# Agriculturist

**Edited By Professor C. A. Stebbins**

*ity Gardeners Hard at Work*

## RDEN LESSONS

What are the results?
**k of Leaves**—A flattened becomes rigid when pumped A wilted plant becomes the roots pump it full of ring the pumping process n into the plant. There is ood in comparison to the water. If a plant were top it would soon fill with ood would be used up for no get in and the plant would nately, the water escapes aves (exercises 7 and 8), mineral food behind, just evaporated from the spoon salt behind in a previous

is in very dilute solutions; stated before, there is but comparison to the amount This evaporation process, piration, takes place through ngs (stomata), usually in ide of the leaves (exercise e oak tree may transpire per day during the sum- ch ounce of dry plant made 25 pounds of water pass plant.

**Prevent Transpiration**— n in a measure is controlled t through its leaves. Ten- ides of grass are rolled to oration. Many leaves have a waxy covering. If such dipped in water it runs off Thick covering and fleshy nt moisture from escaping. her methods used by leaves r water. Look for them as e.

er portion of a plant is car- built into plant ates and they take it

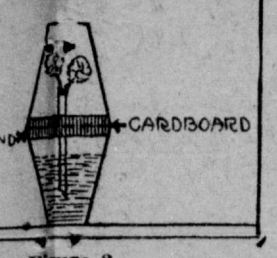


**Figure 2**

This most of the plant's ome from the air and the ared by the leaves. nts, such as parsley and food in their leaves.

**ed Proteids and Carbohy-** food as bread and pota- ade mostly of starch and lled carbohydrates. They on and water. Meats and similar foods are said to Besides carbon, they con- other substances. You ve without carbohydrates nor can a plant.

**for Starch**—Iodine always blue. Corn kernels and in starch (exercises 1 and 2). Let us see how it is made by the leaves.

**Composition of Starch**—Starch is made of carbon dioxide and water. The milky limewater (exercise 3) showed that carbon dioxide came from the starch and the water on the sides of the tube came from the same place.

**The Plant Takes in Carbon Dioxide and Water**—Exercise 11 taught us that

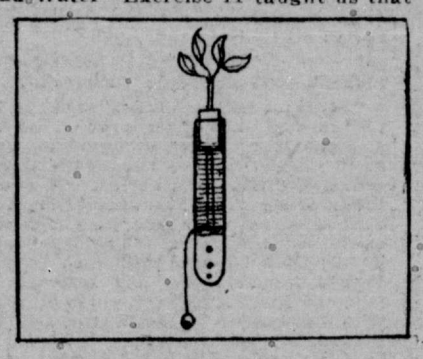

**Figure 3**

air enters the leaves of a plant, and in the process takes in carbon dioxide for the air contains this gas (exercise 6). We know that there is water in leaves from exercises 7 and 8. If starch is made of water and carbon dioxide, and starch is found in a leaf which has been exposed to sunlight, the leaf must make starch from the water and carbon dioxide which it contains. The water comes by way of the roots.

**Starch Digestion**—Water will not put starch in solution, but it will sugar. Therefore, before starch can be used by the plant, it must be changed to sugar. It then goes into solution and is carried by the sap throughout the plant.

**Use of Chlorophyll**—The green color of leaves is due to tiny green particles. Without them starch can not be made (exercise 12). Sunshine is necessary to start the chlorophyll grains to work. Think of one of these grains as a tiny steam engine. The sunshine starts the little engine to work, it puts carbon dioxide from the air with the water in the leaf and makes starch. This is then changed to sugar and used by the plant.

**QUESTIONS**

1. What is the work of leaves?
2. What keeps a plant rigid?
3. What is transpiration?
4. How much water must a plant handle to get enough food to make a pound of dry plant tissue?
5. Plants are made mostly of what?
6. Name two kinds of foods. Give examples of each.
7. What is the test for starch? Of what is it composed?
8. Where is starch made in the plant? How do you know?
9. In what form must starch be in order to be used?
10. What is chlorophyll and what is its use?
11. How does carbon dioxide get into the air? Think of exercises 4 and 5.

## Letters From Gardeners

Porterville, Feb. 20, 1912.

Dear Editor: We received the seeds some time ago and planted them.

We formed ourselves into groups, and each group planted one kind of seed. The seeds are all up. The carrots are not up very well. The cabbage is about ready to transplant.

We water our gardens every night after 4 o'clock.

We thank you very much for the seeds. Yours truly,

WILLIAM GROSSMAN,
Secretary Junior Gardening Club.

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Hearndon, Feb. 21, 1912.

Dear Editor: Owing to the fact that several new pupils have entered the school we will need another package or so of seeds. Please send a package of icicle radishes. You sent one package before, and they are doing nicely.

Please send one package of turnip seed and one of lettuce if possible.

The gardens are very pretty. Most of the seeds are coming up. We have had very little rain in the valley this year, and we have had to carry the water to the gardens. We expect to have some pictures of the garden taken soon. Thanking you, I am

EDNA B. McDONALD, Secretary.

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Professor Stebbins, Dear Sir: I am very glad you started us in gardening. Our garden has changed very much in appearance. Before we started it was as bare as a bone, but now it is as fresh and as green as it could be. I just got some weeds out yesterday. About every three days certain boys water every garden. We dig around the plants with small sticks. The class cordially invites you to visit the gardens. Yours truly,

PERINI CREELY.

## An Older Junior Heard From

Dear Editor: I happened to see the reference to the fact that all the writers of last year had dropped out. The subject struck me as a good one, so I decided once more to try for a prize.

I have been watching the agriculture page in The Junior, and, having taken botany last year, am interested. I find that the course in The Junior just about equals the course of botany given in high school, and if followed closely and carefully should obtain about as good results. This junior course will prepare them for a course in high school if they would care to go on with it.

We each had a plat 12x25 feet and worked in pairs. To show the advantage of working the soil well, the best plat was spaded seven times, the poorest twice. So, to get results, it pays to work the ground well.

I have often wondered if a story may be typewritten and sent in. I would be much obliged if you would answer this in The Junior. Yours very truly, KARL J. PRIDE.

Pleasanton, Feb. 26, 1912.

(Typewritten copy is always preferable. We are glad to welcome you once more.) EDITOR.

## My Garden

**MARIE BUCHHOLZ,**
**Noe Valley School, Third Grade. Age 9 Years**

In our garden at school we planted beans, radishes and lettuce. We water them every day. They are growing very nicely. They are all beginning to grow.

We planted them in soil, sand and clay and we tried them in soil, sand and clay mixed. We saw them grow well in all of them, but best in the clay and sand. So we planted in sand and clay.

## How to Plant Grass

**DOROTHY WEBSTER,**
**Sixth Grade. Age 11 Years**

The soil for grass seed should be rather sandy. Scatter the grass broadcast. Then rake the soil so as to scatter the seed around.

After this pat the ground by walking over a board.

In about a week or 10 days the grass should be coming up or at least showing.

## An Experiment in Soils

**MARGARET BLODGETT,**
**Noe Valley School, B Third Grade. Age 9 Years**

Our class had an experiment in gardening. We planted wheat, beans, radishes and lettuce. They were planted in clay, sandy clay and sand and fertile soil. We found they grew best in fertile soil.

## Wild Flowers Seen in East Oakland Lately

**SIDNEY HILL,**
**Oakland. Franklin School, B Fifth Grade**

I have seen quite a number of wild flowers this spring. I have seen the California poppies, cowslips, dandelions, buttercups and wild clover.

I went into the field across from our house in Cleveland street and found the two poppies. I found the cowslips in my vegetable garden and I saw the buttercups in our field. The dandelion was seen as I was going to the store in Ninth avenue.

I found the clover in the cow corral.

## 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 untrammeled. 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.

## CAN YOU BE DEPENDED UPON?

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 sniffling, 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 note'book 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.