

Home Course In Modern Agriculture

VI.—How Plants Are Propagated

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In order to continue to raise crops from year to year we must propagate the plants in some way. There are two principal ways of doing this—by seeds and by divisions of the plant itself. The most important of these is by seeds, as it is in this way that most of the ordinary farm crops are multiplied.

In order to understand this process we must first learn how the seeds are formed. The tassel of the corn is the male flower and the silk the female. Some plants, such as certain varieties of strawberries, have only female flowers and must be planted in alternate rows with varieties which have both kinds of blossoms. In other plants the male and female flowers are combined in one. This is the case with the apple and many other fruits. In the apple the stamens, or male parts, grow in a ring around the pistil, or female part, which is in the center of the flower. The top of a stamen, which is expanded, is called the anther. This contains a yellow dust, the pollen.

The upper portion of the pistil is called the stigma. From it a tube called the style leads downward to the ovary. This ovary contains one or more egg shaped cells called ovules. Each of these ovules is capable of developing into a seed if fertilized with a pollen grain. When a grain of pollen alights on a ripe stigma it is held by a sticky substance secreted there. It soon germinates and sends a long, threadlike projection down through the style to the ovary. This slender projection enters the ovary, and the resultant union of the male and female elements causes a seed to develop. One pollen grain is required for each ovule, and each ovule develops into a separate seed. There are many thousand pollen grains produced by each stamen, and as there are several stamens for each pistil you will see that a great excess of pollen is produced. This is one of nature's methods of making reproduction more certain.

In flowers like the apple the pollen may sometimes fall directly on the stigma in the same flower. More often, however, the stamen and pistils ripen at different times. The object of this is to prevent self fertilization, which, if long continued, will weaken the vitality of the coming generations. Cross pollination—that is, the fertilization of the ovule of one flower by the pollen from another plant—unites the strength of both parents and produces larger, harder seed.

This has been proved by many experiments. If the tassels are pulled from a row of corn before they have time to shed their pollen, the silks must necessarily be fertilized by pollen from other stalks. The cross pollination will cause the detasseled rows to produce heavier and larger ears. If this process is continued from year to year the yielding power of that particular strain will be considerably increased.

In such plants as corn the wind carries the pollen for rods in every direction. The air in the cornfield is so filled with the yellow dust that there is seldom any danger that the silks will fail to catch more than plenty to fertilize each of the many ovules that are to form the future kernels.

Some plants, however, are not so fortunate in this respect. The pollen of fruit trees is carried to some extent by the wind, but not nearly so much so as that of corn. In such plants as

or rake, but before you build a fire over them stop to think whether you want a crop of clover seed or not.

Some beekeepers are developing strains of honeybees with exceptionally long tongues. Some of these are able to obtain honey from second crop red clover, which has smaller blossoms than the first crop. When these strains of bees become a little better developed and more widely distributed the usefulness of the bumblebee will be over. In the case of small grain cross fertilization is impossible, since the flower is inside of a closed hull. Two varieties of wheat may be planted in adjoining fields or even in the same field without the slightest danger of mixing. Varieties of corn, on the other hand, often mix when as much as forty rods apart.

The selection of seed corn will be taken up in the next article. The best

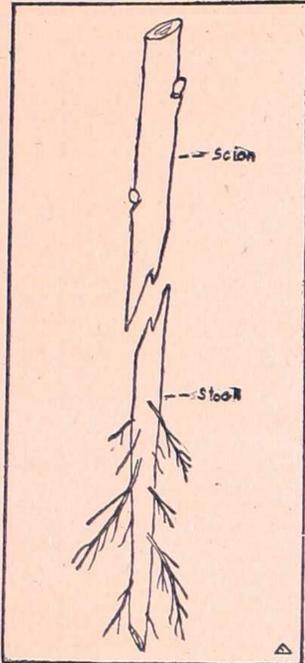


FIG. XIII.—THE STOCK AND SCION READY TO BE UNITED.

method of selecting small grain is by means of the fanning mill. By running through three or four times as much seed as is needed all the small grains may be sieved out and the light ones blown over, leaving only the heaviest, strongest ones for planting.

Grain that is intended for seed should be stored carefully in order that it may go through the winter uninjured. The chief enemies of stored seed are moisture, insects and rats and mice. The seed should be dry when stored and kept where moisture cannot gain access to it. Dry seed will stand almost any amount of freezing without injury.

There are a number of insects that damage seed grain by burrowing into the germ. If the seed room is tight, they may be killed by fumigating with carbon disulphide used at the rate of a pound to each thousand cubic feet of space. Place this in an open dish on top of the seed, close the room as tightly as possible, and in a few hours the insects will be exterminated. Care should be taken not to go near the room with a light, as the gas is explosive. This same treatment is also fatal to rats and mice, unless they have some way of escaping from the room. If possible the seed room should be so well built that these pests cannot get into it.

The second method of plant propagation is by division—that is, by planting parts of the plant itself. Potatoes are propagated in this way almost entirely. If small willow and poplar branches are stuck into the ground, they will grow into trees. Apple and other fruit trees are propagated either by grafting or budding. Apple trees may be raised from seed, but the fruit of seedling trees is usually worthless. By taking a part of the tree and growing another from it, it will, of course, bear the same kind of fruit.

Grafting consists of joining pieces of small branches or scions of the tree which is to be propagated to pieces of roots or stocks. The roots of yearling seedlings are used for stocks. The scions, which should be about the size of a lead pencil, should be cut in the fall and packed in sand. The grafting can be done at any time during the winter. All that is necessary is to cut the lower end of the stock and the upper end of the scion at an angle, as shown in Fig. 13. These are then carefully fitted together and tied with a little common string. The essential point is to be sure to have the cambium layer of the scion join that of the stock. This cambium layer is thin, light brown portion between the bark and the wood. It is the point where growth takes place.

The completed graft, which should be eight to ten inches long, is again packed in sand. In the spring the grafts are planted in a row in the garden and left until they are two or three years old, when they may be transplanted to their permanent place in the orchard.

Ants, flies, butterflies and bees are very fond of this nectar and in collecting it carry the pollen of one flower to the stigma of another. Bees are most important in doing this work because they gather so much more of the nectar than do the other insects. They often carry home some of the pollen, too, which can be seen sticking in yellow balls to their hind legs, but enough is always brushed off to fertilize the flowers which they visit. The blossoms of red clover are so large that the short tongues of ordinary honeybees cannot reach to the bottom. It is upon the larger bumblebees that this crop depends for its ability to produce seed.

Indeed, it is so entirely dependent upon them that the crop of clover seed is in direct proportion to the number of bumblebees in the neighborhood. It is anything but pleasant to run into a big nest of bumblebees with a mow-

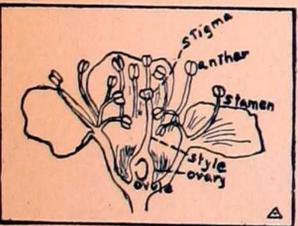


FIG. XII.—SECTION OF CHERRY BLOSSOM SHOWING MALE AND FEMALE PARTS.

clover the stamens are at the bottom of a slender tube, from which they cannot escape unaided. Plants of this nature are dependent on insects to transfer pollen from one flower to another. In order to attract these insects the flowers secrete a sweet nectar, which collects in the bottom of the tubes of which the flowers are composed.

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Nerve of a Doctor.

"I believe," said Dr. John M. Kitchen, "I was the first physician in northern Indiana to make use of chloroform. I was a young fellow not much past twenty-one years old, the ink hardly dry on my sheepskin, when a man came into my office to have an aching tooth pulled out.

"I had a small bottle of chloroform, and with the hardihood of youth I made up my mind to use it. He readily went under the influence of the new anaesthetic. I pulled manfully and the grinder came out. I waited, but the patient did not return to consciousness. I was badly frightened, and, hastily seizing a bucket with about two gallons of water in it, I poured it over him. Gasping he came out from the influence of the chloroform. Then he wanted to know what I meant by giving him such a soaking.

"Mustering all my professional sang froid, I calmly replied, 'That, sir, is a part of the treatment,' and he went away, greatly to my relief, entirely satisfied."—Indianapolis News.

Music of the Wheat.

Wheat has a music of its own; it is different from what you hear in a barley field or oat patch. The ears are heavier and the rustling is more sonorous and more deeply musical than the swishing of the pendulous oats or bearded barley. There are often breezy days just as the wheat is ripening when you can linger and listen to the rustling music; now and then it sounds like the susurrus of the sea, and you are reminded of waves by seeing the cloud shadows flying over the wheat with a motion not altogether unlike the rising and falling of the sea. Just as painters have drawn frequent inspiration from the wheat fields, no doubt musicians have been inspired by their sweet, subtle sounds. As the breeze passes over the field, how the wheat rustles, how it sways and bends, almost sometimes bowing to the ground, but recovering itself easily in due course.—London Globe.

Keeping In the Heat.

You speak incorrectly when you say that your fur coat is warm. There is no heat in the fur coat at all, but it keeps you warm because it prevents the heat of your body from passing off into the cold air. The Bible says that God "giveth snow like wool," because snow is a poor conductor of heat, just like wool, and protects the seeds of fruits and vegetables in the soil in winter just as wool protects your bodily heat. A sauceman which has been used will bring the water to a boil more quickly than a new one because the bottom being covered with soot it absorbs heat more quickly than a highly polished new surface. The cook polishes the lids of kettles because, when bright, they do not draw the heat and in this way keep the contents warm longer than if dull.—New York World.

Generous Boss.

A certain "danky" who works a small farm for "halves" occasionally furnishes much amusement to persons who happen to chance in his vicinity by his originality and "gift of gab." The other day an individual engaged him in conversation with the intention of hoarding up a good laugh for reference at his club. "How do you make out, Joe?" was asked as a way of starting. "Fine, boss," replied that person, "fine." "But you don't keep all you raise, do you?" "No, sah," replied the danky, and he continued: "You see, boss, it's dis a-way. I's gets half of all I raises, and that's all I wants. De boss is a gentleman. I guess I could get a third if I'd ask, and I knows he'd give me a quarter if I wuz hard up."—Pittsburgh Dispatch.

True Philosophy.

A lady was standing on her back porch one bright spring morning. She did not appear happy or contented, and she confided her restlessness to her negro housekeeper. "Oh, I wish I could go away! I do so need a change!"

"Now, chile," said the old negro, "wot you want git 'way fum? Dis yere beautiful house? Now, wot you want git 'way fum? Dese yere lubly chilluns? Now, wot you want git 'way fum? You gotta lug yo'self 'long wherever you go!"—Youth's Companion.

Preserved Hearts.

In Belgium and other countries it has been from time immemorial a custom to preserve the heart of a man renowned for his sanctity, and on the anniversary of the death of its possessor this relic receives a large share of veneration from hundreds of people.

Consolation.

"Whenever I think of the trouble I have keeping one maid I'm glad I'm not rich."

"Why?"

"Just suppose that I had to try to keep three or four of them!"—Detroit Free Press.

She Wasn't Tactful.

Wife—Henry, you need a rest. Let us go to Bongton Springs. Hub—That place! Why, it's only fit for women and fools! Wife—I know it. Let's go there together.—Boston Transcript.

Sharp.

First Hopeful Nephew (proudly)—Aunt says I call her up on the phone oftener than you do. Second Hopeful Nephew—Did she accuse you of anything else?—New York Times.

Not Mercenary.

"I have a friend who just married for money."

"Why, how disgraceful!"

"No, not exactly. You see, he's a minister."—Cornell Widow.

An Old Time Sea Serpent.

Good Bishop, Pontopidan in his celebrated "Natural History of Norway" tells the story of a boat's crew of eight sailors under a certain Captain De Ferry who encountered a formidable looking sea serpent of the Norwegian coast along the middle of the eighteenth century. The animal, according to all accounts, was some 600 feet long or about the size of a modern battleship. The crew at first endeavored to entice the monster into the boat, but the wily beast responded by lashing the water so furiously with its tail that one of the seamen was carried out of the boat on a wave at least 100 feet high, which the serpent with the incessant beating of its tail kept towering rigidly in the air for nearly ten minutes. Meanwhile the seaman slid safely down the other side and back into the boat. Immediately the crew began an assault upon the monster, which they maintained with such fury that the beast turned tail and fled. According to the captain, he went so fast that he "disappeared on the horizon twenty miles away almost on the moment that he began the retreat."

Waking From Sleep.

That is the test of robust health—the manner in which you rise from your bed in the morning. When a man is in perfect health he awakens naturally if his body has been sufficiently refreshed by his rest. The hours of repose are a matter of habit and temperament. In many cases, mental activity is at its height in those first minutes of waking. Poets and authors have conceived brilliant ideas in those moments of perfect physical repose. The brain alert and the organs and tissues toned up after their rest. Reluctance to leave the bed is not a good sign—a really healthy man is too full of vigor to lie still. Quality, not quantity, is the ruling factor in sleep. The broken nightmare or fitful slumber is not rest, for at such times neither brain nor body is in repose. Four hours of sleep with all feeling or thought in oblivion are worth more than nine hours of restlessness.

Knew Him as Well.

A certain cantankerous old gentleman not long ago advertised for a coachman, who was required, among other qualifications, to possess an intimate acquaintance with the neighborhood. But to his great surprise he received not a single application for the vacant post.

"I cannot understand it at all," he said, as during a chat one day with an old ostler at the local livery stables he had mentioned the fact.

"Let me see," said the latter, as a gleam of intelligence flitted across his face. "Ye had advertised, I believe, for one as 'must be well acquainted with the neighborhood,' didn't ye?"

"I did," replied the old gentleman shortly. "I want some one who knows his way about."

"Ah, that explains it," was the answer. "Ye see, they who knows the neighborhood well knows ye too!"—Exchange.

His Pretty Compliment.

When the Dowager Queen Margherita of Italy was the lovely young bride of the crown prince this anecdote of her reception in one of the hill towns was widely told in the press.

The little boy who was to present the usual bouquet was the son of a distinguished literary man, and he had been taught a pretty poem of a few lines in graceful praise of the princess. But when the moment came to recite it he stood mutely gazing at her, too overcome to speak. After a moment, in order to relieve the situation, the princess smiled and held out her hand for the flowers. The little fellow held back for a moment, then, to the delight of the assembly, explained confidentially as he gave the flowers to her: "There were verses, but you are so beautiful I can't remember them."

Schumann, the Composer.

Robert Schumann, the great composer, tried to become a lawyer to please his mother and failed after two years of wearisome study. At Heidelberg university he made the acquaintance of Willibald Alexis, who had already trodden the path Schumann was destined to follow—that through the law to music. And the eminent jurist whose classes he attended, A. F. J. Thibaut, was an amateur musician of high attainments and the author of a work on precisely that aspect of music to which Schumann was peculiarly sensitive—namely, purity in musical art.

A Soft Answer, Etc.

Young Wife (pettishly)—You always seemed to have plenty of money before we were married. Loving Husband—It was only seeming. I had very little. Young Wife—And you told me you expected to be rich. Loving Husband—I am rich, my dear; I've got you. She subsided.—Yonkers Statesman.

Women as a Power.

If ever the time comes when women shall come together simply and purely for the benefit of mankind, it will be a power such as the world has never dreamed of.—Matthew Arnold.

Barkless Dogs.

There are three varieties of the dog that never bark—the Australian dog, the Egyptian shepherd dog and the "lion headed" dog of Tibet.

Voting in Switzerland.

In Switzerland every citizen, whether he is a householder or not, is entitled to a vote on attaining the age of twenty.

If the power to do hard work is not a talent it is the best possible substitute for it.—Garfield.

Single Women in Business.

Why do single women conduct business more successfully than married women?

And, again, why do married women do better in business than widows? I cannot definitely prove to you that single women do excel married ones in business or that those who have a husband are better business managers than widows. But I have the solemn word—and was ever the word of an English official report anything but solemnly to the 'nth degree?—that such is the fact.

Of 390 women traders who failed in business in London during the last year 155 were widows, 151 married and 81 single. But the average amount of liabilities of the three classes varied greatly. With fewer than twice as many failures the widows had more than three times the debts of the single women. The married women's obligations were two and a half times the ones of those who never knew a husband.—Philadelphia Ledger.

Trials of Composers.

They tell of a Scottish composer who fled from Edinburgh to London in order to escape the brain exhausting ordeal of deciphering Carlyle's hieroglyphics and putting them into type. He had been at work in London for some time, when one day a "take" of Carlyle's copy was given him to set up. The sight of it appalled him. "Is that man here, too!" he exclaimed. Whereupon he laid down his composing stick, put on his coat and hat and vanished.

Balzac's copy was also a nightmare to composers. According to the London Standard, the failure of the establishment that printed his works was the direct result of the enormous labor spent in making corrections in the proofs of his manuscript. What it meant to put his copy into type is shown by the fact that "Cesar Birotteau" had to be reset fifteen times in twenty days.

Cocoa as a Food.

We compare cocoa to a vegetable egg because, like the egg, it contains everything necessary for the building of the animal body. When we analyze cocoa we find it a perfect natural food. Analysis teaches us that it contains a fair proportion of nitrogenous matter in the shape of gluten, a very large proportion of fat, a considerable amount of starch, so much mineral matter and, finally, a stimulant of its own called theobromine. Cocoa is an excellent substitute for tea and coffee, especially to those who are overstimulated by these beverages. Pure cocoa is easily digested. But be sure that you get it pure. If you find that one brand of cocoa does not agree with you try another until you find the one which is best fitted for your constitution.—New York American.

Where She Drew the Line.

Mr. Birrell's anticipation that, owing to the bigness of heaven, it will not be inevitable that we shall knock up against our acquaintances there may have been suggested by one of Dean Ramsay's best Scottish stories. It should be mentioned that at Hawick, the scene of the anecdote, the people used to wear wooden clogs, which made a clanking noise on the pavement. As an old woman lay dying some friends said to her, "Weel, Jeeny, ye are gaun to heeven, an' gin you should see our folk ye can tell them that we're a' weel."

"Weel," said Jeeny, cautiously, "gin I should see them I's tell them, but you manna expect that I am to gang clank-clanking through heeven looking for your folk."—London Tatler.

Herbert Spencer and the Sea.

To illustrate the advantages the modern child enjoys in seeing so much more of the world than children of earlier generations did, Herbert Spencer mentions that he had never seen the sea until after he was twenty-one. This is the more remarkable, because his father always spent his summer vacation at the seaside, rambling along the coast from one place to another. But the son never went with the father until he was a man. One result is that we have a first impression of the sea by a self studying adult. It produced in him "a mixture of joy and awe—the awe resulting from the manifestation of size and power and the joy from the sense of freedom given by limitless expanse."

Chinese Blacksmiths.

The Chinese blacksmith thinks a great deal of his anatomy when shoeing horses, which are not numerous in China. He is so skittish in doing a job of shoeing and so dubious about handling the hoofs of the animal that, when shoeing is required, the horse is strung up with ropes in such a manner as to prevent kicking. No exceptions are made, even though the horse be a scrawny cart plug of advanced age.

Drawn Work.

To draw threads for hemstitching or drawnwork wet a small brush, rub it over a cake of soap until a lather is produced, then scrub the threads that you wish to draw. You have no idea how easily they may be pulled out without breaking.

Potato Test.

Test potatoes by cutting in two and rubbing the cut surface together; then press the two parts together. If they stick the potatoes are good.

Didn't Like Dogs.

Hobson—Are you in favor of that curfew law? Dobson—Yes. I'm in favor of any law that reduces the number of dogs.—Judge.

Every misfortune can be subdued with patience.—Socrates.

President McKinley
General Garcia
Admiral Sampson
General Miles

and many other notables who figured prominently in the Spanish-American war are among the characters you will find in our new serial to begin soon—

Holton of The Navy

By LAWRENCE PERRY

To a young lieutenant is intrusted the task of locating a certain spy—a lovely Cuban girl—an ardent patriot whom Holton learns to love. Naturally matters are complicated and the result is many dramatic situations.

Don't fail to read it!
You will enjoy every installment!

His Visit From Royalty.

"Lived in the Latin quarter in Paris, eh? You say you had a prince in your rooms one day?"

"Yes."

"And how did you happen to receive a visit from royalty?"

"He came in there to avoid his landlord."—Washington Herald.

"On Time" In Farm Work.

A good engineer brings his train into the station on time. It is the sign of a good farmer if he rounds up the day's work before dark. It is just as much to his credit if he does that, too, as if he were doing his work at the throttle of an engine.—Farm and Fireside.

Say, Teacher!

Any time you get it into your head that you know a few things just go up against some of the questions the average little schoolboy can ask you.—Florida Times-Union.

Always Out.

Miss Gush—And were you ever out after big game, colonel? Colonel Highflier—Yes, indeed. I have been "out" after every big game I was ever in.—Town Topics.

Dainty Skin.

Remember that rich foods are enemies of a delicate skin. The rose leaf skin of the baby comes from its simple diet.

Let no one do what he pleases but what he ought to do.—Gustavus Vasa.

Unlike Most Visitors.

The perfect baby had reached the age when he could coo, an accomplishment in which he indulged himself most of the time when not otherwise engaged. "He is the most welcome visitor I ever had," said the mother, proudly. "He just lies and talks to me by the hour." "Isn't that nice," replied the caller. "So unlike most visitors—they just talk and lie to you by the hour."

Possible Solution.

"Why do you suppose it is," she asked, "that nearly all the great men of this world have been married?" "I suppose," replied the old bachelor, "it's because they had to do something to get their minds off the troubles they had at home."—Chicago Record-Herald.

To Stop a Leak.

To stop a leak, mix whitening and yellow soap into a thick paste with a little water. Apply this to the place where the leakage is and it will be instantly stopped. A visit from the plumber will still be necessary, but there is no special hurry for more radical repairs.

Insinuation.

"I hope you will be successful and bring home some fish," said Mrs. Fly-caster. "Never fear. I'm the boy that can get them if there's any to be found." "Yes," she smiled reminiscently, "and you'd better take your pocketbook. You can't catch fish without bait."—Kansas City Star.

Brown Eyes.

Brown eyes are indications of deep feeling and quick susceptibility to individuals of the other sex. They usually mean liberality of feeling, a warm, clinging nature and a freedom from Puritanical prudery.

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