

farmer over many men are needed on the farm which the farmer's own for the boys, city or of any kind. find difficulty in machinery, even in and by the time ed to all classes which they could not yet see that all these may help from the United who go out to acity to do farm rs who can will year, and a few do a little toward it is absolutely d, practical, ex- 0 acres in this ned and if agri- tional efficiency, till more to this ent at the con- meant. Every fullest capacity, y be in the best time coming at me is not solved. it is being con- e been made in farmers. And tory help, must. We conclude h by the Hon. of the House a at and supreme t and tax our to come to the ur soldiers are us work of re- in this country, ight and those ural conditions, weigh carefully means now to the days of re-

nts. n published of of California, epared by the I. S. Williams, and naturally s achievements pting these at ever, fail to be e by artificial g many fruits, harm, novelty herself is no Many plant anding merit, natural creative ur ken, coupled e part of the e example, there ahlias, gladioli, site perfection rchid growing e with almost

arm, Burbank y Rose potato t season from produced big h potatoes of gardener, who of \$150 which to migrate to a nurseryman, specialist in im- ularly in the Department of orth of these States. This and the alert of subsequent iety superior Burbank had nato plant on t the potatoes

grown on vines were curiously distorted in shape, and some of them rough and scaly, nor were the tomato roots equal to the task of forming satisfactory tubers. The results were novel, but of no permanent value.

In Canada, probably the best known of Mr. Burbank's creations is the plum bearing his name, which has been widely grown. It was one of some 60 sorts introduced by crossing Asiatic with American and European plums. The initial strain was a specimen which Mr. Burbank secured from Japan, called the "Blood Plum of Satsuma." The Burbank plum, as known in Eastern America, although showy and prolific, is inferior in quality to many others and does not rank high with good growers, but the type is probably better adapted to the Californian region. The plumcot or stoneless plum produced by hybridizing the plum and the apricot on the basis of a little, acrid stoneless wild plum from France is regarded as a most remarkable fruit of good size and quality, though sometimes yet containing a fragment of shell or a seed. A decidedly freakish hybrid was that resulting from crossing the petunia and the tobacco plant, but lacking vitality through being unable to form a good root system. Mr. Burbank's "sunberry," resembling the blueberry in flavor and prized by some for pie making, is a hybrid between two forms, neither edible, of the ill-reputed nightshade family produced after 25 years of effort. Under the changed name of "Wonderberry," it has been exploited by seedsmen, but is hardly a valuable acquisition to our garden fruits.

#### FODDER AND FRUIT COMBINED.

The spineless cactus, highly valued as a forage plant for semi-arid regions and for the edible fruit formed upon perfected varieties, is regarded as one of his most remarkable achievements, the best of them on good soil yielding more than one hundred tons to the acre. Winter Rhubarb developed from a diminutive New Zealand variety is reckoned as another crowning achievement, being practically a perpetual or all-season bearer. Space will not permit to enlarge upon the work at Santa Rosa and Sebastopol with nut-bearing trees like the walnut of remarkably rapid growing habit stimulated by cross fertilization.

In the production of the thornless blackberry, the thornless cactus, the "white blackberry," and in fact in a large proportion of cases almost baffling difficulties are encountered because of the tendency to revert to undesirable characteristics in hybrids which must be eliminated and the desired traits fixed. For such tasks almost infinite patience and skill are required.

#### THE WORK OF SELECTION.

To mention just one of other cases, Marquis Wheat stands to the credit of the expert Canadian cerealists as a result of cross fertilization, but in the category of what may be styled natural productions we have Dawson's Golden Chaff Wheat, the Banner Oat, O. A. C. No. 21 barley and O. A. C. No. 72 oat, all the outcome of selections of outstanding individual merit. In fact, in all the work of Mr. Burbank, selection continues at every stage among the thousands of seedlings under his eye. "The beginning is selection and the end is selection," he declares, and the possibility of developing new races of many types from a single stock through selection alone has been demonstrated by him thousands of times over. What Charles Darwin defined as "spontaneous" variations and what Prof. Hugo de Vries, the noted botanist of Holland called "mutants" Mr. Burbank attributes to hybridization in nature, through the agency of insects, the wind or birds, the resultant plant being in individual cases a marked improvement upon the parent forms, and which by rigid selection becomes a new race with desirable characteristics transmittable. The reputed rule of Mr. Burbank never to put before the public a new variety unless he believes it to be "superior to any other variety in at least one respect and equal to them in all others," is a safe one for all experimenters to follow. It is well also to remember the caution of Prof. L. H. Bailey in an old bulletin on a much lauded new variety of imported plums: "We can depend upon it that they will develop a weak point somewhere."

The popular magazine writer is fond of describing Mr. Burbank as a "plant wizard," but he does not do so himself, nor does Dr. Williams, the author. He has made himself a master of the habits of plant life and growth by indefatigable study, unending work, and a highly developed sense of discrimination between the poor and the promising. He is in short, a scientific duplicator of the methods of nature. In these busy and strenuous times the special methods of the expert plant improver cannot be pursued on the average farm, nor in the garden, but the measure of any one's success this season in growing crops will be in proportion as seed is wisely selected and grown in accordance with the laws laid down in nature.

#### Nature's Diary.

A. B. KLUGH, M. A.

A track which is to be met with in every part of the country is that of the Fox. Fig. 1 shows the trail left by this animal when trotting along, and this "straight-line" trail made by the placing of the feet under the centre of the body is quite characteristic of this species. The trail of a medium sized dog is hard to differentiate from that of a Fox, but I have never seen any dog-trails which attained the perfect alignment of those of the Fox. The track of the Fox when leaping along is shown in Fig. 2. A Fox trail is an interesting one to follow up, for by doing so we can read many interesting little stories

in the snow. In Fig. 3 we have a sketch of an episode of which I have found the record. The interpretation is as follows. A Fox has come trotting along from the left (direction shown in sketch by arrow) and has come across the hole which a Ruffed Grouse has made by flying down and boring under the snow to spend the night. The point of entrance is shown by the round hole marked E. The Fox has sprung on the top of the hind feet at the point from which it sprang and from the heavy tracks and broken-in burrow at the point at which it alighted. But the Fox has missed the Grouse, which has been a little farther on than it calculated. We see where the Grouse has burst up through the snow and the marks of its wings as it took flight. The Fox has made one bound in pursuit and has then gone off to the right at a trot. This story has a happy ending for the Grouse; but not a satisfactory one from the Fox's point of view. In other cases I have read episodes of the same nature which had not a happy termination for the grouse as shown by the splashes of blood and scattered feathers in the broken-in burrow. Again I have seen cases in which the Fox missed the Grouse at the first bound but caught it just as it broke out of the snow. We can tell the state of a Fox's appetite from its tracks. Only a lean and hungry Fox leaves the perfectly straight trail shown in Fig. 1, a Fox with a full meal inside does not bring its

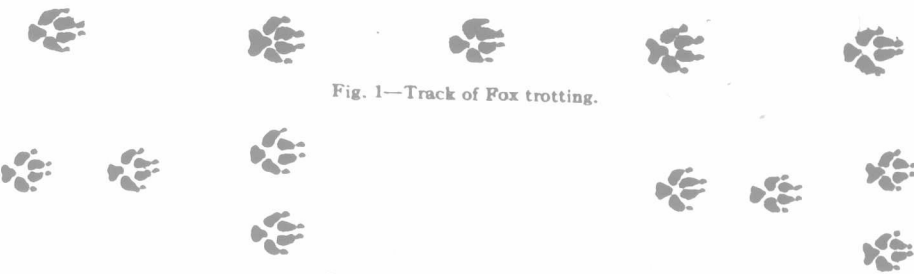


Fig. 1—Track of Fox trotting.

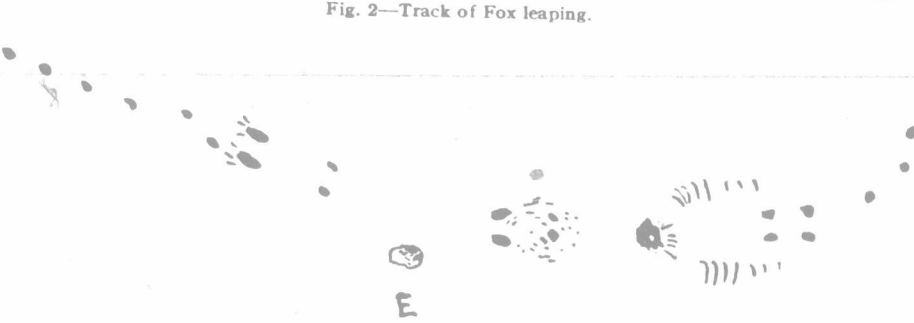


Fig. 2—Track of Fox leaping.



Fig. 3—The story of the Fox and the Grouse.

legs directly under the centre of the body and therefore leaves tracks to right and left of the mid-line.

A trail which is frequently seen, particularly along streams and along the margins of bodies of water, is that of the Mink, shown in Fig. 4. It will be noticed that the tracks of both the front and hind are paired, and that those of the hind feet are in front. The tracks of the Weasels are exactly like those of the Mink, but are smaller. Another way in which the trail of one of the Weasels can be distinguished from that of the Mink is that a Weasel trail winds and twists a great deal more,



Fig. 4—Tracks of Mink.



Fig. 5—Trail of Otter.

due to the fact that a Weasel investigates every nook and crevice, while a Mink often travels straight ahead for considerable distances.

In the wilder parts of the country we may come across the peculiar trail shown in Fig. 5—that of the Otter. This trail is made by the animal bounding along for some distance then taking a slide on the snow. These slides are of varying length, and I have seen places where they were made down-hill in which they were some thirty feet in length.

## THE HORSE.

### Lameness in Horses—XIII.

#### CAPPED HOCK—CURB.

Capped hock is a term applied to a fluctuating swelling on the point of the hock. There are two forms—1, synovial capped hock; 2, serous capped hock. The first, as the name implies, consists in distension of a synovial bursa. It appears as a tense, fluctuating swelling, situated on each side of the point of the hock. The bursa, being anterior to the tendon that passes over the point of the hock, cannot bulge in the centre on account of said tendon. This form is caused by disease of the bursa, or violent strain. It usually causes lameness, is tender to pressure, is quite easily noticed; hence easy to diagnose. The second form is merely a serous abscess on the point of the hock, is caused by a bruise, usually by the horse kicking in the stall, on train board, etc., and the point of the hock coming in contact with the

stall post, partition, etc. It is seldom that lameness is present, the usefulness of the animal is not often interfered with, but the presence of the tumor is unsightly, and reduces the animal's value.

Treatment.—The first form is very hard to treat. The patient must be given rest. It is good practice to give a purgative and low diet. The affected part should be bathed with hot water several times daily, and, after bathing, rubbed with anodyne liniment for a few days to allay the inflammation, after which repeated blisters will have a tendency to cause contraction of the bursa and a lessening of the tumor. Another method of treatment is to lance the sac to allow escape of the synovia, and then apply a bandage, or compress, and flush out the cavity twice daily with an antiseptic, as a three or four per cent. solution of carbolic acid in water. There is danger of this treatment causing violent inflammation of the parts, unless skilfully attended to after the operation; hence, unless the case be in experienced hands it is better not to operate.

The second form should be treated as an ordinary abscess. If only a small quantity of serum be present, its absorption may be caused by a blister, or the daily application of an absorbent, as a liniment composed of 4 drams each of iodine and iodide of potassium and 4 ozs. each of alcohol and glycerine, but if considerable fluid be present, the sac should be lanced and the cavity flushed out two or three times daily, until healed, with an antiseptic. Of course, the cause must be removed.

#### CURB.

A curb is an enlargement on the lower portion of the posterior border of the hock. It consists in a sprain of a ligament, called the calcaneocuboid ligament, which passes from the point of the hock to the cuboid bone, at the lower part of the joint. Hyper development of the cuboid bone gives the hock an appearance simulating curb, especially when it is looked at in an angular direction, but a close

examination will readily detect the difference. Weak, sickle-shaped hocks are predisposed to curb, but the accident may occur to any horse. It is caused by excessive strain being placed upon the ligament, as when the hind legs slip forward well under the body. In horses that are predisposed, it is easily caused by slipping, jumping, rearing, etc., etc., and, while any horse may suffer, it is seldom that we notice a curb on a well-formed, strong hock, with a straight posterior border. Curb usually causes lameness in the early stages. It is not hard to diagnose. The horse will go more or less lame, and will usually rest the leg when standing. An examination will reveal a swelling on the lower and posterior portion of the hock, there will be abnormal heat in the part, and upon pressure the patient will evince pain. On exercise, he is inclined to go as much as possible upon the toe.

Treatment.—The lameness from curb will usually readily yield to treatment, but the reduction of the enlargement is, in most cases, a very slow process. The patient should be given rest and the usual constitutional treatment, consisting in the administration of a purgative, followed by low diet. A shoe with the heel about an inch higher than the toe should be put on the foot of the lame leg. This keeps the heel elevated, and throws the diseased ligament in a state of partial repose. During the inflammatory stage, the long and frequent application of hot water, followed each time by the application of an anodyne liniment, as one composed of 2 ozs. tincture of opium, 2 ozs. chloroform, 1 oz. acetate of lead, 2 ozs. alcohol, and water to make a pint, will, in a few days allay the inflammation and remove lameness. While the lameness can, in most cases, be cured by this treatment, and the usefulness of the animal restored, there will be quite a visible enlargement remaining. The enlargement is hard to reduce, and if the patient be an animal of ordinary value, and required only for ordinary work, it is often deemed advisable to put him to work, and allow the enlargement to remain; but, if he be a high-class animal, or if from any reason the owner is anxious to restore the parts to the normal condition, he must allow continued rest, keep shod with a high-heeled shoe, and either blister the parts repeatedly, or use the absorbent liniment, already mentioned in treatment for capped hock. The ordinary blister composed of 2 drams each of biniodide of mercury and cantharides mixed with 2 ozs. of vaseline, applied in the ordinary manner gives good results, but many prefer the daily application of the absorbent. If it be necessary to work the patient, and in the meantime endeavor to reduce the enlargement, it can be done. He should be shod with the hind shoes slightly higher at the heels than at the toes, (both feet should be shod the same), but the difference should not be more than 1/2 inch, as, if too great, there will be a danger of causing injury to other parts of the limb by placing the foot in an unnatural position. In such cases the absorbent