

RURAL AND SUBURBAN

FRUIT CULTURE.

By W. J. L. Hamilton.

What is a No. 1 apple? It is true this is defined by act of parliament, but I believe that any wholesale fruit merchant, or the manager of any co-operative association will agree with me that each fruitgrower has his own ideas on the subject, as exemplified by the fruit boxes. But, this unevenness of grading has a very injurious effect upon the reputation of our fruit, and upon the price it realizes.

If all fruit packers had the same ideas on the subject, and all graded alike, buyers would know by the brand, exactly what they were paying for, and our fruit would take the high place it deserves in the markets of the world.

Any judge of fruit cannot fail to be impressed by the magnificent fruit exhibited at our local agricultural shows and at exhibitions held in Victoria and New Westminster. But all fruit (and particularly apples), sold as "fancy" or "No. 1," does not approach this standard of excellence.

Our fruit is unexcelled, but is not done justice to, through much faulty grading and boxing, and this will have to be remedied before we can realize in full the adequate commercial returns which are our just due. I believe there is one short cut to success in this particular matter, and that is by establishing a special school at which pupils can be trained to grade and pack apples properly and above all to one standard of quality.

If all learn to grade and pack to uniform standard, these pupils, if sent out as foremen to different co-operative packing stations throughout the province, will see to it that this standard is maintained, thereby ensuring uniform quality of each grade of fruit, from whatever part of the province it may come.

I believe in local packing stations throughout the fruit growing districts. Each one of these should be in charge of a foreman packer (educated as outlined above), who should employ under him the children of the district, thereby educating them in fruit grading and packing, and at the same time keeping in the district the money paid to those who pack the fruit, instead of sending it to China, as is too frequently the case, as some of the best fruit packers we have are Chinamen (not all, thank goodness). No man should pack his own fruit, the temptation to slip in an odd apple scarcely up to the mark is sometimes too great, but each man should roughly grade his apples into boxes of as large a size as he can comfortably handle (but not too deep), load these boxes on to a spring wagon, and convey them to the local packing station, where they can be boxed, and careful account of each man's produce be kept.

I feel sure if this were done prices would soar, and the fruit growing districts of the province would rapidly settle up, raising the value of property and stimulating all the trades and industries of British Columbia, not to mention the revenues.

Cold Storage for Fruit

In a previous article I treated of a central school to teach apple grading and packing, and of sending the pupils to local packing stations as foremen.

I also sketched the objects of these local packing stations. In this I want to treat of the next step in the evolution of our apple industry, and the means whereby the fruit grower can realize adequate returns for his products. Once the apples are boxed, the question arises of what is to be done with them. It is evident that if they have to be dumped upon the market at once, low prices will rule, and frequently the orchardist will find himself out of pocket.

Something of this kind happens at times, with our present lack of organization. Clearly then, the apples must be placed in cold storage and held for high prices, and not too many must be placed on the market at once.

But this cannot be done as long as there are a number of local associations scattered throughout the country, each acting independently of the others, as then the quantity of fruit on the market at one time cannot be controlled.

Besides cold storage plants are expensive to erect, the great outlay crippling the satisfactory working of the association. Centralization generally also means a considerable reduction of working expenses, and a central association controlling all the local ones has a much more powerful voice when dealing with such outside forces as railway and steamship companies, wholesale agents, and especially legislative assemblies, Provincial or Dominion.

Such a central association having more capital under its control than local associations (as it controls all these), and dealing with larger quantities of merchantable commodities, is a great power in the land, and could successfully arrange to have wholesale firms throughout the world act for it in the matter of selling its fruit to the best advantage.

Of course, this central organization would be more legislative, so far as controlling the subordinate local association, than directly commercial, in that it would sell nothing itself, but only for the local co-operative companies which had called it into being, and over which it had a controlling influence, so it would be, as it were, a co-operative parliament the members of which should be elected by and from the different local organizations.

This might in time become a menace to the provincial authorities, if, as is too frequently the case, party politics were drawn into the matter, and any friction occurred, but party politics have nothing to do with fruit growing, and the mistake would be fatal.

But there is a simple remedy for all this, as Kipling would say, "that is another story."

Co-operation in Fruit-Growing

In two previous articles I advocated a school for fruit grading, local apple packing houses, cold storage and centralization of co-operative fruit packing companies. If, by the scheme I have suggested, wholesale stimulation, by means of increased profit, can be given to the fruit growing industry of the province, the immediate result will be a great influx of desirable settlers, increased land values, and a much denser population than dairying or mixed farming would admit of. Increased population would foster all kinds of industries, and the whole province would be the gainer.

Under these circumstances it hardly seems fair that the fruit growers themselves, through their co-operative associations who have done all this, should have to incur all the expense of benefiting the whole community.

Moreover, I have pointed out that whilst it is necessary to centralize, and thus unify, the fruit growing interests of the province, this very unity may, under very possible conditions, prove a source of danger to the provincial legislature.

The obvious remedy for this is that the provincial government, through its agricultural department, should itself take up the matter by acting as the central association, erecting cold storage plants where needed, establishing the apple grading and packing school (say, in connection with the future agricultural college), and doing our bargaining with transportation companies, etc.

Whilst I have said that politics and fruit growing should not be mixed, it seems natural to infer that the party which does all this for the fruit growers should be entitled to their support. They might, however, well hesitate to undertake this for two reasons, the first being that they would not want to force legislation of this sort on fruit growers, unless they were called upon by them to do so, and the second being the fear that whilst fostering the fruit growers, they might work an injury at once on the co-operative associations, the wholesalers and the retailers of orchard produce.

This objection struck me forcibly, but after considerable thought I can clearly see a way to obviate all this, though being a matter of detail in the working out of the scheme, it hardly needs to be mentioned here.

I do hope the fruit growers of the province will give what I say a thought, and try from these crude suggestions to evolve a successful method whereby we can realize the full value of our fruits, and thereby foster an industry for which so much of British Columbia is admirably adapted by nature.

MENDELISM IN BREEDING POULTRY

The rediscovery of Mendel's law has caused a revolution in plant breeding. It is not strange, therefore, that poultry breeders, as well as other animal breeders should ask if it does not also offer them some help. The poultry breeder is, in fact, especially fortunate inasmuch as one of the most extensive studies in scientific animal breeding which has yet appeared is based on poultry. This is "Inheritance in Poultry," by C. B. Davenport, Station for Experimental Evolution, Carnegie Institution. There have also been extensive studies of heredity in poultry by Bateson and Hurst in England and by Erf in Kansas.

Let us consider what Mendel's Law is. We can do this best by taking one of the crosses reported on in the paper referred to above.

Black Minorcas were crossed with White-Crested Black Polish. It is well known that Polish fowls have a crest or "top-knot," while the Minorcas have none. Now in this cross every single one of the seven chicks hatched had a crest. Such inheritance is called alternative—that is, all the progeny resemble one parent in this one respect, while the influence of the other parent is not apparent. When some of these cross-bred birds were bred together, some of the young had crests and some had none. The proportion was not far from three crested to one without crest. This result accords with Mendel's Law. In this case the crest is said to be dominant and crestlessness recessive. A dominant character, then, is one which is found in 100 per cent of the first generation of hybrids and 75 per cent of the second generation. A recessive character, on the other hand, is found in none of the first generation, but in 25 per cent of the second generation. The real meaning of this result may be more readily understood, if we follow the suggestion of Dr. Darbishire in using colored chips. Let white chips represent the germ cells (either spermatozoa or eggs) of the crested birds and red chips the germ cells of the crestless birds. Now the fertilized eggs of the Minorca-Polish cross, will each contain one crest-bearing germ cell and one non-crest bearing germ cell, which we may represent by two chips, a white and a red. Since the crest is dominant, we put the white chip on top. Or, if we choose to represent the whole result, we would have a lot of red chips covered by white ones. When one of these cross-bred chicks grows up, it will produce two kinds of eggs, or if a cock two kinds of spermatozoa, one kind carrying the crest and the other carrying the Minorca head. There are equal numbers of each kind. We can now represent the result by putting equal numbers of red and white chips in a hat. Since one egg will be fertilized by but one sperm-cell, we draw out of the hat two chips. The chances are (you can try it yourself) that one in four times you will get two red chips, and two in four times that you will get a red and a white. Now this same thing happens in the fertilizing of eggs. In that fourth of the cases where the crest-producing egg was fertilized by a non-crest-producing spermatozoon, the chick has a crest, similarly, where the non-crest-producing egg was fertilized by a non-crest-producing sperm-

cell, the chick has no crest. In the other 50 per cent the chicks have a crest, only because the crest is dominant.

D x R. give DR x DR give 1/4 D 1/4 DR 1/2 RR.

Many characteristics of poultry gave results like this in the experimental crosses. In the case where the double comb of the Polish met the single comb of the Minorca, the hybrids of the first generation (DR) had Y-shaped combs. In the second generation, one quarter of the progeny had single combs, one quarter double combs, and one half with a Y-shaped comb. In still other characteristics, such as shape and size, the inheritance was not alternative at all, but blended, i. e., the progeny were intermediate.

Let us now see how Mendel's Law could be used by a poultry breeder. Suppose there appears among a flock of fowls a bird having a new and desirable characteristic, which one desires to perpetuate. For instance, comblessness is dominant or recessive, but by analogy we can assume it is recessive. The progeny of this bird crossed with a normal one will be all normal. If we breed these chicks together, 1/4 will be combless, and when these are bred together, they will breed true. If the new characteristic, which we desired to perpetuate, is known to be dominant, such as the crest, the procedure is more difficult. Three-quarters of the second generation chicks will be crested, but only one-quarter will be pure dominants, which are capable of breeding true. The pullets must be bred to several cockerels in succession till one is found which gives all combless chicks from some of the pullets.

Mendel's Law will be used, however, far more frequently in combining two or more characteristics in one fowl. Although this complicates the work, I can perhaps make it clear in two examples. Suppose we desired to combine the silky feathers and yellow skin. By consulting the table it will be seen that silky feathers and yellow skins are both recessive. This makes their combination easy. The chicks of the first generation from the silky parent and the yellow-skinned parent will be black-skinned and plain-feathered. Crossing these chicks together one-quarter of the progeny will be silky and one-quarter will have yellow skin. The birds which show both silkiness and yellow skin will be 1/16 of the number. These birds bred together will breed true. There may be some slight impairment of color, which could only be eliminated by gradual selection. Yet this is simply because the inheritance is not absolutely alternative.

If we take the more difficult task of combining two dominant characters, the work is somewhat complicated. Let us combine the barred plumage of the Barred Plymouth Rock with the crest of the White Polish. In this case the first generation hybrids all show the desired combination of barred plumage and crest. But we have not yet the object sought; for they will not breed true as yet. If we cross together these chicks, 9/16 of the second generation will show both crest and barred plumage, but only 1/16 is capable of breeding true, that is, are DD in the terms used above. But these pure dominants can only be distinguished from those that are not pure by actual breeding. We must, therefore, take the pullets of this second generation, which show barred plumage and crest and breed them successively with the cockerels showing the same combination till we find one which will throw all barred, crested birds from the same pullets.

Poultry breeders will find in Mendel's Law an explanation of such phenomena as the cropping up of single combs in rose comb breeds, the rose combs do not appear in single comb breeds. It explains too the "strong inheritance" of booted legs and dark feet often noticed by poultrymen. The best short elementary treatise on Mendel's Law is Punnett's "Mendelism" (Macmillan). After reading this, the poultry breeder will find Davenport's "Inheritance in Poultry" (Carnegie Institution of Washington) profitable and helpful.—Roswell H. Johnson.

TYPE AND COLOR BREEDING

It has often been said with much truth, "type makes the breed, and color the variety," supposing we paraphrase that from a specialty breeder point of view and say, breeds throw types and varieties colors; unfortunately poultry judges differ on both type and color, these material foundations to all breeds; and the only means of holding or drawing judges and breeders closer together are the American Poultry Association with its standard and the specialty club, the latter largely a component part of the former.

Experience of many years in breeding Plymouth Rocks, Wyandottes, Orpingtons and Rhode Island Reds, being in touch with the breeders at large shows and noting awards, gives one a pleasant field of thought to revel in, and thereby grasp a few wholesome lessons from past events.

I will endeavor to point out where the more successful arts in poultry culture reveal themselves, and the causes in some instances that waylay the amateur.

Strange to say, I am not a convert to the theory that the male is half the pen; but, like most, I do not believe in large matings for results. It has been my lot for some reason or other to breed better males than females; perhaps I have had better males than females to breed from. A good male will reproduce himself unquestionably, providing the blood lines are right, that is, that he does not happen to be a freak bird or one brought in from another strain entirely. Freak birds are too rare to be of much use. However, none of the above results are my idea of the male proving himself half the pen. To prove this both sexes should be of equal merit. Given a female of

exceptional quality and a well-bred male, but not of equal quality, good results can be obtained in progeny of both sexes. More good can be accomplished with a good female line and more faults introduced by the male line. I think this is well understood by old breeders as they prefer to introduce new blood through a female. A hen with a good comb has power to transmit that good quality, a rose comb hen bred to a single comb will usually throw rose combs, and with such matings a very superior comb can be produced. A hen with slight feathers on shanks will transmit this defect to her offspring in a very much larger ratio than by using a male with slight feathering on clean-legged hens. I say positively that good results can be got from clean-legged hens and slight feathering on shanks of cock birds, but a feather-legged female is indeed a disappointment. Again, if a hen has white in ear lobes she will most surely almost ruin a strain from that defect alone, but a male can readily be bred from if his mates are positively free from white in lobes. Side sprigs in a female are a most serious defect and on no account should such a female be bred from, but side sprigs on the male's comb to my mind are not a serious defect as a breeder, but should be cut off before being used in a breeding pen. These serious faults in a male bird only assert themselves as a rule, when they lose vitality, especially late in the season. Males with such faults should only be mated with a few hens and such a sire to give results must be kept in condition. Many will say why breed from a bird with a serious defect at all? Well, a breeder who knows his business will not do it, unless there is some particular quality he wants in that bird, generally type or color, depending on the breed in question.

Side sprigs, in my experience, are more associated with extra fine-shaped males than otherwise; white lobes with choice color, and leg feathering with extra size. Size and quality seem hard to combine, and large-sized hens are very much the exception. Given these a breeder with skill can outstrip his competitors. I would far rather buy a hen to improve a flock than a cock; I would see that such a female was very strong in breed type. Good hens can be bred to rather inferior males and give satisfactory results, but where we have an extra male bird to mate with strong-typed hens, see how much nearer we get to perfection. This is not a theory lesson, it is the results of actual practice.

There are some exceptions. I will admit. Two breeds, Games and Leghorns, will invariably stamp the progeny either way they are crossed with their shape. It is easy to raise a variety upon its legs, giving it what is called in the fancy "style," but to shorten the thigh and shank is a very hard matter and can be done more readily through the female.

Now, we will turn to the matter of color. Here we encounter a much more difficult problem, one we can not solve so readily. There seems some magic haze surrounding it, still we are making sure progress, especially along the lines of feeds. Here, again, I have found the female the strongest bird of the two. Take a buff hen. What can you expect to breed from her if she has white in wing or solid black in tail? Good wings are easily bred in females; yet in buff and reds we have great trouble to contend with in holding sound top color with heavy laying. The most useful feed I have ever used to maintain surface color and make a heavy laying flock look presentable is linseed meal used in a dry mash, one pound to ten pounds of bread, two pounds of cornmeal, two pounds fine meat meal, two pounds fine sand. Used also in smaller proportion in feeding young stock, even the riotous red will prove attractive under such treatment. This is acceptable to red, buff and black color development, but may prove dangerous to a white bird for show conditions. However, a hen with a good white hackle and a purple tinge to base of new feathers across back can be generally relied upon to give white results, so also a good sound buff hen, but a black hen with purple barring is about useless to produce a flock of beetle-green chicks, however good the sire.

New we come to two rocks on which many a good bird is dashed to pieces, namely, care and feeding. What culls I have seen from the very choicest matings! The causes are like crowded quarters, worms and colds. They make a quartet that is hard to separate. They really arrest animal growth. By careful handling and judicious feeding, only the best results can be obtained. Especially is this true of the breeding stock and the growing chick.—A. G. Goodacre, in Poultry.

SHEEP ON FARM

From the new book, "Modern Sheep: Breeds and Management," by "Shepherd Boy," we reprint the following in regard to the place of sheep on the average farm. The author of this book is the associate editor of the American Sheep Breeder, and is therefore to be regarded as something of an authority on the subject. He makes out a very good case for the increased raising of sheep, and we are very much inclined to believe that he is right. He says:

The sheep business, like every other business, has its ups and downs. At present the world is short both of wool and mutton, consequently prices are high, which is a good reason why all farmers whose farms are at all adapted to sheep farming should keep a few sheep. Prices of wool fluctuate and times have been when sheep paid but little in this country, but such state of affairs is not likely to occur again in a lifetime, since our appetite for mutton and the demand for wool is growing much faster than our flocks. The flock has always held premier position in the animal husbandry of many countries. Especially is this true of Great Britain, and the time will

come when this will be true of this country.

Sheep delight in upland pasture, where dry footing prevails, no matter how poor the pasture. Nevertheless, there are but few farms, fertile or unfertile, upon which one of the many breeds will not thrive. It has been truthfully remarked that sheep will get more sustenance from poor land and do the land more good at the same time than any other class of livestock. And this is not all. In these days of scarce and high-priced labor, sheep-raising might be looked upon as a factor in offsetting this serious condition. For conserving fertility of the soil or renovating the worn-out farm, nothing equals sheep.

It is a fallacy to suppose that sheep cannot be made profitable on high-priced land, since on some of the richest farms in England, sheep are kept in large numbers, and it is a question if the rent of some of them could be paid without the help of the flock. Certainly there is no better kind of livestock on the average farm that gives so prompt and sure returns, and with so little labor as sheep; since they will live largely on the odd growths of the farm. Although it is well to use sheep as a scavenger at certain seasons of the year, it is not advisable to treat them as an everlasting scavenger.

There are thousands of farms upon which sheep would subsist with little more than the weeds and brush with which they are overrun, and which they would convert into the best of fertilizer and distribute more evenly than any other animal on the farm, would give double returns in wool and lambs for the privilege of doing the work. Sheep manure is worth as much, pound for pound, as most of the high-priced artificial fertilizers.

It is claimed that seeds eaten by sheep do not germinate, which is more than can be said of seeds eaten by some other farm stock. Sheep are particularly fond of buckhorn and plantain when in seed.

In clearing up stubble fields, nothing just equals a small flock of sheep. In some instances sheep would be profitable even if they gave no return other than their work of clearing up the weeds and fertilizing the farm.

The idea of sheep killing our pasture is a fallacy, for the densest pastures in the world are found in England, where the land is more thickly populated with sheep than any other country, in the world, and, further, the idea that sheep will not thrive with other stock is untrue—where the small flock is considered, at least.

Never, perhaps, was there a more desirable time for introducing small flocks of sheep to the farm than now. Where there is one flock kept there should be ten. Contrary to general opinion, there need be no special provision made for taking care of a few head of sheep on the average farm; as they are well able to take care of themselves if they have access to shelter and water. Of course, where large flocks are considered, they must have care, and the larger the flock, the more care must be used.

FEEDING YOUNG PIGS

Although pigs possess the ability to digest a comparatively large proportion of the feed given them, it cannot be expected that young pigs, recently weaned, should deal effectively with materials that would tax the digestive powers of an old hog. Indigestion, so common in the pig, and by no means infrequent in horses and cattle, is rarely met with in pigs, unless the feeding is very bad. Their stomachs take kindly to the most mixed and varied diet, but frequent feeding is indicated, as the stomach is a small one, and this is especially the case with young pigs. The amount of food to be supplied cannot be measured in ounces, but it should be as much as they can consume without toying with it, or leaving any in the trough. The feeding troughs should be kept clean. Food left in the troughs is not only a waste, but tends to increase the too commonly filthy surroundings of the piggery, which are by no means essential to fattening.

COAL ASHES AS A FERTILIZER.

Do not use coal ashes as a fertilizer, nor as a mulch for fruit trees if there is any other material at hand. They have no value as plant food and are even of less value as a mulch than sand. Coal ashes are best used on very heavy clay soils to improve the physical condition by making them more porous, but often fail in that effect by making the clay into a sort of cement. They are used as a "filler" to increase the bulk of concentrated fertilizers but add nothing to the value of the mixture.

FARM NOTES.

There are two extremes in caring for the cow, negligence and over pampering. Avoid both.

How glad you are to have a nice lot of fresh milkers now. Checks are sure to be big this season of the year.

The tester and the milk scale mark the parting of the cow paths. They show which leads to prosperity and which to the poor house.

There is altogether too much decomposed cream sent to the creameries, especially to the central plants. Keep the cans, pails, and separator scrupulously clean with boiling water, brushes, and washing soda or powders. Cool the milk or cream as soon as drawn, and keep it cool. Deliver at least three times a week, if cream, and every day, if milk.

On the average about 23½ lbs. of milk is required to make one pound of butter. On this point, however, great variation will be found.