and shading with newspapers or brush until up. Thin to stand a foot apart and blanch, if desired, by inverting a box or flower-pot over each plant, or a cone of stiff paper can be used. For greens, only the top may be removed but for salad the plant may be cut down to the root, the part beneath the surface of the ground being very white and tender. There is no danger of dandelion

grown in the garden becoming a troublesome weed as it is easily kept from seeding, which is its only way of spreading.

FENNEL OR FINOCCHIO

Is extensively used in Italy as a salad. The part used is the enlargement of the leaf stalk at the base of the stem. When this is about the size of an egg, the earth should be drawn up about the plant to cover the enlargement partly and in a week or ten days the eggs may be used, removing as many as required, a succession being produced. The flavor is delicate, resembling celery, and it may be used either as a salad or boiled.

GARLIC

So beloved of the Italians is quite worth cultivating in our American gardens. It is used in minute quantities as a seasoning in almost all forms of savory cooking, in omelets, salads, soups, dressings and wherever a piquant flavor, suggestive of onion, but distinctive, is desired. The garlic comes in a bunch of cloves which are

separated and planted like onion sets an inch apart, but it requires warmer weather than the onion, succeeding especially well in the climate of California. It is, however, indigenous in a wild state in many parts of the country and cattle browsing in garlic-infested pastures have a distinctive garlicky flavor to their milk. So agreeable is the taste of garlic or leeks in butter to some people that it was once quite common in the Philadelphia markets to hear "leeky butter" inquired for.

KALE OR BORECOLE

Are grown for greens and as a substitute for cabbage, being more hardy than that vegetable. For summer use sow the seed in the open ground in May or June and cultivate the same as cabbage. For early spring use, sow seed in September and protect during winter. Some of the varieties, like Imperial Long-standing Kale, are so hardy that they may be dug out from under the snow in the winter. Dwarf Curled Scotch is an excellent sort, very tender and fine flavored

and with beautiful curled foliage. Dwarf Green Curled Kale and Excelsior Moss Curled Kale are other good sorts, very mossy, attractive and delicious.

Sea Kale, less well known than the annual kale, is a hardy perennial that is cultivated somewhat like asparagus, the seed being sown in the spring in rows three to four feet apart. The seedlings give a crop the third year but quicker results come from planting root cuttings or offsets. The Sea Kale has a very long tap-root and should be grown in rich mellow soil that has been ploughed or dug very deep. As soon as shoots show above the ground blanch with boards, earth, sand or anything that will exclude light until ready for use. When blanched the leaf-stalk is cooked like asparagus or the leaves are used as greens.

KOHL-RABI

(Turnip-rooted cabbage)

The bulb which grows on the stalk a few inches above the ground is the edible part of this vege-

table. This is stripped and cooked like turnips, but is much more sweet and delicate. Sow seed in the open ground in June, making the rows sixteen inches apart and thin to six inches in the rows. Sow for succession from early spring until July. Cultivate like cabbage.

LEEKS

Sow seed in April in drills one foot apart and one inch deep. Transplant when large enough to handle or thin to stand six inches apart in the rows, setting the plants as deep as possible so that the earth will come up well about the neck to blanch and insure its whiteness and tenderness. In cultivating draw the earth up about the plants. Seed may also be sown in August or September, the same as onions, and the plants transplanted the following spring.

Prizetaker Leek is a fine exhibition sort. Large Musselburg has enormous broad leaves and a pleasant flavor. Long Mezieres also has broad, erect leaves, fine flavor and a long, snow-

white stem and is very hardy. Leeks are a valuable addition to the onion family of the garden.

MARTYNIA

The curious pods of this vine vegetable are used for pickling and produce a very fancy article. They should be gathered when only half grown. Sow the seed in the hotbed in spring and transplant into hills three feet apart each way and cultivate the same as cucumbers. The plants will self-sow and voluntary plants will appear each year so that once established one is quite sure of a supply. Seed may also be sown in the open ground, if preferred, in May.

CHAPTER XII

QUANTITY OF SEED REQUIRED

Name	Ounces	Pounds	Drill	Hills	Acre	Plants
Asparagus ...	1	4–5			1	200
Beans	1	1	50			
Bush Lima ...	1	1	50			
Pole Lima	1	1	75–100			
Beets	1	5–6	50		1	
Brussels Sprouts	1		200			
Cabbage	1	4			¼	3000–4000
Cauliflower ...	1					3000
Carrots	1	3–4	100		1	
Chicory	1		100			
Celery	1					5000–6000
Cucumbers ...	1	2		50	1	
Corn Salad ...	3		100			
Collards	1					3000
Egg Plant ...	1					1000–2000
Endive	1		300			
Kale	1					5000
Kohl-Rabi	1		300			
Lettuce	1					3000
Muskmelon ...	1	2–3			1	
Watermelon ..	1	4–5			1	
Onion	1	4–5	200		1	
Okra	1		100			
Parsley	1		150			

Quantity of Seed Required

Name	Ounces	Pounds	Drill	Hills	Acre	Plants
Parsnips	1	5–6	200		1	
Peppers	1					1000–1500
Peas		1	50			
Pumpkins	1		25			
Potatoes		13				
Radishes	1		100			
Rhubarb	1		125			
Salsify	1		50			
Squash	1	3–4		25	1	
Spinach	1	10–12	100		1	
Tomatoes	1					3000–4000
Turnips	1	1–2	200		1	

For those vegetables of which only a small quantity is grown the packets will be ample, most packets giving from one to two hundred plants, when started in the hotbed.

CHAPTER XIII

SWEET, POT AND MEDICINAL HERBS

ARE a very welcome addition to the kitchen garden, giving just the often needed touch to the achievement of a successful dish, a touch that will change an everyday vegetable or meat course to something unusual and fancy in cuisine, and with no trouble or added expense to the cook—just a little pinch of this or that, and what a difference it makes! In most households sage is depended on for the flavoring of poultry dressing, sausage and the like, in spite of the fact that it may be anything but pleasing to some member of the family or the welcome guest; so accustomed are we to its use that substitution is scarcely thought of, and yet a very pleasing one is found in summer savory, which most people like better than sage, once its acquaintance is made. Coriander and caraway seeds are

used in bread, cake and cookies, but just a touch of caraway is a very piquant addition to salads. Tarragon is used for making tarragon vinegar —the leaves being steeped in pale cider or white wine vinegar until the flavor is extracted and then used in the concoction of salad dressing. Dill is used principally for making dill pickles, the leaves being laid alternately with the pickles when laid down. Sweet fennel is used for salads and soups and also for fish sauce.

If one has a strip of land at one side of the garden that is not needed, and can be conveniently skipped in the plowing, that will be the place for the herb bed. The soil should be rich and mellow and contain a fair proportion of humus. A poor strip of land may be built up by adding to it from season to season the old manure from the hotbed; this is nearly reduced to humus and the action of the elements will soon complete its transformation.

As many of the herbs are perennial it is best that the bed should be a permanent one, not subject to annual disturbance. It should be long,

rather than wide, so that the herbs may be gathered without walking on the bed; three feet is a good width as that can be reached across fairly well. As the amount of any one herb used in the average family will be small it is not necessary that they be set in regular rows; they may rather be started in rows, for convenience in planting and identifying when up and then the fine, vigorous plants set in clumps in the border, or in colonies of sorts. The leaves of the various plants are the part used and they should be cut or gathered on a bright, clear day just as the plants are coming into bloom, tied in bunches and hung up in a dry place, an attic with open windows, or a shed, or spread out on racks or a floor, anywhere where they will dry quickly so as to retain all their flavor. When thoroughly dry the leaves should be stripped from the stems and packed in bags or boxes for use.

The annual varieties are cultivated the same as the perennials but if one prefers these may occupy a row through the garden where they can have the cultivation accorded the other vege-

tables. The following list is quite complete and will indicate the various uses for which each is suitable.

PERENNIAL HERBS

Balm. Lemon-scented and used for making balm tea.

Catnip. Beloved of cats and useful in colic of infants.

Fennel, Sweet. Used in salads and soups.

Horehound. Very useful in coughs and bronchial colds, made into syrup or candy, with sugar.

Lavender. For perfuming linen. Not hardy and should be protected in winter.

Mint. For mint sauces.

Pennyroyal. Used medicinally, and for seasoning puddings and various dishes.

Peppermint. For flavoring and in candy.

Rosemary. For flavoring. ("Here's Rosemary, that's for remembrance.")

Rue. For roup in fowls and for medicinal purposes.

Sage. Seasoning for sausage, poultry dressing and the like.

Savory, summer. Used in place of sage and as flavoring with string beans.

Savory, winter. Used the same as summer savory.

Sweet Marjoram. Used green in summer and dried in winter.

Tansy. For medicinal purposes.

Thyme, broad-leaved English. For seasoning and poultry stuffing; also a tea for nervous headache.

ANNUAL HERBS

Anise. For garnishing and flavoring and in making cordials.

Basil, sweet. The stems and seeds are used in soups and sauces.

Bene. Used medicinally—the leaves in water, beneficial in cases of dysentery.

Borage. Excellent for bees. Leaves used in salads, the flowers in cooling drinks.

Caraway. The seed used in bread, cakes, cookies and salads.

Chamomile. Medicinal. Prescribed by physicians as an emetic and vermifuge.

Coriander. Seeds aromatic. Used as a stomachic.

Cumin. As food for pigeons.

Dill. In making dill pickles.

Pimpinella. The young leaves, used as salad, have the flavor of cucumbers.

Saffron. Used for flavoring and coloring.

Tarragon. For flavoring and in salads. Does not come from seed but plants must be purchased.

Tagetes. This possesses in its green parts almost the true tarragon flavor.

Thyme. French Summer. Used for seasoning.

Waldmeister. Used in May wine and also for scenting clothes.

CHAPTER XIV

PLANT ENEMIES AND INSECTICIDES

THE well-tended garden does not suffer materially from inroads of insect pests especially in favorable seasons; cool, damp weather, and hot, muggy weather are conducive to fungoid diseases which sap the strength of the plants and make them less resistant to any kind of assaults, whether of insects or disease, but with normal weather and bright dry air a part of each day at least, little trouble should be experienced from insect pests; especially should this be the case if precautionary work has been done the previous fall in the way of gathering up and burning all rubbish that can harbor insects or disease and especially if the precaution is taken to fall plough the garden, leaving the soil in the rough furrow over winter. This is especially good practice when there has been trouble with

insect pests, especially cutworms, root lice, tomato worms—the pupae of which winter in the ground and if turned up by the plough will be destroyed, radish and cabbage maggot and the like.

Even though the past season has been practically free from trouble of this sort the intelligent gardener will recognize the possibility of trouble and in time of peace will prepare for war by supplying himself with the more common and useful varieties of insecticides. It is not desirable that the list should include everything in the bug pharmacopæia; a few standard remedies faithfully and intelligently used are far better than an embarrassing assortment that leaves one undecided as to which is best and often results in half-hearted use of first one and then the other, with lax intervals which give the enemy time to recuperate and multiply.

It is best in deciding upon the insecticides and fungicides to be used to have a clear classification in mind of the several kinds of insect to be exterminated as one form of poison may not be suited to all forms of insect life: for instance, in-

sects which chew or eat the leaves of the plants to which they are addicted, as the potato beetle, caterpillar and the like, can most readily be destroyed by poison applied to the foliage; insects which do not eat the vegetation on the surface, but puncture it and drain away by suction the juices of the plant, like the aphis and other plant lice, will not be injured by surface poison, but must be destroyed by the contact of corrosive poison with their bodies, or with hot water, which is one of the best insecticides known, not only destroying all insect life with which it comes in contact, but cleansing and strengthening the plants. It should be used as a spray at about a hundred and forty degrees, taking pains to reach the underside of the leaves as well as the upper surface, and as it can be used when the fruit is in any stage of growth its advantage is obvious.

For the eating or chewing insects and beetles there are several reliable poisons on the market, all ready for use, needing only to be mixed with a definite bulk of water, flour or lime, according as the poison is to be used as a dust or a spray.

ARSENATE OF LEAD

Used for all chewing insects that attack foliage and fruit trees; will not wash off nor burn the foliage. Use two or three pounds to fifty gallons of water as a spray. Price about forty-five cents a pound.

ARSENATE OF ZINC

A quick-acting adhesive insecticide for potato bugs, rose beetles and vegetables that have not headed sufficiently to be injurious if touched with the poison. Forty-five cents per pound.

BUG DEATH

Used instead of Paris green for eating insects on potatoes, squashes, melons, egg-plants, cucumbers. Twenty-five cents a pound; directions accompany it.

PARIS GREEN

For all chewing insects. As a dust use one part of the poison to one hundred parts plaster, or flour; as a spray, one pound Paris green to

one hundred and fifty to three hundred gallons of water according to the tenderness of the foliage. Sixty-five cents per pound.

PYROX

For eating insects, fungus growth, blight and rot. Adheres to foliage. One pound to six gallons of water. Forty cents per pound.

SLUG SHOT

For potato bugs, tomato and cabbage worms, lice aphis and worms—use as dust with blow gun. Twenty cents a pound.

For fungoid diseases, blight and rot the various Bordeaux mixtures, single and combined with the arsenates so as to take the place of a separate poison for chewing insects, are suggested.

BORDEAUX MIXTURE

The standard remedy against fungus, rust and rot. Five ounces to one gallon of water is standard strength. Spray at intervals until fruits sets, for potatoes till danger of late blight is passed. Thirty-five cents a pound.

BORDEAUX-ARSENATE OF LEAD

A combined fungicide and insecticide for potatoes, melons, cucumbers and squash. Three ounces to one gallon of water. Spray once a week or every ten days. Forty cents per pound.

KEROSENE EMULSION

For all soft-bodied, sucking insects, especially aphis and lice. One pound of paste to ten gallons of water. Paste, thirty cents a pound.

DIRECTIONS FOR PREPARING
KEROSENE EMULSION

Dissolve one-half pound of soap in one gallon of boiling water, add two gallons of kerosene, and force through a spray pump again and again until an emulsion is formed. Dilute from ten to twenty-five times before applying. Use rain-water for making solution.

BORDEAUX-ARSENATE OF LEAD

One pound of arsenate of lead with fifty gallons of Bordeaux mixture for all eating insects and fungoid diseases.

BORDEAUX MIXTURE

Dissolve six pounds of copper sulphate by hanging it in a bag of coarse cloth in an earthen or wooden vessel containing four to six gallons of water, and dilute with twenty-five gallons of water. Slake four pounds of lime, diluting to twenty-five gallons and mix by pouring the two solutions into a third vessel. This is of such universal use that the large quantity will not be excessive, especially when combined with the arsenical preparations.

Vegetables and Insects and Diseases Attacking Them

ASPARAGUS

Keep the beds closely cut in spring and as soon as the shoots are allowed to grow spray with Bordeaux-arsenate of lead mixture.

BEANS-ANTHRACNOSE

Spray with Bordeaux mixture when an inch or two high and repeat as necessary.

BEAN BEETLE

Spray with kerosene emulsion, being sure that it reaches every part of the under side of the leaves.

BEAN WEEVIL

Fumigate the seed before planting with carbon-bisulphide, in a closed vessel for twenty-four hours or with formaldehyde, using one teaspoonful to a pint of water and wetting the seed and covering close a few hours.

FLEA BEETLE

Spray with arsenate of lead or Bordeaux-arsenate mixture.

BEET-LEAF SPOT

Spray with Bordeaux mixture and repeat once in two weeks but the leaves must not be used for greens after spraying begins.

CABBAGE AND CAULIFLOWER

Aphis: spray with kerosene emulsion and repeat as needful until the heads are nearly grown.

CABBAGE WORM

Spray with poisoned resin-lime mixture if the plants are young; after heads have formed use kerosene emulsion or hot water, preferably the latter.

CABBAGE ROOT MAGGOT

Protect the plants with disks of tar paper and wet the soil with Paris green solution or emulsion composed of one pound of soap, one gallon of boiling water and one pint of crude carbolic acid diluted with forty parts of water, using sufficient to soak the soil several inches.

CELERY BLIGHT

Spray with Bordeaux mixture once in two weeks, until plants are half grown.

CUCUMBERS

For the striped beetle, use tobacco dust about the hills. Spray plants and ground with kerosene emulsion. Wrap rags saturated with kerosene about sticks and stick in center of hills to repel bugs with the odor. Better still, protect

hills with frames of wire screening or mosquito netting. Spray with Bordeaux-arsenate of lead every two weeks.

SQUASH BUG

Hand pick the first bugs that appear and find and destroy all eggs. Dust with Bug Death. Protect with wire cloth.

BLIGHT

Leaves become spotted or covered with down. Spray every two weeks with Bordeaux mixture.

ONIONS

Blight.—Spray every ten days with two-thirds strength Bordeaux mixture. Root lice.—Open trench along side the plants and apply salt freely.

PEAS—APHIS

Spray with kerosene emulsion until pods are filling; then spray with hot water.

PEAS—MILDEW

Spray with Bordeaux mixture containing resin wash to make it stick, or with Pyrox.

POTATO—COLORADO BEETLE

Hand pick to destroy eggs. If young appear spray or dust with Paris green or Pyrox and repeat as often as necessary.

FLEA BEETLE

Keep plants well covered with Bordeaux mixture or Pyrox.

SCAB

Do not plant on freshly manured land, should be manured in fall or February at latest. Soak seed in formaldehyde before planting and dip each piece in sulphur.

SQUASH BORER

Slit infested stem and destroy worm and cover injured branch with earth or stone.

SQUASH BUGS

Use tobacco stems freely about hills. Spray with hot water very early in morning.

TOMATO

For leaf-blight.—Spray with Bordeaux mixture every ten days.

TOMATO WORMS

Pick worms, gather eggs and spray with Paris green or Pyrox. Do not use poison after the fruit is set. Fall-plough the tomato lot to rid the soil of the chrysalids of the worm.

CAUTION

In nearly all cases of surface infestation of plants, the insects can be destroyed with clear hot water, hot soapsuds of either whale oil soap or ivory soap or kerosene emulsion and this should be the first resort, using poison solutions only when the former fail to give relief.

Bordeaux mixture is so generally indicated for all diseases of foliage and kerosene for so large a number of insects that it pays to prepare these at home in the large quantities and have them always on hand. The kerosene sometimes "goes back" and needs to be forced with the pump into a fresh emulsion.

CHAPTER XV

WINTER STORAGE

IT is in the late days of fall that one begins to realize substantially on the summer's investment of seed, time and labor in the garden. Previous to this one has watched the maturing of the summer vegetables with an eye to their immediate use; now one sees before one rich stores of food that shall tide one safely through many lean days when the price of food goes soaring and the visible supply temporarily disappears. If one is putting into cellar storage an abundance of such sugar producing vegetables as beets, squashes, carrots, parsnips and the like one need not fear any injury to the health of the family from a lack of sugar if these are used freely, for they will convert themselves into the needed sweet and although they may not be quite so palatable as cake and candy will supply their place in the economy of the physical system.

Winter Storage

Most winter vegetables need to be kept in cold storage, not in a warm, dry place; for this reason a furnace-heated cellar is not satisfactory, but an adjoining room that is connected by a door that can be opened to admit warm air in a severe spell of winter weather is desirable. For certain roots that are not injured by a low temperature, or even slight freezing, an earth cellar is satisfactory. A cellar of this sort usually admits of piling vegetables on the floor or in pens on the floor and throwing dirt over them to exclude the air and prevent evaporation, and as the vegetables are used the surplus earth can be thrown out on the floor and the labor of storing is much lessened, for it is no small task to carry heavy baskets of earth into the vegetable cellar and to remove it again in the spring. If a small room can be arranged adjoining the cellar proper and bins divided off around the sides and the earth allowed to remain from year to year the task of winter storage will be slight. Beets, carrots, turnips, cabbage, parsnips, salsify, celery, all these things belong in the earth cellar and apples,

too, may be stored in baskets, barrels or boxes here and will not be injured by light freezing, as it is heat and dry atmosphere that most militate against the successful keeping of winter apples.

A few other vegetables call for dry, rather warm quarters, like the winter squash, onion, sweet and Irish potato, but good ventilation is indispensable for all. The chief merit of the root-cellar lies in the fact that it can be well ventilated, the windows being opened at times when it would be untenable to open them in rooms devoted to the storage of canned fruit and like perishable things. The windows in the vegetable cellar should not be permanently closed until severe winter weather, though they may be closed during storms and sharp falls of temperature. I have found that the losses from frost were less in direct proportion to the amount of fresh air admitted and in some mild winters the windows have remained open the entire time, the covering of earth being sufficient to preserve the vegetables in excellent shape until spring. Even when such things as are usually stored in the

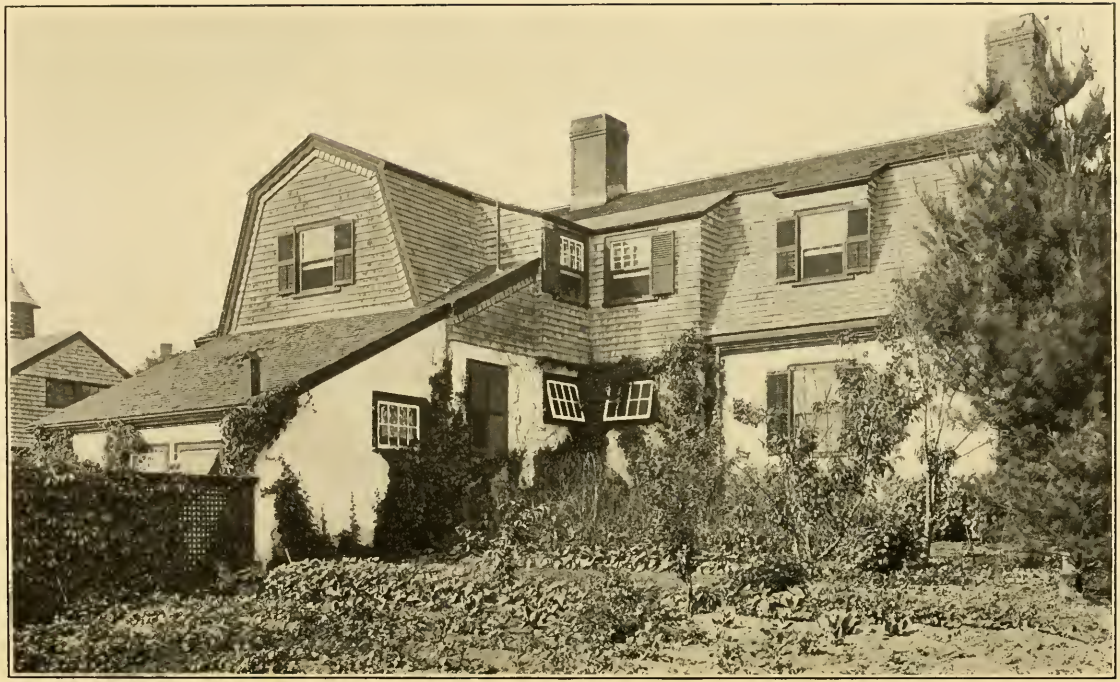
earth cellar are frozen stiff, they will be quite usable if thawed out in cold water. The water will draw the ice to the surface and it should be allowed to thaw, when the vegetables will be found entirely usable, but any vegetable that thaws out soft is beyond redemption and should at once be discarded. Also any vegetables found decaying in the cellar should at once be removed and the cause also removed. Usually it will be found that too much heat and too little fresh air are the trouble; opening a window will rectify both troubles.

POTATOES

Being our most important winter vegetables should be stored with great care. Practically their storage begins in the field when they are dug; they should be dug on a bright, dry day, preferably in the morning that the tubers should have time to dry off if at all damp, before being picked up and carried in. It will pay to sort in the field as they are gathered, throwing the culls —small potatoes and any that have been injured

in digging—by themselves. These will be of value for feeding poultry, rabbits, goats and any stock on the place; they are excellent for horses, keeping the skin and coat in fine shape. Potatoes may lie on the ground in the sun long enough to dry off thoroughly, but not longer; left exposed to the light they will turn green and this discoloration is poisonous. They should be turned over once so that the under side of the potatoes may dry equally.

The best equipment for storing potatoes in the cellar consists of long bins divided into compartments that will hold from one to two bushels; these bins should have holes bored in the bottom for ventilation and they should be raised somewhat from the floor. Never store potatoes directly on the floor as this is the coldest part of the cellar and also the dampest; heat rises and cold falls so what heat there may be in the cellar will circulate beneath the bins and if, for any reason, it is necessary to supply artificial heat in the way of oil-stoves or lamps during a spell of zero



The advantage of having your garden near the house is clearly shown here

weather the heat can get under the potatoes and raise the temperature in the bottom of the bins as well as on the top.

When the potatoes are in the bins they must be covered to exclude light and prevent their turning green. The potatoes should be examined occasionally during winter to be sure that none are decaying or being affected by frost. As a general thing potatoes are not frosted if the skin crackles when the finger nail is pressed into it, but slight touches of frost sometimes do not affect the crispness of the skin but is shown by the potatoes becoming wet after lying for a while in a warm room, or by a sweetish taste when cooked. At that stage they are not injured for food but are less palatable and are liable to develop a queer fungus blight in the center. As spring approaches the potatoes will begin growth at the eyes-sprout, as it is called, and should be looked over and all growth rubbed off. This will probably have to be done more than once as the season advances.

SWEET POTATOES

Are far more difficult to carry through the winter than the Irish potatoes. They require more warmth and a dryer atmosphere, and should be stored in boxes of dry sand and set on some support away from the floor. The furnace cellar, if not too warm is the best place for them and it is well to use them freely so as to lessen the loss from decay as much as possible.

WINTER ONIONS

Should be stored in a dry place, a little above freezing. Slight frost does not injure onions, but repeated freezing and thawing does, while too much heat will start them to growing. An upstairs room that receives sufficient heat to keep it from freezing will do nicely and it is a good plan to use the best onions first so that those which are unfit for use towards spring will not be so much of a loss; however, as these onions make the very best of green onions they are by no means a total loss, but the small and inferior ones will do quite as well for this purpose, for it

is the live germ only that is important, all the onion body is formed anew. Where there is a hanging shelf in a cellar that is dry and warm the onions can often be wintered there successfully.

WINTER SQUASH

Require a rather warm and dry situation; the cellar rarely affords the right conditions for wintering them successfully. An upstairs room or garret where a chimney passes through is often just the thing for them as they may be piled in a heap near the chimney, with layers of excelsior or straw between, and protected with blankets or quilts and so pass the winter in good condition. From such a storage I have taken perfectly sound, dry Hubbards in mid-June and March squash are by no means a rarity.

BEETS

May be dug any time before the ground freezes up; the shorter time any vegetable has to remain in cold storage the better for it, so if not brought in until about Thanksgiving the

delay is all to the good. If the beets are to be stored in a root cellar covered with earth it is not material whether they are topped or not. I have sometimes thought that they kept rather better if the tops were allowed to remain; certainly there is, then, no loss from bleeding, and if piled in heaps with the tops all one way overlapping each other, but the tops free, it is far easier to find and remove them when wanted. Slight freezing does not injure beets if thawed out in cold water, but severe freezing does, so that sufficient earth should be used to cover them and the earth may be protected with blankets if necessary. If no root cellar is available the beets should be topped and packed with earth in bins or boxes in the vegetable cellar. If necessary to store in furnace cellar place as far from the furnace as possible. Where no other place for storage is available running a partition across one end or corner of the cellar will provide a place that will keep most vegetables in good shape and the expense will be covered by the saving in stock. The various wall boards advertised are excellent material with which to

construct these little storage places and any handy man, or woman, for that matter, can put up something that will answer the purpose by the aid of a hammer and saw, a sheet or two of board and a few pieces of two-by-four to nail to.

CABBAGE

Are best stored in the root cellar, they may be pulled and stood up in the corner of the cellar and the roots buried in somewhat damp earth or they may be cut, the roughest leaves trimmed and the heads buried in earth, setting them upside down so that the earth will not work inside the leaves; handled in this way they should come out sound and good in spring. Wrapping in newspapers, where the supply is limited is sometimes successful, the main thing being to protect from the air and too great cold and to prevent the spread of decay which may attack individual heads.

CAULIFLOWER

May be pulled at the approach of severe weather, the lower leaves removed and the plants

put root down, buried in soil, in boxes or pens in the root cellar and will be available for some time, but do not keep through the winter like cabbage.

CELERY

Should be dug, with the roots intact and placed roots down in boxes of wet soil or sand in the dark cellar, packing the plants close together to exclude air. If the cellar is necessarily light, the plants should be shaded or a corner of the cellar may be enclosed to afford protection from light. A movable partition made from wall board is a very handy thing to have in the root cellar as it makes possible the providing of special conditions as needed.

PARSNIPS

Although parsnips are better for remaining in the ground until spring a supply for winter use should be dug in the fall, topped and buried in boxes of sand or earth in the cellar. This may be done in either the root or the kitchen cellar,

as freezing does not injure the parsnip providing they thaw out in the ground or in water.

SALSIFY

Requires the same treatment as parsnips—leaving the main crop in the ground until spring but bringing in a supply for winter use. The main thing in the storing of all root vegetables is to prevent wilting more than freezing. Vegetables stored under any conditions, without the protective covering of earth to exclude air, soon become soft and wilted and unfit for food.

TURNIPS

Are especially sensitive to a dry atmosphere and must always be buried in sand or earth if they are to retain their crispness and flavor. They should not be dug until a touch of frost has sweetened them, then they should be topped, reserving the tops for the pig or rabbits and the roots stored as directed.

CHAPTER XVI

CANNING THE GARDEN SURPLUS FOR WINTER USE

THE fullest measure of benefit from the garden has not been obtained unless one has preserved for future use the more succulent forms of vegetables that are not susceptible to preservation through winter in the usual form of cold storage.

Those early vegetables which are so keen an incentive to the planting of a garden—young beets, spinach greens, string beans, limas, peas, tomatoes and the like must be preserved in a cooked form, hermetically sealed from the air to preserve them from spoiling. This the commercial canners have done for years and we have been content to let them do this work for us at a price that has added materially to the high cost of living, while our own garden product, often of a far better quality, has gone to waste. Market gar-

deners who supply the canneries grow vegetables with a keen eye to their productiveness. If one vegetable will produce a half or a third more to an acre than another variety somewhat better, it is only human to grow that one, but the private garden is not, as a rule, grown with a sole idea of profit; it is quality and the enjoyment of the product that is looked for and only those vegetables that will produce a high grade product will be grown.

The home canning of vegetables has been neglected owing to the uncertainty of results. Occasionally one found a housekeeper who could can corn successfully, but the results usually were unsatisfactory, all this, however, is changed since the government experts of the Agricultural Department have, by careful experiments along the lines of all sorts of vegetable products, worked out canning schedules that only require careful following to insure success.

The government bulletins give explicit instructions as to necessary equipment, method of handling each separate vegetable and try, in all

possible ways, to insure success for the worker.

At first glance the amount of equipment seems burdensome and some of the requirements unnecessary, but I have found that it is not safe to slight any one of them, but that there are short cuts in the work that materially lessen the labor. It will not always be convenient to supply oneself with a canning outfit involving much expense; especially will this be the case in the small family where only a moderate amount of canning is to be done, though the regular canning outfits greatly simplify and ease up the work. A home-made outfit will, however, take care of all the surplus from the small home garden, especially where there are but two or three cans to be handled at one time. There are always vegetables that mature their fruits sparingly—too many for immediate use, but not enough to sell. However, in order that the vines or plants should continue to bear heavily, all such products as string and lima beans, tomatoes, green corn and the like should be gathered as each reaches its most perfect stage. This often involves some waste unless it can be

utilized in some way and here is where the canning is effective, as the continual canning of only one or two cans at a time results in the course of a summer in a well-filled cupboard that will insure one against any serious food shortage that may arise during the winter.

There are five types of canning outfits: *Home-made outfits,* constructed of such utensils as wash boilers, tin pails, milk cans, metal wash tubs and lard pails. The lard pails are especially usable and cream pails are excellent where only a few cans are to be processed at once; even a teakettle can be made to do duty where only one or two pint cans are to be cooked. Any metal vessel that will allow the water to come at least an inch above the tops of the cans will do.

Hot-Water-Bath Commercial Outfits are constructed usually for outdoor work, with a sterilizing vat, lifting-trays, firebox, and smokepipe, combined in one piece. They are light and convenient. They may be moved about as desired, even carried to the orchard or garden where apples and corn are to be canned in quantity, but

are more adapted to clubs and neighborhood cooperative work than to the needs of a small family.

Water-Seal Outfits consist of a double-walled bath and cover which projects down into the water between the outer and inner walls, thus making three metal walls and two water-jackets between the sterilizing vat and the outside of the canner. A high temperature can be maintained more uniformly than with the hot-water-bath outfit, since the escape of steam is prevented and a slight steam pressure is maintained.

Steam-Pressure Outfits are made to carry from five to thirty pounds' pressure and are equipped with steam-tight sterilizer, lifting crate, thermometer, or pressure gauge, safety valve and steam petcock; they are, of course, the most perfect equipment and economical of labor and fuel.

Aluminum Pressure Cookers are combination outfits for cooking and canning and have the advantage of being useful all the year around. They are light in construction, economical of heat and will carry as high as thirty pounds steam

pressure; they are equipped the same as steam-pressure outfits.

The purpose of this chapter, however, is not to go into the methods necessary for caring for large quantities of vegetables at one time nor the expenditure of any considerable sum in effecting the conservation of garden food; rather it is intended to help the housewife to save, cheaply and easily, her garden surplus as it accumulates day by day. Fuller details than are in the scope of this chapter can be gained through the canning and food preservation bulletins sent out by the Department of Agriculture at Washington and by the various states.

The same general principles pertain to all fruits and vegetables to be canned, only the time of processing varying in individual cases.

The vegetables to be canned should always be perfect of their kind and absolutely fresh; indeed, it is better to have everything ready for canning before they are gathered, then dress, sterilize and blanch and get into the cans as rapidly as possible. The Cold Pack Process calls for, first, the steril-

izing of the product by plunging for five or six minutes in boiling water. This is best accomplished by either a wire basket, lined with cheesecloth, if the vegetable is small, like peas or string beans, or alone for such things as tomatoes, peppers or corn on cob, or by a large piece of cheesecloth a yard square at least. After blanching the vegetables must be plunged at once in cold water, to set the color and firm the surface. They are then packed at once in the cans, a teaspoon of salt added to each quart and the can filled with boiling water, rubber and top put in place, but not screwed tight, and the cans placed in the container, the water of which must come at least an inch above the top of the cans, and cooked, or processed, for the time indicated for each product. Before using the cans they should be sterilized by boiling, or at least thoroughly heating to obviate danger of cracking when plunged into the hot container.

The government directions state quite emphatically that the cans should be boiled but after putting up several hundred cans of vegetables of

all sorts, without this precaution, all of which kept perfectly, I have come to the conclusion that it cuts out a lot of unnecessary time and equipment, for the necessity of having one large container to sterilize cans, another to sterilize the vegetables, a kettle of boiling water to fill up the cans, and the container for processing, entails a large amount of working space and an unnecessary amount of fuel. If any short cuts can be achieved it is certainly that much to the good, so I have been able to shorten the work so that much of my own canning has been done on a one-burner oil stove with one vessel of boiling water for processing, blanching, sterilizing jars, etc., and one pail of cold water for blanching and a good, big table for handling the vegetables. In handling the work I have everything ready before gathering the vegetables. For a few pint or quart cans I use a cream-pail which will hold four pints or three quarts. In this I have boiling plenty of water. I place the cans in a pan adding a little hot water, turning them carefully until warm through and then fill up and cover. Put

the vegetables in the wire basket or cheese-cloth, dip them in the boiling water the specified time, plunge into cold water for an instant, take out cans, one at a time, being careful not to touch the tops with the hands, place rubbers, first dipped in the hot water, fill cans with vegetables, with a teaspoon of salt for the quart size, half a teaspoonful for pints, fill with the boiling water from the container, place caps—which have also been sterilized—on, screw down, but not tight and place in container, being sure that there is abundance of water, for the long cooking lowers the water materially and unless there is another kettle of boiling water available for filling up the water may go below the top of the can and the result will be blown out rubbers which will have to be replaced. This is one of the serious handicaps of canning by the cold-pack method. The remedy, however, is simple. Remove the can, remove the cap and put a fresh rubber in place, replace the cap and plunge again in the container and boil for five minutes longer. The changing of the rubber should be done as quickly as possible and

care should be taken to avoid touching the edge of the top of the can or the inside of the cap while doing so. If there is any delay in replacing the rubber it will be better to boil ten instead of five minutes.

When the canning is done on the kitchen range or on a three-burner gas or oil stove it will be better to fill the cans with water from the tea-kettle and to sterilize the cans in a dishpan, allowing them to heat on the stove until required, but excellent results will follow the shorter method. Pint cans are most desirable for such vegetables as string beans, peas, lima beans and the like—things which are used alone and not combined with other foods as tomatoes and corn. Pint cans, however, have about disappeared from the market and even quarts have been at a premium. And one should take unusual care in cleansing cans and tops as soon as emptied, and placing them in a dry place until wanted for another year's canning. A cellar is not a suitable place to store cans, it is far too damp and conducive to mould. If cans are properly cleansed and

dried and the tops adjusted and stored in a dry upstairs closet they will need far less sterilizing when required for use.

Often in canning vegetables it will be found that there is an uneven quantity—that is, there will be a quantity of one kind left after filling the cans, but not enough for another full can; if desired this can be put in a can and cooked with the rest for the family dinner, or it may be put away with the canned goods, for I have found the partially filled cans keep quite as well as the full ones and there are often times when the lesser quantity will be all that is needed for the meal, or it may be just enough for a salad or to combine with some other vegetable in a soup or entrée.

In placing the cans in the container there must always be a rack of some sort to keep the cans from direct contact with the bottom of the vessel. This should, if possible, be in the form of a wire rack. The wire trivets to set hot dishes on, which may be obtained at the ten cent counter of any department store, are excellent for use in cream cans; they just fill the bottom and as

they rest on little half-inch feet they allow the water to circulate freely beneath the cans, which is very important and failure to provide for which is sometimes a cause of blown out rubbers. For canning with large cans—quarts and two quarts —the twenty-five pound lard-cans are excellent. They are tall enough to insure plenty of water over the top of the cans and will accommodate four or five two quart and five or six one quart cans and seven pints, though some recommend placing two tiers of pints in the container, but I have always thought that rather risky. The lard-cans are very light to handle and the lids fit closely, retaining the steam. Whenever there is an imperfect closing of the lid it will be well to place a towel over the top of the can before adjusting the lid to insure the retention of the steam. If this is done the water will not evaporate so rapidly.

The following schedule of time for processing vegetables is that suggested by the Department of Agriculture and is authoritative. In every instance the time for processing must be counted

from the time the water commences to boil after the cans are put in the container, and the boiling must be continuous.

CANNING DIRECTIONS FOR VEGETABLES

Asparagus—The green grasses grown in the home garden do not, as a rule, can well. They are too tender and delicate and break down under the long cooking suggested. It might be well to experiment with this, cooking only a short time and if the asparagus keeps two weeks or more, open a can and test the flavor and if found acceptable more can be canned. It requires the tough white asparagus like the Bonvillet or Argenteuil for canning and those are the kinds used in commercial canning. Possibly if the green grasses were cut below the ground as is done with the French grasses it would stand up better under cooking. The directions follow.

Asparagus—Gather and clean at once, scraping off the scales on the sides, and cut to equal length. It takes about three bunches for a pint can as they shrink in blanching. Blanch five

minutes, plunge at once in cold water. Pack in cans, sliding the stalks in carefully, butts down, fill with hot water, add one teaspoonful of salt to a quart, place rubber and cap in position but do not screw down tight. Place in container as fast as filled and boil 90 minutes. Remove and stand can on cap to cool.

Beets—Select young beets about an inch and a quarter in diameter as the small beets retain their color better than larger ones. About an inch of the top may be left on. Wash very carefully but do not break the skin or remove the tap-root. Blanch four to five minutes, plunge at once in cold water. Remove skins by slipping them off with the hand, avoid the use of knife if possible and pack at once in cans. Fill with hot water adding one teaspoonful of salt to the can and place rubber and cap in place, place in container and boil 90 minutes.

Beans, String—String or hull, blanch in hot water from five to ten minutes, or cut in half inch lengths and steam for five minutes—for small quantities a wire flour sieve over a tea kettle will

answer admirably—dip quickly in cold water, pack in cans. Fill with hot water, adding one teaspoonful of salt to the quart. Place rubbers and caps in position, cook for 120 minutes, remove and invert to cool and test the joint.

Beans, Lima—Shell and plunge in boiling water for five to ten minutes, plunge immediately in cold water. Pack at once in cans, handling very carefully. Put rubbers and cap in position but not tight. Place in container and cook 180 minutes.

Cauliflower—Lay the heads in salted water half an hour to free from any insects that may have lodgment in the head. Break the head into convenient sized pieces and blanch in boiling water five minutes, plunge at once into cold water, pack in cans, fill with boiling water, add one teaspoonful of salt to the quart and place rubber and cap in position but not tight, place in container and cook 60 minutes. This is the government time but I have found it overcooks the cauliflower.

Corn—This seems to give home canners more

trouble than any other vegetable. This is probably caused by delay in the operation. The canning of corn involves more labor than any other vegetable and it is difficult for one person alone to handle it successfully. Two working together, one cutting the corn from the ear and the other packing it in the can, will insure a better result. The corn to be canned should be of the sweetest variety—Golden Bantam or Bantam Evergreen being excellent sorts. It should be picked at just the right stage—between the milk and the dough stage, or when the milk that flows when the grain is broken with the thumb nail looks milky and not watery. It is better to do one can at a time, blanching and dipping in cold water and packing the corn in the can, allowing a half inch at the top for the swelling of the corn, adding a teaspoonful of sugar and one of salt for every quart and filling with hot water, capping and placing in the container before going on with the next canful. The first can put in will not be injured by the extra cooking. Waterlogged or soaked corn is an indication of slowness in

packing. If it is desired to can corn on the ear, blanch, plunge into cold water and pack at once in cans large enough to hold several ears. The two quart economy jars are excellent for canning corn on the ears. Whole corn is a little difficult to pack economically, but it can be packed closely if the jar is laid on the side when packing and the corn slid in, the first row being put in butt down and the second tip down. Add a tablespoonful of sugar to each quart can and do not fill more than one-third full with boiling water. When the can is filled with water the flavor of the corn is impaired, and it is more or less water-soaked. The big Stowell's Evergreen Corn is beautiful when canned whole; indeed so fine is its appearance that it is almost worth while to can it just for its appearance on the shelves of the fruit cupboard. Dipping the tops of the cans in paraffin aids in preserving the contents. When heating for use in winter, place in oven instead of hot water as this will render it more dry.

Okra—Gather the pods while still tender, wipe

clean, plunge into boiling water five minutes, plunge immediately in cold water, remove and cut into half-inch rings. Pack in can, adding one teaspoonful of salt to the quart. Fill with boiling water, place rubber and cap in position, tighten and put at once in container and cook 120 minutes. Remove, tighten cap and reverse to cool and test seal.

Peas—Should always be freshly gathered, shell and steam over boiling water for ten minutes, blanch and pack at once into cans, adding one teaspoon of salt and one of sugar to each quart. Put rubber and cap in position, but do not tighten. Place in container and sterilize 180 minutes. Peas should be very carefully handled. A cloudy appearance of the water is an indication of rough handling or broken peas.

Tomatoes—Scald until skin loosens sufficiently to remove easily, cold dip, empty the seed cavities and cut in small pieces. Pack at once in cans, pressing the tomato down full. Add one teaspoonful of salt to the quart but no water. Place rubber and cap and put in container and

cook 22 minutes. Remove, reverse to cool and test seal. Tomatoes cooked in the open-pan method so long customary are so satisfactory that it is scarcely worth while to change the method, unless one finds the cold-pack way more convenient and agreeable. If preferred tomatoes may be canned whole or simply cut in two and the seed cavities emptied. Smaller or broken tomatoes may be cooked and passed through a sieve to remove the seeds and the purée thus formed used to fill in between the slices in the can; this makes a very fine product.

It is not advisable to can vegetables that can be stored successfully in cellar or store rooms; such products should not deplete the already scanty store of cans; but in the case of people living in flats or apartments where there are no storage facilities squash and pumpkins for pies may be utilized in this way to advantage.

Squash and Pumpkins—Prepare and cut into convenient sections, blanch three minutes, cold dip. Pack closely in hot jars or cans. Fill with boiling water, add teaspoonful of salt to each

quart. Put rubbers and caps of jars into position but do not tighten. Put in container and sterilize 120 minutes. Remove, tighten caps and reverse to cool and test seal.[1]

Soups—Odds and ends of vegetables that occur during the summer may be utilized for vegetable soups. It often happens that tomatoes are picked by the chickens so that they are unsalable, but otherwise sound, or they may be spotted in a way that does not preclude the use of the uninjured portion; such tomatoes may be used for canning if the injured portion is carefully removed. Okra that is getting too large to be left ungathered, a few string or lima beans, carrots that are crowded—anything in the vegetable line that lends itself to the concoction of a palatable soup may be utilized and so make the garden just that much more remunerative. If possible the amount of tomato should nearly or quite equal that of the other vegetables combined.

[1] Or—cut in large pieces and steam or bake until soft, remove from shell and mash smooth. Fill cans, pressing down evenly with a wooden spoon or potato masher, place rubber and caps and plunge in container for one hour.

The tomatoes should be scalded, cold dipped, the seed cavities emptied and the pulp cooked until it will pass through a wire sieve to free it from the seeds. The other vegetables should be blanched, plunged into cold water and put through the meat chopper and added to the tomato and the cans filled, but no water added, the juice of the vegetables, and especially of the tomato, being sufficient. The following combination makes an excellent soup: When the cans are opened for use in winter beef stock to give the proper consistency should be added, or one bouillon cube to each portion to be served and sufficient water may be substituted or a cream soup may be prepared by using milk and adding rolled crackers.

Vegetable Soup—½ bushel tomatoes, three stalks of celery or one teaspoonful of celery seed, one head cabbage, six carrots, three turnips, six ears corn cut down through each row of kernels and the kernels sliced off the ear, ½ peck string beans, two quarts shelled lima beans, one dozen onions, three red peppers, six salsify roots, one

pint of okra pods (sliced) one cup salt, one tablespoon black pepper.

Prepare tomatoes as suggested above, cut all the other vegetables fine and add to the tomatoes. Separate into two parts. To one part add one cup of rice, cooked till tender, to the remainder an equal amount of cooked barley. Fill in cans and process two hours. Soups can scarcely be cooked too much, as unless the vegetables are thoroughly softened the product is unsatisfactory. The cabbage and turnips may be omitted if their flavor is not liked.

The government bulletins give a number of formulas for soups and camp rations which are worth considering when conserving one's garden supplies, if one already has cans and tops. (The pint cans are best as the soup is in solid form and a pint is sufficient for a family, when reduced with broth, water or milk.) The cost of the soup per can will not exceed two or three cents as against ten for the much smaller cans purchased at the grocery.

Sweet Corn Dried—As corn is more trouble to can than any of the other vegetables and more uncertain in its results, many housekeepers prefer to dry it, and a way that is very highly recommended is as follows: The corn is gathered when still in the milk stage, somewhat younger than for canning. It is necessary for two to handle the product as it must all be finished in one operation—that is, it is a one-day job, and a rather strenuous and busy one, too. As in canning, the corn is blanched, plunged in cold water, the grains scored through the center and sliced from the cob, care being given that no part of the cob is included. It is then placed on plates or tins with a small amount of butter or butter substitute added—just enough to prevent the corn sticking to the plates—and placed in the oven and on top of the stove to dry. It must be stirred almost continuously to prevent burning or sticking. Only as much corn must be prepared at one time as can be accommodated on the stove or in the oven and one person must prepare and cut the corn while the other stirs and dries it. The dry

corn is then stored in paper bags or paper cartons until wanted, and is said to be a very delicious product, much better liked than canned corn.

Bulletins for Drying Fruit and Vegetables are sent out by the Department of Agriculture on request and should be very helpful to the housewife.

CHAPTER XVII

FALL WORK IN THE GARDEN

IF the garden has been well tended during the growing season there will not be much rubbish to clear away and the absence of weeds will make the harvesting of the winter vegetables a pleasure. A bright, sunny day is best for digging all root vegetables, especially potatoes which should be allowed to lie on the ground until dry enough for the dirt to shake off, leaving the tubers clean and sightly.

After frost has killed the vegetables so that no further good will be derived from them they should be pulled and piled in a heap to dry and be burned; especially is this desirable if they have been infested with any disease or insects during summer, but if free from any harmful conditions they should, preferably, be put on the compost heap to add fertility to the coming season's garden.

Wire trellises, poles and wires used for the training of peas, tomatoes, cucumbers and the like should now be removed and stored away for next year. All boxes, boards or sash that can harbor insects or the chrysalids of cabbage or other worms, should be raised, cleaned and removed.

The winter treatment of the garden will depend upon conditions that have existed during summer. If the garden has been free from insects and disease it will have been a good plan to sow the entire area to rye for a cover crop during winter, to be turned under for green manure in the spring. This protects the ground from leaching during winter, especially if the winter should be open, and adds materially to the fertility of the soil, but if there has been trouble with insects and disease it will be better to fall-plough, leaving the ground in furrows so that as many as possible of the chrysalids and larvae of the various plant enemies may be destroyed.

If onion seed has been sown in August for

early spring onions it will be well to give the beds a covering of straw or marsh hay at the approach of cold weather. The rhubarb rows may be banked with coarse manure from the barnyard and the asparagus bed may have the tops removed and the roots protected with manure; this will hasten the production of shoots in the spring and make stronger roots.

If there is a bit of land available for early peas it may be ploughed and the furrows filled with well-rotted manure, each furrow turned over the manure in the next and the rows marked with sticks; in early spring, drills may be opened with the hand cultivators and the seed for the very earliest peas sown.

If the lettuce, carrots, beets, salsify, endive, spinach, parsnips and radishes have proved satisfactory and any of the annual varieties have been allowed to go to seed it will be wise to save the seed for the coming season as the increasing shortage of seeds makes it more or less problematical whether a supply may be forthcoming another season.

Lettuce, endive, spinach, Swiss chard, Chinese cabbage, and radishes seed freely the first year, beets, carrots, salsify, parsnips and turnips the second year and the mature vegetables must be planted in the spring to produce seed. If there are good roots of carrots and beets, these may be stored in sand in the cellar and planted out in the spring when they will bloom and produce seed. The parsnips and salsify left in the ground may be dug in the spring and reset where they are to bloom and a few plants will give sufficient seed for the home garden. The seed from the best tomatoes should have been saved, a few melons, cucumbers and egg-plants allowed to ripen and the finest of the red peppers saved for seed. The sweetest and driest of the winter squash should have its seed set aside for the coming year. Even should there prove to be an abundance of seed this saving will do no harm; the raising of seed of biennial vegetables is interesting and should there be a real scarcity of seed one will be very thankful of the fore-

thought which makes the shortage innocuous as far as one's own garden is concerned and, besides, one may do one's little bit by supplying friends and neighbors.

CHAPTER XVIII

THE ANNUAL GARDEN

FOR the busy woman who has but a modicum of time to spare for the growing of flowers, but is loath to relinquish entirely their cheerful presence about the grounds and house, the annual garden with its wide diversity of color, season and charm affords the greatest possible returns for the outlay required. A few packets of seed, most of which may be purchased for from five to ten cents, will lay the foundation for sheets and sheets of bloom and the labor of planting and caring for them will be less than is required for perennials.

One great advantage in growing annuals is that the beds may be freshly prepared each spring, there is nothing in the way to retard spading—no perennial growths to be carefully worked around, that the roots may not be injured or the new growth, not yet above ground, be destroyed.

It is all straight ahead work, and the first early crop of weeds is completely eliminated, grass eradicated and all is in order for the reception of the plants which may have been started in flats in the house or in a hotbed or cold frame or, in the case of such annuals as do not take kindly to transplanting, in the open ground.

Nor is it necessary in the case of annuals that there should be a regular, formally laid out garden or permanent beds. A border about the base of the house along the fence or walks, will give room for several kinds of flowers, flowers that will be a mass of bloom from early summer until late frost.

A very satisfactory place for annuals I have found is down through the vegetable garden. I like their company while I am at work among the useful but less ornamental vegetables, so always plan to have a row of something mid-way of the garden; usually the row takes the form of tea roses which never do so well for me as in this homely situation. The culture is more thorough than can be given to plants in beds, there is less

crowding, hence fewer insect pests and I always plan to have the adjacent vegetables of as ornamental a character as possible; a fine row of mossy parsley on one side, feathery carrots on the opposite row gives a charming background of green. Lettuce, beets, parsnips, any of the pleasantly leaved greens are attractive companion rows and although the rose is the aristocrat of the garden, objecting decidedly to sharing her bed with less royal plants I have never found that she objects to their presence when they keep to their own allotted row.

This long row through the garden is an excellent place to start seeds of hardy perennials for transplanting into permanent beds the following year, but only for this preliminary growth, for the annual plowing makes their permanent tenancy impracticable, but bedding plants such as dahlias, gladioli, tigridias and the like will be at their best here and in their summer culture have all the characteristics of annuals.

For early blooming it is always worth while to sow the seeds of annuals early in the spring in

flats in the house or in a hotbed or cold frame. Usually one can spare room in the hotbed for a few plats of seeds and these should be sown at the same time the seeds of the vegetables are sown, sowing each separate variety in little plats by itself, separating the plats from each other by narrow strips of wood pressed into the ground, and labelling each plat with the names of seed, date of sowing and, if known, the length of time it takes for the seed to germinate. Annuals, however, germinate more rapidly than perennials, many appearing above ground in from three to five days after sowing, though a few, like the Arctotis Grandis, nicotianas and ricinus, may take from ten to fifteen days. This is where the forethought of labelling the seed plats with date of sowing and period of germination is of practical value—it prevents undue impatience and discouragement when the plants fail to appear as soon as we expect them to; but with a mixed planting of seeds of varying characteristics, there will always be early comers to encourage one and

keep alive faith in the ultimate appearance of the least and last.

Any considerable planting of annuals should include those that will give a long season of bloom for scenic effect, those that will be especially desirable for cut flowers and above all those special flowers which most appeal to our sentiment and are dear to us through associations or suggestions.

For mass planting about the base of buildings or in front of shrubbery there are few plants more effective than the celosias, especially the varieties known as prince's feather; many of the varieties in red and yellow effects are very good and they seem to stand the heat and drought and even the early frosts remarkably well. Usually a spray of the plumey blooms is a whole bouquet in itself. If cut before killing frosts and brought into the house they will retain their freshness for a long time, and potted make excellent fall and early winter plants.

The argemone or prickly poppy is a little known plant of rather recent introduction that

is rather slow in getting started in spring, but once on its way produces a continuous succession of large poppy-like blooms in golden yellow, pale yellow and pure white, the latter especially attractive with its crown of golden stamens. Its chief merit, however, consists in its immunity to frost, continuing in full bloom well into November —a quality shared by few annual flowers. Perhaps as close a companion as can be cited is the tall-growing lupine, a beautiful annual that comes in purest white, rosy mauve, sky blue, purple and scarlet and white and mind not at all the frost of late October and early November. The soft foliage would seem ill suited to cold, but if one looks closely one will notice that the foliage is dry, not succulent like many annuals that succumb readily to the first cold wave. Balsams and portulacca are notable examples of this susceptibility.

The nicotianas are other cold-resisting plants and have the added advantage of self-sowing—not to a troublesome extent but sufficiently to insure a yearly supply of volunteer plants without

thought or trouble on the gardener's part. The nicotiana does not open up well in bright sunshine, but unfolds its snowy cups in late afternoon and on cloudy days, but in shady positions is more generous of its beauty and is lovely when silhouetted against the flaming red of the salvias.

The arctotis grandis is another of the less commonly grown annuals that should be included in one's garden planting. These, too, are sturdy defiers of the frost and exceedingly desirable as cut flowers, remaining in bloom for a week or ten days and should be placed in a sunny position for best effect as they are real sun lovers. Like all the preceding they are of the easiest culture—good garden soil, water if the season is unusually dry, and plenty of room to develop. The distance at which any plant should be set depends, of course, upon its manner of growth, but it is an excellent rule to plant all erect growing plants at least half their height apart. Low-growing and trailing plants, of course, are an exception to the rule, many requiring two or three times their height in inches apart, as the verbena.

Few annuals require staking, notable exceptions being the sultanas, tall anterrhinums, scabiosas, the tall stocks and a few others. When staking is necessary it should be done by as inconspicuous means as possible; bamboo stakes painted green are the neatest and most inconspicuous.

For masses of brilliant color there is nothing to equal the scarlet verbena, the scarlet sage, salvia splendens, the various phlox Drummondii or the dwarf nasturtium, the scarlet or orange zinnias and the marigold, and for sweetness one must have the sweet peas and the stock.

Much is gained by the use of low-growing plants as a border to beds of taller plants. Blue lobelias, dwarf morning glories, English daisies, sweet alyssum, candytuft, all require little root room and add materially to the resulting bloom.

For a screen to mask an undesirable view or object there are several very desirable annuals that are of the easiest culture and of most effective presence. With the stately ricinus all are familiar; less well-known is the tall cleom pungens,

with its curious flowers of pure white and white and rose, the long, curving anthers of which have given it the name of "Spider Flower." It is a beautiful and desirable plant, and should be started in the house or hotbed and transplanted where it is to bloom when the nights are warm, setting the plants two feet apart. The Nicotiana Sylvestris is another stately plant, growing to a height of five or six feet in good soil and, unlike N. affinnis, its snow-white blooms remain open all day and are attractive when grown in the rear of beds of salvias. Like the cleom it requires room to develop. Practically all annuals may be sown in the open ground; the only object in sowing in hotbeds or house and transplanting is to bring them forward early so as to have the longest possible season of bloom.

To speak of asters seems superfluous, as whatever flowers may be absent from the annual garden it is a safe venture to claim that the aster will not be missing; that is quite as it should be; there is really no one flower that so completely meets the requirements of scenic effect and cut

flower work as the asters. In the stronger colors of crimson, purple and blue it is as effective a flower as one could wish to use for mass planting; while for more refined and delicate beauty no one could ask for anything better than the pure white and delicate shell pinks of the Ostrich Feather and Late Branching whites. The Comet asters are very artistic, attractive flowers but, unfortunately, do not stand up under wet weather—a hard rain reducing them to a dismal, raggy condition. Set the wide branching asters at least a foot apart and see that all asters have clean, healthy soil to grow in to avoid the troubles that arise when conditions are unfavorable. A warm, fibrous loam, well enriched with old manure, is best and water should be given freely during dry weather, especially when the buds are forming. The black aster beetle is the only serious foe of the aster and makes its appearance when the flowers are in full bloom, doing an immense amount of damage in a few hours if not destroyed as they eat the petals of the flowers, rendering them very unsightly. The only satisfactory rem-

edy is hand picking in early morning while the beetles are sluggish. If a pan of hot water or water with a little kerosene in it is carried and the beetles dropped into it as gathered it will not be difficult to control them. Spraying with arsenate of lead will kill them if one does not object to the use of poisons on flowers that are to be brought into the house. Paris green can also be used but discolors the flowers, but hand picking has no objectionable features aside from the labor entailed, and that is by no means prohibitive as it takes but a short time to go over a hundred plants.

Try planting a few salvias on the shady side of the house; they will not make as much show during the summer as those grown in the sunlight but will be in full bloom long after those in exposed positions are cut down by frost.

A few very desirable annuals are plants of one florescence and need to have repeated plantings of seed for a continuous bloom. Most conspicuous of this class of plants is the candytuft in white, purple and red and the charming little schizanthus, which should be sown every few

weeks for a succession of blooms. The plants come into bloom in a few weeks from the sowing of seed and are perfect little pyramids of bloom. Sow fresh seed of candytuft when the first sown plants are beginning to form flower buds; used in this way the candytuft furnishes a most useful white for window-boxes and vases, and is unexcelled for edgings of taller plants.

CHAPTER XIX

THE HARDY GARDEN

IS a permanent investment, possible only in the permanent home. It adds dignity and charm attainable from no other form of planting. It is to the outdoor life of the home what the possession of colonial furniture and family heirlooms is to the indoor life, and yet is neither expensive nor tedious in its inception. It may be acquired fully grown, as it were, by an order to the florist for ready grown plants of blossoming size, ready to give seasonal bloom, or it may be developed in a few months, inexpensively and most interestingly, by procuring the seeds of as many desirable varieties of hardy perennials as one has room or inclination for and planting them in the hotbed in early spring, and transplanting into permanent positions when large enough or, better still, by planting the seed in cold frames in

August or early September and growing them on until cold weather when they should be protected for the winter and in the spring planted out where they are to bloom. Every hardy perennial set out in one's garden is an asset that will increase in value each succeeding year. Many have the root formation that admits of divisions—as the Shasta daisy, a single two year old clump usually dividing up into from six to ten blooming-size plants. English violets, English daisies, polyanthus, and many other plants may be divided annually until in time one owns large colonies of them, and this is a point well worth understanding,—that a large number of one kind of plant is much more effective and worth while than a large number of *kinds* of plants, of just one or a few individuals. Many plants which are inconspicuous or ineffective singly or in small groups, surprise one with their beauty when grown in large masses or long rows. The ulmaria—a variety of spiræa of deciduous growth—is a notable example of this. Planted singly it is merely a rather pretty flower; grown

in a long row it is a mass of snowy white in late June and July that compels one with its beauty. Its congener, the spiræa fillipendula, a lesser but most graceful growth, also pleases one especially when grown in long rows in front of taller plants. And right here is a point well worth considering in planting a hardy border—the arranging of plants in rising tiers of bloom so that a bank of bloom may be produced. One effective bed that gladdened my heart for several seasons and rose in tier after tier of gracious bloom through several weeks of early summer had an initial planting next the front of tritomas, whose scarlet torches of flame did not come into bloom until late summer, but from then until frost made a brilliant band of color. Back of these was a fine planting of columbine, next a row of scarlet lychnis alternated with white feverfew, and still further back a full planting of the garden spiræa whose feathery heads of pinky-white flowers stood four or five feet high and in turn were topped with fine clumps of physostegias; the whole planting making a beautiful bank

of bloom and one not commonly seen. This was a permanent planting requiring little care beyond the removal of all weeds and grass in the spring and an occasional thinning out of the plants when they became too crowded. The physostegia increases rapidly by root division and the lychnis, feverfew and aquilegias all self-sow so the bed practically never ran out or needed renewing and the cost, except for the tritomas, was that of a few packets of seeds—probably a total of fifty cents for some one hundred and fifty square feet of loveliness, and there are many, many combinations as happy and as easily acquired as that.

Lacking the convenience of hotbeds and cold frames, the vegetable garden is a most excellent place in which to start hardy perennials for a permanent garden. Flowers planted in rows among vegetables always seem to do better than anywhere else, the reason being that they are not crowded—usually being in single rows with a foot or more of open space at each side through which the hoe and cultivator can work freely, and

where they will receive regular and constant attention throughout the growing season. In a garden of say fifty feet in width, several varieties of flowers may be grown in short lengths of ten feet or more. They should be covered somewhat more deeply than when sown in the hotbed or cold frame and the ground firmed well above them, especially if the weather is dry at the time of planting; when the seedlings appear they will probably need thinning in order that they may not grow spindling, but will not need the room they will require when in permanent quarters. Many kinds of hardy perennials will give some bloom the first year, though, of course, they will not be at their best, but they will be sufficiently pronounced to make it possible to select those most desirable for cultivation. Delphiniums, for instance, will give small spikes of bloom, probably a foot high, the first season and if the Gold Medal Hybrids have been planted some very lovely blooms will result. In the fall the plants may be lifted and set in permanent positions, or they may be left in the ground until

spring and then transplanted; probably this is the better treatment providing the ground is not to be ploughed too early, as some of the perennials die down in the fall and may not appear above the ground in time for very early transplanting.

Evergreen boughs make the best winter covering, especially when rested against some support with the tips downward, so as to shed rain. They do not mat down into a sodden mass as do leaves which have a tendency to smother and rot plants with an evergreen crown of leaves, but protect from sun and cold winds, at the same time admitting sufficient air to the plants to keep them in good condition.

When immediate effect is desired from hardy perennials which must be produced from seed, considerable time may be gained by planting the seeds in flats in the house in early February, giving them as light a position as possible, a south window being preferable, and transplanting the little seedlings to the hotbed when that is started in March or early April. This will often force along the blooms and will certainly produce

strong, well developed plants by fall, plants that should stand the winter and come out in spring in fine condition, ready for a notable season of bloom.

While hardy perennials are generally thought of in connection with such herbaceous plants as die down to the ground in fall, reappearing again in spring, and the few that make a crown of winter foliage, like the hollyhocks and delphiniums, no perennial garden could be considered complete without an abundance of lilies. These may be planted here and there, singly and in groups among the perennials and shrubbery and will need little attention, increasing in numbers year by year. This is especially true of the candidum or annunciation lily, which once planted continues to increase for many years, but should have the clumps broken up once in three or four years and spread out to give more room. Failure to bloom successfully always calls for investigation of the condition of the bulbs. Usually it will be found that decay has set in or that worms or ants have invaded the bulbs. In either

case the bulbs should be lifted and cleaned and all diseased scales removed, saving the scales for replanting; reset in clean soil, packing a handful of clean, sharp sand and a pinch of charcoal about each bulb. Candidum lilies should not be set more than an inch or two below the surface of the ground, but most other lilies, especially the auratums, speciosums, Brownii, and giganteums should be planted six or more inches deep and well padded with sand. A little pad of sphagnum moss under each bulb is excellent as it supplies the necessary drainage. Auratum bulbs and bulbs of the Japanese lilies are not as permanent as the candidums and tiger lilies, usually lasting a maximum of five years, if left undisturbed.

It is not much use to plant lily bulbs, tulips and hyacinths in ground infested with moles. The moles should first be eradicated, and then bulbs may be planted safely but it is little satisfaction to make an extensive and costly planting of bulbs only to have them become food for the moles and ground mice. I have known plantings

of several hundred tulips to be entirely destroyed during a single winter. In one such planting of five hundred bulbs only three appeared above ground the following year. A good mole trap is invaluable where moles are in evidence.

CHAPTER XX

THE PLANTING OF FALL BULBS

THE time for planting of hardy perennials and shrubbery is optional with the gardener, many things doing quite as well when planted at one season as at another, but in the planting of spring blooming bulbs less latitude exists; these must be gotten into the ground in fall if any measure of success is desired. The handling of this class of plants is one of the luxuries of gardening, as they come all ready to commence root growth, but in a perfect dormant condition, and may be gotten into the ground very much at one's convenience, and regardless of weather; the earlier they are planted the stronger root growth they will be able to make before the ground freezes, which makes for stronger bloom in the spring.

Crocus, scillas, narcissi, daffodils, tulips, hyacinths and the like may be planted from the time

they can be procured from the florist (which is usually in September) until the ground freezes. They will grow and bloom to perfection in any good, well-drained garden soil, providing it is not infested by moles and ground mice but beware of these, as they seem to possess an insatiable appetite for bulbs and once they have entered a bed will seldom leave it until they have exhausted its resources.

I recall that a few years ago I planted, in an empty canna bed on the front lawn, some five hundred choice, named tulips. The following spring just three tulip plants appeared above ground—the moles having destroyed the other four hundred and ninety-seven. In the flower garden where other hundreds of bulbs had been used to border beds of hardy perennials, they fared somewhat better, the greater part coming up, but many had been destroyed and still others carried far from the place of their planting, coming up as much as three feet away in the middle of paths and in sod.

One of the most satisfactory ways of using

tulips is to plant them as a border to beds of perennials or shrubs, setting them in single, double or triple rows, along the edge and leaving them to ripen and increase from year to year; in this way one gets the greatest good at the least expenditure of time and space. When they are planted in beds by themselves it is customary to lift them when through blooming and to heel them in in some out-of-the-way spot until the tops have died when they may be lifted and stored in paper bags until time to plant out again in the fall. This leaves the beds free for summer annuals or bedding plants. If it is not desired to lift them, then one may sow seed of some annual of light root growth such as the myostis or forget-me-not, the schizanthus, pansy, verbena, or phlox Drumondii, as these plants will not interfere with the maturing of the bulbs and the protection afforded them from the heat of summer will be of benefit.

The soil for any variety of bulbs should be rich, mellow and thoroughly well drained and it is

better in planting any but the smallest bulbs to remove a few inches of the top soil and having leveled off the surface mark it in straight lines from side to side each way so that the lines cross each other and set a bulb at each intersection of the lines. For tulips the lines should be five inches apart each way and for hyacinths seven inches. Where solid beds of hyacinths or tulips are planted small bulbs, such as crocus, scilla or winter aconite, may be used for filling in the spaces between with charming effect. White crocus and blue scillas are especially dainty, or the lovely ixias may be used but in this case the beds must be very carefully protected against the cold and covering removed with discretion in the spring.

Narcissus, daffodils, jonquils and all that family appear to better advantage when planted in long double or triple rows and should be set a foot apart each way and about four inches deep. These bulbs increase by forming new bulbs in a circle around the old bulb and should be allowed

abundant room to increase and once planted should not be disturbed until they have become too crowded to bloom well.

Crocuses are never so lovely as when studding the green of the lawn in early spring and this is the simplest form of planting, it only being necessary to lift a bit of sod with a trowel, slip a crocus bulb underneath and press the sod back above it. Plant them informally, singly, in groups. Scatter them freely about with the hand and bury them where they fall. There is one precaution, however, to be observed in this system of planting—the lawn-mower must be withheld in spring until the crocuses have matured their leaves or there will be no flowers the following spring.

All spring bulbs profit by a liberal application of *old, well-rotted* manure but this should be either spaded deep in the beds below where the bulbs will set or used as a top dressing after the soil removed before planting has been replaced and not allowed to come in contact with the bulbs. Manure is not only harmful in itself but

it is also the home of the little white wire worms so injurious to all bulbs and especially to lilies, and almost always when bulbs are found to be not doing well the trouble will prove to be either worms or poor drainage.

A part of the winter covering of all bulb beds should be lifted as soon as growth starts in the spring as a stockier, stronger growth results but the finer portion should be left and in case of such tender bulbs as ixias that removed may be kept handy to replace in case of an unusually cold snap.

Many of the miscellaneous bulbs offered by the florists are desirable when grown in well established groups, but lack effect planted singly or in too small groups. One of the loveliest of summer-blooming bulbs is found in the anthericum or St. Bruno's lily. These should be set in colonies in the hardy border where they may remain undisturbed for years. Plant about three inches deep and four inches apart. Alliums, chinodoxia, and bulbs of this class need grouping to be at their best, otherwise they are

apt to appear rather straggly. I like to see bulbs colonized among the shrubbery and the edge of evergreens where they appear at their best in the early days of spring and do not seriously interfere with the use of the lawn-mower later on.

An effective treatment of ramblers

CHAPTER XXI

ECONOMY IN THE PURCHASE OF SHRUBBERY

MAY often be achieved by a wise selection of varieties. Any extensive planting runs up into dollars fast, especially if the larger sized shrubs are selected. Fortunately successful planting depends as much upon a number of plants of one variety as upon the size and distinction of the sorts. A dozen plants of one variety of spiræa, for instance, is far more effective than one plant each of twelve varieties—try it and see if I am not right.

If, therefore, one has several strips of lawn to embellish with shrubbery and wishes to economize the expenditure as far as possible it will be found a most excellent plan to make a mixed planting on the most urgent section, selecting those shrubs which by their manner of root formation offer possibilities of rapid increase and use the product for subsequent planting; taking all

of the sort of plant so as to leave as few varieties in the old bed as possible and in this way simplifying the ultimate planting of the entire grounds.

When these new offspring have reached a presentable size they may be retained and the other sorts which can now be spared may be removed to a new location, planting out the youngsters in their vacated positions.

There are three classes of plants which lend themselves very readily to propagation through root division, layering and root offshoots. The first is found in those plants which make an exuberant root system of many fine feeding roots and many stems. A good example of this class is found in the Hydrangea arborescens which may be lifted, pulled apart and the several plants reset without in any way disturbing its growth intention. In this respect it differs materially from H. paniculata which, while making a generous root system, has but the one main stem and so is incapable of division but is easily propagated by cuttings thrust into the ground in the shade of the plant early in June. H. arborescens is

similar in habit to many perennials which are increased by root division, as for instance the Shasta daisy, English daisy, English violets, polyanthus and others.

Often a plant of H. arborescens purchased from the florist will admit of the removal of two or three smaller parts without seriously injuring the appearance of the original plant and if these are set out and well cared for they will quickly develop into blossoming plants for this form is an early and reliable bloomer.

Spiræa Anthony Waterer is another shrub which may be increased by pulling apart the roots; indeed this plant is benefited by occasional treatment of this sort, doing much better and flowering more freely. Planted in front of taller shrubs it is a very desirable and reliable plant and if the faded flowers are removed after the spring florescence it will continue to produce flowers throughout the summer.

One of the most easily propagated shrubs is found in the symphoricarpus or snow-berry; indeed, in the case of this pretty shrub the difficulty

is not to increase one's stock as the new growth is usually prostrate the first year, lying supinely on the ground and if left undisturbed will throw out roots at the joints and rapidly produce attractive little plants as robust as the parent stock. Lifting the branches occasionally will prevent rooting but usually one likes to have the new plants form. I do. After becoming well rooted the branch should be severed between the plant and the parent. As the root growth is dense, consisting of a mass of fibrous roots, the young plants can be lifted at almost any time and reset without much check to growth. The pale, pinky-white flowers come in mid-summer, followed by the white berries which remain on the bushes well into the winter and are very attractive.

Somewhat similar in its way of increase is the Deutzia-Pride of Rochester. That magnificent shrub which challenges our admiration when covered with its drooping, bell-shaped white flowers late in June and which, under favorable conditions, assumes the proportions of a small tree. Like the symphoricarpus the lateral branches are

more or less inclined to a recumbent or prostrate habit or because of their flexibility are easily pegged down and root easily at the joint but do not make as vigorous root growth and the joint should have a little earth drawn over it and be kept moist by placing a stone on top. This shrub is so altogether desirable that several branches may well be devoted to the increase of stock, one or more plants being produced from each branch.

Of those shrubs which throw up suckers from the roots the lilac will occur to most people as a well-known example, so if in buying the newer, double-flowered sorts one will insist on purchasing plants upon their own roots and not be satisfied with grafted plants one will soon become possessed of a quite respectable planting of lilacs of notable size and color of bloom. The suckers should be removed as soon as they have had one season of growth for the protection of the parent plant which will be much depleted in bloom by their permanent presence.

One of the most beautiful foliage shrubs, the fern-leaved sumac—Rhus typhina laciniata—

forms root rhizomes which send up volunteer plants at each joint. These should be removed and replanted. This is one of the most beautiful ornamentals with which I am acquainted, quite rivalling the Japanese maples. The leaves are compound or pinnate, fifteen to eighteen inches long and of a dark, rich green on the upper side, glaucous beneath and with a rich red midrib—an elegant fern-like spray which is very useful in cut flower work and in autumn turns to the most vivid crimson imaginable. It does best when protected from severe wind, from which it seems to shrink, distorting its symmetrical growth. In good rich soil a half dozen offshoots may appear the second year after planting and after one has once become familiar with its beauty all will be welcome.

Another small tree or shrub with similar characteristics is the Aralia spinosa or Hercules' club as it is commonly called. This also has the compound leaves somewhat resembling the black walnut but of gigantic proportions, two to three feet in length and of equal breadth, giving

the tree a most tropical effect. It is very easily transplanted and a few trees in a clump are very effective or it is fine as a specimen tree and owing to its abundance of spines can be utilized effectively as a hedge. Where only a single tree is wanted it is easily kept in check by cutting out the rhizomes with a spade close to the parent plant.

The euonymus, or burning bush as the Indians always called it, propagates itself by means of its coral berries which appear in quantities in late summer or early fall. One finds the volunteer plants appearing every spring in places where one least expects them and one can lift and transplant them wherever desired.

Another most attractive shrub which may be easily raised from seed sown in spring is the Buddleya—a plant with long racemes—in the newer form of B. veitchiaa, over twenty inches long, of violet mauve flowers of a delightful violet fragrance. Spring-sown seed will often produce blossoming plants the first season which in the second will attain a height of from three to five

feet and be a perfect bouquet of bloom throughout the summer. The branches are somewhat pendulous and in the young state are better for a little support. They afford delightful material for cut-flower work and the odor has that fugitive elusive quality of the violet, seeming to come from different directions and to elude one's search.

It will be found an excellent plant to combine with Spiræa Van Hutti as it comes into bloom after that splendid plant has rested on its laurels for the summer and keeps the hedgerow alive with bloom and fragrance.

CHAPTER XXII

A CONTINUOUS SUCCESSION OF BLOOM IN THE SHRUBBERY

HOW TO SECURE IT

THE planting of shrubbery about the home is so important that it may well take precedence of the flower garden proper or even the grading of the lawn itself. Indeed, if one owns the site of a home and the building is yet in the future, no better expenditure of one's spare time and dollars can be inaugurated than such initial planting as shall insure the presence of blooming shrubs about the home at the time of its completion so that all may be beautiful and perfect together, rather than that two or three years must elapse before one can begin to enjoy the results.

Hardy shrubs vary very greatly in the precociousness of their bloom, certain forms giving

quite noticeable results the second season, while others need two or three years' growth even to indicate what their ultimate beauty will be.

The location, too, will have much to do with results. For a low planting about the foundation of the house, in front of porches or to top low terraces many plants may be employed which would be unsatisfactory in places at a distance where a general effect is desired more than an intimate relation. For masking a building, hiding an undesirable view and the like, tall-growing shrubs and flowering trees are usually preferred and these being of more or less slow growth require time to develop.

In all shrubbery planting it will be found that a number of plants of one sort is far more effective than one or two plants each of many distinct kinds. The mistake is often made of planting only shrubs which bloom together, producing a medley of more or less inharmonious colors and form for a few weeks in spring leaving the shrubbery bare and uninteresting for the remainder of the year. This is a mistake I have often made

in my own garden, but one which I usually rectify by planting in other shrubs which will come forward when the first have ceased to bloom.

For a number of years a very beautiful hedge of Hydrangea paniculata grandiflora has separated the lawn from the flower garden; only one objection could be urged against it—its flowerless condition throughout most of the summer. To overcome this objection, scarlet salvias were alternated between the plants and an edging of scarlet and white phlox made a mass of color from mid-June until well into October. This, of course, was not legitimate shrubbery planting, so recourse was made to alternating Hydrangea arborescens with the paniculata. These coming into bloom late in June gave a very satisfactory arrangement, but this year Deutzia-Pride of Rochester, which also blooms in June, was introduced and I am anticipating much pleasure from the addition.

A hedge of Spiræa Van Hutti extending from the house to the road is very beautiful in early May, but inconspicuous and uninteresting the

remainder of the summer. If it had been in a situation demanding a heavier planting I should have alternated the plants, setting them behind the spiræas, with forsythias—whose golden yellow blooms make bright the garden in earliest spring—and between the forsythias introduced the deutzias.

There are few more satisfactory and graceful plants for use in front of a porch than this Spiræa Van Hutti; its gracefully curved branches, though growing to a good length, curve away gracefully from the building, bending with their weight of snowy bloom almost to the ground and the growth is very strong and rapid, but never coarse. It is the very best early blooming shrub to date.

Very lovely effects may be secured by alternating the spiræa with the Weigela Eve Rathke, and keeping this down to a somewhat prostrate habit; this will give a perfect sheet of bloom from early May until the last of June and a less-pronounced show of flowers throughout the remainder of summer from the weigela.

A Continuous Bloom in the Shrubbery

There is a strong tendency when purchasing shrubbery to select a little of everything—one plant of each, perhaps. I do this myself—not without excuse perhaps on my part, for we people who write for the benefit of others have to get our knowledge by, often costly, experience, and not by the mere reading of nursery catalogues. It is sometimes a most excellent thing to gratify this inclination providing one has a piece of land which can be devoted to experimental purposes and where one can shift things about until one has gained just the right combination and exposure for each plant. A strip of ground twelve or fifteen feet wide and as long as available will give room for a very successful planting of small trees and shrubs and hardy perennials may be introduced to fill in until the shrubs have reached an effective size. Ulmarias, hardy phlox, oriental poppies, rudbeckias and the like will be found very useful and tall clumps of lilies should always be interspersed in all permanent plantings.

It will often be found that some shrub which one has admired at close range is entirely in-

effective in the shrubbery border; take, for instance, the Tartarian honeysuckle—a pretty enough thing close at hand but ineffectual and insignificant at any distance.

For a long shrubbery border of twelve or fifteen feet wide no better selection of shrubs can be made than these seven perfectly reliable and hardy shrubs—Forsythia, April; Spiræa Van Hutti, May; Deutzia Pride of Rochester, June; Hydrangea arborescens, July, August; Hydrangea paniculata, September; Althea, October and November. These are—with perhaps the exception of the althea, which is sometimes uncertain—absolutely hardy and reliable plants which increase in size and beauty from year to year and insure a constant succession of bloom throughout the summer and fall so that by their use the shrubbery border need never be without flowers.

In planting a border of these mixed shrubs attention to arrangement will have much to do with success. Of course it will occur to the most inexperienced that the taller shrubs should be in the

rear, but it is not necessary or desirable that they should be planted in a rigid, unbroken line. Better that the line be somewhat waved, dipping forward occasionally a step or two. Then it will, of course, occur that the lowest forms will be in front, but this line, too, may be broken occasionally with advantage, allowing the second row to step forward enough to prevent too much formality of outline.

Where immediate effect is desired, and this is invariably the case, either large specimen shrubs should be used or, if the smaller sorts seem more available, then these should be set as close again as would be done in the planting of large specimens and after they have made two or three years' growth and have begun to crowd, every other plant may be lifted and used to start a new shrubbery elsewhere.

This was what was done with my hydrangea hedge, started as a border between the front lawn and a pear orchard. The plants were first set three feet apart in a single row. When they had filled up the intervening space they were

lifted and used for a hedge in the rear of the lawn, this time being set six feet apart, a distance which they soon closed, and for weeks in the fall were a wonderful mass of bloom. A hedge of Spiræa Van Hutti replaced the hydrangeas in the front and these will probably remain undisturbed for a number of years as, owing to the proximity of a magnificent maple tree, they do not make the strong growth they do in more favorable situations.

Although I have suggested the forsythia, spiræa, deutzia, hydrangeas and althea, etc., as the seven very best shrubs for general planting there are very many more worthy of adoption. Among these the various weigelas, especially the red varieties, the syringas and the lilacs should not be overlooked. Of the latter, far too little is known, most people being content with a bush or two of the old-fashioned purple and white of their grandmothers' garden, and perhaps, as a truth, these old sorts appeal to our hearts more strongly than the newer, more showy varieties and it is in no spirit of disparagement that I urge

the adoption of some of the newer sorts—not to displace, but to supplement and extend the lilac season over a period unknown to the old-time garden.

Syringa vulgaris, alba and purpurea are usually through blooming by the twentieth of May, or thereabouts, but Emodi, with its rosy-white flowers, is ushered in with the early days of June and Josikaea shows its first purple blooms late in the same month about the time that the creamy-white panticles of Japonica appear. The new double-flowered, named sorts come into bloom about the time of the common sorts and are well worth the extra cost they involve. Mme. Cassimire Perier and Pres. Grevy are two of the finest sorts and should be in every collection.

In buying lilacs it will pay well to purchase those on their own roots. Most of the named lilacs are grafted on common stock and the suckers are annoying and worthless and if allowed to grow will seriously interfere with the blooming of the graft. Such shoots as come from true roots can be detached and used to increase the

supply of plants and are, therefore, most valuable additions.

One of the most beautiful small trees for planting where a light and feathery effect is sought or against a background of evergreens is found in the tamarix. I know of nothing so airy and graceful as these at all times and especially when in bloom. The flowers, which are very tiny, quite cover the branches at the time of blooming in May, in mid-summer and in fall according to their season and there is a marked difference in the foliage which in certain species shows a decided blue tinge which is very beautiful. Unfortunately they are not always entirely hardy at the north and require a somewhat protected position. They are very useful at the seashore, being one of the few things which can stand the salt air. As they make a rapid growth one can afford to experiment with them until just the right environment is found for they are well worth trying for and planted in groups of the different sorts will give a succession of bloom all summer. They are very useful for cut-flower work, making ex-

quisite bouquets when placed in dull green majolica or similar holders.

Very careful preparation of the ground for shrubbery is essential as once planted they usually remain undisturbed for years; for this reason the earth should be dug very deep, underdrained, if necessary, and thoroughly fertilized.

After planting the ground should be kept cultivated by hoeing or by the use of the scuffle-hoe—anything which will maintain a dust-mulch, prevent the earth drying out and caking and retain the moisture. The success of the planting depends upon this one feature more than upon any other one thing. A plant insufficiently supplied with moisture during the growing season is quite certain to succumb to the rigors of the succeeding winter—not, indeed, on account of the cold itself, but the condition in which it entered the winter.

The best season for the planting of all hardy shrubs is early spring, before growth starts, the next best, late fall after the foliage has dropped. Altheas and white birch trees, however, do better with spring planting.

CHAPTER XXIII

GARDENING FOR SHUT-INS

THERE are possibilities in the indoor culture of flowers, though it may seem to the casual observer, that only open air culture would justify one in undertaking the growing of a flower garden on any extended scale; but open air gardening, while it certainly makes for unlimited area of flower beds and a great variety of sorts has still its drawbacks of inclement weather, insufficient or too much moisture, much humbling of one's physical self on bended knees and a summer-long fight with the myriad insect pests, from the tiny aphis that colonizes itself on the tip of every green shoot in early spring, to the predatory mole that furrows up paths and beds, making efficient drains to deflect all water intended for the refreshment of the plants.

Such indoor plants as one may elect to grow

are assured an adequate and continuous supply of moisture, a soft and friable soil, a reasonable freedom from insect pests and a certain amount of protection from burning sun and drying winds. Moreover they are not restricted in their season of bloom to a few months of the year; the indoor garden may be in bloom the year around—a bewitching succession of most of the seasons repertoire of bloom.

The indoor garden may have its beginning in the late days of September, when the hardy spring blooming bulbs come into the market. Nearly all of this class of plants force readily and pots and window boxes may be filled with soil, planted to tulips, hyacinths, narcissi, valley lilies, and the like and set aside in a cool dark cellar for midwinter blooming, requiring no further care for weeks to come. In the meantime their places need not be kept empty waiting their time of bloom but boxes and pots of bright geraniums, cinnerarias, primroses, cyclamen and the like will keep bright every nook and corner one can spare. Nothing is more dainty and delight-

ful than a window full of primroses, and no plant will give a more generous and constant succession of bloom from fall until spring.

As far as practicable, the growing of plants in window-boxes instead of pots will be found more satisfactory. Inside boxes which are narrow enough to rest on the window-sill are preferable and the plants may be planted directly in the boxes or, if preferred, in pots and the pots plunged into the boxes with moss packed between the pots to retain the moisture. This gives a better moisture condition than when the pots are stood on a shelf, exposed on all sides to the drying air of the living-room. It has the added advantage of allowing the pots to be lifted from the box for spraying the foliage, a great help to successful growth, and to apply such insecticides as may occasionally be needed. Plants grown in the dry air of the living-room are apt to be affected by red spider; this is especially noticeable with such plants as cinnerarias, calceolarias and a few others. Those who are so fortunate as to possess that modern essential of a

well equipped house—a sun room—will find limitless opportunities for flori-culture, boxes beneath the windows, trellises against the walls and hanging baskets, all affording opportunity for much delightful work with flowers.

One of the most fascinating features of indoor gardening is found in the growing of greenhouse and other flowers from seed, and this is a feature especially suited to the invalid or shut in. The little flats in which seed is started are so light and easily handled and the plants grown from seed so sure to do well that one may depend almost entirely on plants from this source. Almost any light, shallow box may be used, as flat, half size cigar boxes, codfish boxes, or boxes specially constructed to fit the window-sills and divided by strips of wood into several compartments may be used. All require the same treatment—a few holes to insure drainage, a fine mellow soil of fibrous loam, leaf mold and a little sharp sand, filled to within a half inch of the top of the box and well shaken down, and the best seed procurable.

All begonias, rex, fibrous and tuberous may be readily grown from seed which should be lightly scattered over the surface of the soil and pressed down with a bit of smooth board, then set in a pan of water till the surface looks dark, surplus water drained away, covered with white paper, glass and set in a warm place till the tiny plants break through the soil, when they should be given air and light gradually and encouraged to make a healthy, sturdy growth from the start.

A low, broad table with a large, shallow drawer and a shelf half way down one side will be found the most convenient place to work and this can be moved as the work progresses from place to place so as to make as little walking and lifting as possible. Another work-table that I have found most convenient consists of a broad shelf—hinged to a strip of wood nailed to the window-casing, as wide as the window-casing and deep enough to reach the floor when dropped down out of use. This is held in place by two strips of metal attached to the window-casing that hook over screw-heads in the side of the shelf,

but drop down against the wall when not in use. Such a shelf affords an excellent working surface for starting seeds in flats, bulbs and cuttings in pots and is indispensable for drawing plants away from a window on stormy nights. If finished to match the woodwork of the room it will be an attractive feature whether in use or dropped down out of the way and may be used for papers and magazines when not required for plants. For the latter purpose a neat finish is a border to match the standing woodwork and a center of green baize of felt.

There are a number of attractive vines and trailing plants—the Asparagus Sprengeri, Manettia vine, Thumbergia—that may be grown successfully from seed and add greatly to the interest of the indoor garden.

At this time of the year it will be worth while to start seeds of certain garden annuals for use in outside window-boxes. Nasturtiums, verbenas, candytuft, phlox Drummondii, petunias, coleus, ageratums, daisies, lobelias, all make bright and charming window gardens and when

the sliding screens are used that may be pushed up out of the way, the boxes may be planted and cared for from the inside with little fatigue.

Hanging baskets add much to the charm of sun room and porch, but are difficult to care for as usually arranged, but if instead of hanging from a short chain from a hook in the ceiling or cornice of porch or sun room, the basket is attached to a stout cord passed over a pulley and the free end provided with a couple of rings to hook over hooks in the side wall or pillars to hold it at the desired height it can be lowered on to a table for attention with little trouble. The moss-lined wire baskets are the best for this purpose; they retain moisture and are free from danger of breakage. If a pail of water is placed on the table beneath them and the basket lowered into this and allowed to remain until the soil is thoroughly soaked, then raised sufficiently by one of the rings to drain away all surplus water, the plants will be in the best possible condition to grow and bloom.

One of the most fascinating plants for growing indoors is the little Japanese rosebushes, which may be grown from seeds into blooming plants in from six to eight weeks. They make the daintiest, most charming little plants imaginable. Shapely, many branched and loaded with bloom they are the very daintiest "Favors" imaginable for luncheons and other social affairs and are charming gifts at all times. The blossoms are about the size of a ten cent piece, and come in white, pink and red. The seeds may be sown in the pots—three inch ones, in which they are to bloom or may be sown in flats and pricked out into pots when large enough. I have found the seed to germinate very freely and the plants to grow on finely from the start. When planted in pots these should be plunged in a shallow box of wet sand or moss in a sunny window. This is the way to handle all young greenhouse plants, especially cyclamen, cinnerarias, gloxinias, carnations, Lady Washington geraniums and the like. To keep them growing vigorously they

should not be allowed to dry out, nor to become soggy with too much water.

For starting summer-blooming bulbs the use of moss in shallow boxes or baskets will be found more convenient than the heavier soil. The sphagnum moss used by florists for shipping plants is the sort needed and may be used again and again if necessary, the only merit it has being its retention of moisture, exclusion of air and lightness for handling.

If one wishes to grow from seed for outdoor planting the hardier annuals and perennials, then somewhat larger and deeper flats should be used, but none over four inches in depth should be undertaken. In these such readily salable plants as asters, salvias, balsams, cobæa scandens, Shasta daisies, pansies, and the like will prove a veritable little pin-money mine and equally profitable will be found peppers, cauliflowers, bush musk-melons and other of the choicer vegetables, all requiring, practically, the same treatment.

The shut-in who wishes to specialize in the

unusual might make an attempt to imitate the dwarf trees of China and Japan. This is not so impossible or difficult as it appears as the appearance of great age is more often the result of skill than of many years.

CHAPTER XXIV

THE POSSIBILITIES OF A CITY FLAT

THE possibilities of the city flat will depend upon just how much window space the flat affords and how much sunlight the windows receive, for upon the amount of light will depend not so much the quantities of flowers which may be grown, as their character.

It may be possible that, in a restricted area, but one window can be devoted to the growing of plants during the winter season and where that is the case one will wish to realize as much pleasure as possible from that one window. If it is a sunny window then it will be an easy matter to fill it full of bright flowers. Now no flower so well withstands the heat and dust of our living-rooms as the geraniums, but it is by no means necessary that they should be of the more common zonal type. The Lady Washington ge-

raniums—pelargoniums—are far more beautiful and even more prolific in their bloom. They may be purchased all ready to bloom of the florist or easily raised, from spring sown seed, to blooming size by fall. Heliotropes, the sweetest of all flowers, will bloom freely in any sunny window if the precaution is taken to spray or wet the foliage thoroughly every day; without this refreshing bath the foliage will curl up and die and the buds blast.

The carnation is an excellent plant for the sunny window but must be sprayed frequently to keep in check the red spider, and all the spring blooming bulbs can be depended upon for the winter window garden and have this advantage that they can be potted in the fall, tucked away in a dark closet somewhere and brought out when ready to begin blooming, and again relegated to any out of the way place as soon as their season of bloom is passed.

The most convenient way of growing house plants where there are only common windows to accommodate them is in boxes made to fit the

window-sills. The ready-to-use metal boxes are very handy and satisfactory, but not as attractive as simple boxes made of wood to match the standing woodwork of the room; these should have a metal lining to protect the woodwork and if the expense of boxes of hardwood in a rented flat seems undesirable, very simple boxes of cheap wood may be made to imitate the hardwood finish by giving a covering of the paper or wood pulp that comes in all the natural hardwood finishes. This is simply pasted on the boxes and when dry should be given a coat of sizing-glue dissolved in hot water to a thin paste, and when this is dry a coat of varnish or jap-a-lac. This will be so successful that few casual observers will detect the substitution. A very pretty plant box can be evolved from a single cheese box, cut down a couple of inches covered with the paper and supplied with legs or mounted on a small lamp stand, or white enamel will be charming, especially when the box is filled with blooming tulips or narcissi, or given over to ferns, asparagus vines and the like.

Where one has a window opening on to an air shaft or a court that gives no view but infringes one's privacy a delightful screen which will not deprive one of too much light and air, but effectually screen the window is made from a box the length of the window-sill, fitted with double casters to allow it to be moved from place to place. A long rod or wire, long enough to extend upright as high as the screen is desired, cross over and return on the other side, should be fitted into the end boards close to the back by boring holes with a drill the size of the rod for nearly the depth of the wood and the ends of the wires firmly sunk in them. The frame is then covered with wire netting or twine and the box planted to some light, graceful vine like the asparagus plumosus nanna, the manettia vine, clarodendron, but the plumosus nanna is an excellent choice. Such a screen is very convenient and artistic between two rooms where it is desired to leave a door open for air, but desirable to screen the contents of one of them.

It is the summer flat, however, that offers the

greater possibilities of floriculture for in this season the boxes may be placed outside of the windows if properly secured, and a much greater variety of plants grown, for there is no exposure for which there are not many delightful things available. A north window, that to many would seem especially undesirable for plants, will often be found to develop the most interesting boxes. All the hardier varieties of cultivated ferns may be usual here, all the blooming and fibrous rooted begonias, all the asparagus fern, especially A. sprengeri, the various impatiens, especially I. sultani, the trailing fuchsias, abutilons, variegated wandering Jew, aspidistras, farfugiums. Palm grass, Pannicum Excurrens—a palm-like grass which one has to send to southern florists for but which grows rankly at the north, either in the house or in the open ground—is good. I bedded one out in spring, intending to lift in the fall for interior decoration and found it to have made so sturdy a root growth, and so immense a top that it defied a spade to move it and had to be abandoned to the frost. Within

doors its long, curved leaves are most attractive and interesting. It is a magnificent plant for the rear wall of a sun room or conservatory.

If one occupies a flat with a rear outside staircase, then one may utilize the top of the railing to place boxes of trailing nasturtiums and bright flowers—a planting of nasturtiums in the rear, a middle planting of geraniums, justitias, petunias, verbenas, phlox drummondii, etc., and a fringe of sweet alyssum or other delicate trailer along the front will give a succession of bloom all the summer long.

Along the outer edge of the steps one may arrange small but deep boxes of earth and in each plant blooming vines such as the Japanese morning glory, the cobæa scandens, flowering beans, or that gay little new vine—the cardinal climber. These may be trained to run on wire or cord so as to afford privacy for the stairway, or if this is not desired, trailing vines and erect plants may be used instead, the trailers masking the unlovely architecture of the stairs.

Possibly one may be in possession of one of

those flats whose side windows look out upon the roof of a lower building—a tin roof expansion of ugliness which is a hindrance to spiritual calm and mental cheerfulness. If this is the case, why not utilize it to create a roof garden? If the area is small one can utilize all of it, if too large then pre-empt the portion nearest one and draw a trellis of wire across the boundary line on which one may grow in long, narrow boxes of soil morning glories galore. It is not necessary that these boxes be of anything but the roughest construction; home-made boxes, evolved from old packing cases, are as good as anything as they will be masked by the plants and vines; these should extend around three or even all four sides of the roof, those in the rear and, if it is desired to secure privacy, those on the sides, being planted with vines or tall-growing plants like ricinus, cannas, cleomes, cosmos and the like. It will not be desirable to leave too much open space in a garden of this sort, unless it will be possible to cover the roof with sand or sawdust that

can be wet down with the hose to create a moist atmosphere; but where this can be done a very successful roof garden can be created with the principal expenditure that for earth and sawdust. Most flowers of the summer garden can be grown in such a position and one could arrange a very satisfactory little lily pool and fountain by means of a big zinc tub, a length of hose, two or three water lilies and some gold fish. A few inches of earth in the tub will supply a footing for the lilies and a mask of plants around the base will hide the crudeness of the pool.

When one has undertaken a garden like this it will be found surprising how many things one will pick up in one's little excursions out of town to add to it; all one's friends will take an interest and pleasure in donating seeds and plants and if the roof affords room for a hammock and a few chairs, the question of where to go for a summer vacation will not take on such poignant interest, nor the inability to afford one be so great a tragedy. Such an oasis in the heart of a city will be

a delight to a child and solve the problem of keeping it off the street and from undesirable companions. I should like to think that a good many such little oases will develop and that I might know of them.

It might be that two or more people have homes overlooking a roof who would join together in the making of a garden. In that way a larger area could be undertaken and the expense would not be seriously felt. If the roof is one exposed to much sunshine, then one should select plants which revel in sunshine like the annual poppy, the verbena, salvia, sweet alyssum, candytuft, ageratum, dahlia, canna, California poppy, asters; all these are hardy, easily grown plants, which will give an abundance of bloom all summer. Of course geraniums and coleus can also be depended upon to do their prettiest, but one and all should have a daily or semi-daily showering with a hose to remove the grime and dust of the day and freshen the foliage as well as to provide the necessary water to drink. Probably the entire success of the roof garden will depend

upon just this one feature of an adequate water supply at the roots and a thorough cleansing of the foliage each day. Given this there is no reason why a garden of this sort should not be a success.

THE END

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