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The Junior Agriculturist

A Little Paper Issued Once a Week
for the Boys and Girls of California

VOL. 1

Berkeley, California, JANUARY 30, 1911

No. 1

TERMS:

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C. A. STEBBINS

University of California, Berkeley.

This little agricultural paper is for you, the boys and girls of California. It is going to help you to understand what farming is, and how much the work of the farmer means to you and to the world. The schools, universities, and the state are getting behind the farmer and his work and we are going to ask you to do a little for your parents, for your school, for your state and for your neighbor. Right now is the time to begin, for the more you do now, the more you will want to do later and the more good you do later, the more happy you will be.

Some day you will read about little "Chad" in the "Little Shepherd of Kingdom Come" who after the loss of all that was dear to him but his faithful dog said to Jack, "I haint nothin but a boy but I got to act like a man now."

So this little paper has a twofold purpose (1) to ask you to join our body of young California gardeners by reading this little paper and by following its suggestions, (2) to help you to be boys and girls that California can be proud of. In return we expect you to help us and to help each other. We are going to ask you to furnish articles each week for this paper. Thus each school will know what the other is doing.

Nothing is so mean that it can not teach us something. The ant can teach us patience, the pets at home teach us faithfulness, the birds teach us joy, then, shall we not expect you to teach your neighbors and ourselves.

* * *

This paper was planned primarily to reach the boys and girls who are studying agriculture in connection with the extension work of the University Agricultural Department. For the benefit of those who have not been working with us, our junior gardeners, in succeeding numbers will tell what they have been doing.

If you can not interest your teachers in school gardens, start a garden at home and tell us about it through this paper.

You may be more interested in animals, in your pets. If so, tell us how you care for your pet, what it eats, its home, how it gets its food, etc. We should be pleased if some one would take full care of a hen, a cow, a sheep, or a horse for one week or better, for one month, and write to us just what was done. Reading matter will be sent to the pupil or pupils who will do this telling how best to care for the particular animal.

Animals have as much right to live well as we have unless they interfere with us to a large extent. So many animals are wholly dependent upon mankind. Their welfare is a matter of our control. Since they help to make us happy, help to feed and clothe us, let us plan to care for them properly.

* * *

PROBLEM QUESTIONS

Here are some problem questions. Devise experiments to answer them

and they will be published in the Junior Agriculturalist.

Is there air in the soil?

Will the seed die if allowed to dry up after it has sprouted?

Does light affect germination?

Do you find devices to render escape from the cover easy? Try squash seeds.

How much opposition can the stem overcome in forcing its way upward?

Where does the growth take place in the root? In the stem of corn? Bean?

* * *

ROOT HAIRS

Germinate several radish seeds in a small dish containing sand. Keep the sand moist. In a few days notice the minute root-hairs growing from the main root. The absorbing surface of the root is greatly increased by the root-hairs. The surface is sometimes increased from fifty to seventy-five times. Without root-hairs the main root would have to grow from fifty to seventy-five times thicker.

Lift up a seed. Notice how the root-hairs cling to the sand. The minute hairs slip in between soil crumbs where a larger root would not penetrate. The finer the soil the more surface is offered to the root-hairs.

* * *

HOW TO GROW BEST VEGETABLE

mere formal prizes. Good work is its own reward, its own prize.

We do not want you to be satisfied with growing a mere radish, we want you to grow the BEST radish. Any one can grow a radish with both eyes shut, but only one can grow the BEST radish. The BEST things in this world count most. Just look for and do only the best things.

We have been talking to you about prizes and an exhibit to be given near the close of the term. Have we told you that there are several schools concerned in the matter? The boys and girls of Decoto, Niles, San Leandro and other schools are interested in receiving the reward, but do not think too much about

How can one grow the BEST radish?

We have learned that the seed contains the embryo plant and its food. The large healthy colt makes the

best horse. The large healthy seed makes the best radish. First, select only the best looking seed from the best appearing plants (if you gather the seeds yourself). Test the germinating power as follows: Place a moistened blotter in a common plate. Add 15 or 20 seeds. Invert another plate over the seeds. Watch results from day to day. Unless 90 per cent of the seeds germinate quickly, reject the seeds from which the sample was taken.

With the seeds selected, the second step is the preparation of the seed bed. This is an important matter. Seeds need moisture, air, food and warmth. One must see that each is furnished correctly. Examine the surrounding foliage. If the growth is not luxuriant, very likely the soil is lacking in food which must be supplied. Use rotted manure, ashes, or bonemeal. If the soil is too heavy add sand. Squeeze a handful of soil and open the hand. If the earth retains the finger prints its moisture content is about right provided it crumbles rather readily. With texture, water content, food content about right, spade the soil deeply, two blade lengths. Fine soil means equal distribution of warmth, air, water and food. It means ease of growth for the roots and plenty of soil close against them. It prevents loss of capillary water. What shall we do? Make the soil fine, pick out all the pebbles and foreign matter.

Make straight drills (furrows) about three-fourths of an inch deep, sow the seeds about an eighth of an inch apart. To insure straight rows, lay a rake with blade up on the soil and press gently. Mark off two rows the proper depth. Sow the two rows, cover the first but leave the second open as a guide to the next. In covering the first row pack the soil gently. This brings the moisture to the seed rapidly. At the head of each row, place a label telling the vegetable planted and when.

After the plants appear new directions will follow.

* * *

HOW TO USE TOOLS

With the hand in the hand grip of a spade the right farther down the handle, using foot pressure begin at one corner, preferably at the left hand corner and spade one row

across then repeat until the plot is spaded. Each spadeful of dirt should be carefully broken up, but do not swing any tool higher than the knees in accomplishing this purpose. The soil should be loosened not less than a full spade length and if a pupil desires results a little bit better than his neighbor let two spade lengths be the depth of the loosened soil. Each plant grows in two ways, from the surface of the ground up and from the surface down and the race is between the root tip and the stem tip. Give the root tip fair play and plenty of room for growth.

The spaded ground should be carefully fined with hoes and rakes until there are no clumps larger than the little finger nail. The root tip loses time and strength by leaving air spaces caused by lumpy soil thus making it work too hard for soil strength and robbing it of moisture.

* * *

SEED PLANTING

Annual plants are of two general kinds, those to grow where seeded and those to be transplanted. Much of the early seeding should be done in boxes and later the plants should be moved to permanent quarters.

The depth and manner of planting seeds can be largely determined by the seeds themselves. Each normal seed contains a young plant and food to nourish it until the roots have taken hold and the stem reaches the surface, hence the nourishment of the plant in a small seed would be soon exhausted, if the seed were planted deep and the young plant would never reach the light. Very fine seeds should be sown on the surface and lightly sprinkled with fine soil and then pressed firmly.

It is generally safe to plant coarse seeds about three and one half to five times their thickness. In every case of box seeding, soil should be sifted through mosquito netting sifters and well sprinkled. Put leaves or moss in the bottom of each box.

As to distance between seeds, generally, about one-eighth of an inch at first sowing, afterwards thin, leaving spaces the height of the mature plant. Pansies should be four inches apart because they grow four inches tall.

The young plants should not be disturbed until the third leaf appears when they should be thinned and may

be transplanted.

After the plants come up keep them on the dry side to keep them from "damping off."

At the blossom period, see that no blossom is left too long on the plant. The aim of each plant is to reproduce itself and hence it hurries to form seeds. With this aim accomplished, it stops blooming. The more blossoms picked the harder the plant works to send out more.

Vegetables

CARROTS Sow in rows one foot apart, seeds one inch apart. Cover lightly and press down firmly. Thin to four inches. The seeds are slow to start. Carrots mature in about three months. Follage may be used to fill out boquets.

LETTUCE Sow in rows, cover lightly, and press down. Matures in about four weeks.

ONIONS Sow in drills one foot apart and cover with half an inch of fine soil. Thin to four inches. Start seeds in boxes and transplant later. Mature in four months.

PEAS Sow as above but from one to two inches deep. Thin to six inches.

BEANS Same as peas.

BEETS Sow in drills one inch deep, one foot apart. Thin to eight inches.

POTATOES Cut pieces from potatoes so that each piece will have at least two eyes. Plant three inches deep, two feet apart.

RADISHES Sow in rows one foot apart, one inch deep. Thin to three inches.

TOMATOES Sow seeds in boxes. When plants are two inches high, transplant, and tie to stakes.

Rakes and hoes when not in use should be turned with prongs and blades down. Tools should always be carried with the blades near the ground and never used but for garden work.

Cuttings and Slips

Roses, carnations, chrysanthemums etc. should be grown from cuttings and slips.

ROSES Select sturdy growths of last year, testing the branches by

breaking until some are found which break with but slight report, leaving no jagged edges. Branches which bend and double are too young, those that break, leaving splintered edges are too old.

With a sharp knife, cut stems off just below the bud. Some five inches from this bud cut the stem above a bud.

Fill a box with about three inches of moist sand. With a pencil or a stick, make holes in the sand and into these insert the cuttings some two inches, leaving at least two buds exposed. Be careful not to bruise the stems in inserting. Pack the sand around the cuttings and to insure close contact between sand and stems pour a small stream of water directly on the cuttings so that the water will wash close against the stems. Use a small tin can with a hole made by a shingle nail.

A few days later, if a stem is growing black, or is shrinking, replace with a fresh cutting. As to later watering, sprinkle with a spray or something which throws a fine stream. The cuttings must not be disturbed. Keep the sand moist but not soaked.

When the buds begin to appear, carefully break off all but the one at the top thus concentrating the growth.

With the forming of two or three leaves to each stem, the cuttings may be transplanted or potted.



KINDS OF SOIL

The best soil for farm and garden crops is a mixture of clay and sand called loam. It is called a sandy loam or a clay loam depending on whether there is more sand or more clay. Which type of loam do you think will retain moisture better? Why?

Both sand and clay are formed by the breaking down of rocks, that is, they are of mineral origin. Humus is partly decayed vegetable matter from leaves, stubble, etc. Its presence is necessary in good farming land because it helps a sandy soil to retain moisture and makes a clay

soil more open and free to work, preventing its packing down too hard.

The rich prairie soils contain a large amount of humus, which has been formed by the decaying vegetation. Farms which have been tilled a long time are apt to have their humus used up. It is very necessary for farmers to keep up the supply in their fields by applying barnyard manure or by plowing under green crops.

* * *

HOW WATER RISES IN THE SOIL

Water rises in the soil just as the oil in a lamp rises through the wick. The wick is full of little tubes called capillaries, and so is the soil, and the water rises through these.

If a little kerosene or gasoline is put into a bottle and the bottle filled with soil, the oil will rise, and if lighted, will burn on the surface. When the water rises to the surface of the soil it evaporates.

Evaporation from the soil is going on all the time when it is not raining. The soil soon dries out if something is not done to prevent it. Covering the soil with a light mulch prevents evaporation. Cultivating or loosening the surface of the soil soon after a rain serves the same purpose. Cultivating breaks the small tubes, so that they are unable to bring the water to the surface.

A soil that contains much humus (that is, vegetable matter) catches and holds more water than one that contains but little humus. Such soil also holds moisture longer in dry weather. Plenty of barnyard manure applied to the soil helps to retain moisture, but chemical fertilizers are of little aid in retaining moisture, although valuable as feeders of plants.



The Junior Agriculturist

A LITTLE PAPER ISSUED TWICE A MONTH
FOR THE BOYS AND GIRLS OF CALIFORNIA

University of California, College of Agriculture, Berkeley, Calif.
Agriculture Experiment Station, E. J. Wickson, Director

Vol. 1

Berkeley, California, MARCH 18, 1911

No. 2

Communications should be sent to

C. A. STEBBINS, Editor

Berkeley, Calif.

Agricultural Education Division

WHY PLANT THE GARDEN?

Before selecting the seeds for your garden had you not better consider what you wish to do with the product?

Many uses may be made of the output from the gardens. (1) may be eaten at school, (2) may be taken home and given to your parents, (here is a chance to help them) (3) may be given to the neighbors or to the poor people, (we in Berkeley are going to plan to give the needy, vegetables for their Thanksgiving.) (4) the vegetables may be served at the school lunch tables, (5) give a vegetable dinner; prepare the vegetables as a class at school and invite the teachers to the feast, (6) enter the products in exhibits for the best flowers and vegetables.

We suggest that a portion of your output at least be given away. Do you not like the idea of a big vegetable Thanksgiving for the poor of your vicinity? Have you not felt a little mite happier after making some one else happy? Here is an opportunity to do an extra amount of seeding. Sow seeds of happiness in those about you. In every case the crop is smiles and good cheer, not only for your neighbor but for

yourself. It might be that you can help California and San Francisco when the time comes to entertain the thousands in 1915 by growing flowers for beautifying places visited, by starting cuttings, etc. for wood grown lots. There are thousands of children in California. If we could get them all working to help entertain in 1915 visitors would not only come but they would stay.

While 1915 is some time away let us make plans. Can you think of any way to help? If so write to us.

SPADING

Many children are not spading and cultivating the seed beds properly. The trench system should be used in spading. Dig one row straight across your garden throwing the dirt in front of the trench thus made. Dig another row piling the dirt just beyond the trench. Continue until the plot is spaded. Break up each spadeful of dirt thoroughly.

This method enables the air to reach the air crumbs which have been far from the surface and insures proper capillary action later as the plants need water. Do not turn large clods under and cultivate the top merely.

Seeds need air and moisture. Unless the seed bed is properly prepared these are not available. To grow the best vegetables you must pay particular attention to the soil before seeding.

SELECTION OF VEGETABLES

This long rainy spell may have made many have the "blues" particularly those gardeners interested in starting seeds who let the open days pass without seeding. However, let us smile about it and think how much good this water is going to do California as a whole.

Selfishness is a bad plant to let grow within oneself. It is a good plan to look beyond oneself and see the other people, particularly the neighbors.

Since the growing season is so short before the close of school we have prepared the following list for you so that you may select seeds that mature quickly. If you are going to be at home during the summer would it not be a good plan to take care of your garden? If so, you could plant almost anything that you desired. Possibly if your neighbor is going away you could care for his plot also.

VEGETABLES

Name	When plant	When mature
BEETS	Jan to May; Aug. to Nov.,	3-4 mo.
CABBAGE (early)	Jan. to March,	5 to 7 months.
CARROT	Any time except July,	Aug., 4-5 mo.
SWEET CORN	Mar.- June; Sept.-Oct.,	2 months.
CUCUMBER	Mar.-June; Sept.-Oct.,	2 1-3, 2½.
LETTUCE	Any time,	2 to 3 months.
ONIONS	Feb.-May; Aug.-Nov.,	9-12 mo.
PARSLEY	Any time except July	Aug., 2 mo.
PARSNIP	Any time except July-Aug.	8-10 mo.
PEAS	Any time,	2 months
PEPPERS	May-July,	3 months.
POTATO	Feb.-May; Sept.,	2 to 4 months.
SPINACH	Any time,	6 to 10 weeks.
TOMATO	Feb.-March,	3 to 4 months.
TURNIP	Any time except summer months,	2 to 4 months.

RADISH

Any time, ½ month.

FLOWERS

SWEET ALYSSUM

Oct. and Nov., 3 to 4 months.

CALENDULA

Any time, 3 to 4 months.

CALLIOSIS

Oct.-May, 3 to 4 months.

CANDY TUFT

Oct.-May, 3 to 4 months.

COSMOS

Oct.-Jan.; May-July

CALIFORNIA POPPY

October, 3 months.

LARKSPUR

October, 3 months.

LINUM

Fall, 3 months.

MIGNONETTE

Fall and winter, 2 to 3 months.

NASTURTIUM

Spring, 2 months.

PANSY

September and October, 3 to 4 mo.

STOCKS

September, 3 months.

SWEET PEA

Oct.-March, 3 to 6 months.

ZINNIA

Spring, 3 months.

DAISY

Any time except summer months, 3 months.

FOUR O'CLOCKS

Spring, 2 to 3 months.

GAILLARDIA

Any time except summer months, 4 months.

PETUNIA

Fall, 3 months

SALVIA

Fall, 3 months.

SNAPDRAGON

Fall or winter, 3 months.

WALLFLOWER

Fall, 3 months.

VERBENA

Fall and Spring, 4 to 5 months.

* * *

BE A UNIVERSITY PUPIL

We wonder what the picture is that rises in your mind when one speaks to you of the University of California. Whatever your picture may be we want to tell you that the University is a great school. There are many fine buildings spreading over acres of ground. There are more than 350 teachers and 2,200 students. It is a great honor to attend this school and to be one of its students. However, you cannot come now. There is much hard work ahead of you before that time arrives. But if you cannot come today we are anxious to bring something of

the University to you at once. We want you to enroll as one of our University pupils to study agriculture with us.

By reading the papers sent, you can readily see what we are asking our pupils to do. We are going to send this paper free to those who will fill out the blank on the last page of the paper and mail it to us.

At present there are two hundred children receiving instruction from the University and they all have gardens at school and at home. Besides these there are hundreds of children who are growing vegetables and flowers throughout California, and there are hundreds of others who want to garden if we can but find them.

We want at least 1,000 University pupils, 1,000 junior gardeners. It is an easy thing to join the small band of 200. Will you not do so? You will not be sorry for there are good times ahead.



CHILDREN'S ARTICLES

THE ICHNEUMON FLY

A caterpillar was crawling along on the ground in search of a place where it could hide itself and form its chrysalis. But as it was crawling along slowly an ichneumon fly came and rested on the caterpillar and stung it, and then laid an egg. Then the fly went off and the caterpillar went on in search of a place.

When it at last found a place it spun its chrysalis and went to sleep. But the little egg was in such a warm place that it hatched and became a larva. So while the caterpillar was sleeping the larva was busily eating the caterpillar until it killed it. Then it spun its own chrysalis, and when the chrysalis broke open, instead of a beautiful butterfly coming out, it was an ichneumon fly like the one that had stung the caterpillar.

HELEN MURPHY, Niles School.

COTTONY-CUSHION SCALE

A few years ago some lemon trees were brought over to the United States from Australia. And on the limbs of these trees were tiny insects called the cottony cushion scale because they were soft like a cushion.

After some time the insects be-

came so numerous that they were not only found on the lemon trees but on the oranges also.

By this time many trees were dying from the insects so the people sent back to Australia to try to find something to check them. After a little investigation they found that the lady bird was its enemy so they brought a few over and ever since the insects have been kept in check by the lady bird.

FLORENCE ABBROTT, Niles School.

FLOWERFLY AND BEE

The flowerfly is protected from its enemies, the birds, by resembling the bee. Birds as a rule do not catch bees for their prey on account of their being noted for stinging and their bitter taste. So the flowerfly is protected by resembling the bee. The only difference between them is that the bee has a stinger and the flowerfly has not. The birds seeing the flowerfly are not sure whether it is a bee or flowerfly so they pass it by and hunt something else for their prey.

ZULMERA DOMINICI, Niles School.

GOOD CROPS

There exists all around the surface of the earth a thin layer of soil which feeds insects, birds, beasts and men. It is composed of sand, clay and humus, and under the top layer is the subsoil which is harder and colder.

Good soil has about one third of sand, one third of clay, and one third of humus. As the time is passing and the crops are being raised year after year, the soils are wearing out. And if we want to raise good crops we must improve the soil by cultivation. And along with tillage we must have good drainage to act well with good tillage, which allows air to circulate between the soil particles and it arranges the plant food so that the plant can use it.

And so, if we want the soil better year by year, we must cultivate well, drain well, and in the most intelligent way add humus and plant food to the soil.

JOAQUIN FIELDS, Niles School.

The cottony cushion scale is a bug about the size of a finger nail, soft and puffy, which was brought over from Australia on some lemon trees. The farmers did not see them until they began to destroy all the trees and they spread all over the

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Vol. 1

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No. 3

Communications should be sent to

C. A. STEBBINS, Editor
Berkeley, Calif.

Agricultural Education Division

Have you ever been in the Greek theater at Berkeley? Have you ever seen it full of people? If you have not and feel it impossible to visit the theater soon be sure to see a picture of it before many days pass, for history has been made there this past week. Mr. Roosevelt, our ex-president, spoke there five times to thousands of people.

The theater, as many of you know, is built of cement tiers, or seats, rising one above another just as the baseball seats are arranged. The cement rows are built in a circle. The theater is placed on the side of a hill among tall eucalyptus trees and is open to sunshine and to birds.

Each afternoon that Mr. Roosevelt spoke, the theater was crowded with people to the number of eight or nine thousand. We were glad to see so many of our gardeners in the audience who saw with us the bright colors of parasols, dresses and hats and who saw Mr. Roosevelt and listened to his talks.

Many of us arrived very early one day. Two of our Berkeley boys sat below upon a newspaper. The paper came in nicely to prevent the soiling of the clothes and helped to shut out the coldness of the cement rock. Two ladies entered and sat down near the boys. Without any hesitation they tipped their hats and divided their paper with the ladies. These boys are on the way to be men.

Mr. Roosevelt talked to us about men. He said he liked to see men who had courage to do right, men

who treated their wives with great kindness, men who were chums with their boys, men who made enough money to make their homes comfortable. WE ALL LIKE SUCH MEN. He does not like men who cannot say "NO" to the act they know is wrong, men who are cross at home and unreasonable, men who are too lazy to work. WE ALL DISLIKE SUCH MEN.

It takes a long time for a boy to become such a man as Mr. Roosevelt likes and such as we all like, so you must start early, right now, if you have not started before, and most of you have. The boy who is going to make a strong and good man must be "square" to those whom he meets, he must treat his sister and his mother the best he knows how, if he doesn't know what is best to do he will talk with his father about it, and he won't hesitate to work when work is wanted.

Your gardens are going to give you a chance to help at home. Do not take your vegetables home and expect pay for them, but give them to your parents, and still better, make your mother happy by helping her prepare them. Your mother is doing her best for you; what "best" are you doing for her?

Do you know that all your friends are watching you? What do they say? "He is going to make a man" or "He will NEVER make a man?"

Our University class of California junior gardeners now numbers 500. Articles which you write are helpful to a great many of the other children.

Before very long we hope to have a pin for each gardener. We may ask you to help out a little by paying just what the pin costs, possibly two cents, and it may be that

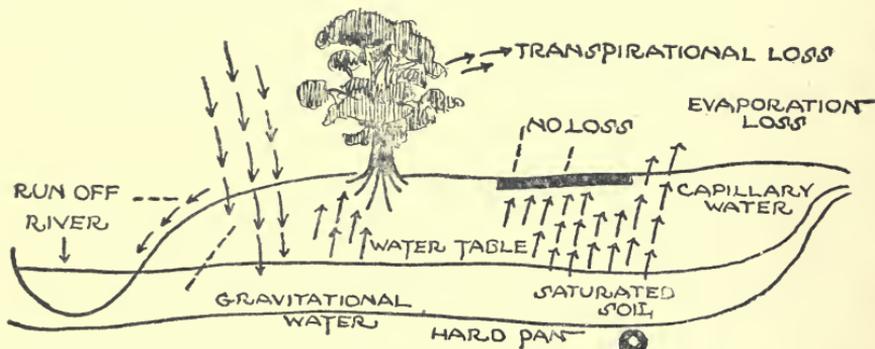
one cent will do.

* * *

THE RELATION OF WATER TO SOIL

Water reaches the soil in two ways, (1) by the rains, (2) by irrigation. The water which falls upon the soil and is pulled in by gravity is called gravitational water. If the land is level and has been plowed,

that is, plowing around a hill rather than up and down. A better method is to plant trees. Each tree has a great mass of roots which acts as a tub to hold water. Besides, leaves fall to the ground soaking in the rain and preventing the soil from being washed. The water company at Berkeley has planted hundreds of trees on the hills to conserve the water.



very little of this water runs off. It seeps through the soil, putting plant food in solution and carrying it to the roots of plants. Finally the downward progress of the water may be stopped by a bed of clay or hard pan, or it may be lost through a bed of gravel. The soil just above the hard pan layer becomes saturated or wet as does a sponge. When the rains stop and the sun comes out the water begins to climb back to the surface through the capillary tubes which most of you are familiar with. This is capillary water and is most used by the plants. The water climbs through soil just as the ink works up a blotter.

If the water is not used by a plant and partly thrown off into the air it comes to the surface and is lost through evaporation. This loss may be prevented by breaking the capillary tubes, by making mulch, or by cultivating. (See picture.)

This capillary water forms as a film around each soil crumb as your cap fits over your head. It follows that the more soil crumbs there are the more water there will be. Therefore the soil should be kept fine.

Much of the water which falls as rain forms the "run off" which rushes to the ocean by way of the rivers, carrying the hills to the valleys, and much of the valleys to the river beds and to the ocean.

Floods are often due to the "run off." The run off may be partially prevented through contour plowing.

During the summer it is cool and moist in the forest. The soil is full of moisture. The water seeps into the streams causing a steady flow of water or it bubbles out as a spring.

Thus the streams run all summer. Without the trees the water would rush down the hills causing torrents in the rainy season only to dry up during the summer time.

In regions of China and in our own country, once fertile region have become barren stretches of land due to the destruction of trees. Trees have been cut ruthlessly, and forest fires have destroyed thousands. However, the government of the United States has come to realize the value of forests and laws have been passed to set aside "forest reserves" and to prevent reckless and ignorant campers and lumbermen from destroying trees.

If you want to help this great country of ours of which we are so proud, spare the trees and plant as many new ones as you can.

* * *

THINNING OUT

Sometimes a careless boy or girl can cover up poor work in school but he or she cannot mislead Nature. Seeds that were sown carelessly by those who did not listen to instructions or did not follow suggestions have published to all ere this something of the character of the sower.

We have seen some crooked rows, some rows too close together, some rows partly sowed, others with plants

crowded together in bunches, but best of all we have seen rows after rows which were planted just right. Most of these rows are now ready to be thinned. At the first thinning have the largest plants about one inch apart. If some portion of the row is vacant, transplant the plants thinned out. Later the plants should be thinned again to their final distance. Thin as follows: Carrots 3 to 4 inches, lettuce (head) 6 to 8 inches, onions, 3 to 4 inches, peas, 4 inches, beets, 3 to 4 inches radish, 3 inches, or thin as used.

HARD PAN AND IRRIGATION

Hard pan is a layer of earth just below cultivation which is often impenetrable. It is most abundant in summer, particularly late summer. When abundant, irrigation may be of no value since water does not penetrate hard pan. It is ~~not~~ abundant in clayey soils and when the irrigating water contains much lime.

As the water seeps into the soil the lime is carried with it and it cements the particles of clay together as the water is used or is lost through evaporation.

To prevent the formation of hard pan the ground should be cultivated at different depths so as to continually break up the forming layers. Humus mixed in the soil will often act as a preventive.

PROBLEM QUESTIONS

Experiment I

Of what is soil composed?

Fill an ordinary bottle one fourth full of garden soil. Add water until the bottle is nearly full. Shake it thoroughly and set aside. Observe 24 hours later.

Experiment II

In which is capillary rise of water the more rapid, sand or clay?

Cover the small ends of two lamp chimneys with cloth. Fill one with sand and the other with clay. Stand each in a shallow pan of water. Observe results. The tubes should be at least 11 inches long.

MAKING THE ROWS

I find that many of the young gardeners have difficulty in properly laying out the rows of the plot. We all want to have the gardens look nice, as well as to have them planted right. We may have the seed bed well pulverized and free

from clods, but if the rows when planted are not straight, but crooked and zig zag, the appearance of the garden will not be satisfactory. So you had better take a little time to plan out what you are going to do, and how you are going to do it, before you begin sowing the seeds.

Suppose you plan to have seven rows in the garden. The first thing to do after you have the soil in good shape is to mark the garden at one end with seven equally spaced lines, so that you will have room for all and not crowd some rows while others are very wide apart. Be sure to leave enough room between the rows for cultivating with the hoe later.

Having determined the spacing, take the handle of the hoe or a piece of string and measure the distance from the white stake to the mark where you have indicated the first row is to go. Take that measure to the opposite side of the garden and mark off an equal distance from the white stake on that side. Now lay the handle of the hoe so as to connect these two marks made and press down on it. You then have a straight line to guide you in making the furrow. Do the same thing with the second row, and the rest. You will find your lines not only evenly spaced on the garden, but they will be straight and parallel, and the appearance of your garden will be increased wonderfully.

A. R. BAIRD,
Student Teacher.

NATIONAL FORESTS

If you have read the preceding article you may wish to know more about the national forests. These are tracts of timber land set aside and controlled by the national government. There are now 145,000,000 acres of national forests in the United States.

The government does not lock up the usefulness of these acres but controls them wisely to prevent useless waste of the trees.

Trees of certain sizes are sold to lumbermen at reasonable prices. Cattle are allowed to graze in the forests. Each settler has an equal chance, no one man can utilize the forests for his own selfish use. Generally speaking, the forests are made the most useful to all the people rather than to a few.

The government hires special watchmen to patrol the national forests to see (1) that forest fires

are not started, (2) to see that young trees are not cut for lumber, (3) to prevent over-grazing of stock, etc.

* * *
CULTIVATION

Many of the gardens cannot be irrigated, so recourse to "dry farming" must be had. Dry farming means to keep the top soil open in order to catch the rain and then to conserve the water by means of a mulch. If you have forgotten the work of the mulch turn to other pages of the "Junior." In making the mulch use the corner of a hoe to break up the soil several inches deep. Be careful not to disturb the plants. Those whose rows are far enough apart to receive the blade of a hoe will find the cultivation an easy matter.

Cultivate often to hold the mulch and to keep out the weeds. A plot of weeds the size of an ordinary lot throws a great deal of moisture into the air in 24 hours.



CHILDREN'S ARTICLES

OUR GERANIUMS

The low seventh grade in the San Leandro grammar school has a room in the basement of that school, and it is there that we do all our agricultural experiments.

In this room there are several tables on which we have long boxes, filled with earth and planted with seeds. In two of the boxes we have planted geranium slips.

First we sifted the dirt and then put sand on top of that, and then smoothed it over. Afterwards we soaked it with water and put in the geraniums.

One box of these cuttings grew, and had flowers, but we picked them off. The slips in the other box did not grow so well because we did not water them enough. As soon as the weather settles we are going to plant them around the school house.

MILDRED MACEY,

106 Crark street. San Leandro.

* * *

HOW I DISTILLED WATER

Mr. Stebbins, our teacher in agriculture wanted some distilled water to try the experiment if seeds would grow as well in it as in drinking water.

I was one of those selected to distill the water for the experiment.

As I wanted a quantity, I took the teakettle and filled it nearly to the top and waited for it to boil. While waiting I washed the dishes I was going to use in warm water, to be sure they were clean. When the water was boiling I placed one of the bowls I had washed under the spout and held another one over it. As it was cold the steam condensed and collected in drops on the inside of the upper bowl. Soon it began to drip in the lower bowl. This was distilled water.

When the upper bowl became hot it did not drop so fast, so I changed for cold ones.

It took me a long, long time to get a pint. JESSIE H. JONES,
East 14th street, San Leandro.

This is an original plan but an easier one might be devised.

* * *

TESTING SEEDS

We tried an experiment by putting damp cotton into two bottles.

In one bottle we planted seeds and put a cover on the bottle to keep out the air. In the other bottle we planted the seeds but did not put a cover on. We tried this to see which way the seeds would grow best, with air or with out the air.

By trying this experiment we found out that the seeds grow better in the bottle with the air than in the bottle without.

ALOUISE RAVEKES,
San Leandro. Low Seventh Grade.

This experiment teaches us that air must circulate in the soil. This may be brought about by thorough cultivation.

* * *

Mr. Morse, the seed man of San Francisco, is going to help you materially by furnishing many seeds free to those who plant school gardens. Write to us, since the seeds are in our care.

Please enroll my name to receive the Junior Agriculturalist FREE.

Name

Address

Grade

Teachers Name

Teachers Address

The Junior Agriculturist

A LITTLE PAPER ISSUED TWICE A MONTH
FOR THE BOYS AND GIRLS OF CALIFORNIA

Vol. 1

Berkeley, California, APRIL 15, 1911

UNIVERSITY
OF
CALIFORNIA No. 4

Communications should be sent to

C. A. STEBBINS, Editor

Berkeley, Calif.

Agricultural Education Division

Not long ago a bank president and his directors were conducting a meeting at which a vacant position in the bank was to be filled. The name of a young man was proposed. "I do not want him considered," said the president, "for I have seen him loitering on the streets smoking cigarettes." Another applicant's name was read. Again the president objected, for this man he had seen enter offices in the city in an ungentlemanly way. Finally a man was selected who suited all concerned. Thus the first two men lost opportunities because they forgot that the eyes of business men were upon them.

If for no other reason than this, it pays you to remember that you are being watched by business men as well as by friends. The business man wants the young man who is honest and energetic, who does not have time to smoke cigarettes and to loiter about the streets, who acts like a gentleman. The business man is ever watching the boys who are to make such men. The boy who does his work well, who acts "on the square," who tips his hat to girl and lady friends and his elders is on the way to a good position, for some one is watching him.

The business man knows that whatever you do now, as a boy, you are pretty sure to do as a man so he is interested in you now, as are all of your friends.

During the month of March, we visited a class of blind children twice

to teach them about our song birds. These poor children have a great deal of joy shut out of their lives. You would think it a great hardship to have to be blindfolded one day.

The first day we told them about the habits of the birds showing them how much value they are in helping to control the destructive insects. The stuffed skins of the birds which many of you have seen, were then handled by the children.

On the second day we all went out into the fields. When a bird sang, the children were told its name and were allowed to handle the stuffed skin of a similar bird. Thus they learned the songs of eight different birds. At our next visit, the children will remember these birds, even better than you would.

The next time your tooth aches or something else goes wrong just think of these blind children and be thankful that your troubles are so small in comparison.

We wish to tell the Berkeley gardeners that four banners have been ordered. Two to be used as rewards to the two groups having the best gardens on the University campus and two to go to the two best individual gardens. Each gardening day the gardens will be judged and the banners will be flown in their proper places. They will remain there from day to day so long as these gardens are the best. However, if on succeeding days other gardens are judged the best, the banners will be flown in their new places. Thus it will not only take work to win a banner but it will take work to keep it.

The banners have arrived since the above was written. Mr. Baird's and Miss Van Mater's children received the banners for the first and

second best groups. For the best individual garden banners were given to Joseph Hooker and Roscoe Scammon.

* * *

At the present writing, we think the gardens at the Niles school are the best. The boys have built a fence around the plot. The gardens are uniformly laid out, raised about three inches, and are producing a fine growth of vegetables. We are going to have a picture of the gardens in the "Junior" before long.

Some day if a big auto-truck rolls up to your school filled with children, greet them as gardeners from Niles, for seventeen of them are planning to rent such a car so as to visit the other school gardens of Alameda County. We like this idea. The children of Niles are "up-to-date."

* * *

The Decoto gardeners have made a large cardboard bird chart. Columns have been made for (1) the name of the bird, (2) when seen, (3) winter, permanent, or summer resident, or transient, (4) where it nests, (5) kind of food, (6) protected or unprotected, (7) name of the pupil who sees the bird first, (8) time of arrival or leaving.

Several "summer residents" have just arrived, (1) the russet-backed thrush, (2) the plain tit-mouse, (3) the chipping sparrow, (4) the black-headed grosbeak. We think the varied thrushes have gone north.

* * *

One class at San Lorenzo is putting in a lawn in front of the school house. The fifth grade children are growing flowers and geraniums to place about the building besides growing vegetables in their gardens.

* * *

We wish to correct an error which was made in the last number of the "Junior." In the article on "Hard Pan and Irrigation" two lines were interchanged and one left out. The article should read that "hard pan is MOST abundant in clayey soils."

* * *

If nothing happens the "California Junior Pins" will be ready for distribution before long. They are going to be given to you.

* * *

THE SEED

A seed is an embryo plant provided with food, usually, and a cover. The embryo sleeps within its cover until awakened by moisture. The

moisture is necessary in order to carry food to the small plant. We learned in the previous lesson that there is moisture in the soil so it follows that the first effort of the seed is to bury itself. Observe a seed closely and you may see that its shape is such that it may readily, with the help of winds and rains, work its way into the soil. Many seeds have mechanical arrangements which aid in burying them. Alfilaria seeds have a screw-like attachment which helps them to work into the soil and into your clothing. The fox-tail has seeds which penetrate your clothes very readily. Birds help to bury seeds.

With the seed buried by nature or by man, the water enters a little opening in the seed called the micropyle. This moisture sets up action in the seed, sugar is made, and more water is drawn through the seed cover. The experiment which most of you have seen with the walnut shells taught you this. The cover which up to this time has been helpful to the seed is now a hindrance and the seed tries to rid itself of its coat. Finally, the cover splits and the little plant pushes its way, a part upward to become the stem and leaves, a part downward to become the roots. The plumule becomes the stem and leaves, the radicle becomes the roots.

In order to form roots and leaves, food is necessary. The chick comes from the egg and runs about immediately to find its food. The little plant cannot do this so nature has placed its food close at hand, in the seed leaves, or cotyledons. In the case of the bean the seed draws for a long time on the seed food, sometimes until the plant is four or six inches high. By this time the roots have formed and have begun to draw upon the soil for mineral food, the leaves have begun using the air for food. The pansy seed has very little plant food for its embryo. The bean has a great deal. These facts tell us something about the depth to plant seeds. The small seed planted deep would not furnish the embryo enough food to help it to the sunlight. We know a general rule to use in planting seeds. It is, plant seeds as deep in the ground as three to five times their diameter. Seeds should always be planted deep enough to rest in moist soil, regardless of the rule. We have seen children plant seeds in dry soil. Since moisture is essential to plant growth, no results can, thus, be ob-

tained. Large seeds may be hurried in germination by soaking in water the night before planting. Often good results may be obtained by digging the row for the seeds, by filling with water, and after the water has soaked in, by sowing the seeds in the trench.

We hope that you have remembered that plants are grouped into classes by the number of their cotyledons. For instance, monocotyledons are plants having one cotyledon, such as corn; dicotyledons have two seed leaves, the bean; polycotyledons have many cotyledons, the pines.

* * *

QUESTIONS

- 1 What is a seed?
- 2 What awakens the seed?
- 3 How does the seed bury itself?
- 4 How does the water first enter the seed?
- 5 What happens when water first enters the seed?
- 6 What does the seed try to do with its coat?
- 7 Where is the food stored for the small plant?
- 8 What is the rule for planting seeds? What determines this rule?
- 9 How may germination be hurried?
- 10 How are plants grouped?

Many of our gardeners will recognize that some of the material found in the last two numbers of the "Junior" reviews the lessons given by the student teachers. This plan is going to help you to remember what is taught you.

* * * * *

CHILDREN'S ARTICLES

* * * * *

HOW DEEP TO PLANT SEEDS

Gardening is very interesting for me. I have always planted my things so deep in the ground that they never succeeded in coming up. I have learned now how far down to plant seeds. We had an experiment and quite far down we planted a seed and a little higher up another until we planted another seed in the right place. The one in the right place is quite high now. The others are still struggling to get up to the light. I remember one time I had some very nice seeds and I went out and dug a great hole and

dropped them in. It is over a year now and I have had nothing from my seeds. I have learned how far down to plant my seeds and the next time I shall know and may be I shall have some flowers. I have learned the rule which is to plant the seed from three to five times the smallest diameter.

MELIA FARWELL

High 5th Grade, Oakland.

* * *

PLANTS NEED LIGHT

To be sure that a plant needed light, we tried an experiment in our class room. We had made a small garden in a box. We put a cardboard box over a pea plant. The box kept the light from the plant. About two weeks after we took it off to see what the result was. The plant had turned yellow. The other plants that did not have any box over them were green. This experiment shows that a plant needs light.

VERNA JEFFERY,

5th Grade, Washington School, Oakland

* * *

PLANTS NEED HEAT

The plants need heat. If you plant some seeds in the shade and then plant some in the sun you will find that the one you put in the sun will come up first. We proved this by planting some seeds in two cans. We put one away from the sun and one in the sun. The one in the sun is lots larger than the other one.

JAMES REED,

A 5th Grade, Oakland.

Possibly the presence of more light had more to do with rapid growth than the difference in heat. This experiment hardly proves that heat was the controlling factor alone.

* * *

A SEED

A seed is a tiny plant surrounded by food. It needs plenty of air, moisture, heat and good soil. The parts of a seed are the coat, micropyle, cotyledons and embryo. In showing how the seed needed air we tied some seeds in cotton and put them into a bottle with water, then we put in the cork to shut out the air. Then we took a glass and put some cotton and seeds into it with a little water and did not shut out the air. The ones we put into a glass have come up very well, and are green, and the one we put in the bottle is not sprouted, so that showed that a seed needs air.

The Junior Agriculturist

A LITTLE PAPER ISSUED TWICE A MONTH
FOR THE BOYS AND GIRLS OF CALIFORNIA

Vol. 1

Berkeley, California, MAY 20, 1911

No. 5

Communications should be sent to
C. A. STEBBINS, Editor
Berkeley, Calif.
Agricultural Education Division

It is only necessary to visit the school to determine what a town, what a community is. If the school yard and the school house are untidy, are unattractive; if paper is scattered about, windows broken and everything points to carelessness, then we know what the community is, for such a school is like a big looking glass and reflects the life of the district. Thus the neglected school advertises a careless community.

The groceryman advertises his wares, the contents of his store through window cards and newspapers. Each individual has his way of not only telling the people what he may have to sell, but what he is as a man. Each boy and each girl indexes, or tells, to his or her neighbor, his or her character, by many little "signs" we have read "hung" out by our gardeners. The Berkeley gardeners are asked to report at 2.15 p. m. Three boys and two girls have reported several days behind time and at the first opportunity slipped away. It is not necessary to tell how, we all read such a sign. The university has given many children the privilege of coming on the campus to work and they have been asked not to climb the fence, but some sill do so. How shall we read this sign? We do not like to see bad signs, so let us

turn to those which are more pleasing. We have seen many gardens carefully laid out, well cultivated, indexing careful, conscientious boys and girls. We have seen boys and girls careful to return tools and willing to let others use these tools when in the garden. We have seen boys and girls patiently working, saying but little and accomplishing a great deal. We have seen a hat lifted to student teachers, and these indexes, or signs, tell their story. Not only do they tell what the boy is now, but what he is to be as a man. What signs are you hanging out by your actions, by your speech, and by your work?

* * *

We have received a great many interesting letters from our school friends asking for the "Junior." So many that it will be impossible to send individual answers. We want to thank you all. No doubt you will do your part and try to follow some of the suggestions the little paper brings to you. Our subscription list is growing so rapidly that we shall have to limit our readers only to those who have gardens at home or at school at the beginning of next term.

In September, we want to organize a great body of California Junior gardeners who will have gardens at home or at school. To them, we will send the "Junior" and individual club buttons or pins. We want to arrange for an exhibit, to show the parents of California what their children can do. Mr. Morse, the seed man, has put up many packages of seeds expressly for the California Junior gardeners. These will be sent free, as long as they last to those children who will start gardens at school. Thus you are furnished free, seeds, a paper, a

pin, and a lot of good times growing the seeds. But, better than all, you become a member of a great university class that, collectively speaking, is going to help California to become a great state.

Now is the time to begin to help if you do not wish to wait until September. Thousands of teachers from all over the United States are coming to San Francisco in July to attend the National Educational Association. Hundreds of these teachers are interested in gardens. They are going to hold a meeting in Berkeley. Since these teachers are interested in children's gardens and in children, should not the California Junior gardeners entertain them? We are going to give them a big vegetable dinner. The vegetables are to be grown, prepared and served by our gardeners. Thus we shall want many vegetables for the dinner and many flowers for decoration. We are going to make the sweetpea the principle flower. Will you help us by starting a garden at home and by sending us many sweetpeas and vegetables for the dinner to be held about the tenth of July? If you wish to help, send your name and address telling what you can give. Sweetpeas may be obtained rather easily. Ask your mother to help you.

* * *

We have been fortunate the past few days in traveling with the Southern Pacific railroad and the University of California demonstration train. There are ten cars in the train and each car contains an exhibit and men and women to teach the people how to farm and how to live better. At each town many people, including school children pass through the train. One car contains several hogs, another carries chickens, ducks etc. One shows cereals of all kinds, another carries an exhibit which teaches the people not to use community drinking cups, common towels, etc. It also points out the danger of the housefly, mosquito, tse tse fly, etc., to the public health. The people are much interested and get a great deal of help from the train. If you have an opportunity, be sure and visit it. more about the work of the demonstration train. Next term we are going to tell you

* * *

The gardeners should thank Mr. C. Runckel, of Niles, for making it possible to issue this little paper.

Mission San Jose.

Mr. C. A. Stebbins,
University of California,
Berkeley, Cal.,

Dear Sir: — Today we harvested our third crop of radishes at our school experimental garden. The "prize" radish was grown in the plot cultivated by Marinna Sezarío and myself. We are sending it to you for comparison with those grown at other schools.

We are raising twenty different kinds of vegetables and fifteen kinds of grain in our school plots and each of the pupils have been given seeds to take home. The home gardens are as good as those at school.

We have learned much about raising vegetables this year and are able to show our parents how to plant properly and how to save money by growing many things for the table. Please come and visit our school.

Yours Respectfully,
DELPHINE FRATES.

The "prize" radish is a wonder and too good to eat. It hangs in our office, labeled "The Best Radish Grown by California Junior Gardeners." The Niles children have grown some almost as large. Next term each one will have to work hard, for competition will be close.

Thank you for the invitation to visit you. We shall do so at the first opportunity.

* * *

Franklin School, E. Oakland, Cal.

Professor Stebbins,

Dear Sir:—We received "The Junior Agriculturalist" a few days ago and have found the articles in them very interesting.

The pupils of our class are experimenting in home gardening. Some of us are growing vegetables while others are raising flowers. We are all doing our very best to make this work a success, for it is very interesting and a pleasure to be among the plants and take care of them. This subject is comparatively new to most of us. Snap shots of ten of the best of these gardens will be taken by our teacher and if they turn out well, we shall send you the prints of them. We have not a school garden but hope to have one sometime in the future.

Yours Respectfully,
NELLIE MORRILL.

6 B. Grade

We are very glad indeed, to have such good reports from the Franklin School. Do not fail to send us the pictures.

* * *

WHAT PLANTS NEED FOR FOOD

Water and soil food are the chief part of a plant's diet. Manure makes soil rich; if you haven't this, buy it.

Soil food and air food are what the plants need and so it makes a good deal of difference to a plant if it finds plenty of food, in its home or not, the ground should be broken into small enough pieces, for the roots, not being gimlets, find it hard to push their way through. So when real gardeners are making ready homes for the plants they dig the beds deep, so that the roots will have something nice to work in.

When the soil is the result of the blending of several materials, it is called a loam, and the relative proportion of sand or clay produces what is known either as sandy loam, or clay loam, depending upon the different kind of sand or clay.

If a large quantity of vegetable or animal matter is to be found in the soils, such matter is called humus. When humus is in large proportions, it forms a class of soil called muck.

In order to show the movement of water in soil, arrange a couple of glass tubes or straight lamp chimneys such as are used with different burners, and in each place a different kind of soil, in one a pure sand, in another, a mixture of sand and clay, in another a sandy loam, and in still another, some leaf-mold.

Note the time and the distance to which the water rises in each of the chimneys through the different soils. This rise of water through the different soils is called capillarity. Do not go and fuss with the earth while it is wet. Air is necessary in the soil in order to make it a proper place for the growth of plants.

MARGARET GLOOR.

6th B. Whittier School.

* * *

AN EXPERIMENT

One day at our school in Niles, Calif., Prof. Stebbins, our agricultural teacher gave us an experiment which goes to show that leaf capillaries carry nourishment to all parts of the plant.

First, he took a small glass of water and placed a small amount of red ink into it. This was to color the water red.

Next he took a lily leaf which had a medium length stem and placed it into the glass of water. In a few days he cut the leaf into many parts and each part was slightly colored along the veins showing that the colored water was carried through the stem to parts of the leaf.

HARRY WALKER.

Eighth Grade Niles School.

* * *

CULTIVATION

Many gardens or farms cannot be watered, so some recourse must be had, in order to keep the soil moist underneath. In order to do this, cultivation is necessary. Cultivation is done by hoeing or with a cultivator. It breaks the capillary tubes that are all through the soil. It is through these tubes that the water comes up to the surface of the ground and evaporates. If people would cultivate their land oftener, irrigation would not be necessary.

In cultivating, one must be very careful that he does not harm his plants in any way. If the plants are close together, the side of the hoe should be used to make sure you don't cut any of the other plants. If the plants are far apart the blade of the hoe is used.

Cultivate often, to hold the mulch and keep weeds out. A garden or farm of weeds throws a great deal of moisture into the air in twenty-four hours. ZELMERA DOMENICI.
Eighth Grade Niles School.

* * *

DOMESTIC ANIMALS

The progress of a nation is measured by the kind of livestock or people in it. If the livestock or people in it are poor, that nation cannot prosper.

The farmer must also have good livestock on his farm, if he wants to prosper. Slowly, degrees by degrees we develop the possibilities of our animals. Animals are used for work. Without them, we would have to find other means for plowing and harrowing orchards.

Animals are used for milk such as cows, reindeer and goats. Without milk, we would have no butter or cheese and many other things. Can you find a substitute for milk?

Animals are used for pleasure, as horses and ponies. True, the automobile and airship have been invented, but you could never find a more gentle or surer way of riding, than behind a horse.

Animals are used for food. Beef,

which we get from the cow, is the most digestible of all meat. Poultry, games, and most animals are also used for food. There is not an animal in the universe that is not used for food. Man was once used for food by cannibals.

You may go to Europe, Asia and many other countries; in them you will find different animals, but all working for the same domestic need.

EDWARD ELLSWORTH
Eighth Grade, Niles School.

* * *

THE COTTONY CUSHION SCALE

Once upon a time, there came into California, some small, smooth, white insects called the Cottony Cushion Scales. These insects stayed on lemon and orange trees and had come over from Australia. The growth of these insects spread so fast, that all these lemon and orange trees had begun to die.

When the people of California saw all these trees in such a bad condition, they wondered what could have happened them, so later they found out that it was the Cottony Cushion Scale that had spread so fast. Now they wondered how they could get rid of them, so some one went over to Australia to get some other insect, which was its check. So they found out that an insect, called the lady bird, was its check. They got these lady birds into California, and at last, they got rid of these Cottony Cushion Scales.

FLORA LANFRI,
Eighth Grade, Niles School.

* * *

BIRDS SEEN AROUND NILES

The white-crowned sparrow, or striped-head as it is sometimes called, is a winter resident of this part of the county. It is found in the Sierra Nevada mountains any time of the year. The male is a bluish grey colored bird with two white stripes on the top of its head. The female has just a brown head, and a body like the male.

It is a little larger than the English sparrow. Scientists who have studied this bird say that it does more good than harm but I don't believe them.

The other day I awoke about 7 o'clock and went out to see how my radishes were getting along. I saw about twenty of these picking and scratching up my garden.

The California Towhee or brush robin, is a very useful bird in this community. It is of a brownish hue

with a tinge of orange under its tail. They live on insects most, though they have a small percentage of grain on their list.

The Red-Headed Linnet, Goldfinch and Oriole are summer residents.

The Alaskan Robin, Western Evening Grosbeak, and Wax Wing are transient residents.

The Alaskan Robin is here only once in a while. As there was great cold in Alaska this year it came down clear to Monterey.

RONALD HUNT,
Eighth Grade, Niles School.

Ronald, you should not condemn the white-crowned sparrow until you have studied it thoroughly as "scientists" have done. Possibly you are wrong.

* * *

HOW WE LAID OUT OUR GARDENS

When we got ready for our gardens, our school principal gave us a plot of ground fifty feet long and thirty feet wide.

After a few days, our school teacher selected three boys beside myself to divide the plot into small gardens. To do this we drove stakes at each corner, then we put a string around the plot. After putting the string around, we measured eight feet on the long side, and put in a stake; then we measured two feet and put in another stake. This two feet was where the path was to be. When we had finished the long side, we went to the short side and measured five feet and put in a stake, then we measured two feet and put in a stake. When we had finished all the sides, we put the string across the plot and staked it out eight feet one way and five feet the other way. By doing this, we made gardens eight feet long and five feet wide and a path two feet wide on three sides.

HENRY M. HALE
San Leandro Grammar School.

The Junior Agriculturist

A LITTLE PAPER ISSUED TWICE A MONTH
FOR THE BOYS AND GIRLS OF CALIFORNIA

VOL. 41 /

BERKELEY, CALIFORNIA, SEPT. 23, 1911

No. 46

Communications should be sent to
C. A. STEBBINS, Editor,
Berkeley, Calif.
Agricultural Education Division

PLANS FOR 1911—1912

The beginning class at the University of California numbers 1000 Freshmen. Our California Junior Gardening class numbered about 1000 last year but this term we hope to have at least 3000 pupils enrolled. In order to add numbers to this University gardening class ask your teacher to organize a California Junior Gardening Club. I am sure he or she will do so. If you read what follows you will know what to do.

Call a meeting, adopt the following constitution and elect your officers. Send to the editor of this paper a request for a printed constitution and enrollment blanks. Fill out the blanks and return.

CALIFORNIA BOYS' AND GIRLS' JUNIOR GARDENING CLUB

By-Laws of Local Club

ARTICLE I.

Name of Local Club.

THIS CLUB shall be known as the California Junior Gardening Club of School District County of

ARTICLE II.

Regulations.

This club shall be governed by the Constitution of the County Junior Gardening Club of California, issued by the Division of Agricultural Education of the University of California.

ARTICLE III.

General Officers.

The officers of this Club shall be a Supervisor, President, Vice-President, Secretary and Treasurer.

ARTICLE IV.

Supervisor.

The teacher shall be supervisor, having the general supervision in all local club work and power of exercising authority in proper management of the Club.

ARTICLE V.

Duties of Other Officers.

All other officers shall perform such duties as are usually assigned to such officers in other parliamentary bodies.

The President shall preside at all meetings and the Secretary shall keep the minutes and records of all such meetings. The Treasurer must care for all funds collected and shall only pay out the same upon the written order of the President, approved by the Supervisor. The Vice-President may act as President in the absence or disability of that officer.

ARTICLE VI.

Reports.

The Secretary shall submit a general report to the Manager of the County Club on or before June 1st of each year and shall make such special reports as may be called for from time to time by the County Manager (County Superintendent of Schools) or some one appointed by him, or by the Instructor of the Division of Agricultural Education of the University of California in charge, located at Berkeley.

ARTICLE VII.

Regular meetings shall be held each week as desired by the Supervisor while the school is in session. Meeting for garden work may be considered a regular meeting. Special or called meetings may be had upon call of the Supervisor, the request of the President through the Supervisor, or a written request of three members of the Club, approved by the Supervisor.

ARTICLE VIII.

Quorum

A majority of the members of the Club shall constitute a quorum for the transaction of any business.

ARTICLE IX.

Fees and Dues.

There shall be no entrance fees or annual dues, but the right to assess a fee of not more than twenty-five cents per member may be exercised by the Club upon motion indicating the purpose for which funds are to be raised; provided, a two-thirds vote of the quorum present supports such motion for assessment.

ARTICLE X.

Relation to College of Agriculture.

The local club may receive any special privileges offered by the Division of Agricultural Education of the University; namely, (1) the "Junior Agriculturist", (2) a club pin or button, (3) seeds, (4) permission to enter "growing" contests, etc.

ARTICLE XI.

When feasible, a "Garden City" shall be organized on a self government basis with a mayor, council, and other officers in charge. (Write to the Division of Agricultural Education, Berkeley, for further information.)

ARTICLE XII.

These by-laws may be amended by a two-thirds vote of members present at a regular meeting.

Did you read Article XI? It speaks of a "Garden City." In Berkeley, at the campus gardens we shall have a mayor, councilmen, etc. to govern the gardens. Vegetables and flowers will be placed on sale at the "Garden City" market. A banking institution will be started with the children in charge. We expect to make at least \$500.00 on the sale of products.

Ten per cent of this money will be long to the bank, the rest will go

to those who earn it. We hope that you will start a garden city

CONSTITUTION TO GOVERN THE "GARDEN CITY"

ARTICLE I.

The name of the garden at shall be the "Garden City."

ARTICLE II.

The object is the betterment of citizenship among its citizens and the development of body, mind and morals.

ARTICLE III.

Any boy or girl of the ages of six to sixteen may become a citizen by owning and caring for a garden.

ARTICLE IV.

The officers shall be mayor; city council of 6 members; garden commissioner; street commissioner; water commissioner; tool commissioner; city clerk; two police officers. (City clerk should be appointed on basis of ability and efficiency.)

(a) They shall take office September 1st and February 1st of each year.

(b) They shall be elected on the Monday preceding the above dates by popular vote.

ARTICLE V.

The duties of these officers shall be those usually devolving upon such officers.

ARTICLE VI.

Recall: A petition signed by qualified electors equal in number to twenty per cent of the entire vote cast for Mayor at the last preceding general election at which a Mayor was elected, demanding an election of a successor of the officer to be removed, shall be addressed to the Council and presented to the City Clerk.

Grounds of Recall: Reasons for the recall of an officer shall be stated in the call for the new election.

ARTICLE VII.

Gardeners shall work at least one hour two days a week—Wednesday between the hours of 2:15 and 4:30 and Saturday between 9 and 11. During the season each shall work ten hours for the public good.

ARTICLE VIII.

For lease of the individual plot and for other privileges, each gardener shall give ten per cent of the output of his garden.

ARTICLE IX.

The "Garden City Bank" shall handle all financial activities connected with the "city".

ARTICLE X.

The officers of the "Garden City Bank" shall be appointed by the Garden Director.

ARTICLE XI.

A "Garden City" market shall be established at which the output of the gardens may be placed on sale.

ARTICLE XII.

The City Council shall meet as requested by the Garden Director at which meeting all officers shall report.

ARTICLE XIII.

Amendments can be made to this council, upon a week's notice, with approval of the Garden Director.

If you read Article X you found certain privileges that come to you as a gardener. We have but 2000 pins and "first come first served" in other words those who "join the class first get the pins. Mr. C. C. Morse of the Morse Seed Company, San Francisco, has promised to furnish seeds free for our big class of 3000 pupils. However, if you wish to start a garden at home you will have to buy your seeds. Seeds are given only for school gardens.

THE VEGETABLE LUNCHEON

You may have heard of our vegetable luncheon at Hearst Hall. The vegetables were grown by our Berkeley gardeners although many potatoes and flowers came from Gardena.

Three long tables were prettily decorated. At each plate were a menu card and a cornucopia made by the gardeners. In the cornucopias were beautiful sweetpeas. The menu cards were turnips, radishes, and carrots done in water colors by the Whittier School children. The room was decorated with potted ferns, palms and flowers.

The children helped in the kitchen and waited on the table. Twenty children from the Franklin School

of Berkeley and four from San Leandro furnished splendid orchestral music.

Some 200 teachers were the guests of the gardeners and they all enjoyed the afternoon very much.

This year we want to repeat the luncheon before the close of school. The best children's orchestra will be asked to furnish music. The most original menu card design will be used. The luncheon this time will be for the gardeners themselves not for the teachers unless invited as special guests. So if you want to be with us grow an excellent garden.

One of the best features of the luncheon was the way some of the children helped. Many gave their services in preparation but a few only staid to help "clean up." It is an easy matter to start but not so easy to finish. We like those boys and girls who "stay on the job" until it is done.

NOTES

Mr. M. B. Hill formerly of Uplands, California, and now principal of the Ontario High School writes,

Record of the Upland Schools in Gardening, school year 1910, 1911.

No. pupils who had home gardens	149
No. pupils who did home gardening as a result of school gardens	83
No. of individual gardens at schools (about)	550
No. doz. radishes harvested, 1481 5-12	
heads of lettuce .	190 1-2
onions	17 1-2
carrots	81 3-4
beets	48 1-4
turnips	11 5-6
No. feet of lettuce	644

The statistics quoted above were reported by the children themselves; they raised much more.

Besides all this, we established school flower gardens, e. g. we planted 4 doz. rose bushes and dozens of other shrubs and trees. We grew 2000 pansies, etc. At one time we had more than a dozen different kinds of flowers blooming in the school yards.

During two years of agriculture work we have planted on our school grounds more than 100 trees, and we have transformed the school yard from a barren spot to a place of beauty.

The children of the LeConte school Mr. Imrie principal, have an excellent set of gardens.

We visited the Emerson School gardens lately. Mr. Vergon, the principal has an acre of ground in vegetables and flowers. Later we will tell you what is taken from the plots. The children have corn about eight feet high, pole beans nearly twenty feet high and other plants in proportion.

Some of the children in the Franklin School of Berkeley are going to start gardens at their school.

The editor will be glad to hear from the gardeners at any time. Tell us what you are doing and the best letters will be published in the "Junior."

The campus "Garden City" at Berkeley is to be open on Saturdays 9—12 and Wednesdays 2:15—4:30 for the boys and girls from 6 to 16 years of age.

CHAPTER I. The Soil.

Exercises

All exercises should be performed at school or at home.

1. Place in a medium sized bottle a small amount of garden soil. Add water until the bottle is nearly filled. Shake well and set aside.

2. Examine closely samples of clay and sand. Roll each about and feel both. Note the size of the particles.

3. Secure a sample of garden soil. Note the pieces of decaying leaves and other vegetable matter. Heat over a flame a small tin of garden soil. Note the burning and the odor.

4. Obtain samples of sand, clay, and garden soil and expose them to the sun for an hour. Which is the warmest; the coldest?

What Soil Is.

Do you know what soil is? A great many children and a great many fathers and mothers think soil is merely "dirt". Dirt which can be washed from hands and faces and which seems so much in the way. But soil is more than this. It is filled with little plants and animals, and many wonderful things take place in the soil. It is a great factory and store house where material is made and stored away. Look about you. Where did the iron and lumber come from which built your desk? The soil. Where did the linen come from which makes the girls' dresses? It comes from the fiber of the flax plant that grows in the soil. From what is glass made? It is made of sand which is part of the soil. Ask your teacher to tell you how linen and glass are made. The soil furnishes all you need to make you comfortable and happy.

Nearly everything about you came from the soil. Examine them and see if this is not true. You should know more about this soil which includes so much.

Examine the bottle after completing Exercise 1. The largest and heaviest particles at the bottom are sand. The finest particles just above lying on the sand and floating in the water are clay. The little particles of leaves, twigs, etc., resting on the clay and floating on the surface of the water are humus. Thus soil as a cold dead thing is made of clay, sand and humus, but soil as we wish to know it contains more water, air, little plants and animals and their dead bodies. Estimate the relative amount of sand, humus, and clay.

80-100 percent sand means sandy soil.
60-80 percent sand means sandy loam
40-60 percent sand means loam.
20-40 percent sand means clayey loam
0-20 percent sand means clay.

Characteristics of Sand, Clay and Humus.

The sand particles are the largest and they roll about more readily than do the clay particles.

Sand contains little food for plants but it makes soil loose and open so that air and moisture may be obtained by plants. Sandy soils plow easily. Sand is heated readily by the sun as you learned through Exercise 4, hence it makes soils warm.

Clay is made of very fine particles. When it is moist it helps to bind sand. Clay is a storehouse for plant food. It is cold in temperature.

Humus, which is decayed vegetable matter resembles clay more nearly than sand in size of particles, warmth, etc. Trees, flowers, and other plants add humus to the soil. Humus is very necessary. It holds sandy soils together and loosens soil containing a great deal of clay. Humus is a food storehouse for plants.

A brick chimney is made by piling one brick upon one another. Nature piles sand particles and clay particles in such a way as to form "chimneys", or tubes, in the soil. The tubes made by the sand are larger than those built by the clay and the humus. The proper name for the soil funnels is capillary tubes.

QUESTIONS

1. What is soil?
2. Which is the heaviest, sand, clay, or humus?
3. Why are foothill farms usually sandy? Why are there so much clay and humus in valley soil?
4. Of what use are clay, sand, and humus in soils?
5. What are capillary tubes? Are the capillary tubes smaller or larger in sand than in clay?



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GIFT

The Junior Agriculturist

A LITTLE PAPER ISSUED TWICE A MONTH
FOR THE JUNIOR GARDENERS OF CALIFORNIA

Vol. I. BERKELEY, CALIFORNIA, October 16, 1911 No. 7

Communications should be sent to

C. A. STEBBINS, Editor

Agricultural Education Division

A School Garden

ALFRED VAUGHAN,

Twentieth Street School, Los Angeles

Our garden has a path going through the middle of it. Each room has a certain part of the garden to plant and take care of. We were going to start a lawn in part of the garden, but couldn't, so it was divided into parts and given to the eighth grade to work.

Some of the pupils have borders of flowers around their garden and some have figures made in flowers.

The kindergarten has its plot fixed up like a farm. At one end it has a little house with walks and lawns around it and a barn behind it, and then it has the vegetables at one side.

All through the garden there are walks dividing it into plots.

WALTER GUTHRIE,

Twentieth Street School, Los Angeles

First, I would like to tell you about one of the foes of man and how to destroy it. The diabrotica is a beetle which is sometimes mistaken for a ladybird. It is a great foe to the garden, feeding on different kinds of plants. Another harmful beetle which is sometimes mistaken for a ladybird is the striped beetle which is found on melons and tomato vines. It is sometimes called the squash bug. The only remedy for these beetles is to pick them off by hand, or go out early on cool mornings with a can containing a little coal oil and shake them off the vines into the cans.

LEON CARTER,

Twentieth Street School, Los Angeles

Our garden has been a success because of the work we children and teachers have put into it. We first had the ground plowed and harrowed. The pupils then leveled it off and built all the paths in the center higher to drain off the water. The ground was then divided off and so much was given to each room. We sowed all the front of it in grass, but the grass did not grow well. It took too much time to make it grow well, so the lawn was dug up and all the ground given to our room. We are the A eighths and therefore should have the best garden and I think we will. We have nearly everything planted in our garden that you can think of and hope some time to see you.

A Patriotic Garden

RALPH L. BAILEY,

Twentieth Street School, Los Angeles

About the 20th of April I spaded up my garden and a few days later got it ready to plant seed and worked out my design. When my garden is finished I shall have a large star outlined in white flowers and filled in in blue with a large flower in the center. Between the six points I will have first red, then white, then blue twice. From the large flower to each of the points of the star I will extend strings and have red, white and blue running up these strings. Wallace Gray, whose paper you will find in the bunch, and I have a garden together and he expects to make a small star and a crescent.

We are trying to make a beautiful garden of flowers and by working together we can not help but succeed.

I have been reading some of the letters on this subject and am very much interested.

First Hints

VERE ERICKSON,

Twentieth Street School, Los Angeles

The first thing you do, if it is not very good soil and hasn't been taken care of, is to soak the ground well with water and get it ready for spading. When you have it soaked up good, take a spade and spade the whole plot. Then spray it thoroughly again, and when you are ready to make your garden mark it off. If you have any fertilizer handy you could put it on your garden and spade it under. When you are ready to put your seeds in, make straight and even grooves about half an inch deep, according to the seed you intend planting.

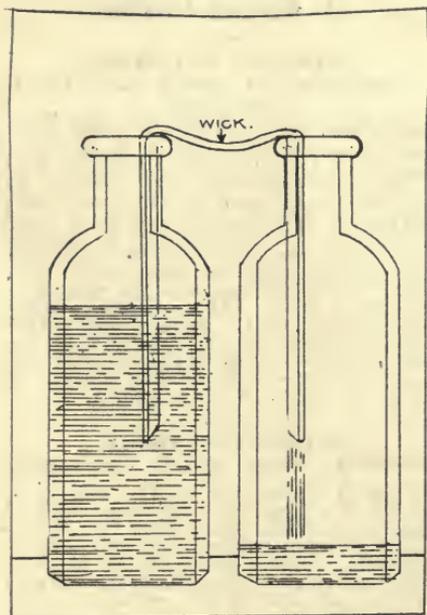
Capillary Attraction

BERTHA BRONDY,

Twentieth Street School, Los Angeles

Water will rise through almost any porous substance as a wick, a sponge or the soil. The force which causes oil, or water, or any other liquid to rise through a porous substance, is called capillary attraction.

The water in the soil is always at work. During rain, or whenever the surface soil is wetter than the soil below, the water passes down into the



soil until it reaches a layer that it can not pass. After a rain, the water penetrates into the soil. Then, when the sun comes out, it draws the water out of the soil and it evaporates into the air.

The passing off of water from a wet surface into the air, is called evaporation. In dry weather water evaporates from the surface of the soil, and other water from below rises to take its place. In wet weather the water in the soil tends to move downward.

If you take two bottles about the same size and fill one bottle up to the top, and leave the other one empty, then put a wick into the full bottle and extend it over into the other bottle, you will notice that the water passes through the wick from the full bottle into the empty one until there is an equal amount of water in both bottles.

The Properties of Soil Water

ALMA DILLARD,

Los Angeles, Twentieth Street School

Soil water is a subject well worth discussing, so I will write some points about it.

Soil water takes up and dissolves nearly every substance that we see in daily life, including air. Soil water is important because it contains the chief plant food and it acts as a carrier of all the other plant foods that come from the soil.

Soil water contains many different gases, nitrogen, carbonic acid, oxygen. It causes iron to rust under water. The substance that is most abundant in water is lime. There is salt, a little potash, phosphoric acid, sulphuric acid, magnesia, iron, etc. Nitrogen is mostly taken from humus by the plant. It is dissolved in the soil water in the form of saltpeter.

The dissolving action of water is due to carbonic acid gas. Well water contains more solid matter than river water. Soil water is very different from rain water; it contains all the plant soil foods in solution.

For the best growth of crops the water content of soil should be at about 50 to 60 per cent of the water capacity of the soil.

How He Works

By RAY WALLACE

In my garden I intend to plant potatoes, radishes, onions and carrots.

The first thing I shall do will be to get the ground in good condition, and then I shall put my potatoes in. They should be about five inches in the ground, and as they grow I will hoe them. Some people, when they plant potatoes, hill them up the first thing, but I think they grow better if the ground is just level, and as the stalks grow up hoe them and then pull the dirt around them. If the cutworm bothers the potatoes I am going to experiment by putting lime on top of the ground in the morning.

When I plant my radishes I will get my dirt real fine and then plant the seeds in rows about one inch deep and cover them over with fine dirt; but first I want to see that the seeds are not too thick, because when they grow up they will be in bunches and then they will not grow well. If you put the seeds half an inch apart they will be all right. You don't have to measure, but just guess at the distance. Your judgment ought to tell you how far apart to plant them.

When I plant the onion seed the dirt ought to be fine, so when the sprouts come up they will not encounter any lumps. They ought to be planted about one inch deep and covered over with fine dirt.

For my carrots I will have the soil in good condition and plant them about one inch and a half apart and one inch deep. Every night and morning they should be sprayed with water and the weeds kept down and the dirt loosened so as not to form a crust.

Clean gardens, like clean cities, are possible if each citizen does his share of the work. Not long ago, Mayor Wilson of Berkeley organized a campaign for "Clean Berkeley." All citizens were requested to see that the weeds were cleared away in front of their homes and on the vacant lots near them, and three days were set aside when this should be done. As a result of this effort, some parts of the city look much more attractive, but it is not hard to find places where the citizens failed to do their part. We are more ashamed of these bad looking spots than ever now, and perhaps a way will be found to clean them, too.

Have you heard how the boys and girls in New York city were organized into street cleaning squads? They did not do the heavy work of sweeping, hauling, etc., but they made it their business to pick up every piece of paper, stick of wood or refuse of any sort and put it in the garbage boxes provided on all streets by the city. The result was wonderful, and everybody was proud of what the children did. If boys and girls can do this for a great city, why can not the Junior gardeners work together in the same way? Let us make our slogan "A Clean Garden City!" Then, if the mayor appoints you on the street cleaning squad, you should be glad to take a little time from your own garden for the sake of yourself and your neighbors. You can "pick up and slick up," and we shall all be prouder of our garden city.

It seems that they have a new law in Oregon which provides for the division of each county into several districts. Each district will contain from 20 to 30 schools. Then district supervisors of agriculture are to be employed, at a salary ranging from \$100 to \$200 a month, plus traveling expenses. This plan will make it possible to promote the teaching of agriculture in all the schools of the state. Are you going to let California lag behind her little sister? Just say a word to father about this, for he can vote. E. B. B.

CHAPTER 2.—Water and Soil.

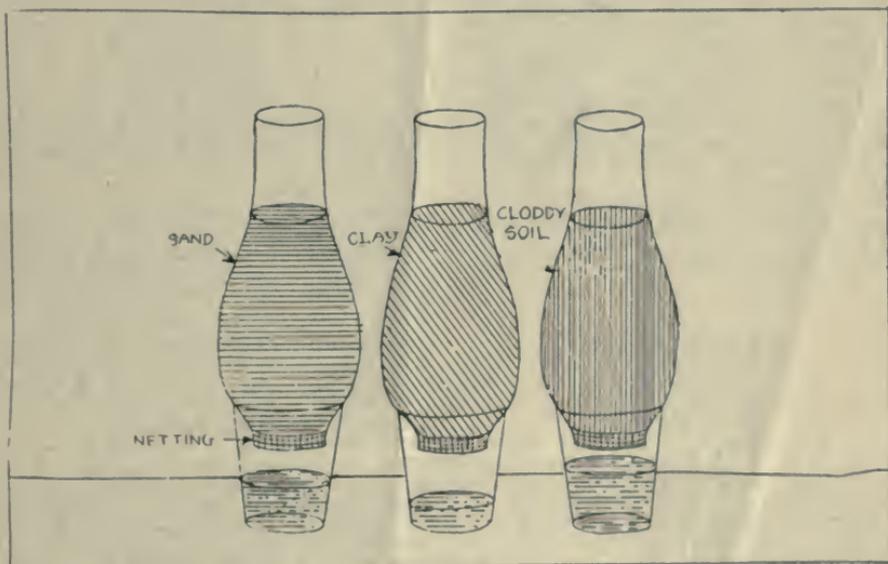


Figure 2.

Exercises

1. Arrange chimneys and tumblers as shown in Fig. 2. Use dry soil in the chimneys. Pour the same amount of water into each at the same time. Note progress of water through soils.

2. Arrange as in Fig. 3. Note the action of the water.

3. Ask your teacher to make you several fine glass capillary tubes. Stand these in colored water as shown

in Fig. 4. Observe the action of the water.

4. Hold a cold saucer over the nose of the teakettle. Observe the drops of water as they form. This is artificial rainfall.

5. Moisten samples of clay, sand and garden soil (containing much humus), roll into balls and set aside to dry. Mix samples of clay and sand, lime and clay, humus and clay, humus and

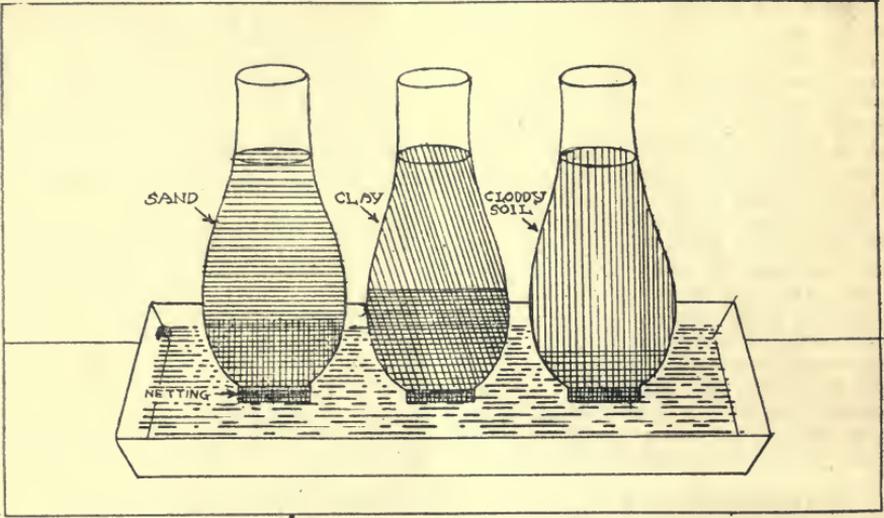


Figure 3.

sand, moisten and place to one side. Note the general appearance of the samples before and after mixing, before and after moistening.

The Work of Water—You have learned that soil is more than “dirt,” which gets in the way, and so water is more than something to drink. Let us see what the work of water is. In the oceans it beats upon the shore, breaking the rocks to form soil. The oceans swarm with animals which furnish us with food. Often the water seeps through the ocean bed, strikes hot rocks, forms steam and bursts the side of a mountain. Drop a little water on the hot stove and see how active the water becomes.

On warm, clear days water evaporates from the oceans, strikes a cold

current of air or a cold hillside or mountain side, becomes fog or a cloud, and is carried over the land and falls as rain. Then everything awakens. The farmer puts in seeds. The seeds send up the young plants and the country turns green and becomes alive with flowers. Water not only awakens the young plants, but it carries food to them. The wells are filled. The rivers rush toward the ocean through the valleys, bringing soil from the mountains to the ranches below. If you dip up a little water during the rainy season and set aside for a short time the water will evaporate, leaving soil which it has carried for miles from the mountains.

Thus water helps to build mountains; it helps to make soil and carries it where it can be used best; it scatters and awakens seeds; it waters animals and plants and carries food for all. Without it there would be no life.

Gravitational Water—A ball thrown into the air falls. The force of gravitation pulls it and all bodies toward the earth. The rain falls and sinks through the soil until it reaches a hard layer which it can not penetrate. This is called gravitational water. Gravitational water as it sinks carries some food to plants and awakens life in the soil. If the soil has not been plowed this water may not enter. It may run off to the creeks and be lost in the ocean, or it may run down a hillside, causing floods. What can be done to prevent the “run off”? Fig. 5. Plowing opens the surface and holds the water until it soaks in. On a hillside one should plow around, not up and down. This is called contour plowing. Each plant has a mass of roots, which is like a big sponge. Growing trees on the hillsides and protecting our forests will prevent the loss of gravitational water.

(To be continued)

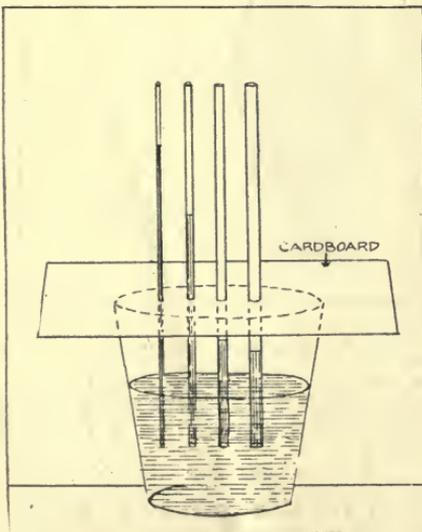


Figure 4.

The Junior Agriculturist

A LITTLE PAPER ISSUED TWICE A MONTH
FOR THE JUNIOR GARDENERS OF CALIFORNIA

Vol. I. BERKELEY, CALIFORNIA, October 30, 1911 No. 8

Insect Pests

EARL W. REID,

Los Angeles. Twentieth Street School

Every one who grows plants and vegetables must fight against the insects which destroy the plants. Some insects eat the leaves and some suck the juices from the leaves. They also feed upon the roots, and some bore into the wood or bark. Poisonous gases are used to kill all sorts of insects. For an example, take the peach worm, which injures the peaches in much the same way as the codling moth does the apple. It attacks also apricots and plums. In the fall the young worms bore into the bark, choosing the crotches where the new branches join the older stems. The worm lines its burrow with a tube of silk, which sticks out. The tube is covered with tiny crumbs of bark. Most of the insects can be checked by spraying with lead arsenate or paris green.

Mosquitoes

MILDRED LEAHY,

Los Angeles. Twentieth Street School

Our class thought it might be interesting to write some letters telling of our agriculture studies. I have chosen to tell of the mosquitoes.

A single mosquito lays from 300 to 500 eggs. When she is ready to stop laying them she makes a little raft. They turn from the egg into the larva, then into the pupa, which is a very ugly looking creature; from this stage soil is merely "dirt"—dirt which can they pass into a mosquito. There are great many fathers and mothers think two kinds of mosquitos, one which carries malaria and the one which does not.

Plant Pests

MABEL KLUMP,

Los Angeles. Twentieth Street School

The foes of the plant may be divided into three classes—those which eat the leaves, which may be poisoned by spraying with paris green or lead arsenate; those which suck the juice which may be killed by using a spray that kills by touching; those which feed on the roots, which may be killed by poisoned food left on the ground.

Butterflies and moths, though they help by carrying pollen, are harmful because they lay their eggs on the plant, and the young caterpillars feed on the leaves.

Field mice and gophers eat the root and seed of plants, and so ruin the plant. The best way to kill gophers is to put poison on vegetables and put them in the gopher holes. Field mice may be killed by poisoned grain or alfalfa. Alfalfa is best, because it is not eaten by birds.

The white fly is found on orange and lemon trees and does a great deal of damage to them. One way to destroy them is to burn the leaves to which they have fastened, but a better way is to wash the tree all over with water. In many places this has been done, and the fruit produced is much better than it was a few years ago.

Lady Birds

HELENE DAVIS,

Los Angeles. Twentieth Street School

As I live in a different part of the state, we do not hear much of what they are doing in the schools of the north. As we study agriculture, and it is my favorite study, I take pleasure in sending you a letter about my favorite subject, "The Lady Birds."

The lady bird was first brought to this state from Australia. It is the greatest friend of man because it feeds on plant lice and the cottony cushion scale.

Sometimes we see soft wormlike insects that are feeding on plant lice, but at a glance we think they are worms feeding on plants. It is the larva of the lady bird, and later on it turns into lady birds and flies away.

Growing Flowers

GENEVIEVE NEILAN,

Los Angeles. Twentieth Street School,
A Eighth Grade

My partner, Grace House, and I have a garden together, which is 20 feet long and 11 feet wide. The very first time we went to the garden we measured off our plot. Next we made our paths. Then we raked and shoveled our garden and made it level. In the middle of our plot we planted pansies in the form of a "G" as both our names begin with a "G." At the edge of our path we transplanted a border of "hen and chickens." We then planted two rows of forget-me-nots. We have quite a large space still in which to plant seeds, and as four girls and four boys go out every day, and it is my turn to go out tomorrow, we will plant some more flowers. Our garden will be all flowers.



YOUNG GARDENERS IN THE UNIVERSITY CAMPUS

GARDEN CITY MAYOR MAKES APPEAL

Juhl F. Gerdts, Garden City Mayor (Berkeley)

To the mothers and fathers who have children attending the Junior Gardens: I think this may interest you. I suppose your children have been telling you what a wonderful city we have. I think, in fact, it is one of the finest things that could happen for the school children. Some time ago we had an election of the officers who help conduct the city.

As we have just started this movement, we have not yet got everything we want. We intend to make many improvements. Among them we need first a bank, next a tool house, and several more things would be quite convenient. We want to make this movement both a pleasure and a profit to the children. Every child that attends the gardens has a plot. They all raise vegetables, and if they follow instructions there is no reason why each one should not make \$5 during the term.

Now, this is what we want to ask of you. If each parent will buy one dollar's worth of vegetables in advance from their children's gardens, we will be able to raise the amount of money needed. We can hardly ask the university for it, because they have donated us the land. So, if you are interested in your children's gardening we wish you would help them and us at the same time. You are respectfully invited to attend at the hours on Wednesday from 2 o'clock until 4:30 and on Saturday from 9 until 12 o'clock and see how the garden city is carried on. "No vegetables will be sent out unless they are as good as those secured at the markets."

The gardens are open to all children from the ages of 6 years to 16 years. All we ask is to think the matter over and attend our gardens, and I am sure you will help us in our work.

An Experiment

HARRY WALKER,

Eighth Grade, Niles School.

One day at our school in Niles Professor Stebbins, our agricultural teacher, gave us an experiment which goes to show that leaf capillaries carry nourishment to all parts of the plant.

First, he took a small glass of water and placed a small amount of red ink in it. This was to color the water red.

Next he took a lily leaf which had a medium length stem and placed it in the glass of water. In a few days he cut the leaf into many parts and each part was slightly colored along the veins showing that the colored water was carried through the stem to parts of the leaf.

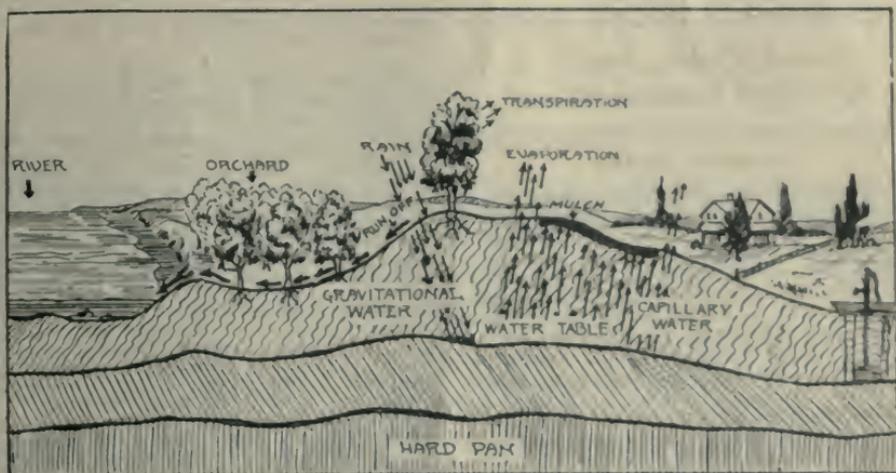


Figure 5.

(CHAPTER 2.—Continued from last issue.)

Exercise I. taught you that gravitational water runs rapidly through sand. Land with a sandy base should not be bought, for the water would run through it and be lost, unless there is plenty of water for irrigation. By using a post digger one may test land before buying.

Capillary Water—During the rainy weather the ground gradually, like a great sponge, fills with water. After the rains stop the water in the soil climbs to the top slowly and is lost, unless evaporation is stopped. This is capillary water. Capillary action is greatest in clay. Sometimes in trying exercise 2 the water rises most rapidly in the sand. The water in the sand is a "short distance" runner, while in the clay is a "long distance" one; that is, the water may rise more rapidly at first in the sand. Finally, however, it will climb higher in the clay. You should never be satisfied with one experiment. Try it several times to see if the same thing happens each time.

Clods and Water—Capillary action in the tube of cloddy soil (exercise 2) was very slow. It is the capillary water which nourishes the plants during the dry weather. The seed bed should be very fine and contain much clay. A cloddy bed would dry out quickly and water would not climb to the seeds.

The Mulch—If in exercise 3 you should break the small tube below the surface of the water in the tube, what might happen? How might the overflow be stopped? Soil water is continually flowing out the capillary tubes. They may be filled by breaking them with a hoe or rake. This careful breaking up of the soil surface forms a mulch which prevents the water in the soil from escaping. Enough rain falls each year in most countries to grow plants without watering, if the

water is kept from escaping. Your motto in the garden should be: Work the watering can less and the hoe more. Fig. 5.

Dry Farming—The plowing of soil to catch the rain, the mulching to prevent the escape of the soil water make up what is called dry farming.

QUESTIONS

1. What causes a volcano?
2. Name the uses for water.
3. What is gravitational water? Of what value is it?
4. How may gravitational water be saved?
5. Why is soil on a sandy bed poor to buy?
6. What is capillary water? In what kind of soil does it work best? Why?
7. Of what harm are clods in a seed bed?
8. How does the farmer get rid of clods?
9. What is meant by a mulch?
10. How does the farmer make a dirt mulch?
11. What is dry farming?
12. What is a good motto to follow in gardening?

HOME STUDIES

1. What farms in your locality are well taken care of; that is, well plowed and cultivated?
2. Which is better: To plow with horses or with a traction engine? What does a traction engine cost? What is the cost of a plow? A horse?
3. Which is the better place to begin plowing; at the center of the field or at the edge?
4. How many times do the farmers plow in your locality during a year?
5. What does it cost to plow and to cultivate an acre of ground?
6. Make a list of tools used on a farm for plowing and cultivating.
7. How often is the land allowed to rest that is not plowed? Is any use made of this land for pasturing, etc.?

Communications should be sent to

C. A. STEBBINS, Editor

Agricultural Education Division

GARDEN NOTES

We visited the Emerson school gardens lately. Mr. Vergon, the principal, has an acre of ground in vegetables and flowers. Later we will tell you what is taken from the plots. The children have corn about eight feet high, pole beans nearly 20 feet high and other plants in proportion.

Some of the children in the Franklin school of Berkeley are going to start gardens at their school.

The children of the Le Conte school, Mr. Imrie principal, have an excellent set of gardens.

Garden City and agricultural clubs have been formed at Niles, Decoto, San Leandro, the Washington and Franklin schools of Oakland, the Whittier school of Berkeley, the Social Settlement of San Francisco, and at other places which have not as yet reported. It might be a good plan to have each school a part of one big republic made up of gardening citizens from different schools with a governor and other officers of the republic. However, organize your own garden city first.

The following officers were elected to govern the Berkeley Garden City: Mayor, Juhl Gerdt; commissioner of streets, Albert Becker.

Later, as the gardens commence to produce, a market will be established at which flowers and vegetables will be sold. This will be followed by a bank which will be established on the grounds. Officers will be chosen from the citizens. We confidently expect to make \$500 the first year from garden sales. It will be no small task to keep the books, but we are sure the officers can do it. Ninety per cent of the sales goes to the citizens and 10 per cent to the bank. This money will be used to buy more tools, seeds, etc.

We need a toolhouse with room for a council chamber and the bank very badly. What can be done? See Mayor Gerdt's suggestion.

The Berkeley gardeners are trying out two irrigation plans: The "trench" system and the "check" plan. Nearly two acres of land are now under cultivation.

Miss Sellander of the Franklin school of Oakland could not find room for gardens at school, so she has donated her back yard. Could not find room, yet there are many vacant lots near the school overgrown with weeds, with owners too stingy to give boys and girls a good time. Read what Professor Babcock said about one helping the other. When you grow up do not have a vacant lot overgrown with weeds, but use it or let some one else use it. You will enjoy life in proportion to the amount of enjoyment you give.

If you organize a club be sure and tell us what seeds you want and for how many children. Almost any vege-

table may be planted now but beans, tomatoes and potatoes.

The school garden may be impossible for you, but the home garden is always possible. Later we will show you the pictures of some home gardens. We are going to give banners to the schools having the best gardens and banners to the children having the best home gardens.

Principal Vincent of the Niles school has started agricultural work again this term in the upper three grades. Last term he had the best gardens in the county of Alameda.

Mr. Saunders, a student teacher of the university, visits Decoto once a week. Principal Runckel is giving his support. The children of the sixth grade are preparing their gardens.

The children of the fourth grade at San Leandro, with the assistance of Mr. Walton, are arranging to not only grow plants in their gardens, but are going to beautify the school grounds. You could do nothing more worth while than to make your school home attractive. So many children are poor school housekeepers. Later the Junior will offer suggestions for beautifying the school yard.

The Junior Call is helping you gardeners, and those that are not gardening but will be, very much. Read it.

Mr. Morse of the Morse Seed company of San Francisco is always giving you a lot of fun if you will accept it. He has presented the club with flower and vegetable seeds.

The following gardeners have received the banners for first, second and third best gardens during the last two weeks: First banner, Frank Peterson, twice; second banner, Helen Whitney; twice; third banner, Margaret Gloor.

Exterminating the Rose Aphis

BLANCHE KERSEY,

Los Angeles. Twentieth Street School, A Eighth Grade

Our teacher, Mrs. Larkey, thought perhaps the readers in the northern part of the state would like to know what we have been studying about in agriculture.

We have spent a good deal of time learning about the plant foes and what can be done to destroy them. I have had quite a time trying to destroy the rose aphis, which is found on nearly all of our rose bushes. I have put ashes on the bushes in the evening and let the dew come down on them to form a paste; then wash it off the next day. This has helped some, but not as much as the sprays. These insects spread rapidly, as some of them have wings, so they can fly to other bushes.

The scale is another thing we have a hard time to get rid of. We have two orange and a lemon tree that were almost covered with the red scale. We destroyed a great deal of it by simply washing the trees with soap and water. We get much better fruit from them now than we did before.

University of California, College of Agriculture, Berkeley, California
Agricultural Experiment Station, E. J. Wickson, Director

The Junior Agriculturist

A LITTLE PAPER ISSUED TWICE A MONTH
FOR THE JUNIOR GARDENERS OF CALIFORNIA

Vol. I.

BERKELEY, CALIFORNIA, November 20, 1911

No. 9

How We Laid Out Our Gardens

HENRY M. HALE,

San Leandro Grammar School.

When we got ready for our gardens, our school principal gave us a plot of ground 50 feet long and 30 feet wide.

After a few days, our school teacher selected three boys besides myself to divide the plot into small gardens. To do this we drove stakes at each corner, then we put a string around the plot. After putting the string around, we

measured eight feet on the long side, and put in a stake; then we measured two feet and put in another stake. This two feet was where the path was to be. When we had finished the long side, we went to the short side and measured five feet and put in a stake, then we measured two feet and put in a stake. When we had finished all the sides, we put the string across the plot and staked it out eight feet one way and five feet the other way. By doing this, we made gardens eight feet long and five feet wide and a path two feet wide on three sides.



BOY GARDENERS AT THE PARENTAL SCHOOL.

CONSTANCE CLAIR,

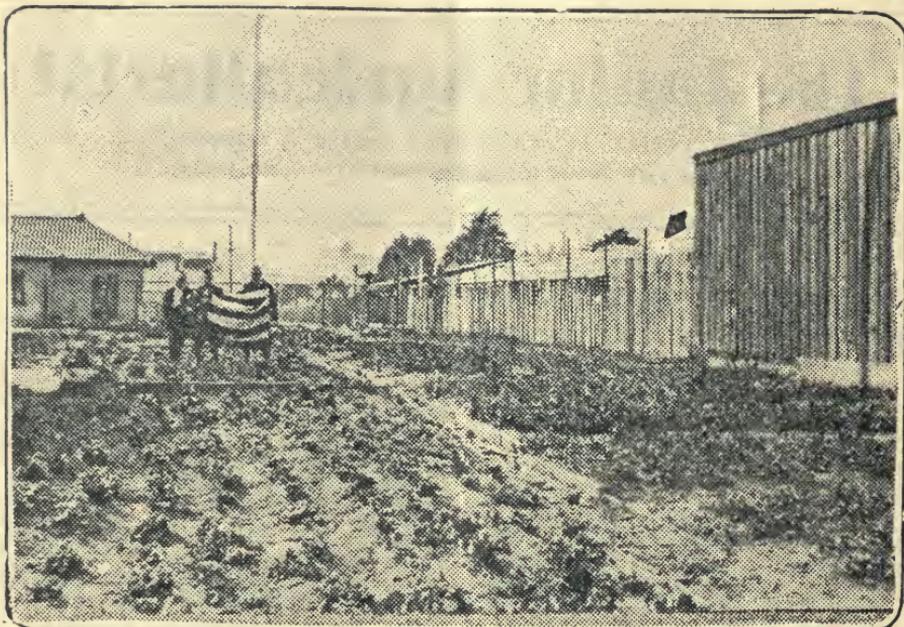
East Oakland, Franklin School

Our class, the A fifth grade, has started a school garden. Our teacher tried to get a vacant lot near the school, but could not secure one, so we have a garden in her back yard. We have 39 plats and find the work very interesting. The plats are all planted

now. Miss Collier, the assistant teacher, has been helping us and we have organized a club. Our officers are: Jimmy Rinehart, president; Ralph Lorimer, vice president; Constance Clair, secretary, and Dudley Palmer, treasurer.

We are very glad to hear from Oakland. Thank you for the pictures. We are using them to show other gardeners what you are doing.

GARDENERS RAISING THE FLAG



YOUNG GARDENERS RAISING THE FLAG ABOVE THEIR GARDEN

EDITORIAL

In the last few days many vegetables have been sold at the Berkeley Garden City market. Several of our older citizens and many who have entered of late have become more ambitious since the two market afternoons. We can guess the reason easily. It is due to the silver dollars which have come to the gardens. We do not censure the citizens in their new interest, in their desire to obtain money. We all want it. We all need it; but let us be careful how we get the dollar, and, after it is ours, let us be careful how we use it.

A brother and sister were talking to a man who was selling vegetables in an Oakland free market. "Brother bought 20 cents' worth of groceries yesterday," said the sister, "and the clerk gave him back 80 cents, which he kept. The clerk thought the 50 cent piece which brother gave him was a dollar." "Well, your brother will be a business man," said the vegetable clerk. We are afraid such a boy will be a crooked business man if he gets money in such a way. Anything that we obtain which we have not earned is not got "on the square," whether it be a dollar or an arithmetic problem. Make the vegetables worth the price; give too large rather than too small a measure.

The citizen who works faithfully and gives good weight earns, and so deserves, his dollar. It is right to recognize his labor, but now what is the dollar to do? It might buy a pair of skates for himself or for his sister. It might buy him candy and gun for himself, or a present for mother. Well, what do you think it ought to do?

Here is what we ought to remember: First, to be sure that the dollar is earned "squarely"; and, second, that it does good work in giving some pleasure to ourselves, but more to our best friends.

GARDEN NOTES

New gardening clubs are being formed every week. The latest to enter the enrollment are: The Prescott school at Mills college, Miss Ida E. Carter, teacher; Charles Silva, secretary; membership 20. The Elmhurst school, H. H. Coulter, teacher; Jennie Pieretti, secretary; membership 40. The San Leandro school, C. Leroy Walton, teacher; Lucy Martin, secretary; membership 19; and the Capay school, Yolo county, Miss Lillie L. Laugenour, teacher; Julia Giovannetti, secretary, membership 18.

* * *

We visited the Prescott school in Oakland last week and found that the teachers of the first and second grades had installed sand and dirt tables, one in each room. On each table was laid out a typical farm in miniature, with a little historical setting to lend it an added interest. The children were deriving no little benefit from the exercises given in connection with these tables, and the work accomplished was as much a labor of love as of industry.

* * *

In response to invitations, Superintendent McClymonds and E. M. Cox visited the gardens of the Franklin school last week and were loud in their praise of the club members' energetic application to the study of seeds and soils.

* * *

An interesting feature of the Elmhurst school is a tin can garden which has been organized by Miss Coulter. In these cans, which will be kept in the schoolroom, the boys and girls will plant flowers, and they are looking forward to making their room the prettiest one in school.

* * *

The regular gardening meeting was held by the Berkeley Gardening association in California hall last week and the attendance of mothers and fathers was unusually large. The Berkeley Gardening association is growing rapidly and is planning to do all in its power to further the gardening movement this year.

* * *

The Mothers' clubs of the Le Conte, the Lincoln and the Franklin schools of Berkeley have all held meetings at which the members expressed themselves as anxious to co-operate to the fullest extent with the university work.

* * *

The necessary funds for the building of a combination toolhouse and bank for the California garden city have been loaned by the University of California, and work will commence on the structure right away. The building will cost about \$300, and the children will pay the debt incurred by giving a

certain percentage of the vegetable sales. Toolhouse and bank officers will be appointed shortly.

* * *

Market day on the university campus was a busy one last Saturday, and the citizens of the California garden city sold out entirely their stock in hand. About 50 parents were in attendance and the proceeds amounted to \$3.70.

* * *

Isabelle Fiselbrand was awarded the first banner for the best garden last week in the California garden city while Grace Becker was given the second. Banners will be awarded again in a fortnight.

A New Junior Heard From

EVA NEAL.

I am very much interested in the agriculture Department of the Junior Call. We only have one school in Paso Robles, but it is a very good one for the size of the town. We have each got a flower pot and Miss Elliott, our teacher, gave us each three beans to plant: No. 1, pink bean not soaked at all; No. 2, black eyed bean soaked four hours; No. 3, black eyed bean soaked two days.

The first beans to come up were the ones we soaked two days or No. 3. Almost all the beans have come up, except mine; it seems they withered.

We tried capillary attraction. We put some beans in a bottle and they pushed the cork out.

Domestic Animals

EDWARD ELLSWORTH,
Eighth Grade, Niles School.

The progress of a nation is measured by the kind of livestock or people in it. If the livestock or people in it are poor, that nation cannot prosper.

The farmer must also have good livestock on his farm, if he wants to prosper. Slowly, degree by degree, we develop the possibilities of our animals. Animals are used for work. Without them, we would have to find other means of plowing and harrowing orchards.

Animals are used for milk, such as cows, reindeer and goats. Without milk, we would have no butter or cheese and many other things. Can you find a substitute for milk?

Animals are used for pleasure, as horses and ponies. True, the automobile and airship have been invented, but you could never find a more gentle or surer way of riding than behind a horse.

Animals are used for food. Beef, which we get from the cow, is the most digestible of all meat. Poultry, game and most animals are also used for food. There is not an animal in the universe that is not used for food. Man was once used for food by cannibals.

You may go to Europe, Asia and many other countries; in them you will find different animals, but all working for the same domestic need.

CHAPTER III

An Ideal Soil or Seed Bed

Examine the balls of earth prepared in Chapter 2. Of the three made of sand, humus and clay, which has the greatest power of holding its particles together? Which would be the most liable to bake? To puddle? What effect did the humus and clay have on the sand? What effect did the sand have on the humus and clay? What effect did the lime have on the clay?

Sand—We have learned that sand is heavy in weight, but light to plow; that the particles are large, admitting much air; that it is warm in temperature; that water runs through it rapidly and does not climb back very far, and that it loosens clay.

Clay—We have learned that clay is heavy to plow; that the particles are small; that it is cold; that water runs through it slowly and climbs back many feet; that it holds water well; that it contains plant food; that it binds sand together, and that it packs and puddles when alone.

Humus—We have learned that humus binds sand particles and loosens clay particles; that it is cold; that it contains plant food; that it holds water.

An Ideal Soil—Knowing these things about sand, clay and humus, let us see what an ideal soil should be and how it can be made.

Soil a Reservoir for Water—Clay and humus hold water best. Most of the soil water comes from rain which does not fall regularly, so an ideal soil must receive and hold water to supply the plants during dry weather. Usually there is enough clay in soil. Humus may be added by stirring in dry cow's manure or horse manure. Sometimes clovers are grown and plowed under.

Soil Must Be Warm—Soil which is too clayey in nature not only packs, but is too cold for plant growth. Such a soil is loosened and made warm by adding sand.

Soil Must Be Porous—Clayey soils are loosened by adding humus and sand. A sandy soil is too porous and dries out too quickly. Humus absorbs and holds moisture and thus would improve it.

Soil Must Contain Plant Food—A sandy soil contains little food, as you will learn later. Humus added to such a soil improves it.

An Ideal Soil—An ideal soil should contain enough clay and humus to hold water and to lead it toward the surface. It should contain enough humus and clay to furnish food for plants. There should be enough sand to make the soil porous and warm, and finally, as you will learn, such a soil must contain minute plants—bacteria.

Good Soil Necessary for Plant Growth—Before starting your garden at school or at home, examine the soil to see if it needs treatment. If plants are growing well near or in the soil where the garden is to be, it probably will not need especial care.

Questions

1. What change is made in a clayey soil when sand is added?
2. How would you improve a sandy soil?
3. How would you add plant food to a clayey soil?

4. What is the need of air and water in soil?

5. How might humus be added to soil?

6. How does the farmer work adobe, or clayey soil?

7. Name a method used by the farmer to loosen clayey soil without adding sand.

Home Studies.

1. What is the average rainfall of your district? Is irrigation necessary?

2. Observe young plants in the morning. Where does the moisture come from? What is dew?

3. Is there any way to prevent loss of water through "transpiration"? What effect have weeds on soil moisture?

4. Find out how much water is lost by an acre of corn or wheat.

5. Make a collection of soils found in the neighborhood. Make a physical analysis of each (see Chapter I, exercise 1). Note the plants growing in each different kind of soil. Make a list of plants best suited to sandy soil; to clayey soil.

6. Would dry soil make brick?

7. Notice the difference in color between hillside and valley land. Why is this?

8. What has been done by the farmers in your vicinity to make an ideal soil?

The Cottony Cushion Scale

FLORA LANFRI, Eighth Grade, Niles School.

Once upon a time, there came into California, some small, smooth, white insects called the cottony cushion scales. These insects stayed on lemon and orange trees and had come over from Australia. The growth of these insects spread so fast that all these lemon and orange trees had begun to die.

When the people of California saw all these trees in such a bad condition, they wondered what could have happened them, so later they found out that it was the cottony cushion scale that had spread so fast. Now they wondered how they could get rid of them, so some one went over to Australia to get some other insect, which was its check. So they found out that an insect, called the lady bird, was its check. They got these lady birds into California, and at last, they got rid of these cottony cushion scales.

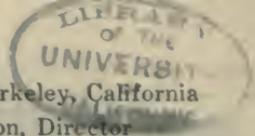
An Experiment I Tried

JOHN GRANT, East Oakland, Franklin school, Fifth A Grade.

I took a bottle of red ink and a yellowish rose and put the rose in the ink to see what would happen. In a little while the veins of the rose petals became red.

Then I took a white chrysanthemum to do the same with. It made a better looking flower. It was osmosis that drew the ink up into the petals.

Communications should be sent to
C. A. STEBBINS, Editor
Agricultural Education Division



The Junior Agriculturist

A LITTLE PAPER ISSUED TWICE A MONTH
FOR THE JUNIOR GARDENERS OF CALIFORNIA

Vol. I.

BERKELEY, CALIFORNIA, December 20, 1911

No. 10

Growing Contest.

Junior gardeners, would you like to earn a good prize and become famous besides? Prizes are to be offered to the schools and to individuals that grow the best sweet peas. There isn't a boy or girl in California who can not grow sweet peas. Of course, all can not win prizes, but those who think most will. We want you to start at once after reading the following notes:

First—In order to enter the contest as an individual, you must be a California Junior gardener. It is only necessary to send your name and address to C. A. Stebbins, Berkeley, asking to become a member of our large class, if you are not already enrolled.

Schools that contest must be organized as a California Junior club. Write for information to the agricultural education division, University of California.

Second—Contestants must have no direct assistance in planting the seeds or caring for the plants further than that obtained from suggestions by friends or from reading. Each contestant must do all of the work in growing the sweet peas.

Third—Scoring percentages will be announced soon, with a list of the prizes.

Fourth—On these pages you will find instructions for sweet pea culture.

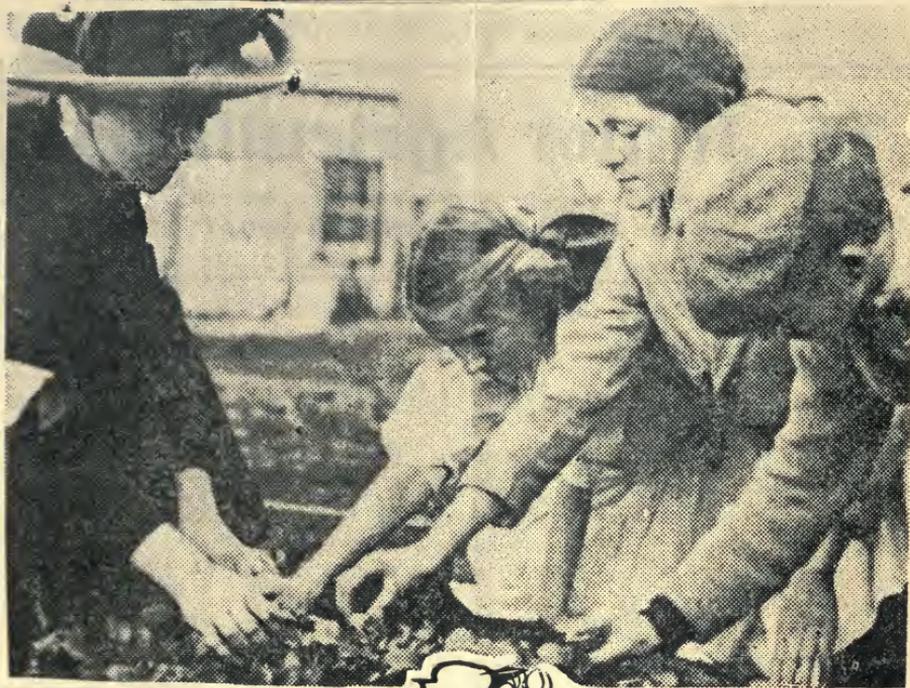
Fifth—Remember:

1. To buy good seed.
2. That "well begun is half done." Make the seed bed ideal.
3. To ask questions of florists, gardeners.
4. To read books on the growing of sweet peas.
5. That prizes will probably be awarded on the 20 best sprays of sweet peas, not on a great number.
6. That it will be fun to join this big game and show the other children what you can do.

Sixth—Do not wait to know just what the prizes are. They will surprise you. Commence studying at once.

A package of six varieties of the best sweet peas for schools:

1. King Edward VII; red.
 2. Dorothy Eckford; white.
 3. Prima Donna; pink.
 4. Lady Grisel Hamilton; lavender.
 5. Miss Willmott; orange pink.
 6. Hon. Mrs. E. Kenyon; primrose.
 7. The Countess Spencer; giant pink.
- These are all 5 cent packages, or six for 25 cents.



WEEDING THE PLOT.

EDITORIAL

DO NOT BE A "QUITTER"

After Lincoln had delivered one of his best speeches, a friend hurried to him and said: "Mr. Lincoln, how could you make such a fine speech?" "Why shouldn't this speech be a good one?" said Mr. Lincoln. "I was 17 years in preparing it." For 17 years Lincoln never lost courage, never gave up his purpose to write and to deliver his great Gettysburg address.

We are sure that you are all acquainted with General Grant, the man who, during the civil war, never gave up.

Where would we loyal Americans be today if Washington had given up to the British? With his best friends turning against him and suffering with his small band of faithful followers during the terrible winter at Valley Forge, Washington still clung to his purpose, that of freeing the colonies. He had set his mind to this purpose, and he would not "quit."

We admire a man or a woman who does not quit. We admire a boy or a girl who does not quit. There were two or three "quitters" at the vegetable luncheon held in Hearst hall, Berkeley, the last summer—children who started their work, but who did not finish. But we are glad to say there were many who stayed until all the hard work was done. Do not be a "quitter." Do not start anything that you can not or will not finish. If you start a garden, do not give up if things go wrong. Keep at it. If you are elected as an officer of the gardens, or are only a citizen worker, do your share, even if matters do not suit you entirely. We are sorry, but we shall have to call the boys and girls who are easily discouraged "quitters." Are you a "stayer" or a "quitter"?

* * * *

Many of the gardeners at the Berkeley Garden City forgot to put their tools away. We are thinking seriously of fining each boy and each girl 1 cent who forgets twice. Some one has the tools to put away. Who shall it be, the boy or girl who uses them or the teacher who gives you the privilege of their use?

CHAPTER IX

How to Grow the Sweet Pea

The sweet pea is the most beautiful and fragrant of flowers. It lends grace to every occasion. There is no flower which responds more readily to careful treatment. Your garden is not complete without sweet peas.

In growing this plant, as in growing all other plants, use all the information that you have gained and that you can obtain in plant culture.

Preparation of the Seed Bed—Select a plat which is partly shaded during the day and which has a background, such as a fence, shrubbery, a shed, etc. The plat should be oblong in shape, about two feet wide and as long as desired. Sunlight will have its best effect if the plat lies north and south.

In the fall work well rotted barnyard manure and bone meal deep in the soil. If you desire extra fine flowers, spade the bed at least two blade lengths in depth. This may be done as follows: (1) Dig a hole at one end of the plat the depth of one spade blade, and two feet long; (2) cart or carry this soil to the other end; (3) stir the subsoil thus uncovered another spade length; (4) throw the following two feet of surface soil on the subsoil which was spaded; (5) break up the newly exposed subsoil, cover with the following top soil and continue the process. Fill the hole at the end of the plat with the dirt which was first moved.

If you do not desire the best flowers, use the trench method of spading. Be sure to run the spade straight into the soil. Add a fertilizer as suggested above.

Sowing the Seed—Sweet peas like a soil which is not too light or too warm. The seeds do best if they are planted in November and December, although planting time may continue into May.

If the rains have not softened the proposed seed bed, the ground must be thoroughly sprinkled two or three days before working.

After making a careful selection of seeds from a seedman's catalogue, soak them after receiving 24 hours before sowing. Dig a trench about five inches deep and sow the seeds about one inch apart. Cover with one inch of dirt, pack the soil carefully and leave the rest of the trench open.

Care of the Young Plants—As the young plants come up, thin them to about one foot apart. The plants will not produce beautiful flowers if they are crowded. Add soil about the young plants gradually, until the trench is filled.

When the plants are large enough, furnish them with something to climb upon. This may be twigs stuck in the ground, a string frame, or a wire netting. The frame should be at least five feet high.

After each rain or irrigation with a hose, cultivate the soil with a hoe to the depth of two or three inches. Cultivate whenever a crust forms on the surface of the soil.

The plants, at a height of two or three feet need much water. It is much better to dig a trench close to the row and irrigate thoroughly twice a week than to sprinkle each evening. At this stage of growth, train any young plants to the netting that are out of position.

Care at the Blooming Period—The brilliancy and beauty of a flower depend upon healthy growth, due to proper food conditions and to excellent care. Soak a sack full of cow manure in a tub of water. Add a quart of this liquid to six gallons of water and apply close to the sweet pea row, but not on the vines, once or twice a week. Irrigate first with pure water. Pick the blossoms regularly. Do not let them go to seed. Long sprays of sweet peas in glass bowls make an attractive display.

To keep insects, such as the red spider, away from the vines, spray now and then with the hose held close. This treatment will wash off unwelcome visitors. If the red spiders should become too numerous, spray with whale oil soap or "back root," a tobacco preparation.

By plucking off many of the flower buds before they open, the food supply may be forced into the remaining blossoms, thus the plant may be made to grow extra fine flowers.

Sweet Pea Culture in Pots, etc.—Procure a few three inch pots and fill nearly to the top with soil mixed as follows: one-third leaf mold, one-third sand, one-third loam, and a little bone meal. Plant three seeds one inch deep. Keep the soil moist, but not soaked. In the spring transplant wherever you please.

Sweet peas will do well in tin cans, paper pots, window boxes, etc.

Kinds of Sweet Peas—Seedmen group sweet peas into four classes: (1) Early flowering, (2) dwarf, (3) grandiflora, (4) Spencer.

The early flowering class blossoms in about three months after seeding. Planted early in September, blossoms are ready at Thanksgiving and Christmas.

Dwarf sweet peas grow about eight inches high and spread widely over the ground. Rows planted a foot apart will become one mass of green foliage and brilliant colors. This type makes an excellent border.

The grandiflora is the ordinary sweet pea which is so well known. The seeds of this class are quite inexpensive. Gardeners who know prefer the Spencer sweet peas because of the rich colors, the size and beauty of the blossoms, the long sprays, the long blooming period.

"Sweet Pea Culture" is a little booklet issued free by C. C. Morse & Co., 48 Jackson street, San Francisco. Send for it, for it will help you to select the best variety of seeds to plant. If you write to Mr. Morse, Junior gardeners, thank him for the seeds which he has given you through the university.

GARDEN NOTES

A California Junior Gardening club has been started in the Garfield school, Oakland. There are 39 members. Miss L. Phillips, the teacher, will be in charge.

Miss B. Langenour has organized a club of 25 in Woodland.

Mary Thornton, age 13, is the newly elected secretary of a Palo Alto club.

Leland McConnell, age 13, is the secretary of a club of 20 members, organized by Ruth Kellogg, in the San Joaquin district, Sacramento county.

The Las Lomitas district, San Mateo county, Miss E. A. Wilkins, teacher, has organized with 25 children. Gladys Lightbody was elected secretary.

The Fillmore district, Yolo county, Miss Julia Bray, teacher, numbers 22 boys and girls, with Mary Kampke secretary.

Mr. Abbott of the Armona district, Kings county, starts with more than 50 gardeners, Alice Hitchcock, secretary.

We hope to hear from these club members from time to time. Pictures of the gardens sent to the editor will be published. Each member of our big class wants to see and to know what the other is doing. There is not a schoolroom in California large enough to hold our class, and soon even the Greek theater at Berkeley would not hold it.

* * *

Are you reading and studying the garden lessons? Later we may ask your teachers to give you a written lesson, and prizes may be given for the best answers. If you can answer the questions at the end of the lessons you may win one of the prizes.

We hope that you are performing the exercises suggested in each lesson.

* * *

The first mothers' market day at the Berkeley garden city netted about \$5. Radishes and turnips were the main productions. We feel the need of our bank at once. It will be established soon.

We visited the Franklin school gardens of Oakland last week. They are the best gardens that we have seen lately. The secretary of the club and her friend have a home garden worth while. By the way, have you a home garden? Would not sweet peas look well on that unattractive fence? Would not a few flowers add to the yard?

There are thousands of children in California. If each would help to beautify the home just a little, so much good would be done.

More than 50 mothers and fathers visited the gardens of the California garden city on the state university campus last Saturday, the occasion being the first market day of the season. There was a fine display of lettuce, radishes, Swedish turnips and greens, and, taking into consideration the fact that the gardens have only been under way about six weeks, the proceeds, which amounted to about \$5, were most encouraging.

Beginning with last week the garden city from now on will hold one day apart, which shall be known as "mothers' day," when the parents will be at liberty to visit the market and purchase their supplies from their own boys and girls. Ninety per cent of the money thus obtained will be given the children, while the remaining 10 per cent will be placed in the garden city

To Grow Flowers

Dorothy Dow,

Junior Gardening Club, Durant School

We were a long time in starting our garden because we could not get the seeds.

When at last they came the boys dug the ground up and divided it into plats, while some of the girls divided the seeds into packages for the different children.

As Mr. Dunbar, the principal of our school, was kind enough to give us the land, yesterday after school we went down to plant our seeds.

Everybody was very much excited, and it looks very nice.

In my garden I planted sweetpeas, cosmos, carrots and parsley.

When we get some more seeds I am going to plant poppies and pansies.

An Experiment to Show Osmosis

EUNICE FONES,

Oakland. Franklin School, A Fifth Grade.

This week we learned a new word. It is "osmosis." This is how we learned the meaning of it: The teacher took two dried lima bean seed coats and put a few sugar crystals in them. Then she filled a glass three-fourths full of water. She then put one of the coats on a dry glass slide and put the other in the water to float.

The results were, the sugar remained dry in the coat on the slide and in the other one it melted.

This shows that the water enters the seed by osmosis through the pores of the coat as well as through the micropyle.

Communications should be sent to

C. A. STEBBINS, Editor

Agricultural Education Division

The Junior Agriculturist

A LITTLE PAPER ISSUED TWICE A MONTH
FOR THE JUNIOR GARDENERS OF CALIFORNIA

Vol. I.

BERKELEY, CALIFORNIA, January 12, 1912

No. 11

SWEET PEA CONTEST

Junior gardeners, would you like to earn a good prize and become famous besides? Prizes are to be offered to the schools and to the individuals that grow the best sweet peas. There isn't a boy or girl in California who can not grow sweet peas. Of course, all can not win prizes, but those who think most will. We want you to start at once after reading the following notes, if you have not begun:

First—In order to enter the contest as an individual, you must be a California Junior Gardener. It is only necessary to send your name and address to C. A. Stebbins, Berkeley, asking to become a member of the large class, if you are not already enrolled.

Each school that contests shall be organized as a California Junior club. Write for information to the agricultural education division, University of California.

Second—Contestants shall have no direct assistance in planting the seeds or caring for the plants further than that obtained from suggestions by friends or from reading. Each contestant shall do all of the work in growing the sweet peas. He shall keep a diary noting the following points: (1) Variety of seed planted and where obtained; (2) place and date of planting; (3) details of planting, preparation of soil, depth of sowing seeds, distance apart, etc.; (4) time young plants are first seen; (5) drawings of the young plants two weeks and four weeks old (6) care of the seedlings, cultivation, irrigation, etc.; (7) time of blossoming; (8) the signature of your teacher or another friend who knows of your sweet pea garden. This diary in a legible form shall be sent in with the 20 sprays of sweet peas entered.

Third—Prizes will be awarded from the following score card:

	Points.
For freshness and good color.....	6
For number of flowers to stem (four).....	4
For length of stem (approximately 18 inches).....	4
For arrangement of flowers on the stem.....	4
For size of bloom—approximate width of standard, 1¾; Spencers, 1¼, and others	4
Total.....	22

Fourth—You will find instructions for sweet pea culture in The Junior Call of December 9, The Junior Agriculturist of December 25, the Town and Country Journal December 15.

Fifth—Remember:

1. To buy good seed.
2. That "well begun is half done." Make the seed bed ideal.
3. To ask questions of florists, gardeners.
4. To read books on the growing of sweet peas.
5. That prizes will probably be awarded on the 20 best sprays of sweet peas, not on a great number.
6. That it will be fun to join this big game and show the other children what you can do.

Sixth—The prizes are as follows:

First prize for the best 20 sprays grown by a California Junior Gardening club	\$10.00
Second prize	5.00
Third prize	2.50
First prize for the best 20 sprays grown by an individual California Junior Gardener	\$10.00
Second prize, a set of gardening tools.....	5.00
Third prize	2.50
The next 15 prize winners.....	1.00 each

Seventh—One or more of the following varieties must be grown:

1. King Edward VII; red.
2. Dorothy Eckford; white.
3. Prima Donna; pink.
4. Lady, Grisel Hamilton; lavender.
5. Miss Willmott; orange pink.
6. Hon. Mrs. E. Kenyon; primrose.
7. The Countess Spencer; giant pink.

These are all 5 cent packages, or seven for 25 cents. We do not furnish the seeds.

Eighth—The awards will be made at an exhibit to be held in Hearst hall, University of California, the latter part of May. Announcement will be made at the proper time as to methods of sending in the flowers and the date.

In order to have the peas blooming the latter part of May or the first of June, all seeds should be in by the middle of January or the first of February. This suggestion should be followed all over the state. Plant your seeds now. Since the awards are to be made on 20 sprays, enough flowers may be grown on a very few plants in boxes or pots, inside or outside. Flowers grown in hothouses are not eligible.

Plant a few seeds every two weeks for four plantings, so as to be sure that blossoms are ready at the right time.

Ninth—After the exhibit the flowers will be sold: (1) To help pay the expenses of the exhibit and vegetable luncheon; (2) to further the Junior gardening work.

The following institutions have donated prizes: The San Francisco Call, the Morse Seed company, San Francisco; the California Seed company, San Francisco, and the Germain Seed company, Los Angeles.

EDITORIAL

What best thing have you done this month, this week, today? Do you know the great difference between a man of success and a man of failure? One sees and does the best things as a boy, the other wastes his time on matters that do not count.

It is a small accomplishment to grow a radish, to have a garden, but it is a feat to be proud of to grow the best radish, to have the best garden. After all, so many are lagging behind that it is quite easy to be the best in some ways, if not in all. Just think a little more and work a little harder, and the best garden is yours. If you are asked to clean a path, clean it well; if you drive a stake, drive it straight. Whatever task is set you, do your best.

We feel quite sure that the Junior gardener who is conscientious, thinks most and works hardest, and who therefore grows the best radish, is going to make the best man, for he will ever be dissatisfied with anything not the best. He will not only do his best, but will look for the best. He will read the best books, he will look at the best pictures, he will select good companions. Such a boy will make the man that he wishes to be. If a girl wishes to be a good woman she must do these things, too. Boys and girls, it is the good man and the good woman that do most and that are loved most.



Two years ago in May, during the graduation exercises held in the Greek theater, Berkeley, President Wheeler announced to the thousands of people assembled that he wished to grant honorary diplomas to members of the first class of the university. As each man came forward to receive his honors he was cheered by the people according to the amount of good he had done. Finally, as one old man rose and came forward, the whole audience rose, the men doffed their hats and the applause was very great. This man was not only a good man, but he used his power in doing good for his people. Men recognize the intellect of a great lawyer, they applaud the power of a great doctor, but they reverence goodness in a strong man which causes him to help his neighbor.

What best thing will you do this coming month, this coming week, today? Do not wait until the New Year, but try something at once and keep it up.

GARDEN NOTES

We have received many New Year greetings from the Juniors. Among others has come a beautiful color design of holly and the Christmas star from the Fresno Junior Gardening club. Miss Harvey, teacher. Juniors, we wish you all a new year rich in happiness and good doing.

* * *

The "Junior Agriculturist" which is mailed to you separate from the "Junior Call," reaches the club members irreg-

ularly for we are waiting to be put on the newspaper rate mailing list.

* * *

We hope that you are all going to enter the sweet pea contest. Seeds should be planted by February first at the latest. See the "Junior Call" of December 9 for instructions in growing sweet peas.

* * *

Do not forget to start such flowers as pansies, stocks, daisies, etc. in boxes now for early summer flowers. You should be making plans during this wet weather for early spring planting. The school yard should be made more attractive. Did you read the lesson in the last issue on "Beautification of School Grounds?"

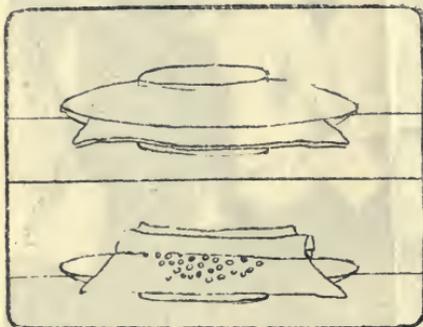
GARDEN LESSONS

CHAPTER IV

The Seed and Its Needs Exercises

The exercises of this lesson should be started several days before studying the chapter.

First—Arrange two plates, blotters and seeds as shown in the picture. Moisten the blotters as needed. Use



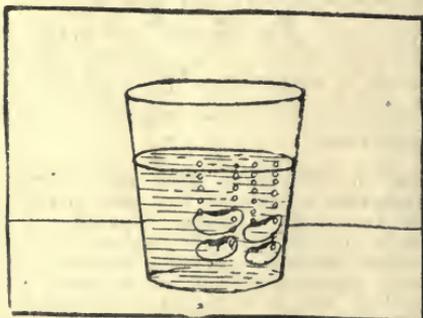
—First Exercise, beans, corn, radish, wheat. Examine the seeds daily.

Second—Fill a tumbler half full of boiled water. Drop in a few beans (Windsor beans if you can get them). Note the bubbles. Where are they coming from? How does the water first enter the seed?

Third—Arrange material as pictured. Chalk boxes may be used. Bury six Windsor (or lima) beans or kernels of corn half in the soil with scarred end down. Bury six beans with scarred end up. Note results from day to day.

Fourth—Float two halves of a walnut shell on water. Place sugar carefully in one. Observe from day to day. Treat the coats of squash seeds in the same way. Note results.

Fifth—Between two plates of glass place two or three thicknesses of blot-



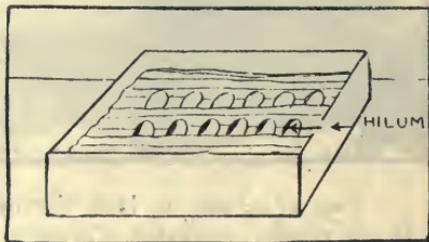
—Second Exercise.

ter. Next to the glass on one side place wheat, on the other corn. Note the growth of the roots.

Sixth—Examine a bean or pea pod. Open it carefully. Pull off a bean or pea and notice where it fastens to the pod. This is the hilum.

If you were to plant peas today in your garden would you know just what to do? Few people know much about seeds. This chapter and the one to follow will tell you how to plant your seeds.

Water Awakens the Seed—A dry seed may lie for years apparently dead. Add a little water and soon it rids itself of its coat and the young plant begins to grow. Exercise 2 and 3 told you that the water enters first at the micropyle, a little opening near the hilum. Just



—Third Exercise.

as soon as the water enters the seed activity begins. Sugar is made and water passes through the seed coat, just as it passed through the walnut shells and the coverings of the squash seeds into the seed (exercise 4). Thus seeds must be planted deeply enough in the soil to cover the hilum and the micropyle.

The Seed—Select a bean which has germinated, or started, and open it carefully. Find the little embryo, or plant. It has a short stem and the beginning of a root. The little stem has a bud or small leaves on it. This is the plumule, and it grows into the main stem and the leaves of the new bean plant. The embryo needs food at once. Find its food. It is stored in the seed leaves, or cotyledons. You have learned that a seed is a sleeping plant in a secure house, the seed coat, with enough food to last until roots are formed and the stem and leaves get above the ground. Therefore, large seeds, such as beans, containing much food, are planted more deeply than small seeds such as radish. The general rule is to plant seeds five times their diameter.

(To be continued.)

Communications should be sent to
C. A. STEBBINS, Editor
Agricultural Education Division

The Junior Agriculturist

A LITTLE PAPER ISSUED TWICE A MONTH
FOR THE JUNIOR GARDENERS OF CALIFORNIA

Vol. I.

BERKELEY, CALIFORNIA, January 26, 1912

No. 12

GARDEN

The following clubs have been organized lately: Stirling City, C. A. Davis teacher, Rae Horton secretary, number enrolled 30; Cacheville district, Yolo county, D. D. Sturgis teacher, Whedon Elton secretary, 40 enrolled; Lodi district, L. E. Brauer teacher, 30 enrolled; Lorena district, Fresno, Lawrence Childers teacher, Edna MacDonald secretary, Halght school, Alameda, Elsa Maertens teacher, Margaret Mott secretary, 18 enrolled; Piedmont school, Piedmont, 80 members; Laguna district, San Mateo, Mrs. H. M. Lynch teacher, Mae Casey secretary; Lodi normal, W. C. Baldwin teacher, 40 enrolled; Franklin school, Oakland, Nell Findley teacher, Bernice Barry secretary, 40 enrolled; Paso Robles, Essie Elliott teacher, Dorothy Webster secretary, 27 enrolled.

* * *

George Moeser and his chum, Fred, won the banner at the Washington school for the best garden.

* * *

We visited the Franklin school, in which two gardening clubs are organized. In Miss Sellander's room there were several experiments under way. The children of this club garden in their teacher's back yard.

The Five A club, under the direction of Miss Findley, has many plants growing in tin cans and boxes. The children have learned, through experience, to use soil which is at least one-third sand and not to apply too much water. The children have been very persistent and are now getting results.

* * *

Later on we hope each club will enter growing contests, such as the raising of alfalfa, sugar beets, wheat, corn, vegetables, flowers, etc. In due time more will be said regarding the contests.

* * *

We found the boys and girls of the Piedmont school, Piedmont, eager to join our big class, which is growing so rapidly. The election of officers is to be held soon, and you will hear of the results later.

The mothers' clubs of Berkeley are helping the gardeners. Garden meetings have been held by the clubs of the Le Conte, the Lincoln and the Whittier schools. We hope that definite action will be taken to beautify and make useful many unsightly vacant lots. Plans should be got under way so that work may be started early in the spring. The first definite step for a school is to obtain the use of a vacant lot; second, the principal should be willing to devote at least one hour a week of school time to this worthy purpose; third, certain grades, probably the fifth and sixth, should be interested; fourth, arrangements should be made to obtain tools, seeds and water; sixth, a supervisor for each garden is needed. The agricultural education division of the university desires to help and will supply, so far as it can, efficient supervisors.

* * *

An ideal miniature farm is to be established at the California garden city. The plan is shown in figure 6. The boys and girls of the Franklin school, Oakland, have donated a fine cottage, which was built by them in their manual training work. We appreciate their assistance. It is to be hoped that the Berkeley children will build the other necessary buildings.

* * *

We wish that you might all visit the gardens at the "People's Place," San Francisco, and see how much hard work the boys and girls and the teachers have done. A lot which was covered with debris due to the earthquake and fire has been cleared of old bricks and ashes. It has been discouraging to spade up bricks and plaster to get this lot in shape, but they have never given up, and now the gardens are taking on a pleasing appearance.

There were many visitors Saturday. Boys from the Franklin School club, Oakland, with their enthusiastic, helpful teacher, brought over stakes which they had made and bulbs which they had collected. These were given to the boys and girls of the "People's Place" club. These Oakland boys worked

while visiting. We admired the persistence of the "People's Place" gardeners and the helpful spirit of the Franklin school boys and teachers. And why should we not help one another? The thing most worth while, after all, is that of helping our neighbor who needs assistance. Pictures were taken of the gardeners and officers, and we hope to reproduce them in The Junior Agriculturist.

* * *

If you are planning to start a garden out of doors, we advise waiting until the rains begin, since the growing season is now so short. However, plants may be started inside. Plant such seeds as pansie, stocks, coreopsis, verbenas, petunias, etc., in boxes, to be transplanted in the spring. The gardeners in Berkeley started early this year and in consequence have sold many radishes, turnips and much lettuce.

* * *

We visited the Melrose Gardening club last week to find the boys and girls anxious to apply the principles which the principal, Mr. Mortensen, had given them the last term in school gardens. The children are to beautify and make more useful a vacant lot which is now breeding weeds. This club is starting right.

* * *

Miss McDermott of San Francisco reported the formation of several clubs in the Glen Park school with a membership of 253 children. They are all going to enter the sweet pea contest. You will hear from them.

* * *

The Durant club of Oakland sent in a picture last month, which we have shown to many other clubs. We hope that others will follow the example of the Durant organization.

* * *

The Berkeley garden city has been quiet during the vacation and the rains. The banking fund is growing rapidly.

* * *

Have you started the early spring flowers in boxes? Also such vegetable seeds as onions, cabbage, etc.

We receive many interesting letters from our gardeners which we should like to publish. We wonder if the writers would care.

We are in need of more compositions about the gardening work. If a set is mailed from a club it is better for each writer to take a different subject.

The sweet pea contest is well under way. Be sure to read the full announcement published last week. Keep the "diary" in neatness, for it will influence the judges.

The vegetable luncheon to be held at Berkeley in May will be open to any of our gardeners who do the best work. We ask the clubs for their assistance. What club will grow the potatoes, the peas, the beans, the turnips, etc.? These are to be sent in when notice is given in May.

Have you made a plan for beautify-

ing your schoolyard? If not be up and doing.

Are you studying the garden lessons and performing the exercises? You ought to be, for they are written entirely for your benefit. You will find the exercises interesting if you try them. Get your teacher to help you.

The University of California wants to help you and to help your parents. The agricultural department has published many bulletins giving aid to the farmers. If your father is a farmer have him send in his name to receive these bulletins free. One has just been issued telling how to prevent plant diseases.

Tell your teacher that articles are to be printed soon in the Junior Agriculturist for her benefit.

The numbers of California junior gardeners have grown to 3,500. Many clubs are helping in the additional expense to the agricultural department, namely from Yolo, Occidental, Marshalls and Tehama. The Tehama club sent us \$1. Thus these boys and girls are of service to their other garden friends.

A Word of Appreciation

Professor Stebbins—Dear Sir: I am writing you to thank you for the things you have given us. Our gardens are getting along fine. I wear my button on my coat. I received the paper from you that you sent me. All my seeds are up. I am going to transplant soon. I have lettuce, radishes, carrots and parsley growing in my patch. I have to keep the leaves off my plat.

Oakland. HARRY MARTIN.

Raises Radishes and Onions

ARLINE MILLER,
727 L Street, Fresno

I am very much interested in your Junior Agriculturist and would like to receive your paper regularly.

I have in my garden some radishes and onions. We are living in rooms and I can't have much of anything at home, but I have a few house plants. I like to work out in a garden. Last year we were on our ranch and I worked out in the garden all day long. I had watermelons and muskmelons. I tried to raise some lettuce, but the chickens would eat it up.

Capillary Attraction

MARION WELBORN,
Paso Robles

Our teacher, Miss Elliott, hung two bottles on the wall. Into one she put about a cup of water, the other she left empty. She then put a lamp wick from one bottle to the other. In about two or three days the bottle which was empty had about an inch of water in it. This shows capillary attraction.

We are now trying subirrigation to show capillary attraction. The water has already been to the top. It was brought up by capillary attraction.



EDITORIAL

Juniors, who is your best boy or girl friend? Think a moment. Have you decided? Now, why is he or she your best friend? Why do you like this friend the best? Among other things, isn't it because this friend is honest with you? Because you can always depend upon him or her? The people love and trust Mr. Roosevelt because he is honest. He does what he thinks is right. You love your parents for their kindness and justice to you. Think again with us of the man you like most, of the man you most respect. Would you be willing to have him, or any one else, think you dishonest for the sake of a radish? You may think that a strange question. Let me tell you of a gardener who thinks more of a radish than her honesty.

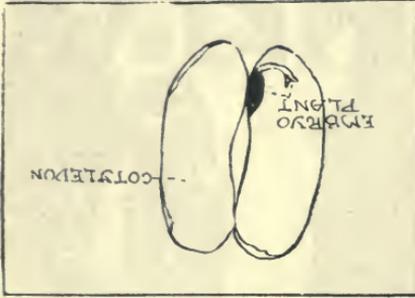
This gardener, with a sackful of vegetables which had been given her (we are sorry to say it was a girl), thinking that no one was near, pulled radishes from a garden which did not belong to her. She looked about guiltily. What a lowly thing a radish is to receive in return for dishonesty. We should have been glad to give her dozens of radishes rather than to have her prove dishonest. If you ever feel a desire to take something which you have not earned, and you feel that you can not live without it, ask the owner or the one in charge. Ten chances to one you will get it. Do not let any one feel that you would steal.

Some one is watching you always to see whether you are going to make a strong man or a weak one, a good woman or a weak one. Which are you going to be?

CHAPTER IV.—Concluded.

Mono, Di, Polycotyledonous Plants—

How many cotyledons has a bean? How many cotyledons has corn? All plants such as corn are monocotyledons, plants with one cotyledon. All plants such as bean dicotyledons, having two. Some seeds, such as pine tree seeds, have many cotyledons and are called poly-



—Fourth Exercise.

cotyledons. All plants belong to one of these classes.

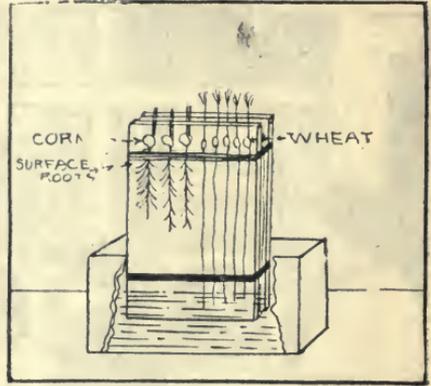
Distance Apart for Plants—Examine the wheat and the corn roots (exercise 5). The roots of the wheat run side by side and are very long. They are deep roots. Plants having such roots may grow close to each other without crowding. The corn roots are not so long, and near the stem many surface and bracing roots are forming. Plants with branching surface roots must be planted far apart.

Many seeds do not germinate. At first sowing put many seeds in the trench and later thin out the weak plants. Plants such as lettuce, which mature above ground, should be thinned until they are as far apart as the distance across a mature plant. Chapters 9 and 10 tell you more about sowing seeds and thinning plants.

By this time you should know why a good seed bed is necessary. You should know considerable about preparing such a bed and you should know how deep to plant seeds. If you are not to have a school garden, ask your parents for a plat at home, or start a garden in a window box. The following chapters will tell you many interesting things about gardening.

QUESTIONS

- 1—What starts germination in a seed?
- 2—Of what use is the micropyle?
- 3—What effect has sugar in the seed?
- 4—Where does it come from?
- 5—Why should seeds be buried in the soil?

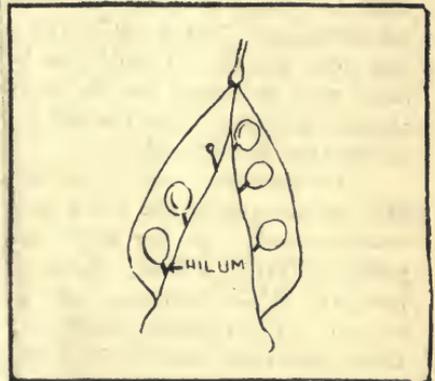


—Fifth Exercise.

- 6—What is a seed?
- 7—How do we know how deep to plant seeds?
- 8—How are plants grouped?
- 9—How do we know how far apart to grow plants?

Home Studies

- 1—Examine the seeds of many different plants. What about the seed helps to bury them?
- 2—Dig up corn and wheat plants, wash off the dirt and compare the roots.
- 3—Open several pea and bean pods. Are the seeds in the separate pods all the same size?
- 4—Germinate as many seeds as you can find from weeds to the coconut. Note the embryo and food supply of each.
- 5—Note the great number of seeds produced by one plant. Why is this?
- 6—If you live on or near a farm examine a handful of seed that is to be sown. Can you find any foreign seeds?
- 7—Make a list of seeds that are blown about, that are carried by water, that are distributed by animals.
- 8—Visit a nursery and see where flower seeds come from.



—Sixth Exercise.

Communications should be sent to

C. A. STEBBINS, Editor

Agricultural Education Division

MAR 5 1912
GIFT



University of California, College of Agriculture, Berkeley, California
Agricultural Experiment Station, E. J. Wickson, Director
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The Junior Agriculturist

A LITTLE PAPER ISSUED TWICE A MONTH
FOR THE JUNIOR GARDENERS OF CALIFORNIA

Vol. I.

BERKELEY, CALIFORNIA, February 26, 1912

No. 13

EDITORIAL

Several of our Garden city boys have become interested lately in selling vegetables to housewives. The Garden city bank pays the salesmen for their efforts. After each market day the boys have been anxious to receive the award for their work. This is proper. The boys put into the Garden city thought and honest work, and they should be given recognition. Possibly the money is used to satisfy their own desires. This is improper.

Let us not hesitate to receive the dollar, but let us be sure that we have earned it squarely, and then let us be sure that it does the right kind of work. The dollar which takes us to the moving picture show while our small brother or sister needs clothing or books, or wants to see the pictures, too; the dollar which takes us into temptation and leads us to see and do wrong; the dollar which buys a vote or friendship, these dollars are working in the wrong way. On the other hand, the dollars which bring happiness to us and our neighbor are the ones to be proud of; these are doing good work. So it is plain that a dollar, like a boy, may do good work or poor. Or shall we put it this way? A dollar with an unselfish boy or man attached will do good work, while a dollar hampered by a dishonest, selfish boy or man works dishonestly and selfishly.

It is quite possible while reading or writing to get in our own light, to get in our own way. It is quite possible for our dollar to get in our own way. If we hold tightly to the coin when others are hungry, we are stingy and selfish, and hence disliked and unhappy. We may grip the dollar so closely, we may love it so much more and the best things so much less that we fail to see and know the best. That is, the money may lie in the bank when it should be used to purchase a good book, a music lesson, a beautiful picture. We may hoard the dollar fondly, being satisfied with second class books, music, pictures, beds, food, manners, and thus the second rate life becomes a habit. Then again, the dollar may get in our way by being held too loosely, particularly if it comes too easily and with too little work on our part, for it leads us to the theaters too much, it makes us think "clothes" too much, it leads us to matters which fascinate. We must agree that the city life is fascinating, that some city men are fascinating, for they are its medium, but they are not always the best to tie to. Let us make the dollar work to bring the best into our lives, the life of our neighbor and the life of the community.

Not only does the dollar often get in our own way, but it gets in the way of a community's progress. The grip on dollars keeps our teachers from doing their best, for the schoolrooms are too crowded; it keeps the cities from becoming more useful and more beautiful. Fifty dollars and less keeps a bay city from ridding itself of the weedy vacant lot pest. A city beautiful is a city valuable.

Let us think hard that our dollar may not get in our own way or in the way of our community, that it may work for us to do the most good, that it may work for the community.

GARDEN NOTES

The Melrose club, Mr. Mortensen supervisor, has announced work on an adjoining vacant lot. The Melrose school is on the progressive list and will have an interesting demonstration in the early summer. The sixth and seventh grades are interested. They are entered in the sweet pea contest.

* * *

The Hillside school, Berkeley, is the first to announce the attainment of a vacant lot for this term. The children will commence work at once to beautify and to make useful this plat. This announcement was made by the principal of the school at a mother's meeting. The lot will be made the center of extension work for the community. Other lots will be lightly plowed and the children will sow flower seed broadcast. Each school should be an influence for good in its community.

Mr. Underhill, living in the Hillside region, offered, at the above meeting, to prepare as well as to donate his vacant lot if the children would sow the seeds. Let other Berkeley citizens follow suit.

* * *

Mr. Imrie has been able to obtain an adjoining lot through the kindness of the owner, Mrs. Rush. The Le Conte school, Berkeley, will thus widen its work.

* * *

Many new clubs have been formed during the past week. Our garden enrollment now numbers at least 4,000 boys and girls.

* * *

Miss McDermott, an enthusiastic worker in San Francisco, has interested over 250 children in the sweet pea contest. Mr. Heaton of the same city has long had home gardening as an ideal for school children, and intends to further the sweet pea idea.

* * *

Birds bear a close relation to gardening. Several Oakland teachers met in Berkeley Saturday morning of last week to study birds in the field. Seventeen different varieties were identified; the English sparrow, white crowned sparrow, the spurred towhee, the California towhee, Arma's humming bird, red shafted flicker, ruby crowned kinglet, California woodpecker, California bushtit, dwarf hermit, thrush, house wren, California jay, Stellers jay, Sierra junco, western robin, song sparrow, plain titmouse. Trips are to be taken every other Saturday morning.

* * *

A few boys were at the Berkeley garden city Saturday. They sold many vegetables. The soil is too wet to be worked, but the plants need thinning

out. One row of radishes which was well taken care of has produced nearly \$3 worth. Other rows not thinned out will be a loss to the owner.

* * *

Do not forget to plant flower seeds in boxes now, that the young plants may be moved to the open later—pansies, stocks, verbenas, petunias, coropsis, daisies, etc.

* * *

It is not too late to enter the sweet pea contest. Send in your name. If directions for growing sweet peas are desired they will be mailed to growers.

* * *

Mr. Vergon, principal of the Emerson school, Oakland, did a fine piece of work last year in school gardening. The boys and girls under his direction worked nearly an acre of land. Potatoes at the rate of 250 bushels to the acre and other products in a like proportion were raised. Mr. Vergon has given us many pictures of the work. Some of these will be reproduced on these pages. We hope that he will continue his efforts.

* * *

We are glad to hear from you, Juniors. Write, telling of your garden work. Pictures also are welcomed. The other boys and girls are anxious to know about your gardens.

* * *

L. E. Brauer, principal of the Salem school, Lodi, has added his fifth grade of 44 members to the Lodi gardening club.

* * *

J. H. Garrison of the San Fernando schools is doing excellent work. He has a gardening contest under way which is giving much interest to plant growth. Forty-five dollars is to be given as seven prizes to the best gardeners of the fifth, sixth, seventh and eighth grades. The prizes are offered by patrons of the schools. Miss Cecil Peabody is helping Mr. Garrison.

* * *

The Berkeley Gardening association is planning to give seeds to the children for home gardens.

* * *

Miss Z. Henrich and Miss Collier have many new plans for the People's Place gardens in San Francisco. These teachers are really serving.

* * *

Three points should be added to the sweet pea score card for punctuation, arrangement, spelling and neatness of diary.

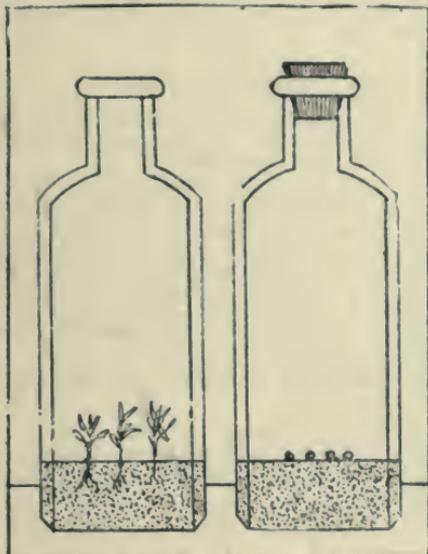
GARDEN LESSONS

CHAPTER V.

THE SEED AND ITS NEEDS—(Continued)

EXERCISES

1.—Place seeds in two bottles and arrange as shown in Figure 1. Use cot-



ton or sawdust in the bottom of the bottles. Observe from day to day.

2.—Plant seeds in two tumblers or cans. Moisten the soil in one. Keep water standing in the other. Figure 2. Observe each day.

3.—Put seeds in three open bottles, containing a little moist cotton or sawdust. Place one near the stove, one outside but protected from rain, and one on the window sill away from the stove. Note results each day.

4.—Arrange two tumblers suspending seeds in the water with mosquito netting as shown in figure 3. Put distilled water in one and ordinary well or tap water in the other. Be sure that the seeds do not dry out when the water evaporates. Add water as it is needed. (Ask your teacher to tell you how to make distilled water. It contains no plant food.) Note results.

5.—In a box of moistened sawdust or soil place three rows of Windsor beans. (These can be obtained from any seed man.) As the seed leaves, or cotyledons appear break them off the plants in the first row. A week later treat the second row in the same way. Let the seed leaves remain on the third row. Observe what happens.

Plants Need Air—Exercise 1 and 2 which should have been set up several days ago show very plainly that plants need air. What can be done in order that seeds shall have plenty of soil air?

We have learned that humus opens the clay. Thus air would circulate more readily. Humus prevents soil from puddling again, keeping it free for the entrance of air.

Plowing, spading and cultivating make the soil open and porous. The finer the particles the more air space. Besides, the water supply is much increased and soil food more readily reaches the fine root hairs in fine soil.

Seeds should not be planted when the ground is too wet for the soil air has been driven out. (Exercise 2).

Plants Need Warmth—Exercise 3 teaches us that plants need warmth but not too much. The warmth of soil may



makeup. Sand is warm. Clay and humus are cold. By mixing sand with clay and humus, the soil is given warmth.

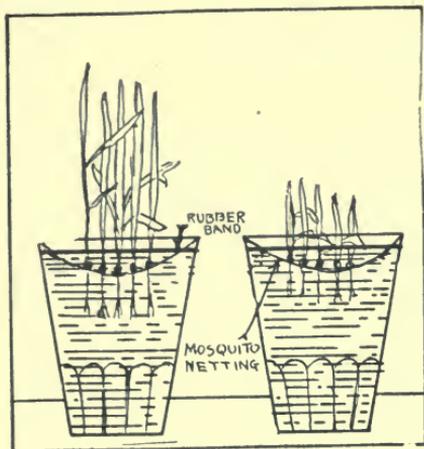
Avoid planting seeds during the cold wet season and during the hot weather. Manure which heats should not be added during the hot weather.

Plants Need Food—Exercise 4 teaches us that plants need food. However, as you noticed the plants did very well in both tumblers for several days before those in the distilled water

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began to fail. This is easily explained. You have learned that a seed contains a young plant and enough food to keep it growing until roots and leaves are formed. From that time the plant must get its food through the leaves and roots. Distilled water contains no plant food hence the roots could not convey food to the plants and they died. Exercise 5 shows that the seed leaves, the storage house for the embryo plant, furnish food for some time until the young plant can get established. The third row of plants has done the best of all. The plants in the first row from which the seed leaves were picked are doing very poorly.

The Embryo Plant Does Not Need Light—The natural place for seeds is beneath the surface of the soil. Therefore, the little plant within the seed coat does not need light. Can you perform an experiment to prove this?

The Plant Above Ground Needs Light—Light is essential to the plant after the seed food has been used. Notice how these plants lean toward the window. Arrange an experiment to show that plants need light. Later you will learn how plants make sure of plenty of light.

The sun rises in the east and sets in the west. Rows of plants should be planted north and south, so that sunlight may strike the plants from all sides and the soil between the rows. Sunlight purifies soil.

An ideal garden should slope gently toward the south in order that the sun's rays may fall more directly on the plants and on the soil.

Flowering plants need much sunlight. Others, such as ferns, do best in cool, shady spots.

Note—In talking about the needs of a seed we mean the needs of the living plant within the seed coat.

QUESTIONS

1. What does the embryo plant need for growth?
2. What may be done to the seed bed to furnish air to seeds?
3. Why should seeds not be planted while soil is wet?
4. How may a seed bed be made warm?
5. When should manure be added?
6. How do you know that plants need food?
7. What is the main use of the cotyledons?
8. How do you know that plants need light?

HOME STUDIES

1. How does the farmer nearest you prepare the land for air, for warmth, for food, for sunshine?
2. Why are the plants in your vicinity that grow close together so tall?
3. Notice the limbs of a tree; why are some dying? Why are there no branches on the lower part of a tree?
4. How far apart should orchard trees be planted to insure enough sunlight?
5. How does irrigation furnish food to plants?
6. What is meant by "cover crops"? Of what value are they to the farmer? What plants are called legumes?
7. Find out a way to irrigate with manured water.
8. What is the cost in labor, etc., of manuring an acre of land? Of adding lime to an acre? How is lime put on the soil?

The Swelling Power of Seeds

LLOYD KENNEDY,
Oakland. Franklin School, A Fifth Grade.

The teacher took a small bottle and filled it with dry beans. The bottle was three and one-half inches tall and one inch in diameter. After this was done she filled it with water and placed it in a large glass that was almost full to the brim with water. On the glass was pasted the label: "Do seeds as they swell exert any force?"

The next day, the bottom of the bottle fell out, and the following day it was split lengthwise, only held together by a thread which was wrapped around it.

That afternoon the thread also broke, the bottle was in pieces, and the beans were on the bottom of the glass. This teaches us that seeds do exert force when they swell.

The Junior Agriculturist

A LITTLE PAPER ISSUED TWICE A MONTH
 FOR THE JUNIOR GARDENERS OF CALIFORNIA

Vol. I.

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No. 14

GARDEN LESSONS

CHAPTER VI

PROBLEM QUESTIONS

Soon you will be at work in the gardens. To grow vegetables which will be just as good as the vegetable man sells, and to grow flowers such as you can buy at the florists, you must be able to answer the following questions:

1. Will seeds grow well in sand? In clay? Or, better, in a mixture of the two?
2. Will seeds grow well in a cloddy seedbed?
3. Will you wet the seedbed just before spading and raking?
4. What causes the roots to grow downward?
5. Will you irrigate with trenches,

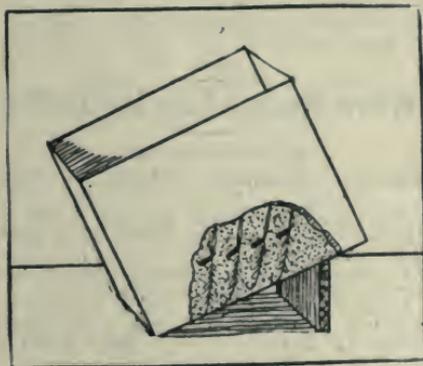


Figure 1.

flood, subirrigate, or sprinkle your garden?

6. If sprinkling is necessary at first to start the seeds, when should it be done?
7. Does cultivation keep the soil water from escaping?
8. How deep will you plant your seeds?
9. How far apart should vegetables and flowers stand?

There are two ways to answer these questions. You can ask some one to answer them for you, or you can set up the experiments and answer them yourself. You will take the second method if you really want to learn.

EXERCISES TO SOLVE THE QUESTIONS ABOVE

1. Get three chalk boxes. Fill one with clean sand, one with clay and one with a mixture of sand and clay. Moisten the soil in each, and 24 hours later sow 10 of the same kind of seeds in each box. Note the results.
2. Get two chalk boxes more. In one place fine soil. In the other put cloddy

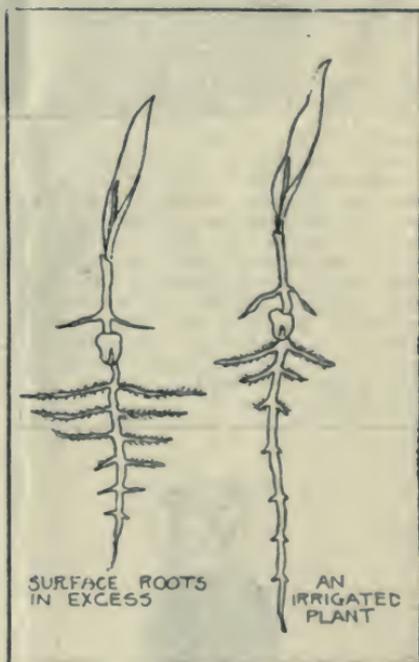


Figure 2.

soil. Water alike and sow 10 seeds in each. Observe daily.

3. Fill a box with dry soil. Add water and stir at once. What happens? Fill another box with dry soil. Water and set the box aside. Stir the soil next day. Which is the better way?

4. Knock out the bottom of a chalk-box. Tack wire fly screen in its place. Fill the box a third full of sand or sawdust. Arrange the box as shown in

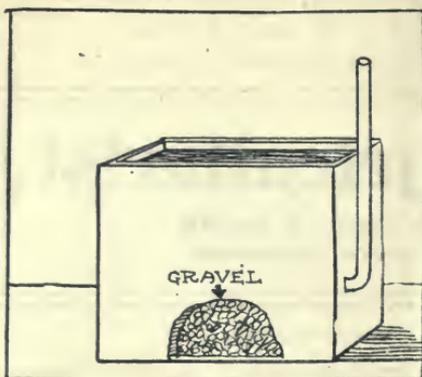


Figure 3.

Figure 1. Plant wheat seeds in the sand or sawdust. Add water. Watch the roots. Why do they grow through the screen first and then turn back?

5. Get four boxes about 12x14 inches in size. Prepare enough moist soil for all. Plant the same kind of seeds (use corn or peas) the same depth, in rows, in each box. The rows should be four inches apart. Sprinkle a pint of water on one box of soil. Dig trenches between the rows in one of the boxes and fill with the same amount of water. Cover the trenches after the water soaks in. Add the same amount of water as needed to both boxes until one quart has been used. Pull up a few plants from each box and compare the root growth. The sprinkled plants will probably have roots near the surface, while the others will have long roots. Figure 2. Flood one box with a quart of water. Give it the same treatment as the others, but do not add any more water. Make a hole in one side of the last box. Insert a funnel snugly (figure 3). Pour into the soil water as needed until one quart has been used. This shows the method of subirrigation. Which is the best way to water the soil for plant growth? How does a farmer subirrigate his land? Observe the experiments daily, and question 5 will probably be answered correctly.



Figure 4.

6. Fill two boxes with soil. Plant seeds the same depth. Sprinkle both

correctly. Put one in the sunshine each day after watering. Put the other in the shade. Note results.

7. Prepare two tomato cans of soil that weigh the same. Add the same amount of water to each. Each day, some time after watering, stir the surface of the soil in one can with a small stick. Weigh every other day. Which loses water the more rapidly?

8. Line a tumbler, or fruit jar, with black cloth and fill with sand or sawdust. Place seeds at different depths between the cloth and the glass (figure 4). Moisten the contents of the tumblers. Note results daily. Which is the best depth for the seeds? How many times the diameter of the seed is the best depth?

9. Arrange corn and wheat seeds as shown in figure 5, chapter 4. Put several thicknesses of blotters between the plates of glass. Observe the root growth. Notice the surface roots (roots near the seed) forming.

It will take some time for each pupil to set up these exercises at school. Would it not be well to divide them among the class? You could arrange at least two experiments. Your neighbor two and so on, and then all could tell results. You could each perform all the exercises at home.

You must not get discouraged if your experiments go wrong. "Try, try again."

THIS WEEK'S READING LIST AND REVIEWS

1. "Garden Book for Young People." (Alice Lounsberry.)
2. "Flowers Shown to Children." (J. Kelman.)
3. "Trees Every Child Should Know." (J. Rodgers.)

When Mother Lets Us Garden

EUNICE FONES,

Oakland. Franklin School, B Fifth Grade

The book, "When Mother Lets Us Garden," was written by Frances Duncan.

It tells how to plant radishes, carrots, turnips and many other vegetables.

It also tells how to plant flowers.

When you are planting your vegetables or flowers it is a good book to have.

Garden Fairies

MILDRED TAYLOR,

Oakland. Franklin School, B Fifth Grade

"Garden Fairies," which was mentioned in The Junior Call not long ago, is a very interesting book.

It tells of a little girl who was in a hammock in her garden when a fairy came to her and told her all about seeds.

The fairy told her to think just of the fairies that night when she went to bed and she would see and dream of a fairy wedding. This book would be very interesting for other children to read.

THE WORLD'S GREAT PAINTINGS



"The Gleaners" by Jean Francois Millet

COURTESY OF RABJOHN & MORCOM

If you ever visit the historic Louvre, France's famous art gallery, which is one of the great show places not only of Paris but of all Europe, you will in all probability see Jean Francois Millet's painting, "The Gleaners."

The picture is a wonderful example of the beauty to be found in homely things and places. In the foreground appear the gleaners working their toilsome way across the acres of the broad fields, in an endeavor to glean from its sunbrowned stretches some small leftovers of the harvest. In the background are the figures of the harvesters working busily, while at the left loom the two enormous stacks of grain which bespeak the richness of the harvest's yield. Away in the distance may be seen the homes of the villagers and a fringing line of trees. To the right sits the silent figure of an overseer on horseback. Over the whole scene the hot August sun beats down.

The artist has concentrated his attention upon the figures of the three women in the foreground. The one standing apart from the others shows her age. She has worked long and late, and the toil is telling upon her. Her attitude is strained and awkward, and her tired muscles find it exceedingly hard to respond to her direction. Of the other two, one is right in the prime of her womanhood. Her back is strong

and broad and her position is free and untrammelled. One could imagine her moving from place to place with the machinelike movement of clockwork. The third member of the group is younger than either of the others. Her hands are as yet smooth and unroughened with toil, and her attitude is replete with the lithe grace of youth.

In painting his gleaners Millet has filled his canvas with atmosphere. One feels the heat of the August sun, and one feels the weariness of the older woman. There is sympathetic understanding in his handling of colors.

Millet was born in 1814 in Gruchy near Cherbourg, France. Born of the peasant class, he was greatly impressed with their distinction as a type, and on arriving at man's estate determined to make them the subjects of his paintings. He began to study painting in earnest at the age of 18, and was first a student in Cherbourg. Later he went to Paris and studied under the great Delaroche. His fame did not come without a struggle, however, but he worked on faithfully. After a time public opinion changed. His painting, "The Gleaners," was first exhibited in the salon in 1867. It was purchased at that time by M. Binder and later by Mme. Pommeroy, by whom it was presented to the Louvre in 1889.

EDITORIAL

Can you be depended upon, Junior? If you are asked to drive a stake, can you drive it straight? If your teacher asks you to plant seed rows 14 inches apart, is your row distance 14 or 18 inches? If you are an officer of a gardening club, do you attend to your duties? We received a letter lately from a boy who is interested in his school club. He wrote: "Our club may bust up because the president does not come to the meetings. We don't want it to bust up. What shall we do?" This officer accepted the presidency, and in doing so became responsible to his boy friends. Let us ask you a fair question: Had this boy, even if he had lost interest, any right to miss the club meetings? We think not. He was selfish, and thought little about service for his neighbors. We are all responsible, not only to ourselves, but to our neighbors. As we have told you before, no one has a right to neglect a cold, for an irritable person, coughing and sniffing, is not only unpleasant for his neighbor, but the friend may catch the cold, since colds are transmitted from friend to friend.

A Garden city officer failed in a responsibility lately. The activities of more than 100 boys and girls were upset. This individual, a girl, sent no word, and evidently thought little about her responsibility to the other children.

Last Sunday the Columbia Park Boys' band delightfully entertained the people of Berkeley in the Greek theater. We are sure that each one of the boys enjoyed his service to his Berkeley friends. We know that each member of the band was to be depended upon, for the harmonious rendering was perfect. One error by the boy who struck the drum would have upset, in a measure, the good work of the others. Have you ever realized that you are a part of a great orchestra, a part of a great whole, and that if you do not "hit the drum" at the proper time the very best that you know how, you are causing a discord, you are spoiling the work or play of others?

If you can not be depended upon, do not accept a responsible position. But if you can not be depended upon, make up your mind at once that from now on you will always drive the stake straight, plant seeds at the required distance, hit the drum properly and attend to your duties as an officer and as a citizen. Put a mark in your notebook each time that you fulfill a responsibility until you make "fulfilling responsibilities" a habit. For if you do not learn to fulfill responsibilities now, at home and in school, you will not be worth much as a man or as a woman in the community and in the state. If, as a boy or girl, you are not a good citizen, we doubt if you will be one as a man or as a woman.

GARDEN NOTES

Last Wednesday I met with the club in its first meeting of this year. The meeting was called to order by Vice President August Thiery, and where do you suppose it was held? They have cleared out the basement of the manual training building and set some old desks on the dirt floor. There are desks at one side for the officers. In this basement the club holds all its meetings and works during the rainy days.

After the meeting was over the children worked out in the gardens. New land was carefully prepared for another crop of radishes and onions. Some of the larger boys went to work and before night succeeded in fencing about half of the plats. They used old lumber from the school and rabbit wire, which some of the boys brought from home. They expect to continue the work as soon as sufficient material can be obtained. They also plan to plant

flower seeds in the boxes inside and then re-set the young plants in the school yard. They will plant some more of the red geraniums, too. These will be flowers which will last and there will always be some one saying, "These flowers were planted by the gardening club of 1912."

* * *

We have just returned from a 2,000 mile journey limited to California. Everywhere we found children and parents interested in agriculture. Many new "gardening clubs" are to be formed and our large class of junior gardeners will soon number 5,000.

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The Junior Agriculturist

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No. 15



Squad of Boys and Girls at Work at the People's Place, North San Francisco

EDITORIAL

Last week a small gardener said to us, "I love to plant seeds, because something always comes up." Do you know, Juniors, that we "grown-ups," who never gardened when we were at school, missed learning a great deal. The garden can teach so much. The spider and its marvelous home can teach the most skillful designer and architect. The birds as they soar tell of secrets that the brightest student of the aeroplane may well listen to. The lowly ant tells us of the greatness of patience, and the seed as it sends forth a plant to blossom for us teaches the great lesson that we "reap what we sow," that we get from the world about what we give.

There is your sister, brother, mother, or father. Smile at him or her, what do you get in return? Yes, a smile. Speak happily, and back comes a cheery remark. Put joy into your home, and good cheer flows in on you; scowl crossly and speak harshly, and back they come. Your friend is your looking glass. In his face shows your smile or your scowl. Be careful how you mark his face. You have no right to be cross, for you are putting wrinkles in some one's brow. We know of friends who smile so easily, and soon everybody is smily.

Put care, patience and thought into the planting of a seed, and the gift is a superior flower. Put carelessness into the planting, and it is advertised in the plant. If you put unhappiness and dishonesty into the world, you will suffer in their return. If you help your friend, you will receive help in turn. It is best to sow service more and selfishness less, that you may reap service and not selfishness.

We want you to think about service to your friends, for California can never be a great California unless you Juniors grow up to be less selfish than are so many fathers and mothers.

Book List for This Week

1. "A Little Garden Calendar" by A. Paine. (Book review concerning same by Helen Diehl.)
2. "Trees Shown to Children" by J. Kelman.
3. "First Book of Forestry," by Roth.

"A Little Garden Calendar"

HELEN DIEHL,
Oakland, B Fifth Grade, Franklin School

The book entitled "A Little Garden Calendar," written by Albert Paine, tells about the different flowers grown in the different months.

The story part is about a little boy named David, his sister Prudence and the gardener.

In January the children are told all about seeds and how to plant them in flower pots. Then in February the little plants come up. The children are told how to care for them.

In March David and Prue discover that some of their little plants are really radishes.

In April the showers come and the children find that the yellow dust or pollen is food for the seeds. They are told how seeds are fertilized in May.

June is the month when they go down to the strawberry patch.

The next month is July, when weeds are studied.

In August they learn about the different kinds of leaves.

The next month is September and the children are told about the servants of the flowers.

The month of October is the time when the scattering of seeds is studied.

In November they are told about annuals and perennials.

The last month is December, when they talk about the Christmas tree.

The book is very interesting.

Other teachers should take advantage of the Junior to vitalize composition work. Boys and girls, why do you not send me in more letters?

If gardens are started in cans or pots be sure to use soil containing one-third sand. The soil should be wet at least 24 hours before stirring and using. Get the soil ready before placing it in the cans. Do not keep the soil too moist. Why do you gardeners use water so much? Saturday morning followed a heavy rain, yet six of the Berkeley gardeners asked if they might irrigate. One club has failed just because the boys and girls "puddled" the soil.

Perseverance

LLOYD PETERS,
Sixth Grade, Pitts School

We have joined the Junior Gardening club and in the spring we hope to do something in the vegetable line. We have received our seeds and were glad to get them, and now we hope soon to get our papers and pins. We have a few house plants and will have more. We had some bulbs three years ago and some turned out good and others were failures. This year we have some more bulbs in tin cans, all the same size, and hope they will grow well. Still, if they do not we will keep on trying.

The Ideal Home

The children of the B Fifth grade, Franklin school, Oakland, have formed in miniature on a sand dirt table in the schoolroom an ideal home. The teacher, in connection with her nature study work, has been teaching the children the points to be considered in making a beautiful home. This is nature study well aimed, indeed. The articles below were written by two members of her class.—Editor.

AN IDEAL HOME
Stewart Carter

An ideal home must have plenty of sunlight and pure air. The house should be placed on a slope, where the water will run off. It should have a good outlook or view, such as a lake that you can just see a little of through the trees, or a meadow filled with flowers, hills in the distance or any pretty view of nature.

If you have a garden do not cut it up by planting different kinds of flowers here and there, but make it look restful. You should not have paths that wind around too much, but just have slight turns. To make it pretty mass the foliage. Do not have a tree or bed of flowers right in the middle of the lawn. Have it open in the center. Have colors that harmonize. If you have a variety of flowers that blend plant them according to height.

AN IDEAL HOME
Eunice Fones

An ideal home must have plenty of pure air and sunshine. It should not be closed in by high buildings nor be near any factories.

The drainage should also be good, otherwise the water would get in the basement and it would not be healthy. The home should be on a slight hill.

The ideal home should have a good outlook, such as a lake, meadow or hills.

The garden should look restful, flowers that blend placed next to each other and the paths slightly curved. The tall flowers should be near the fence and the smaller ones in front.

An Appreciation

DOROTHY DOW

Our teacher, Mrs. Melquiond, is having us write about our gardens. I have planted a garden at home that is doing better than the one at school. In my home garden I have planted lettuce and radishes that are coming up, and carrots, onions and spinach that have not yet come up.

For flowers I have planted sweet-peas, poppies and pansies. Monday I am going to plant more seeds in my school garden. We wish to thank Professor Stebbins for all the things that he has given us to start the garden with, and know that he will be glad to learn that they are doing well.

In Piedmont there is a model twentieth century school sitting high on a hill. We were pleased, indeed, with the cosy homelike building and its big family. Each child in the school from the first to the eighth grade has a garden. This week we hope to have them join our big class.

* * *

We hope that you are studying the garden lessons. Can you answer all the questions? The lessons should be kept on file and used as a textbook.

Garden Notes

This is the garden time of the year for most plants. Put the seeds into the ground early.

Teachers and children should make use of the "picture and book" corner.

New clubs are being formed every day. Within the last two weeks more than 25 have joined the gardening class, which numbers nearly 5,000 boys and girls.

Teachers who wish assistance in school gardening work should send to Macmillan company, San Francisco, for "Elementary School Agriculture," price 50 cents. It is a teacher's manual.

We can use more articles written by Juniors. Send in your compositions.

The "book reviews" are written by children of the Franklin school, Oakland, Miss A. Sellander, teacher. Teachers, why do you not use the Junior page to give new life to your composition work, as has this Oakland teacher?

The Berkeley garden city is flourishing. The bank is hard pressed, during its short banking hour, 10:30 to 11 o'clock on Saturday mornings, to handle the financial activities of the city. Many vegetables and flowers were sold this last week. The president of the university has kindly given us more land, and through the assistance of the children and the student teachers an embryo city will be ideally built about the gardens. From 20 to 50 visitors are welcomed on each garden day.

Principal Edgar of the Franklin school, Oakland, has obtained a vacant lot for a garden. Under the direction of the regular teachers, Mrs. Smith, Miss Findley and Miss Graham, 160 children have made an excellent start. We are glad to welcome them all as new members of the great class of California Junior gardeners. The Franklin school children do things so well that we expect "something different" in school gardens from them.

A miniature farm has been started by one grade on a sand table under the direction of Miss A. Sellander. The small cottage was made in art work. Vines and young trees have been grown to satisfy landscape architecture. The children are making a study of an ideal home. We like this idea, for nothing is quite so fundamental to the future of our state as raising the ideals of the homes.

Through the sand and dirt table, art, history, manual training, arithmetic, etc., may be given new and vital direction. In addition, the principles of agriculture may be taught.

Have the boys make a box 4x6 feet and 6 to 8 inches deep. Fill this with equal parts of sand, leaf mold and garden soil. Plan in miniature an ideal farm home and reproduce it in the box. Grow young trees, a lawn, flower beds, vegetables and grains in their proper places. Try out simple agricultural experiments. "Elementary School Agriculture," published by the Macmillan company, San Francisco, price 30 cents, will be of assistance.

Garden city citizens should hand their grievances in writing to the mayor for adjustment by the council.

Mr. Packard, in charge of the Imperial Valley Experiment station, has undertaken the organization of cotton growing contests in Imperial county. A large sum of money has been donated for prizes to be given to the boys who grow the best half acre of cotton. The high school men in the county who are interested in agriculture are to assist Mr. Packard in forming local clubs. One does not know California until a visit is made through the southland.

The Awakening of the Seed

H. WASSON,
Oakland, Franklin School, A Fifth Grade.

When I came into the room I found a lima bean on my desk. It had been soaked for three days. How did the water enter the seed? It entered through the micropyle, a tiny hole. When the water entered this caused action in the seed and made sugar. The water was next drawn through the coat of the seed by osmosis.

We then opened the seed coat. We saw the embryo, which is the baby plant, and the cotyledons, which are the two fat seed leaves, or food leaves.

What awakened the seed? The water awakened the seed. In what kind of soil should seeds be planted? They should be planted in moist soil.

CHAPTER VII

The Garden

Now you are ready to start your garden. You should have a home garden, whether a garden is given to you at school or not. You may start your garden at any time. If started in the fall, you must first water the soil well several days before spading. (Exercise 3, chapter VI, taught you this.)

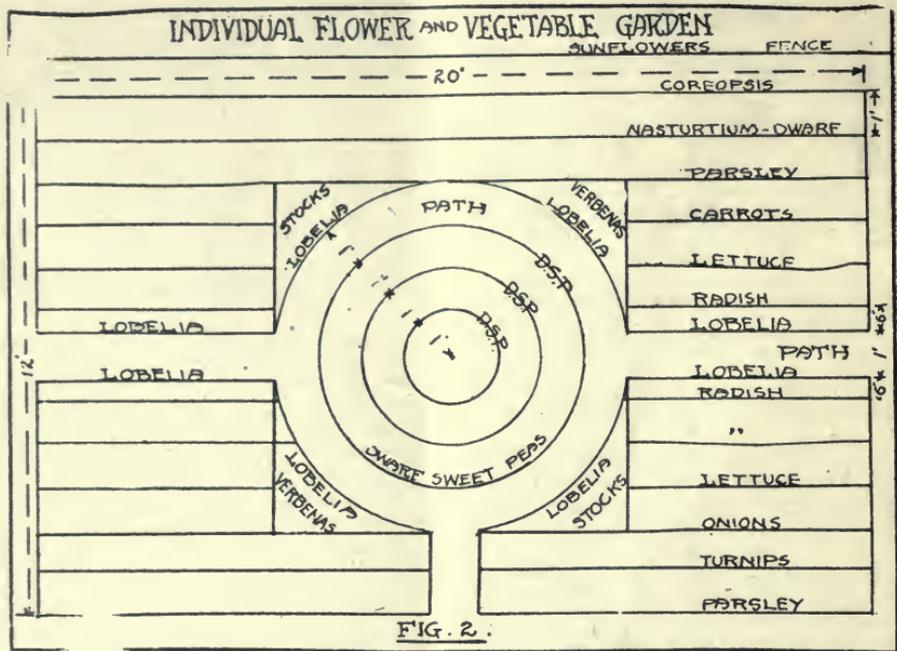
Selection of Plat—Select as good soil as can be found in a sunny place. If the soil is too clayey, add sand. If humus is necessary, stir in two inches of dry, decayed manure. Plants do not grow well in sand or clay alone, as shown by exercise 1, chapter VI.

Laying out the Garden—Do not make your first garden too large. A plat 10x20 feet for vegetables and a smaller space for flowers will be about all that you can attend to. Here is a simple plan for the vegetable garden (figs. 1 and 2).

Most vegetables are sown in rows. The rows should be far enough apart to allow ease of cultivation and trench irrigation, 10 to 14 inches. Such plants as corn, potatoes, tomatoes, etc., should not be grown next to rows of radish and other low growing plants. Grow them in plots by themselves. Tall growing plants are best grown on the north, so as not to shade others.

A Large Garden—You may wish to grow vegetables either at home or at school to sell in the market. Here is what some children have done:

"During the first year I raised enough garden truck to supply our own family, and besides that I sold \$12 worth to the neighbors. With this I bought myself a watch and chain," said one gardener from Ohio. Another raised \$105 worth



of vegetables and sold about half of them. One girl sold enough vegetables in one year to supply the family and buy a bicycle.

The picture shows a method used by truck gardeners. It insures plenty of water to the plants at little expense for labor.

If the garden is started before the rains, raise a small levee, or embankment, around the whole plat and flood with three or four inches of water. The ground should be plowed or spaded, raked or harrowed, and made with a slight slope. The trench (a) should be made by banking up loose dirt. Each plat, 4x5 feet, should be banked in the same way. Sow seeds broadcast or in rows. Thin out and cultivate as needed. From a hose, a hydrant or a stream run the water into the trench (a). Remove a portion of the bank at (b) and dam the trench with the soil. Flood (X) with two or three inches of water. Treat (y) and the other plats in the same way. After a few hours cultivate each plat. In the hot weather such flooding may be done once a week or less often.

Fig. (3) also shows another method of irrigating a large garden. Vegetables grown close to the trenches receive water in large quantities from below. Therefore the roots grow deep in the ground.

Room is left between the rows for thorough cultivation.

If you make a plan of the back yard for both vegetables and flowers, here are a few points in flower growing to think about:

(1) Flowers should not be scattered about—red here, yellow there. It is better to have a gay show of reds, yellows, blues, etc., as one color scheme throughout the garden.

(2) Tall flowers should not be grown next to short flowers.

(3) If there is a fence around your yard, grow sweet peas and let them climb over it. Flowers are used generally for decorations. They show off best when seen against a background. Such a background may be a building, a rock, a fence, trees, shrubbery, an ash barrel, etc.

(4) Do not grow flowers in an open lawn. The lawn should be a solid unbroken green with possibly a tree or two.

(5) Flowers may be used to edge a path, to screen a rubbish pile.

(6) If there is a tall fence around your back yard try this plan: Grow double sunflowers close to the fence. Follow with coreopsis and edge with dwarf yellow nasturtiums.

With your garden planned, get a string, stakes, a mallet, a yardstick or tapeline and stake the garden out. Paint the stakes one color and make them all the same size, about 14 inches long by 1¼ by 1¼. Stretch the string from post to post to guide you in keeping the stakes in line. Make the stakes in the manual training department. Prepare three stakes for each pupil who has a school garden.

Tools—Little need be said about tools. A spade, a hoe and a rake are needed.

The membership of our large gardening class is growing rapidly. Many seeds and pins have been sent out during the last week, yet we have a great many left. You should enroll at once before the seeds and pins are gone.

* * *

The Franklin School club, Oakland, is very much alive.

The Junior Agriculturist

A LITTLE PAPER ISSUED TWICE A MONTH
FOR THE JUNIOR GARDENERS OF CALIFORNIA

Vol. I.

BERKELEY, CALIFORNIA, April 14, 1912

No. 16

SWEET PEA CONTESTANTS

Please fill out the blanks below and mail to the agricultural education division, University of California, Berkeley. It is necessary that you do this to be considered an earnest applicant for a prize:

1. When and where did you plant your seeds?
.....
2. What variety of seeds did you use?
.....
From whom were they obtained?
.....
3. Briefly state how you prepared the seedbed?
.....
4. How deep were the seeds planted?
.....
How far apart?
.....
5. When did your plants come up?
.....
How tall are they now?
.....
6. Who knows about the planting of your sweet peas? Give name and address.
.....
7. Will you send in a photograph of your blossoms before they are picked, with those which you wish to enter in the contest?
.....
8. Are you keeping a diary?
.....



In order that you may not forget the terms of the contest, they are repeated below:

First—In order to enter the contest as an individual, you must be a California Junior Gardener. It is only necessary to send your name and address to C. A. Stebbins, Berkeley, asking to become a member of the large class, if you are not already enrolled.

Each school that contests shall be organized as a California Junior club. Write for information to the agricultural education division, University of California.

Second—Contestants shall have no direct assistance in planting the seeds or caring for the plants further than that obtained from suggestions by friends or from reading. Each contestant shall do all of the work in growing the sweet peas. He shall keep a diary noting the following points: (1) Variety of seed planted and where obtained; (2) place and date of planting; (3) details of planting, preparation of soil, depth of sowing seeds, distance apart, etc.; (4) time young plants are first seen; (5) drawings of the young plants two weeks and four weeks old; (6) care of the seedlings, cultivation, irrigation, etc.; (7) time of blossoming; (8) the signature of your teacher or another friend who knows of your sweet pea garden. This diary in a legible form shall be sent in with the 20 sprays of sweet peas entered.

Third—Prizes will be awarded on 20 sprays from the following score card:

	Points.
For freshness and good color.....	6
For number of flowers to stem (four).....	4
For length of stem (approximately 18 inches).....	4
For arrangement of flowers on the stem.....	4
For size of bloom—approximate width of standard, 1¾;	
Spencers, 1¼, and others.....	4
For neatness, arrangement, spelling in relation to the diary..	3
Total.....	25

Fourth—The prizes are as follows:

First prize for the best 20 sprays grown by a California Junior Gardening club.....	\$10.00
Second prize	5.00
Third prize	2.50
First prize for the best 20 sprays grown by an individual California Junior Gardener	\$10.00
Second prize, a set of gardening tools.....	5.00
Third prize	2.50
The next 15 prize winners.....	1.00 each

Fifth—The awards will be made at an exhibit to be held in Hearst hall, University of California, the latter part of May. Announcement will be made at the proper time as to methods of sending in the flowers and the date.

Sixth—**Flowers grown in hothouses are not eligible.**

Seventh—After the exhibit the flowers will be sold: (1) To help pay the expenses of the exhibit and vegetable luncheon; (2) to further the Junior gardening work.

The following institutions have donated prizes: The San Francisco Call; the Morse Seed company, San Francisco; the California Seed company, San Francisco, and the Germain Seed company, Los Angeles.

EDITORIAL

We hope that you read the editorial in last Saturday's Junior Call and that you have done BEST things mostly since then. Have you been thinking and preparing to enter the sweet pea contest? Here is a chance to be best, or one of the best, in growing this plant. We want you to grow the best sweet peas, but do not forget that we are more interested in you and the way you grow the peas than in the plants themselves. You must prepare the soil, plant the seeds and take care of the plants yourself. In the spring your sweet peas should hold up their heads, look you straight in the eyes and say, "We were raised squarely, according to the rules governing the contest; we stand for honesty and we deserve the prize." Look at a boy's work in the manual training shop or at a girl's problem in sewing, and much is told of their character and of the kind of man and woman the workers will make. So the sweet peas you grow and enter in this contest will speak of your character. Be sure that they speak of conscientious work alone.

GARDEN NOTES

PLAN for a TEN ACRE FARM

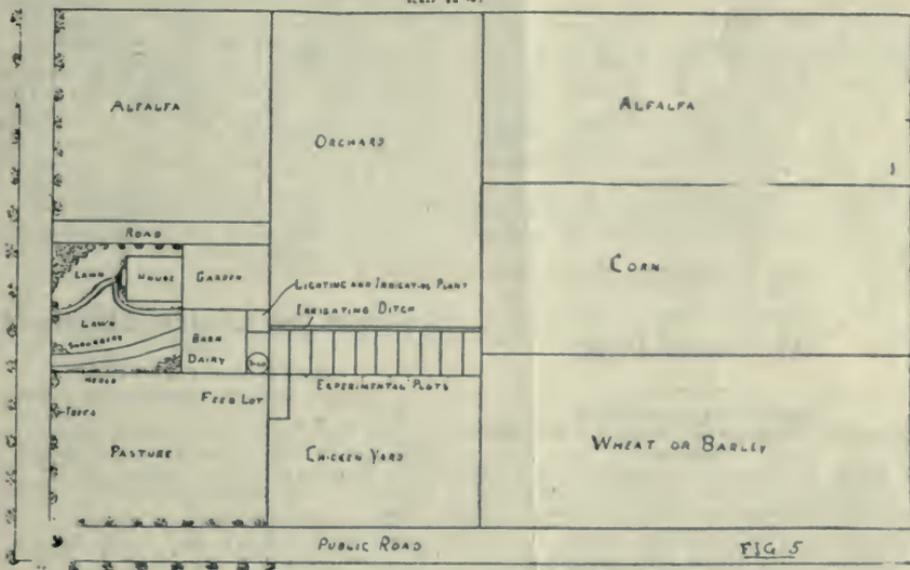


Figure A.

The Emerson school gardeners of Berkeley planted their seeds last week. The gardens are staked out neatly. An adjoining vacant lot has been sowed to dwarf sweet peas and nasturtiums. The whole plot of two vacant lots has been bounded by giant Russian sunflowers. We expect to find the Emerson school children strong contestants for one of the "rotating" banners.

* * *

Saturday was market day at the Berkeley garden city. The vegetables were placed for sale on a new stand. Albert Becker, the garden commissioner, was in charge. Albert does excellent work and is a good citizen. Soon we hope to have stars for each officer.

Many new gardens have been started at the "city." Pins are to be given to the gardeners who work a plot continuously for 5 or 10 months.

* * *

A piece of ground 20x100 has been set aside for a miniature ideal farm. The fifth grade boys of the Washington school, with their teacher, Miss Willson, come on Tuesday afternoons to work out the plan. Last Tuesday an area of wheat was planted. A part was broadcasted, a part drilled and a part broadcasted and rolled. A thorough study will be made of the factors which make for an ideal farm. (See figure A.) Several plats 10x20 have been set aside for flower gardens.

The second grade children of the Lafayette school, Oakland, have formed an ideal farm in the schoolroom on a dirt table 4x6 feet. (See figure B.)



Figure B.

Miss Rogers and Miss Collier have taught the gardeners a great deal about plant life. The farmhouse, barn, chickens, stock, etc., were made in the art work. Alfalfa, wheat, corn and a small orchard are growing excellently.

* * *

You Junlor gardeners should take time some day to thank Mr. Morse of the Morse Seed company, 48 Jackson street, San Francisco, for your free seeds. He has furnished free seeds for sowing Berkeley vacant lots.

My Spring Garden

HENRY WOOD,

Le Conte School, High Fifth Grade

At the beginning of the term I found my garden in a pretty bad shape. There were a good many weeds and the plants were very crowded.

The first time we went out to our gardens we took out the weeds and thinned out the plants. The ground was wet, so we could not do any cultivating.

We thinned out the lettuce plants and had a sale at which we made nearly \$2. We sold most of the plants to the mothers of the children. We used some of this money to buy seeds for the sweet pea contest.

There are still things to do, such as cultivating, pulling more weeds and transplanting, but it is still too wet to do much.

We expect to have a pretty good crop later on in the term.

My Sweet Peas

JIMMY RHINEHART,

Oakland, Franklin School, B Fifth Grade

My home garden consists of a little plat of sweet peas. On Saturday, January 6, I broke the soil. I dug it one and a half spade blades in depth. On January 8 I bought the seeds and put them to soak in a cup of lukewarm water.

The next day, January 9, I made a trench the length of my plat and five inches deep. Next I put the seeds in the ground about an inch apart and put one inch of soil over them, leaving the other four inches open.

The seeds came up on January 19. Every day, as my little plants grow, I gradually fill up the trench. A few days ago I thinned out the plants about a foot apart. My sweet peas are up about four inches now.

Caterpillars

JANE REILLY,

Le Conte School, High Fifth Grade

One day a girl in our room brought three caterpillars, which our teacher put in a jar. Soon after, when we looked at them, instead of caterpillars there were three cocoons. After that two of the caterpillars formed crystalids but the third died. The one that died I am going to tell you about.

First a fly, named ichneumon, stung him in the back and laid its eggs there. After that the eggs turned into grubs. The caterpillar then died and shriveled up, but the grubs grew larger. Soon after he was dead some brown pea shaped crystalids rolled out of his body. In a few days, when we went to look into the jar, instead of crystalids there were two flies.

These flies were the ichneumon flies. The ichneumon fly is one of the caterpillar's enemies.

Sweet Pea Contest at School

BROWNIE FRANCIS,

Le Conte School, High Fifth Grade

When we started our plat we first dug it up about two spades deep. Our plat is at the southwestern corner of the building. The sweet peas will climb up the side of the school building.

There is a lot near the school where some of our boys got some fertilizer. This we spread over the plat. We also used a bone fertilizer. These two we dug into the soil, mixing them well.

We did not do the seed planting until a few days after. The girls planted the seeds. They first made a trench about two inches deep. Then they put the seeds in about six inches apart. We expect to make a success of our sweet pea growing. Our seven varieties are Countess Spencer, Prima Donna, Hon. Mrs. E. Kenyon, Mrs. Willmott, Lady Grisel Hamilton, Dorothy Eckford and King Edward VII.

A WORD WITH THE TEACHER

We hope that you have school gardens, not for the sake of the gardens alone, not because school gardens are fashionable, but because of the larger lessons toward which the gardens point. The school garden is a fundamental factor in education. It should be potential in giving new direction to the old subjects. Its activities should be woven into the school work. Also, you should teach by experiment the principles underlying agriculture. Follow the classroom experiment into the garden, then into the community. Capillary action at work in glass tubes in the schoolroom is the same force which the boy gardener and the farmer must in like manner take cognizance. Far too much farming is being done by rule and not through the application of principles. Will you not give this new agricultural movement, which is so fundamental to our welfare, your close attention and study? It depends on you, the regular teachers, not on the university, not on the supervisors, for its success. You have done considerable this term. Plan to conserve the work indefinitely. The way of least resistance is to follow and to teach the lessons which are printed in *The Junior*.

It is a task on the university division to print and to mail out 5,000 copies of *The Junior Agriculturist*; will you not see that the paper is read by the Juniors? Let it be used to give new direction to the composition work. Read and discuss the editorials with the children. Make a study of the "famous" pictures as they are issued. Have the children perform the experiments and recite on the lessons.

University of California, College of Agriculture, Berkeley, California
 Agricultural Experiment Station, E. J. Wickson, Director Agricultural Education
 Entered as second-class matter, November, 1911, at the Postoffice at Berkeley, Cal.

The Junior Agriculturist

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Vol. I.

BERKELEY, CALIFORNIA, May 14, 1912

No. 17

LOOK FOR THE GOOD IN PEOPLE

Some months ago certain school children started gardens. Anxiously they waited for the young plants to appear. Patience was finally rewarded and the leaves timidly pushed their way through the soil. Each day the children measured the growth of the plants. But one morning indignation ran high, for the young vegetables had been snipped off close to the ground. Many were the threats that were made. All day long at intervals they watched for the culprits. To the astonishment of the children the white crowned sparrows proved to be guilty. The class immediately decided to destroy the sparrows. Would you have done the same?

Another pupil made war with slingshot and airgun on California woodpeckers because he had seen one make a hole in his barn. Would you have done the same?

The boys and girls who condemned the white crowned sparrows so quickly and the pupil who destroyed woodpeckers were led to study the birds, and soon they learned that both the sparrows and woodpeckers do far more good than harm. So we all have sharp eyes for evil and dull eyes for the good. The farmer sees the meadow lark as he picks up the grain, but he does not see the bird as he eats grasshopper after grasshopper (and grasshoppers are very harmful to the farmer), and just so we are quick to see and to talk about the faults of our friends rather than about their virtues.

So far as we know, all life has good within it. Even the housefly has some usefulness. If you ask yourself this question, "Where is the good within?" and then use sharp eyes, you will be surprised with what you can find. Whom do you consider your worst enemy? Now use sharp eyes for the good which is there. We want you to use sharp eyes for the good and dull eyes for the evil. We want you not only to do this, but to keep pointing out to your friends what you see in them and about them that is good.

Dear Mr. Stebbins: It has been a long time since I wrote you last, so this time I have quite a lot to tell.

My sweet peas are quite large now. Last Saturday I started tying them up, but have not finished yet. I have learned that the peas that get the morning sun are the best, for they are higher and are a darker green than the others.

We are disappointed in not having

our new school yet, and are obliged to plant in boxes, but will transplant later.

At school last week I planted lettuce seeds in a cigar box and now they are one and three-fourths inches high. The stem is long and frail, which is caused from not having enough air and sun. I also planted tomato seeds, but they are not up yet.

The seeds I planted a long time

ago grew very well but the chickens found them and they were destroyed before I discovered the harm they had done.

I will close now, hoping all the children belonging to the Junior Agriculturist club will have good luck with their plants. I am your junior friend.

FLORA MacDONALD.

Salada Beach, April 30, 1912.

* * *

Dear Sir: I am a member of the Junior Agriculturist and I received your letter stating that you would like to hear from me. The reason I did not write sooner was because I was waiting for my vegetables and flowers to sprout. I planted the following seeds: Carrots, radishes, kale, lettuce, onions and potatoes. The flower seeds are: Sweet William, sweet peas, daisies and California poppies. They are all growing nicely now. I have not received an issue of the Junior Agriculturist since March 14, 1912, and I would like to receive it regularly.

As I am a pupil of the Hunters Point school I have my garden at home. The reason the pupils have no garden at our school is because the soil is very sterile and will not produce any crops. Hoping to receive my paper regularly.

Yours truly,
MAY DONOHUE.

San Francisco, April 16, 1912.

Our Bulbs

BY FREDERICK BYRNES,

Seventh Grade, Pitts School

The bulbs we planted last fall have all blossomed except one. One did not bloom because it was planted too deep. The largest bulb grew 29 inches high and the blossom was four inches in diameter. Each bulb had two blossoms, while one had three and another four blossoms. After the blossoms had died we cut the leaves off about four inches above the ground.

We are now watering them very sparingly waiting for the remaining leaves to die. When they die we will place the can and bulbs in a cool, dry place.

Next October we will prepare a place outside, take the bulbs out of the cans, separate and plant them about six inches apart.

An Experiment

MILDRED TAYLOR,

Oakland, 5 B Grade, Franklin School

A few days ago we tried an experiment on our zinc lined sand table to show that forests prevent erosion of the soil.

A few children made a mound of earth very solid, two feet in diameter and one and a half feet in height, to represent a mountain. Our teacher put some moss and little twigs in the ground to represent a forest and left the other sides bare. She took a sprinkling can and held it about two feet high and let the water come down as if it were rain.

The results were the barren side had

little gullies, and muddy streams came tearing down. If there were a farm at the bottom of the mountain it would be flooded. If there were a farm at the bottom of the forest side it would not be flooded out because there was nothing but a clear little stream there.

JIMMY RINEHART,

Oakland, 5 B Grade, Franklin School

A few days ago we tried an experiment on our zinc lined sand table to show that forests prevent erosion of the soil.

First, we made a mound of earth two feet in diameter and one and a half feet high. This mound was packed hard. Next on one of the sides we stuck in pine twigs to represent trees, and moss to represent underbrush. Then we took a sprinkling can and sprinkled water on the top of the mound to represent rain.

The result was that the barren side had all the good, fertile soil and some of the pebbles washed down to its base, while the side with the forest was just the same, only under the growth the ground was soaked.

This happened in the Sacramento valley on a larger scale when the mountain forests were cut down. Before the forests were cut down, steamers used to go up the Sacramento river almost to Shasta, and now they can go only about half this distance. The reason for this is that since the forests have been cut the heavy rains have washed down fine soil and loosened boulders, which, coming down, have filled up the river bed.

Reading List

1. "Tree Stories"—L. E. Mulets.
2. "Little Brothers of the Air"—Miller.
3. Pacific Nature Stories—H. Wagner.

TREE STORIES

Edith Warness.

The book entitled "Tree Stories" is written by Lenore E. Mulets. It is very interesting. Some of the pupils in our class told the stories about the oak tree and the pussy willows. The following are some of the stories in the book: "Why the Poplar Branches Turn Upward," "Why the Aspen Leaves Always Tremble," and "Why Some Trees are Always Green."

Since the sweet peas are maturing so slowly, the awards will be made in July at a potato bake to be held at the Berkeley garden city. All contestants are invited to attend. Potatoes, radishes, lettuce, etc., will be furnished, but visitors will be asked to bring cakes and pies. The potatoes will be baked on the grounds by individuals and groups. We are looking forward to a good time. Notice of the exact date for shipment of the peas and for the bake will be given later.

Packing Sweet Peas for Exhibition

With care in packing sweet peas a 12 to 15 hour journey will do little harm. If you live near the place of exhibition, select the best type flowers, 20 or 30 sprays, and cut them the morning of the awards. Many flowers will have to be shipped some distance. Sweet pea blossoms should be **dry** when **packed**. Cut the sprays in the morning after the dew has dried up or late in the afternoon. Cut the sprays at least two hours before packing. Place the peas lightly in water and set them in a dry, light place where the air is in motion (not in the sunlight nor in the dark).

Cut the sprays when the lower blossoms are well open and the top blossoms half open or when maturity is nearly reached. The stems should be woody, not "soft" and weak. Moisten cotton and wrap the ends of the stems and place the dried sprays in pasteboard boxes. (They may be obtained from florists, or a shoebox, cut down, will do.) Line the boxes with waxed paper if the weather is hot. This keeps the plant moisture from evaporating. Lay the sprays close together in rows and cover each with tissue paper. Do not put too many sprays in a box for fear of bruising the flowers. Pack the box with tissue paper to keep the blossoms tightly in place.

On arrival at the place of destination, place the sprays in clean soft water at once, and arrange in attractive transparent glasses. In a short time the blossoms will awake in their freshness and beauty.

If possible, go with your sprays to the exhibition so that you may arrange them artistically as to color and stems.

It is planned to have the sweet pea contest close during the first week in July.

Junior Agriculturist

It costs us a great deal to send you The Junior. If you want it again next term fill out the blank and send it to the editor, C. A. Stebbins, Berkeley.

Dear Editor—

Date.....

I shall grow plants next term. Kindly keep my name on your mailing list to receive the Junior Agriculturist.

Name

Address

School and Club.....

Teacher's Name and Address.....

LESSON 7—Concluded.

Use of Tools—There is a right way to use tools. When you are ready to spade, stand in one corner of your

plot facing one edge. Press the spade into the ground as far as you can (about six inches from the edge) with your foot. If the ground is hard work

the handle forward and backward, then throw the dirt a few inches in



front. Be sure to break up the clods thoroughly as each spadeful is turned over. Plants do not grow well in cloddy soil. Exercise 2, Chapter VI. taught you this. Continue spading across the garden, leaving a trench in front. Guided by the trench spade another row. Keep the trench open as each row is spaded. (Fig. 4.)

With the whole plot spaded or at least the part spaded which you wish to saw at once, rake back and forth to break up any lumps still left. It is a good plan to push the rake from you, otherwise the soil will be drawn from the center to the edges. When finished the bed should be soft, a little higher in the center than at the edges. It should be raised about two inches. The edges should be in line with the stakes. String stretched around the plot will guide you in making straight edges.

The School Garden—A diagram of school gardens will appear in the next issue. If you have a school garden your teacher will help you in planning and laying out the garden as a whole. An individual garden will be given you, you may work in a group with others, you may have an experimental garden or you may do all three. However, what you have learned will help in the school garden. Unless your teacher has given you a plan to follow, work out some original way. Follow his instruction closely so as to grow the best vegetables and flowers. Any one can grow a radish, but any one can not grow the best radish.

You and your neighbors should plan to arrange your vegetables and flowers so as to make the garden as a whole attractive. A row of corn next to a row of beets would not look well. Two rows not parallel would not only spoil the appearance of one garden but would make the whole plot less attractive. You and your neighbors must think of the good or all.

Tools—You may have to furnish your own tools. The school may furnish them. In either case, take care of them. Put them in a tool house or a box carefully and well cleaned. When not being used in the gardens lay hoes and rakes with the prongs down. Some one may fall or step on them. Probably there will not be enough to give each pupil a set. Remember your neighbor and be satisfied with one tool.

A tool broken by a gardener should be fixed or replaced by him.

With the seed bed carefully spaded, raked and formed you are ready to plant seeds. Do not be in a hurry to plant, however. The most important step in growing the best radish is a perfect seed bed. After the seeds are in little can be done to improve the bed.

If clods persist rake them into a pile. Dig a hole in one corner of the garden and bury them.

QUESTIONS

1. What should determine the choice of the garden plat?
2. How far apart should the rows be?
3. Why not plant corn and beets close together?
4. Give some rules for the growing of flowers.
5. Explain the proper way to spade and to rake.
6. Describe an ideal seed bed.
7. What steps does a farmer take in preparing a good seed bed?
8. What should each pupil bear in mind to make the whole plat attractive?
9. What is the most important step in growing the best vegetable or flower?

HOME STUDIES

1. Why does a farmer select well drained land when buying?
2. Why will ordinary crops not grow on wet lowlands?
3. How might swampy land be reclaimed?
4. How far apart does the farmer plant corn and wheat? How are the seeds sown?
5. How might your own and the homes of others living near be made more beautiful? Make a rough plan of a flower scheme for your home.
6. What will be the cost of such a garden as shown in figure 2? Find out what vegetables and flowers are worth and estimate the profit to be gained.
7. What methods are used to irrigate orchards, gardens and fields in your vicinity?
8. Study figure 5 carefully, for this 10 acre farm will be referred to often. What would it cost to fence this farm? How many years will a good fence last? What kind of posts is it best to use?

The Junior Agriculturist

A LITTLE PAPER ISSUED TWICE A MONTH
FOR THE JUNIOR GARDENERS OF CALIFORNIA

Vol. I.

BERKELEY, CALIFORNIA, June 14, 1912

No. 18

What Are You Going To Do for 1915

In the Junior Call we wrote you about Johnnie, who had no right to eat green apples because he made so many people unhappy. We told you that one should care for a cold, since others might be made sick. A selfish boy or girl or selfish parents will not agree with us, for they think that they can do anything they please. There is some excuse for you boys and girls, but no excuse for parents and others for so much love of self. Truly, the man or woman who thinks only of himself or herself is not quite grown up.

There are nearly 200 children who work in the Berkeley Garden city. Each has an individual garden. Last week we walked through the gardens. We found a few plats full of weeds. The presence of weeds told us two stories: (1) That the owners of the weedy gardens are not good workers, and (2) that they are selfish. They have no right to allow the weeds to grow. One weed will grow thousands of seeds, each of which will make a new weed. Thus because of one selfish boy or girl all of the other children will have to do extra work to keep weeds from their gardens. Not only does selfishness cause their neighbors extra work, but a weedy, unsightly plat spoils the appearance of the whole garden and makes visitors feel that we are all careless. How much better if these selfish gardeners would serve the whole city by keeping their plats clean and attractive.

Such thoughtless gardeners we may excuse, yet not praise in our Garden city, for the boys and girls are young, but we have no excuse nor any praise for the selfish owner of a vacant lot overrun with weeds. He or she furnishes a breeding place for the weeds, which later all of the neighbors have to fight. The unsightly lot helps to keep strangers from locating in the city, for they feel that individuals who will not treat their neighbors right will not vote right. Thus property adjoining such a lot is of less value. Why do these individuals not grow up and serve their city?

In 1915 thousands and thousands of visitors are coming to California. We want many of them to stay, and we want all of the others to speak a good word for California when they return home. Let us all serve our state by making the cities and the country beautiful. If each city school would beautify and make useful one vacant lot, if the children of each rural district would beautify their own schoolyard, grow and plant trees along the country roads and see that fences and homes were improved, what a great amount of service they might do. Think about it, you 10,000 Juniors, talk about it, for we may ask you all to take hold soon for California.

Junior Agriculturist

It costs us a great deal to send you the Junior. If you want it again next term fill out the blank and send it to the editor, C. A. Stebbins, Berkeley.

Date.....

Dear Editor—

I shall grow plants next term. Kindly keep my name on your mailing list to receive the Junior Agriculturist.

Name

Address.....

School and Club.....

Teacher's Name and Address.....

Packing Sweet Peas for Exhibition

With care in packing sweet peas a 12 to 15 hour journey will do little harm. If you live near the place of exhibition, select the best type flowers, 20 or 30 sprays, and cut them the morning of the awards. Many flowers will have to be shipped some distance. Sweet pea blossoms should be **dry** when **packed**. Cut the sprays in the morning after the dew has dried up or late in the afternoon. Cut the sprays at least two hours before packing. Place the peas lightly in water and set them in a dry, light place where the air is in motion (not in the sunlight nor in the dark).

Cut the sprays when the lower blossoms are well open and the top blossoms half open or when maturity is nearly reached. The stems should be woody, not "soft" and weak. Moisten cotton and wrap the ends of the stems and place the dried sprays in pasteboard boxes. (They may be obtained from florists; or a shoebox, cut down, will do.) Line the boxes with waxed paper if the weather is hot. This keeps the plant moisture from evaporating. Lay the sprays close together in rows and cover each with tissue paper. Do not put too many sprays in a box, for fear of bruising the flowers. Pack the box with tissue paper to keep the blossoms tightly in place.

On arrival at the place of destination, place the sprays in clean, soft water at once, and arrange in attractive transparent glasses. In a short time the blossoms will awake in their freshness and beauty.

If possible, go with your sprays to the exhibition so that you may arrange them artistically as to color and stems.

It is planned to have the sweet pea contest close during the first week in July.

GARDEN NOTES

We visited the Melrose school gardens last week. Mr. Mortensen, with his willing workers, has converted a weedy vacant lot into an attractive spot. He intends next term to enlarge his idea of pupil self-government and to extend it to the school gardens. A market and a banking institution are to be established. A definite plan whereby the activities in the gardens may be woven into the school subjects is to be worked out.

* * *

Principal Crane and his school board are interested in gardens and agriculture. We hope that the school boards of Melrose, San Leandro and Decoto will co-operate in employing a supervisor of agriculture. In Oregon the

state pays supervisors of agriculture in the elementary schools. Thus the schools are becoming of direct service to their communities. We hope sincerely that the legislature of California at its next session will make this plan possible in California. The San Leandro school is a model in every respect from building to principal.

* * *

Miss McDermott of San Francisco is doing an excellent piece of work. She has over 300 children entered in the sweet pea contest. It means much to the future of San Francisco to bring children close to the soil and growing things. The closer a man gets to the soil the purer he is.

SWEET PEA CONTESTANTS

The awards which are indicated below will be made at the Berkeley Garden city on Saturday, June 29. A potato bake will be held at the Garden city the day the awards are made. All contestants and their parents are invited to attend. The Berkeley gardeners will furnish potatoes and other vegetables. The visitors are requested to bring their own bread, pies, cakes, etc. For the noon meal come early.

Be sure to follow instructions in pages of The Junior as given as to shipping sweet peas, if you do not bring them yourselves.

Please prepay all packages of flowers and mail or express them so they will arrive in Berkeley on June 28. Be sure to send your diary. See that the sweet peas are labeled with your name and address.

Prizes will be awarded from the following score card:

	Points.
For freshness and good color.....	6
For number of flowers to stem (four).....	4
For length of stem (approximately 18 inches).....	4
For arrangement of flowers on the stem.....	4
For size of bloom—approximate width of standard, 1 1/4; Spencers, 1 1/4; and others.....	4
Neatness, etc., in diary keeping.....	3
Total	25

Prizes will be awarded on the 20 best sprays of sweet peas, not on a great number.

The prizes are as follows:

First prize for the best 20 sprays grown by a California Junior Gardening club.....	\$10.00
Second prize	5.00
Third prize	2.50
First prize for the best 20 sprays grown by an individual California Junior gardener.....	10.00
Second prize, a set of gardening tools.....	5.00
Third prize	2.50
The next 15 prize winners.....	1.00 each

One or more of the following varieties must have been grown:

- | | |
|--------------------------------------|------------------------------------|
| 1. King Edward VII; red. | 2. Dorothy Eckford; white. |
| 3. Prima Donna; pink. | 4. Lady Grisel Hamilton; lavender. |
| 5. Miss Willmott; orange pink. | 6. Hon. Mrs. E. Kenyon; primrose. |
| 7. The Countess Spencer; giant pink. | |

Flowers grown in hothouses are not eligible.

After the exhibit the flowers will be sold: (1) To help pay the expenses of the exhibit and vegetable luncheon; (2) to further the Junior gardening work.

Money to Be Changed Into Glen Park School Banner

DANIEL LYNCH

The children of the Glen Park school have taken great interest in the agricultural movement. We have planted various kinds of vegetables, including parsley, onions, carrots, beets, turnips, radishes, lettuce, parsnips, endives, peas, beans and muskmelons.

The day after May day I read the following in The Call:

"Some school without a banner had its pretty girls in bright hued gowns, and on each head a bright pink bow on one side and a pale blue on the other."

That school which was so unfortunate as to be without a banner is, I am sorry to say, the Glen Park school. But it shall be without a banner no longer, for the enthusiastic gardeners have decided to buy a banner with the money derived from the sale of vegetables. A few of the children in one of the smaller classes proposed this plan to Miss McDermott and it was met with approval, not only by Miss McDermott, but also by Miss Wade, our principal, and all the gardeners.

We have only sold our radishes, as the other vegetables are not large enough to dispose of.

Last week the eighth grade pupils thinned their turnips and found sale for the greens. I have been told that these greens, when cooked, form a good substitute for spinach.

We planted onion seeds twice, but somehow or other we did not have luck with them and therefore were forced to plant onion sets.

We transplanted our lettuce and beets and the first two days they looked as if they would not grow, but on the third day I was surprised to see them lift their heads. Some of the children were not successful in their transplanting, because they handled the plants too roughly.

Each class is allowed one hour a week to devote to its vegetables. For instance I, as president, choose four children to work in the garden on Tuesday for half an hour; and four different

children on Thursday for the same length of time. I choose the children from the B eighth grade on Tuesday and from the A eighth grade on Thursday, thus giving every gardener a chance to work in the garden.

All the other classes do likewise, although they do not all choose the same day.

We have the following amount in the treasury:

Eighth grade.....	\$0.05
Seventh grade.....	.15
B sixth grade.....	.10
A sixth grade.....	.20
A fifth grade.....	.20
B fifth grade.....	.05
Fourth grade.....	.15
Third grade.....	.15

Total.....\$1.05

This amount was obtained from the sale of radishes and turnip greens only.

Energetic Alhambra Gardeners

MARY SUTTON

In Alhambra we have four ward schools and one central high school. The high school and three of the other schools have school gardens.

At the Garfield Avenue school we have two garden plats. One belongs to the lower grades and the other to the higher grades. Besides these school gardens there are 181 pupils who have home gardens.

The pupils of the sixth grade in this school have organized a junior gardening club. There are 25 members of our club. We receive the Junior Agriculturist.

We (the club) have sold 55 cents' worth of radishes from our garden this year and will have peas, turnips, beans and onions ready for market before the close of school in June.

This is our first year in gardening. We like the work.

The Week's Reading List

1. Plants and Their Children—Mrs. Dana.
2. Little Flower People—Hale.
3. Seed Travels—C. Weed.



A Vacant Lot in North San Francisco Before Beautifying by a California Junior Garden Club.

