

Correspondence.

GRAFTING.—John D. Ellis.—The March number contained full directions for grafting.

ORCHARD GRASS.—J. R., Goderich, Ont., and G. S. McT., Madock, Ont.—Orchard grass may be obtained from any of the seedsmen advertising in our columns. Its price in Toronto is 40 cents per pound.

SEED PEAS.—A. J. Dugger, Highland, Ill.—Canadian field peas for seed can be procured from Mr. Wm. Rennie, Toronto. The price will be about eighty-five cents per bushel, and they will be subject to a duty of twenty cents per bushel.

SILVER-HULLED BUCKWHEAT.—We have an enquiry from a correspondent for Silver-hulled buckwheat. Probably some of the seedsmen advertising with us have the article. A special mention of it in our advertising columns would be advisable.

BOUND VOLUMES.—E. B., Brantford, Ont.—We can supply the bound volumes of the CANADA FARMER for any year during its existence, except 1871. The price is \$2.00 per volume for the 1873 and 1874 volumes; \$1.50 per volume for the remainder.

LICE ON APPLE-TREES.—J. D., Dalhousie, Ont.—To keep lice off apple-trees, wash the trunks over with a compound made of soft, soap water and lime, in the proportion of one part of soap to four of water, using enough lime to bring the mixture to the consistency of whitewash. Apply with a brush.

FRENCH HORSES.—Reader, Scott Township.—Montreal would be the best place in Lower Canada at which to get the large stand best bred French horses. We do not know the price of a good one now, but it is much higher than it was a year ago. Can some of our readers tell our correspondent more about them?

CORN-PLANTER.—There is no corn-planter by horse-power manufactured in the Dominion that we know of. There are several such implements in use in the Western States. We do not think they would be of any value on the small fields of corn which Canadian farmers plant. In the hundred-acre corn fields of Illinois, it is a different matter.

APPLYING SUPERPHOSPHATE TO CORN.—The superphosphate should be applied as nearly in contact with the seed as possible. It will not be absolutely lost if it is scattered about, but the roots of the plant will not find it and it may not be utilized for years. With corn, apply the superphosphate to the hill, dropping the corn directly upon it. Use about a good handful to each hill, which will use up about two hundred pounds to the acre. Sown broadcast for other crops, about 400 lbs. to the acre will be found about right.

FENCE POSTS HEAVING.—Reader, Renfrow, Ont.—We presume that the reason for the heaving of fence posts is that the frost expands the water in the soil—water expanding about one-eighth in bulk while in the act of freezing. This lifts the posts, and on thawing the dirt gets under and keeps them from settling back. We should judge that fence posts sharpened at the end, are more liable to be heaved by frost than those put down with square ends. Some persons bore an inch auger hole through the fence post near the bottom and put in a hardwood peg, leaving a few inches projecting on both sides, to prevent heaving.

TO CORRESPONDENTS generally, and A. K. McD., particularly:—This column is intended to be used for the answering of questions pertaining directly or indirectly to farming in some of its branches. We take pleasure in giving to our subscribers all the information in our power; and such information as we have not at hand we will endeavour to obtain for them. All that we require is that the enquirer be a subscriber, or resident in a house where the FARMER is taken, and that the question possess some interest to the general reader as well as to the enquirer. The question asked by A. K. McD. is one fitted only to the columns of a sporting paper, being in no way connected with agriculture and not possessing interest except to a person devoted to horse-racing.

Miscellaneous.

Fish-Culture and Fish-Protection.

Mr. Samuel Wilmot, of Newcastle, Ont., sends us a paper which he read at the late convention of the American Fish-culturists' Association. In the last number of the CANADA FARMER we gave a brief synopsis of the paper; we now make more copious extracts from it. Fish breeding and the protection of fish during their spawning season are subjects of which the importance is only beginning to be understood, and they are subjects of prime interest to Canadian farmers, many of whom are so situated that they could derive a handsome revenue from the breeding of trout for the city markets. The Dominion is, to claim the least, abreast of the other nations in the science, and to Mr. Wilmot, as much as to any one, is the fact owing. In the paper mentioned, he says:

Fish culture having now become both a popular and successful industry in the United States and Canada, it is of importance that it should be vigorously carried on. The once many famous rivers in both of these countries have now become very much reduced in their supplies of salmon and other fish. This falling off is also experienced in the countless lakes and their innumerable tributaries everywhere throughout the land. Both demand early attention in order to prevent the final extermination of an article of food which it is now almost impossible to sustain in the natural way alone. A judicious application of the natural and artificial methods of propagation, together with thorough protection during the close seasons, would soon reproduce in those waters a large supply of fish, both for domestic purposes and foreign trade. The outlay required to achieve this object will be found to be trifling indeed in comparison to the ultimate benefits that would assuredly flow from its application.

There is a period when fish are in season, and when they should be taken by legitimate means. There is another period when they are out of season, and then should be protected by all legitimate means. They are in season after they have fully recovered from the prostrating and exhaustive effects of spawning, and when found upon their feeding grounds, putting fat upon the body. At this time, though the eggs and milt are in the ovaries, they are so minute as to take little, if any, nourishment from the system, all of the food taken forming fat and muscle. They are out of season when they have left their feeding grounds, and have reached their spawning beds, and are in the act of spawning. The eggs and the milt at this period having absorbed from the body of the fish most of the fat which had been previously put on, become enlarged to the full size, and are mature and ripe for being deposited.

In the egg will be noticed a fatty substance, resembling small globules of oil, which is provided by nature for the nourishment and growth of the embryo fish during incubation, and is the food contained in the sac attached to the young fry for several days after emerging from the shell. This drain of fat from the parent fish into the egg and milt, and the prostrating effects of spawning, cause it to become lean and lank in condition, and therefore foul, out of season, and actually unfit for food. The killing and eating of fish at this particular period should be strictly prohibited by law. It is not less repugnant to common sense than it would be to kill our domestic animals in an advanced state of pregnancy, or for some time afterwards. Why, then, should I people conjure up the belief that fish do not come under the same laws of nature as other animals?

It is also of importance to remember that nearly all fish, during the spawning season, become very dull, and are in semi-lethargic state, and, generally speaking, consume little or no food whilst performing this work of nature. Salmon eat nothing whatever at this time, neither do they take food within their stomachs from the time of leaving salt water till after they have performed the work of spawning, even should the time of their migration extend over a period of six months, or longer. At the end of their long journey, and from eating nothing since leaving the sea, they become changed in color, their former rich red flesh now becomes a flabby white, their bodies are frequently covered with wounds and sores, parasites begin to prey upon them, a fungoid growth sets in, and great numbers die. It is easy for any person possessing ordinary intelligence, and not selfishly prejudiced to the contrary, to infer how necessary and important it is that all fish should be protected by proper legislation at proper seasons, and also that all persons should be legally prohibited from killing or selling that which is foul and unfit for food.

Having explained the great necessity for passing laws in relation to the preservation of fish at certain seasons of the year, it will be necessary now to meet the question, Why resort to artificial means for the propagation of fish; why not allow them to produce their young in the usual way?

In contrasting the artificial with the natural method, the superiority of the former over the latter system will be easily understood, even by the great mass of the people, who are as yet wholly uninformed as to the novel science

of artificial fish culture, not long since introduced into the country.

It has been advanced by naturalists of an early period, and upheld by eminent writers of more modern times, that not more than one per cent. of the ova laid in the natural way ever becomes a living fish. But in the present day it is possible, by artificial propagation, to rear from eighty to ninety living fish from every hundred eggs, which larger increase is actually needed for restocking the waters of the country with fish of such various kinds as may be required in various places, and for supplying in part the increasing demand in the markets of the country for fish food.

As we have chosen to illustrate the necessity for legal enactments for the protection of fish, by introducing the salmon, we shall continue to take the same fish for an example while we explain the *modus operandi* of laying down and hatching out of the fish spawn in the natural way, and relate the many difficulties which beset the eggs at the time of their deposit by the parent fish, and through the process of incubation, and until they are hatched out in the river or other waters. It may be observed that these operations are performed at different times and places by the various kinds of fish.

Salmon, after leaving their feeding grounds, will, after the somewhat lengthened migration previously mentioned, reach their spawning grounds far up the river, or, in some instances, if very late in the season, near at hand above tide-way. A suitable gravelly bottom and rapid part of the stream is selected, where the female fish commences by writhing movements of her body to displace the stones and gravel in order to form the bed in which she may lay her eggs.

In this work she is very much aided by the swift current of the water, which helps to move the gravel down stream that is being displaced by the exertions of the fish. In this way a hollow spot is dug out, and a small hillock of stones is formed just below. Into this scooped-out bed the fish, by contortions and strong muscular action of the body, ejects a portion of the mature ova, many of which sink to the bottom amongst the gravel, whilst numbers are carried below and far beyond the bed by the current. The little ledge of gravel just above the bed is again disturbed, and the stones in the act of falling are by the action of the fish, assisted by the swift water, carried down over the eggs, thus partially covering them, and hiding many of them from sight, and also from many of their numerous enemies.

This operation of spawning will take from two to three days to a week, and sometimes longer, depending much upon the lateness of the season, and also the flow of water in the stream at the time. Should the season be dry, and the water low, the fish will rest in deep pools below, waiting for the water to rise in the rapids, that they may be enabled to get upon the shallows to form their beds.

All this time the eggs are maturing, and at last, late in the season, unable to retain the ova any longer, they will rush up at the first freshet, and in some instances lay the whole of their eggs in one or two nights.

During the time in which the female is engaged in depositing her eggs, she will generally be accompanied by a male fish, who performs very little, if any, of the labor in forming a bed; he is constantly hovering about just below the female, and when she is in the act of laying her eggs he will run alongside, and, by a muscular movement of his body, eject some of his milt, which, if perchance it touches the egg, impregnates it.

[We will resume our extracts from Mr. Wilmot's paper in our next issue.]

Peas Three Thousand Years Old.

In the course of late explorations in the ancient ruins of Egypt, General Anderson, an English traveller, found enclosed in a sarcophagus beside a mummy, a few dry peas, which he preserved carefully, and, on his return to Great Britain, planted in the rich soil of the Island of Guernsey. The seeds germinated, and soon two little plants appeared, from which, at maturity, sufficient peas were gathered to plant quite a large tract of ground in the following season.

Some of the plants thus raised have attained a height of over six feet, and have been loaded with blossoms of exquisite odor, and of a delicate rose tint. The peculiar feature of the growth is the stem, which is small near the root, but increases in size as it ascends, requiring a support to sustain it upright. The pods instead of being distributed around all portions of the stem, as in the ordinary plant, are grouped about the upper extremity.

The vegetable, it is said, belongs to the ordinary garden variety; but from its presenting the very distinctive differences above noted, it seems worthy of close botanical examination. The peas are of remarkably fine flavor, excelling in delicacy those of the choicest known varieties.—*Scientific American.*

ABSORPTION OF WATER BY LEAVES OF PLANTS.—It has recently been shown by M. Baillon that the leaves of plants are capable of absorbing water. He has been experimenting by sowing peas in a box of such a construction that the plants can be immersed in water without the roots or the soil in which they are growing becoming damp. He has kept peas alive for two months without giving the roots any water whatever, the soil being virtually quite dry.