

though he is my son. But I will have no half measures. If I send for Basil, I will send for Miss Vydall too. You can punish him then to your heart's content."

"I punish Basil!" answered Polly, now sobbing bitterly. "I that am so fond of him and that love him so! Why, I would rather die any day than that his little finger should be hurt! Oh, how can you think I would do such a thing!"

"My dear girl," Mrs. Treherne said, "one of two things must be done. Basil can't marry both of you. You must not mind my saying that Miss Vydall is the more suitable match. But if Basil has behaved badly to you, you have the right to punish him, although it will ruin his life. If Miss Vydall hears a whisper of this, I know she will break off her engagement, and rightly too. It is for you to decide. I can't defend Basil."

During this speech Polly dried her eyes and ceased her sobs somewhat.

"Would you let me stay here for the

night?" she asked humbly. "If I could see the young lady only for a minute, I could make up my mind. I will tell you in the morning for certain one way or another."

Mrs. Treherne reflected for a minute. Her battle, she felt, was almost won.

"Certainly," she replied. "You shall sleep in my dressing-room. In any case you are not fit to go back to town to-night. Denvers will look after your comfort. Denvers was Basil's nurse when he was small. She will bring you up some dinner here, and when the dancing begins she will show you a corner of the gallery from where you can look down on the great hall below. I shall be obliged to be with my guests, but Denvers will point out Miss Vydall. I will see you again in the morning, and you will tell me what you have decided. I will abide by your decision, I promise you, whatever it may be."

But next morning, before Mrs. Treherne was up, generous, true-hearted Polly Daggs

had vanished. With the faithful Denvers' aid, who had a strong suspicion of how things really were, she had made her arrangements and had caught the first up-train at 7.30, leaving a letter for Mrs. Treherne in which she explained her motives, unconscious of any heroism.

"I can't," she wrote, "*make Basil miserable* just because I am, nor punish him because he loved me once and doesn't any more. I hope he will be happy with his beautiful young lady. She looks as though she would make anyone happy. Only, afterwards, when he is married, tell him that Polly didn't forget if he did; but she forgives him, and wishes him luck because she loves him so much."

The letter was badly written, ill-expressed, and tear-stained, but to Mrs. Treherne it was the most welcome communication she had ever received, and in her heart she knew that Polly, the common storekeeper's daughter, had excelled both her and her son in true nobility.

HOW TO GROW APPLES AND PEARS.

By B. WELLS, F.R.H.S.

INTRODUCTION.



HERE are hundreds of thousands of acres of land in this country well suited to the work of apple-growing; in fact, so general is its suitability, that it is hard to find a spot which, with judgment in the selection of varieties to

suit soils, could not be profitably devoted to it, either in small quantities for ladies, or as commercial enterprises for men of business; and it would be immensely to the advantage of landlords to encourage their tenants, and give them good business security to plant large tracts of their estates with orchards; and plenty of tenants would be found to do so if they could have the land on terms of similar length to building leases, with liberty to dispose of their interests in them. This would do away with derelict land everywhere, and increase the rent-rolls satisfactorily.

Some have cried out in fear of over-production. There is no danger of this for many a long year, or scores of them. Such a state would be against precedent for skilled labour. Many instances are not wanting, and to instance a small one, see what production has done for tomatoes—the more tons are grown the more are required. Less than a century ago they were only grown by the curious as an ornament, and that sparingly, because they had a disagreeable odour in the greenhouse; now their odour seems turned to a perfume. There is no fear of over-production.

The general market price for good apples is about six shillings per bushel from November to Christmas, while Cox's orange apples sold for twenty-eight shillings per bushel in April, 1898. Apples will pay to grow at two shillings and sixpence per bushel, and they cost all that to send from America for freight, barrel, commissions, etc. All the costs must come out of the fruit. So there is not much fear of over-production at present, or the next century.

Good things are always high in price, and poor things low. The unskilled produce common things, and it is a good thing they can produce the common necessities of life;

and as they are employed about this there is room for skilled persons to employ themselves in more skilful operations, of which fruit-growing is one. Common necessities of corn and meat can be produced abroad cheaper than at home; but not so fruit, for its great bulk for weight, its tender nature, the requirement of nice packing for transport, cold storage, and many things more, all add greatly to cost of transit; therefore it will never be cheap by importation, and if persons continue as backward in its home production, it will get much more dear as consumption increases as it does now, so there is full encouragement for ladies and others to plant apples.

The spread of the industry would also be good for the labouring people of the country. For want of profitable work they are not in anything like regular employment; they therefore crowd into the towns to deteriorate and diminish. If it is true that an industrious peasantry is the stamina of a nation, they should be cared for, and if they diminish below a fair standard, it is hard to say where the defenders of the hearths and homes of the nation will be on land and sea. It is as yet a necessity of nations to have armies and navies, and they require replenishment.

Now Mr. B. has touched a chord which vibrates, and it may not be amiss to respond to it a very little about my "past." I began to love the work when a lad. The first tree I propagated with success stands in my garden. I was then about seventeen years old, and now I am sixty-three. I have learned in the most costly school—that of experience. Many thousands of trees stand about my little inheritance, in which my grandfather died, and which has come down to me, and which I have added to, and am planting with apple trees as fast as I can, so that I am practising what I preach. The next field is ten acres, now in preparation. I have three sons; they are all with me; we all work. I do not ask "What shall we do with our boys?" but employ the boys of others, as well as their mothers, sisters and fathers.

PLANTING.

Having treated of the principles of the growth of trees, as illustrated by the apple tree, it now occurs in the natural order to treat of planting. The selection of varieties may be deferred until opportunity offers.

If the planting is for business purposes, it is necessary that care should be exercised to ward off disasters and ensure success; while if the purpose is for pleasure only, then the chief point is to please. If for business, and in a field, it is best when the trees are planted in such a regular form as will secure convenience in the after care, and to economise the space, thereby making the most of it at the least expense. The greatest return at the least outlay consistent with economy should be the guide of every effort in the operation. If for a garden or ornament, then other points may take precedence of the profit of the trees; but when done for success, in any case, the best rules to obtain it should be followed, and they must enter into business management; therefore such will be considered, and as many of them may be followed for pleasure as desirable.

The preparation of the land may be first considered. This can be done at no time so easily as before the trees are planted. For very small pieces and up to an acre, hand-work will be the most economical; for pieces up to five acres horses; over five acres steam is the most effective and the least expensive. It is best if the land can be moved to a depth of at least eighteen inches. This is easily done by hand, although costly. Good horses will do it by deep ploughing, with a strong subsoil plough to follow after, at less cost; while steam will do it at half the price of horses, so that if culture is looked upon as an item to consider, and breadth is of benefit, then steam will do more than horses for the same cost, and it must be remembered that efficiency cannot be obtained without cost, and if any fixed amount must be expended, then it must be most economical to get the most for the money possible, hence a large piece by steam is more economical than a small piece by horses at the same cost.

Some planters have gone to the cost of doing large fields by hand trenching. This amounts to a great sum, and the money spent so would have prepared many times the size by steam, and done it just as well, for a tree makes no choice whether the land is done by hand or by steam, so long as it is done as well, and if it is well moved that is all that is required, so that to do great areas by hand is wasteful. Steam will do three feet deep if required quickly in dry weather at five pounds per acre, which would cost near twenty pounds per acre, and steam will do it honestly, while

men need watching. It is well to dwell on this, as it is a great item in the first cost of an orchard. Of course, the surface should be cleaned by a mixture of horse- and steam-power, and the last steam-culture done when the sun has power, after which no horses should be allowed on in a wet state. Good drainage is very beneficial.

If the land is naturally rich, it will not be absolutely necessary to manure it until the trees have got some rooting, but they will need it when they begin to grow. This may be done with stable manure as a mulch or by concentrated manures. The use of either

Diagram I. shows five figures. Fig. 1 is a plan for planting.

Having prepared the land, the next work is to mark it out with lines and pegs, placing a peg for each tree. It is most convenient to work on after if this is done in a regular manner at even distances each way, as shown. A fuller treatment of this may be deferred to another paper. But if the most is to be made of the land, the way is to plant at from 6 feet to 8 feet apart, in which case they may be planted in fours each way, every fourth tree being a standard, and the remainder dwarfs. The dwarf trees may then be thinned out as they become thick and removed to another position, as judgment may direct. The letters S S S S represent standard trees.

In reference to Fig. 2, H represents a hole in which to plant a tree. The shape of it should be a little high in the middle of the bottom, so that the roots may not be curled up, as shown in Fig. 5, if it had been planted in a hole with a round bottom, as shown by Fig. 4.

Fig. 3 shows a tree planted as it should be. A hole with a rounded bottom will turn up the roots at their points, which is very commonly done; this way is quite wrong, and is calculated to bring on disease, which is irrecoverable. It is just as easy to dig a hole properly, as shown, as it is to dig it improperly, as at Fig. 4, and it costs no more, it only requires a little care.

Further in

reference to these holes, it will be seen that the shading of their position is different. In Fig. 2 B B B B B represents broken earth. If the horse or steam culture is not deep enough it may be done by hand in the position of the most permanent trees, at least for the standards. It is the practice of some to dig large holes at least six feet wide and two and a half feet deep, throwing out the earth on the land around the hole, thereby allowing it to have not only the benefit of deep culture where the trees are to be planted, but by allowing it to remain out for

some months it nitrifies the earth so thrown out, which is very beneficial. Care should be taken at the same time to loosen the bottom of the holes to another six inches. It is then filled in and allowed to settle, when the tree is planted on the rounded mound which will be found there, as in Fig. 3. The letters S S S S represent solid soil which has not been moved. By this method planting can be done on unprepared land without having to wait for a year to prepare the land, especially if it is only a small piece which has to be worked by hand, and the land between may be dug after planting as desired, for a man can dig between trees as well as if they were not there, whereas it is not so with horses.

After the digging the dwarf trees may be planted at convenience, and as they are not intended to stand for so many years, it is of no great consequence as to whether they are planted so carefully or not, for their requirements will not be for so long a time.

A very good article appeared in the *Journal of Horticulture* on August 31st, 1893, from the pen of Mr. Molyneux, of Swanmore, in which he reports very well of some trees planted in this manner there, and he has reported very well of them since.

Trees should always be planted at the same depth as they grew in the nursery, as that is their natural depth. All wounded roots should be cut off clean, and it will be the best to cut them off rather close, for it is seldom that very long roots do so well as rather short ones when planted. They should be cut off with a sharp knife, holding the stem in the left hand with the top part backward, then taking cuts from the bottom of the roots, and cutting outwards; the cuts will then be from the bottom, and when planted the cut will be downwards, in a good position for the young fibrous roots to strike down into the surrounding earth, and being planted on well-mellowed soil as described, they will at once strike down and grow.

The autumn is generally reckoned to be the best time to plant trees, as soon as the leaves are well off, which is generally about November. If they cannot be got in by the middle of December, if the weather is not good and open, it will be the best to defer the planting to the latter end of February, or even to the end of March, as it is not reckoned to be so good to plant them in the dead of the winter, when they are at their most dormant state.

It is necessary to keep young trees well clean about the roots at the very least for some years, whether they are planted on cultivated land or grass. This can be done by digging lightly, or by hoeing around them with a heavy hoe; in fact, it requires both sometimes, according to the weather.

It may be remembered that fresh moved earth always keeps more moist than if allowed to become caked hard in the sun, and frequent moving is easier than when delayed long.

(To be continued.)

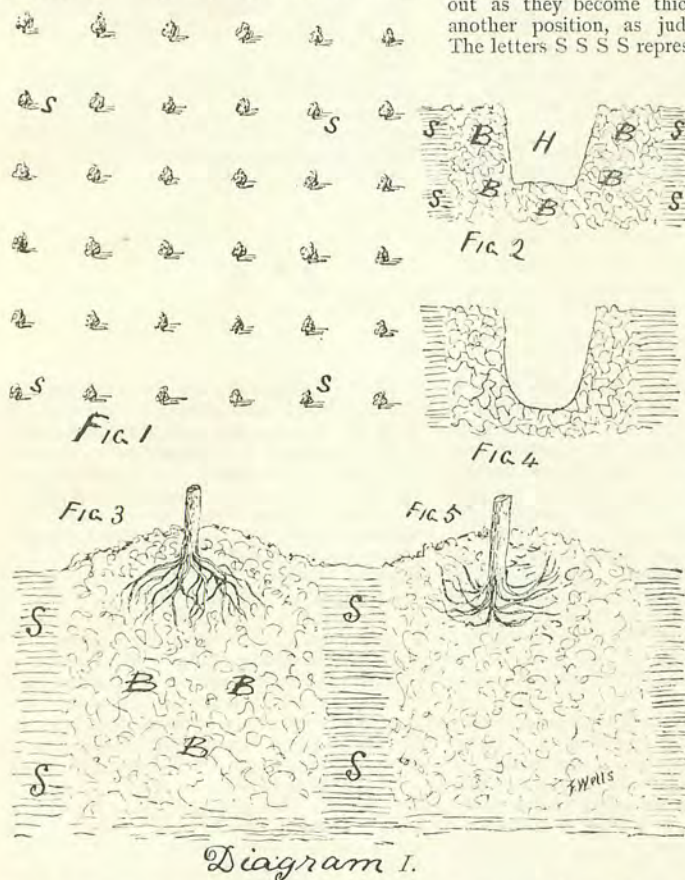


Diagram I.

must be guided by all the surrounding circumstances, which are too many to write here. The advantages should be balanced against each other; one advantage of artificial manure is that it has no weed seeds in it, while the other has, and good clean after-culture is beneficial; another is cost of carriage and application, but the cheapest artificial costs 50s. per ton, while the other costs about 7s., so that seven times as much stable manure can be had for the cost of artificial. This is an item. The manure problem requires more study than it has hitherto received.

LIFE'S TRIVIAL ROUND.

By ROSA NOUCHETTE CAREY, Author of "Nellie's Memories," "Mollie's Prince," etc.

CHAPTER III. HOPE TURNS RESTIVE.

"Much talking leads to exhaustion; therefore he who is wise knows when to stop."

Lao Tszc.

I HAD to do an errand in the village that evening. We were short of eggs,

and I knew they would let me have some at Maple Farm, so directly after tea I started.

It was a lovely evening. The soft spring air had a promise of summer in it; the clear golden light and the fresh young tints and tender green of the leaves gave a new beauty to the familiar

landscape; it was as though the world had been re-created and was jubilant with youth. There was a sense of newness, of life in the air; lambs were bleating from the meadow; a young foal, with its mother, was looking over the gate of the five-acre field; broods of yellow ducklings were running across

HOW TO GROW APPLES AND PEARS.

By B. WELLS, F.R.H.S.

STOCKS.

IN reference to the operations of orchard planting, this matter of stocks may be taken as one of the most important items to consider, as the stock is the base of every tree. To make this matter unmistakably plain, it is well to state very simply that the stock, as it is called, is a young tree of a common kind upon which a good variety of apple-tree is propagated, so as to have the variety of apple desired—e.g., a young crab-tree on which is grafted perhaps the wood of a Blenheim Orange apple-tree, which, when grown, will be a Blenheim Orange apple-tree. It will at once be seen that the stock supports the entire tree, and that the stock furnishes the root and a small portion of the trunk of the tree when grown, while the head and chief part of the trunk will be of the Blenheim trees from which the scion was taken, and grafted upon the stock. Therefore the stock is the base, as said. As that is the case, the stock has to nourish the entire tree from the land in which it will have to grow. This makes it very evident that the health of the tree and its vigour must necessarily depend upon the health and vigour of the stock. Consequently it cannot be too plainly and strongly impressed upon the planter that it is of the utmost necessity that the stock should be the healthiest and most vigorous it is possible to get, as upon this must largely depend the success or failure of the planting. If the stock is not hardy, strong, and healthy, the tree on it must of necessity be weakly too. Nor will the best of land and culture remove such weakness.

There are three varieties of stocks upon which apple-trees are propagated by either budding or grafting; they are Crab stocks, Free stocks, and Paradise stocks, each having

different natural properties. As so much importance is attached to them, it will be well to treat of each rather fully. But it may be stated shortly that the crab stocks are the natural product of the country, and are, therefore, the hardiest and best for large trees, while the Paradise, being a dwarf kind of apple-tree of a hardy nature, is most suitable for the production of dwarf trees to bear fruit quickly. As to the Free stocks, which are the produce of the apples from which cider has been made, they are merely a mixture of all kinds of apples with as variable constitutions as the apples from which they are grown, and are consequently worthless, and worse, as they are very disappointing, occasioning great losses. These are the kind of stocks which are grown so largely on the Continent and sent all over the world by the million, hence such poor orchards.

Crab stocks (*Malus Sylvestris*) are raised from the pips of the common wild wood crab, collected from where they are grown wild in the woods and hedges. At present there are enough for the demand, simply because they are very little used. This last may be proved by observation in almost any locality where they grow, by taking notice that they are generally allowed to waste on the ground, although the trees themselves are somewhat few and far between; whereas if every nurseryman who sells trees were to use only these, there would not be enough by a great deal. Hence it is plain that they are but little used, proving that some other kind of stock is substituted, of which further on.

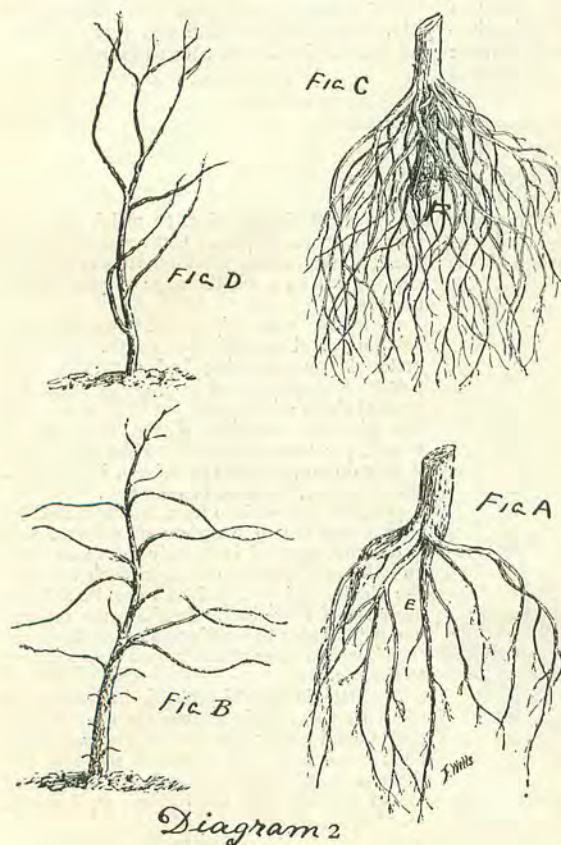
As crab-trees are natives of England, they are the most hardy and healthy it is possible to get. Their vitality is of a very tenacious kind; they do not grow very fast, but they keep on growing healthily. They are furnished with rather few roots, but they are strong and spiny, running deep into the soil; see diagram 2, fig. A. Being true trees raised from seed, they have true tap-roots, as at E, and several anchor roots, all of which have a tendency to grow down deeply into the soil, which is their nature, and has a purpose in it, which in the first place fits the tree to find such mineral food in the soil as is required, and only to be found there. In the next place they serve to hold the tree upright and firmly against the wind. In this they resemble the oak, which is proverbially the type of hardy vigorous English trees. The oak and the crab both require a good supply of the same mineral plant food, potash, with other minerals, and are both naturally fitted with suitable roots to find such mineral foods, and it must be borne in mind that the earth only is the source from which such foods are to be derived, whether found naturally in the soil or supplied artificially from another earthly spot; therefore the greater depth the roots can reach and spread, so much greater the bulk of earth from which such supplies can be drawn, and consequently the greater the natural supply, so that it is plain that these deep running roots are for large growing

trees a great good. As the oak and the apple so closely resemble each other in their natural requirements and form of rooting, it naturally follows that where one will grow well so will the other. This is also found to be the case in practice, for where good oaks grow there good apple-trees are found too.

Some nurserymen express a dislike for the crab stock for the purpose of propagating apple-trees upon, saying its deep penetrating roots grow too deeply into the soil, producing too much wood, thereby delaying or entirely hindering fertility, and that the roots "getting down too deep in the cold subsoil induces canker"; therefore they prefer the free stock as partaking more of the nature of the apple, and more likely to do better, because they have noticed that when the trees they have sold, which have been planted, have got down into the cold clay, they have cankered. Would it not be more natural to think that so large a portion of the trees they have sold being on the free stock, which it is but reasonable to suppose is less hardy, they could not stand the deep rooting of which they complain, and that if they had been on the crab they would have grown healthily? The truth is that this is a fact, as will be proved later on. As to the first part of this proposition—that the continual growth of wood delays fertility—of course it does! And quite correctly too! This is quite as it should be! Except a few of the most abnormally prolific varieties, as the old Hawthornden, the Domino, the Stirling Castle, and some others, it is seldom a good growing tree is very prolific in a young state, and when they are, they do not live long. But such as the Blenheim, the Foxwhelp, and some others, delay their fertility to a good age, and live long, becoming very large trees—healthy and long-lived, which was required. The crab stock will certainly assist this desirable end; but when persons come to the nursery and say they want trees that will bear "next year," because they do not know any better, it is not right for a professional orchard planter to supply trees on unhealthy stocks. The proper course of a professional man is to work straight on, upon true principles, quite regardless of absurd requests, and if persons require trees to bear next year, to supply them with trees propagated on the Paradise stock, of course telling them so. But to say that deep-running roots induce disease is certainly a fallacy, and in many cases said to suit other ends. It stands an indisputable fact that wild crabs in their native state are healthy, and very tenacious of life. It is very questionable if ever a person saw a native crab, growing where it started from the seed, that was troubled by the canker, or any other tree disease, except outward pests, as caterpillars, aphids, or something of that kind, which are general, even on the oaks. So that this at once destroys complaint against deep-running roots of the crab. But to say that crabs grow too strong is to say that they grow too healthy and good, for this is the sum of such an expression. It is cottagers who have grown the best trees; their practice has been to carry a crab stock home, plant it in their garden, and there propagate it with a suitable variety. This is simple, and if the mute lesson had been properly learned by nurserymen, there would not have been so much disappointment and loss to planters, and less imports would have been required. This is a serious charge.

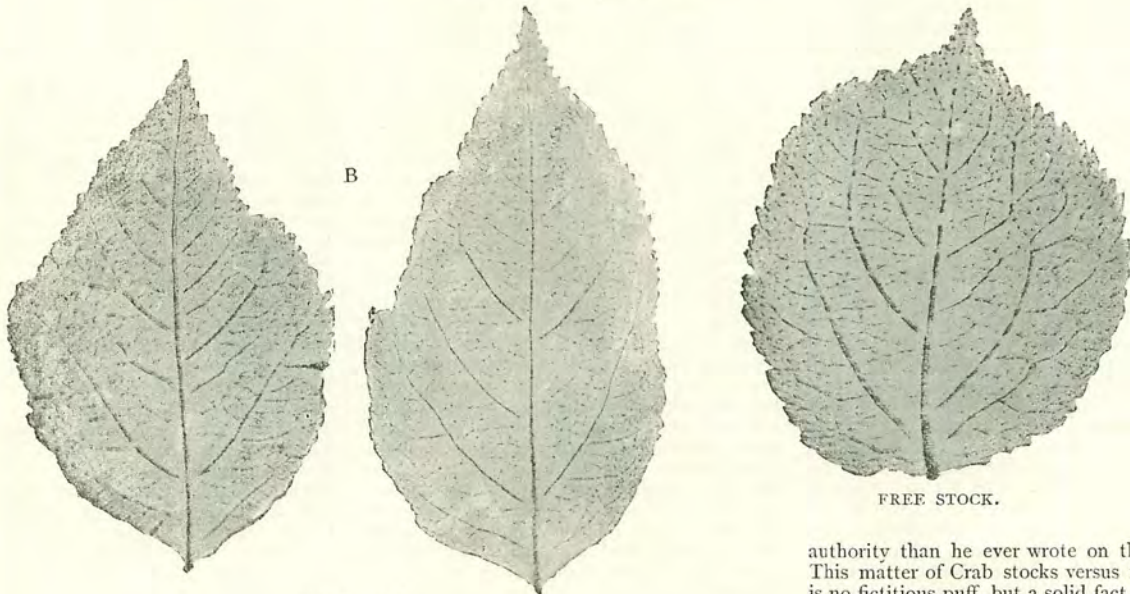
The diagram represents the roots and young trees of the Crab stock, A, B, and the Paradise stock, C, D. The tap-root of A is shown at E; the section of the layer of the Paradise stock at F.

(To be continued.)



HOW TO GROW APPLES AND PEARS.

By B. WELLS, F.R.H.S.



PART III.

STOCKS.—continued.

A LITTLE further notice of the Crab stock must be given before it is left—which is the witness of centuries ago. Turning to Miller's *Gardener's Dictionary*, which still stands in the highest esteem, there may be found this: "The Crab

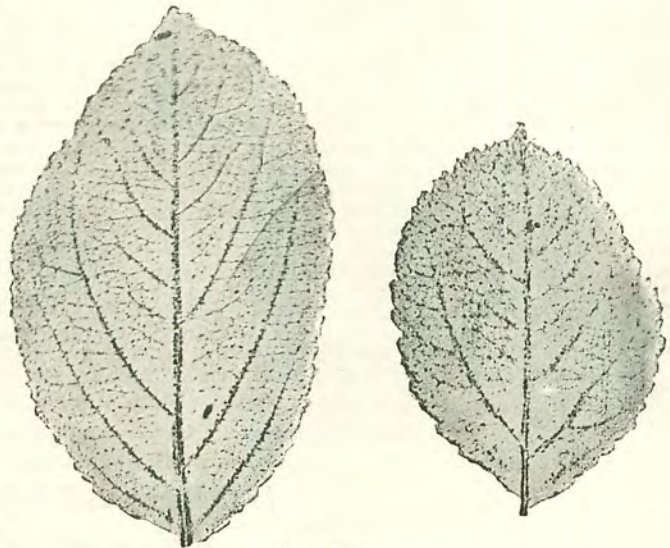
has been greatly esteemed as the best stock for grafting apples upon, but of late years there have been few persons who have been

curious enough to raise these stocks, having commonly sown the kernels of all sorts of cider apples for stocks without distinction as they are much easier to procure than the other. The gardeners generally call all those Crabs which are produced from the kernels of any sort of apple; but were the kernel of the Crab sown, I should prefer those for stocks, because they are not so luxuriant in their growth as those from the apple kernels, and they will continue longer sound.

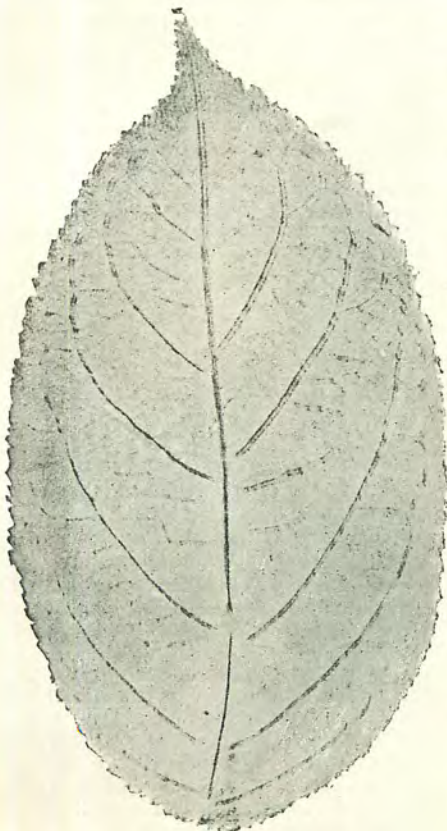
Besides, these will preserve some of the best sorts of apples in their true size, colour, and flavour, whereas the other free stocks, large fruit, which are not well shaped, nor will they keep so long." And yet in the face of all this I have a printed record of one who actually told the reviewer of a high-class newspaper that his firm supplied trees to orchard planters propagated on the *free stock*! So it is plain the sins of a hundred and fifty years ago are still practised. Professor Miller wrote in 1761. No better

authority than he ever wrote on the subject. This matter of Crab stocks versus free stocks is no fictitious puff, but a solid fact.

The next in importance is the Paradise stock (*Malus Pumila*). As the Crab stock is considered the best for large or standard trees, so the Paradise stock is considered the best for all dwarf trees. It has been written



FREE STOCK.



APPLE LEAF.



A.—LEAVES OF CRAB.

of as of modern introduction, but this is a mistake, for Miller quotes a writer who mentioned it as in use in 1671—not very modern this! The tree is of a dwarf habit; Miller calls it “rather a shrub than a tree.” Mr. Scott in his *Orchardist* states that it is a native of Russia, although found in the Caucasian Mountains, and northward into Siberia. He speaks of one Seivers as its first discoverer, but gives no authority. Dr. Hogg in his *Fruit Manual* says nothing of its origin, but that it has a peculiar property of rooting very near the surface of the soil; this and its dwarf habit are its marked features. It is very hardy; it is an apple and not a crab at all; its fruit is small and pleasant. Miller says of it, “The Paradise apple for some years past was greatly esteemed for stocks to graft upon, or bud other sorts upon; but those are not of long duration, nor will the trees grafted upon them ever grow to any size; therefore it is only by way of curiosity or for very small gardens that these stocks are proper, since there can never be expected any considerable quantity of fruit from such trees.” There are three varieties of it now; they are named, the Doucin stock, the English Paradise, and the French Paradise. The Doucin stock is the most free growing, the English is the next, and the French is the most dwarf, which is of very slow growth indeed, and of not much value on that account. The effect of this dwarf habit, and surface rooting, is that the trees are very prolific in a young state, and their small size allows the planting of many more to the acre than of large-growing trees; by this means an orchard comes into a state of fertility quickly, and large returns are soon realised from the outlay. Such facilities give orchardists a mastery over their work that would not be otherwise obtainable. The fruit from such trees is also very fine, well developed, handsome, and the best quality; therefore these Paradise stocks are now in these days of steam a great acquisition. It is propagated by layers; by this method it is kept true. But this is a department of the nursery, not belonging to the planter. On reference to last month's diagram at F, a mark will be seen where it was separated from the parent tree. The result of such propagation is that all the roots are merely fibres, sprouting out from that portion of the branch which was layered for the purpose. Consequently each stock is but the tip of a branch, and its roots mere fibres. It is therefore not a true tree with true roots at all. Hence it grows a mere stunted dwarf

kind of growth, and should not be called a tree at all, but merely a cutting. The result of this is that although hardy by nature and healthy, and so very useful, yet it is weakly, and the tendency of all weakly trees is to become extra fruitful, so as to reproduce their kind before death. To slightly digress: in this lies the secret so much vaunted of growing “trees on their own roots.” All such trees, so called, are as the Paradise stock, weakly and prolific. Further, some nurserymen have propagated their own varieties of Paradise stocks, first making a start from some prolific variety, and some from a very strong growing variety; in fact there is room for great experimentation in this line, and many results might be expected by those curious enough to do it.

Now as to the free stock. It was before said that they are worse than worthless, but sent all over the world by millions, creating great disappointment and loss, which is all true, although a most serious statement to make. But this is made by reason of observation of the results of their known use, by reasons bearing on it, and by the authority of good planters of experience. Some orchards were planted some years ago with trees on the free stock, and out of the many hundred trees there is scarcely a score of good ones remaining in all of them, while many scores of them have died quite out. In the very same spots other young trees have been planted, propagated on the Crab and on the Paradise stock, which are growing well. It is true the fresh trees were planted quite young, while those first planted were some three or four years older, which may account for some of the difference; varieties more suitable to soil have been planted as well in the second work, but the chief reason of failure seems to have been the use of the free stock, for the first planting have not rooted scarcely at all, many of them have fallen sideways, and more are very loose on the ground for want of rooting. These orchards have been the occasion of great loss to the planters. This much on observation. Now as to reasoning upon the matter. Of course it must be known to all on observation that the Crab is the only native and natural apple, and that all other varieties are developments and sports from it as is the case with flowers from their natural prototypes, and perpetuated by human culture. As with flowers so with apples and other fruits. Consequently every one of them is of abnormal growth, and more or less weakly than the original crab. And the seed of every one of them

must of necessity partake of some of this weakness of constitution. Some will scarcely produce seed of sufficient vitality to continue the propagation. This shows the natural weakness; therefore this weakness in varying measure is inherited by every free stock which is, as before said, raised from cider pomace. To get stocks from such a source is a cheap way, for it is as Mr. Miller said an easy way, but it is not a good way. If it was not so done, but raised from Crab trees they would be much more dear, and crab trees would have to be grown for the purpose of producing seeds from which to raise the stocks; but such is not the case. This again proves that they are raised from another source; and this is stated by more than one eminent writer, among them the Secretary of State for California.

The diagram shows the impression of a few leaves of the Crab, the Paradise, and the free stock in Figs. A, B, and C. The Crab leaves are taken from both old and young trees, and as nearly illustrative of the bulk of each as possible; the small ones are from an old tree, and the larger from young stocks. They are very characteristic in their shape, pointed tips, and serrated edges. The Paradise leaves are larger and broader, more like an apple leaf, while the free stock leaves are quite distinct, being larger and more rounded, more like apple leaves of better varieties. But as the tendency of seedlings is to revert to the original prototype, the Crab, they are not quite the shape of good apple leaves, being produced from a poor class of cider apples from France, they are a poor cross between an apple and a crab, in some cases hard to distinguish. It is well to know something of this matter, so that one may not be entirely at the mercy of all that may be told by every nurseryman, for even they are of many varieties as well as the apples they sell. The best way to know about them is to visit the nurseries in the summer time when the trees are growing and see for oneself. Another guide may be taken that free stocks produce much finer young trees than Crab stocks, therefore it is not best to be always guided by such beautiful growth as is seen in many places. Crab stocks grow young trees less than Paradise stocks, while free stocks grow them much finer and larger. This is a very good mark to look to. Persons like to see very fine young trees, and nurserymen are tempted to so produce them to please, but they are not the best.

(To be continued.)

MORE ABOUT PEGGY.

By MRS. GEORGE DE HORNE VAIZEY.

CHAPTER XII.

ROB received Peggy's confession of her latest gardening exploit with a roar of good-natured laughter. She had been afraid lest he might be angry, or—what would have been even worse—superior and forbearing; but he was neither the one nor the other. Such a genuine, Peggy-Pickle trick, he declared, was worth taking some trouble to enjoy, and went far towards consoling him for the advent of a fashionable young lady in the place of his mischievous little friend. His generosity was not sufficient, however, to prevent him from enlarging on the exceeding

beauty of the seedlings which had been so ruthlessly disturbed, and Peggy listened in an agony to a string of names wherein syllables ran riot. *Salpiglossis!* Alas, alas! she had not the faintest idea what the flower was like, but the name was exquisite, all-satisfying. It rolled off her tongue with sonorous effect. To speak of it alone would have been joy. She looked so meek and wretched that Rob nerved himself to fresh efforts, and wrought miracles on her behalf, so that if by any chance she admired a plant in The Larches garden, that plant was transplanted bodily to Yew Hedge, and smiled a welcome to her on her next approach.

The gardener pointed out the folly of moving plants in bloom, and prophesied failure, but no failure came, for plants have their likes and dislikes like other living creatures, and there is no doubt that they are more amiably disposed to some people than to others. If another man had been rash enough to disturb their flowering, they would have sulked for the rest of the season and made him suffer for his boldness; but no plant ever sulked at Robert Darcy. He had simply to lay it down in any spot he liked, and behold, it grew and flourished! His fingers seemed to possess the power to impart health and strength, and

hospitality, and am anxious to test them. I shall treat you like a puppet and play all sorts of experiments on you to try the effect. I should wish you to feel tired sometimes in the morning, and stay in bed to breakfast, so that I could wait upon you, and to be too lazy to dress yourself now and again, so that I could arrange your hair in different styles. If you could manage to be a little ill, it would be charming, for then I could nurse you and be severe about your diet, but if you keep well we will make the best of it and entertain the neighbourhood. I'll set to work at once to plan something original and startling."

"Oh, do!" cried Eunice eagerly. "I'd love to be startled. I shall look forward to coming every single day until the time arrives and be the most obedient of puppets. You are a dear, Peggy—I do love you. I'm so grateful to you for being kind to me."

"It's my nature, dear. Go on deserv-ing it. Three remarks at least I insist upon at every meal, and if you could increase the number to six I should be correspondingly gratified. Don't stare at the carpet, don't look frightened when there is nothing to be frightened at, and look after my beloved brother for my sake. Those are my last instructions for your guidance. Arthur feels lonely sometimes, just as you do, and it would help you both if you would talk to him sometimes, or, still better, let him talk to you. Men, my dear," sighed Miss Peggy with an air of experience, "men like nothing better than to talk of themselves with a woman as audience. Ask questions about his work, his plans, his thoughts, and he will go on talking happily so long as you will sit and listen to him. You could do that, at least, if you could not talk yourself."

"Oh, yes, easily. I'd like it. I love to hear him talk," assented Eunice naively. She fixed the soft shy eyes upon Peggy's face, and that young lady

felt that she had shown her usual shrewdness in suggesting such an arrangement, for a sweeter *confidante* it would have been difficult to find, or one more ready with sympathetic interest.

With her usual tactfulness Eunice declined to accompany Peggy to the station, so that her presence should put no check upon the last conversation between brother and sister, but no reference was made on either side to the event of two days before. Arthur seemed anxious to talk on impersonal subjects, so they discussed the old friends and their doings—Esther and her theories, Mellicent and her romances, and sent affectionate memories after the two absentees, Reg working his uphill way in the world, and Oswald in his luxurious home. It was always a happy task to recall bygone days, and the "Do you remember?" filled up the conversation until the last moment arrived, and Peggy leant out of the carriage window looking down upon Arthur with an anxious scrutiny. The dear face looked worn and thin, and the forehead showed a couple of lines which she had never seen before.

"Oh, Arthur, I wish I were staying longer or that you were coming home with me!" she cried impetuously. "I can't bear leaving you alone just now. You need to be petted and coddled and made a fuss of, you dear old boy, and I am desolated that I can't do it! What is the use of having a sister if she can't do anything for you when you are in trouble?"

"She has done a great deal for me already, and is such a sympathetic person, Peg, that I am afraid she would spoil me altogether if she had her way! It's just as well that we have to be separated for a time, for the less I think of myself the better. It can do no good and only unfit me for work. I'm going to set my teeth and begin afresh. Consolation prohibited, my

dear, but hints for support and occupation thankfully received!"

And then had Peggy an inspiration! A flash of mischievous enjoyment lit up the hazel eyes, but before Arthur had time to discover it, it had disappeared and been replaced by an innocent little smile.

"You might do a good turn to Eunice by cheering her up after my loss! It would be beneficial for you to make the effort, and the Rollos would be grateful. It is not easy to make her talk, but you would find it worth the effort, for she has sweet thoughts, and—on occasion—a pretty little wit of her own."

"On somewhat rare occasions, I should say," replied Arthur smiling, but all the same he looked pleased at the suggestion, and the smile lingered on his lips as at some pleasant remembrance.

When the whistle sounded and the train began to move onwards, he waved his hand and nodded a cheery assent.

"Right, Peg! For the credit of the family, your pupil shall not be allowed to fall back into her old ways. I'll do my duty towards her."

"Mind you do!" cried Peggy and flopped down on her seat with a soft explosion of laughter. "Ha! ha!" she cried aloud. "Ha! ha!" and flourished her magazine in triumph.

The next moment she became aware that an old lady seated in the opposite corner was regarding her with glances of apprehension, and stealthily fumbling for her umbrella as a possible means of defence.

"She thinks I am mad!" quoth Miss Peggy to herself. "How truly gratifying! I must foster the delusion." She turned her magazine ostentatiously upside down, smiled vacantly at the pictures, and feigning to fall asleep, watched beneath her eyelashes the compassionate glances with which she was regarded, shaking the while with inward laughter!

(To be continued.)

HOW TO GROW APPLES AND PEARS.

By B. WELLS, F.R.H.S.

PART IV.

VARIETIES AND LAND.

A SHORT allusion was made to some orchards in the last paper as to loss from the use of improper stocks, choice of wrong varieties to suit soil, and wrong age of trees at planting. The first matter was treated, the other two come in course, and as they are belonging to first principles, it will be well to treat of them at fair length, as, being "principles," they are most important points in fruit-growing, especially in planting orchards. It is on the observation of simple things and carrying them out diligently that success depends, while negligence is almost sure to bring disaster. And not only has suitability of varieties to soil to be considered, but market requirements, as well as private use, require a little attention.

An illustration is here given (Fig. 4) of a tree that has done badly. It is that of a King of the Pippins variety, and had been

planted something under twenty years when the photo was taken. Its poor growth, together with the failure of many more of the same variety, planted at the same time, goes to show that it was not a proper variety to suit the soil. Out of a good many planted there are only a very few now left standing. There are about three or four better trees than this, but not one good one; about from 80 to 90 per cent. of them did so badly that they were grubbed up, and only these few left to see what they would come to, but the longer they stand the worse they appear to get, although they occasionally bear a lot of fruit for their size and vigour, which last is very low, as may be seen. They are very tender as to soil. The land on which this tree stands has had a very liberal treatment, as to culture and manure, for many years. As there was a crop of other fruit, under the trees, these things had to be attended to. All the trees were fine, healthy-looking, well-grown trees when planted, with six feet stems

and nice-looking heads; all looked very promising at the time of planting: and they fruited heavily the second summer from planting; but they began to get sickly and diseased after three or four years, and they continued to get worse as time went on. Among the varieties the "Cellini" was the worst. Only one tree remains out of them all of that variety. The number was considerable, and that tree is too ridiculously bad to put before the world. It has a stem six feet high, and it has one bough on it about two feet long. That is all except a few short stumps which will not grow, for it was cut back to get rid of the dead and dying limbs, in hopes it would put forth fresh growth, but it never has, and there it stands, a monument of stagnation. All the others have been removed. They had no roothold in the ground. The roots of many of them when grubbed up were not as good as when planted, many of them having died completely. They were cankered and done for, the canker disease

having run quite down the centre of the tree to the roots, as could be seen when cut asunder, the wood being discoloured and dead in the middle of the trees all the way down. The "Loddington" was as bad, and all the trees of it are quite gone. The varieties that at present seem to do the best are Lemon Pippins and Wellingtons. The Pippins stand first. They have grown almost all the time, although there was a time in which the tips of the branches died off too much to be good. The Wellingtons are now growing, and some others; but it is no use to particularise every variety here. There is no doubt there was more than one cause operating for the bad when they were planted. Bad stocks, wrong varieties, and too large at planting; either of which would work harm, but when all three come together, as in this case, then nothing but failure can be expected. As to wrong stocks this seems to be one cause of the failure, for other trees planted on the exact same spots as the dead ones occupied, being propagated on the Crab stock, are growing healthy and strong as they should. But it must be said that they were quite young at the time of planting which is another point in their favour. The varieties are more hardy, and consequently more suited to the clay soil. Therefore these last planted trees have all three points in their favour instead of against, as was the case with the first planting. All this makes a wide difference in total, but not such difference as would be generally noticed, and what is more, the differences are not such as are popularly accepted as good. The reverse is generally sought for, as persons generally like to see good large trees when planted, and will give more for large than small young trees, and as to varieties, the finest and most handsome are most sought for, regardless of other points, and as to the stocks upon which they are propagated, it is seldom the purchaser knows anything about it, but the nurseryman knows very well that those propagated on the free stock will grow faster in the nursery, and so make finer-looking trees to get out quickly, and as they come easier and please the customer better, there is every temptation for him to use them.

Now as these points should be accurately known by the planter to whose hand the work is entrusted, it follows that one who does not know much about them is very likely to go wrong. And his work proves his knowledge. It is true that all must have a learning, and no school is so good as that of practical experience, but it takes years of life and close observation to learn it out so. There should

not be any need of this if a man can be found whose good work proves his knowledge. They are not plentiful, but there are some; but proof lies in the management of the work that has been entrusted to their hands. Had all these points been known to those who had the management of these orchards, it would have amounted almost to a criminality to have planted them so. Evidently they were not known, and so the blame is less, although



FIG. 4.

those who do wrong from want of knowledge have to suffer just the same as those who do wrong wilfully. The laws of nature are inexorable: they put nothing to the account of intention. If an evil is committed it is done, and the penalty must be paid just the same as if done with the most wicked intent.

It will be seen that the specimen in the photo is in a very bad way. The tips of the branches are dead; the tree has grown but very little indeed; the body is unhealthy, rough and ragged; the bark has none of that

smooth green and glossy appearance which belongs to healthy, strong-growing trees: it is flaky and rough, although it has been dressed with lime and other washes to keep it right; but such things in such cases are no good. The fault lies at the root. It has scarcely any rooting in all these years; it is easily swayed to and fro by the hand, and it could almost be pulled up by the roots, even after all these years of standing there, having received more than a usual amount of manure and culture. The weakness is inherent, as was pointed out in the paper on stocks. It is not the fault of the land, as it stands on good mould of two feet deep, resting on a good friable clay subsoil, and is well drained. Some young Bismarck trees, some Duke of Devonshire and some others are close to it and are doing very well, a specimen of which may appear in the next paper. It would appear that these varieties are hardier or more suited to the soil. But, as before said, they were planted young and on the Crab and the Paradise stocks. The newly-planted trees, only having been in the land a few years, are going by the old trees very fast. There is evidently something which is operating very decidedly, and it can be nothing else more or less than the causes stated, namely, more proper stocks, younger at planting time, and better suitability to soil, which last is not a small matter, as there are some Mr. Gladstones, Stirling Castle trees and one or two others which do not grow so well as the Bismarcks and Duke of Devonshires.

Altogether, the orchard spoken of is a most excellent object lesson. It shows many instances of varieties which are suitable and unsuitable to soil, and it is from such instances that knowledge should be gained. It serves to guide in other operations. But these orchards referred to are by no means singular exceptions, they are only fair samples of thousands more throughout the country. No better proof of this can be found than by a perusal of the little book *Wasted Orchards*. It gives a graphic description of the state of the orchards in twenty-four of the best orchard counties of England. It was their wretched plight that caused the Wool Hope Club to look into the matter in Hereford, and resulted in the book *The Herefordshire Pomona* with a measure of merit, and highly esteemed by some. It is very costly on account of the many coloured plates in it, which some admire. Such disaster almost invariably follows the three faults named—bad stocks, planting large trees and bad selection of varieties.

(To be continued.)

ANSWERS TO CORRESPONDENTS.

TWILIGHT CIRCLE.

A. H.—The oldest and most experienced of God's children have to fight against the tendency to wandering thoughts both in public and private prayer and other devotional exercises. We all need to ask our Father to pardon "the iniquity of our holy things." Does it not seem strange that a sense of mere good manners will restrain us, in our intercourse with human friends, from the carelessness and absent-mindedness which too often accompany us when we profess to enter the more immediate presence of God? We look towards those whom we address and listen for their reply. If we ask a favour, we wait eagerly for the answer, stirred, as the case may be, by hope or fear. We are generally in earnest in dealing with our earthly friends, because, if we ask them for anything, we really want it. Look into your own heart, dear girl, and ask yourself whether you really long to be heard and answered when you go to make known your requests unto God. By your own confession, you are unable to say your prayers without finding yourself "thinking of all kinds of things that have no connection with them." Yet your letter shows that you do wish for real communion with your Father-God, instead of the poor lip-service you so constantly offer. The

"saying of prayers" is far from being real prayer. You have already found out this much. There is more true prayer in your simple words, "Help me to overcome this temptation. I do so want to be able to say my prayers properly," than in any number of formal sentences with the uttering of which the heart has nothing to do. Did you ever read and enter into the meaning of that beautiful hymn on prayer by Montgomery, which is to be found in most hymn-books, and begins—

"Prayer is the soul's sincere desire,
Uttered or unexpressed;
The motion of a hidden fire,
That trembles in the breast.
Prayer is the burden of a sigh,
The falling of a tear,
The upward glancing of an eye,
When none but God is near."

These verses will just illustrate what I meant in the words that preceded them. Read the hymn and ask with all your heart, "Lord, teach me how to pray." We want, not merely words, but the spirit of prayer and of longing to be, as it were, in touch with God by means of it. We need to feel and mean every word we say, and to want what we ask for. If we do these, there will be

no wandering minds, no mere lip-service, no forgetting that we have asked for anything, but a looking for the answer, yet in a spirit of submission to God's will. Lastly, long prayers have no special merit. The poor publican's prayer was only, "God be merciful to me a sinner," but he went to his house a happy man. The Pharisees made long prayers for a pretence, and so received condemnation instead of comfort and blessing. The Wise Preacher in Ecclesiastes gives these inspired words, "Be not rash with thy mouth, and let not thine heart be hasty to utter anything"—or "a word"—"before God: for God is in heaven, and thou upon earth: therefore let thy words be few." I have written at much greater length on this subject than I meant to do in answer to your letter, which was alike short and to the point. In replying to you, I am also responding to the requests of several other correspondents who wished for something to be said about prayer. I do trust this letter may be helpful to you all, for, quoting again from the hymn I have named—

"Prayer is the Christian's vital breath,"

it is the way by which we approach God to seek comfort, guidance, pardon, new strength—in short, all that we want, and that He, in His great love, is more than willing to give us for Jesus' sake.

obvious, but the purpose of poetry is not to describe a scene in detail, but to depict it in broad and telling outline. However, puzzle solvers are so accustomed to strict accuracy that we accepted "laid" instead of *flayed* whenever the solver explained why the f was omitted. On the other hand, we could not regard "pile" as being equal with *pyre*, for the drawing was quite distinct.

Most of the solvers grasped the idea of repentance or remorse from the mysterious picture in line 11. A few, however, merely drew upon their imagination for a fitting word or phrase, as, for instance, "such bitter." Needless to say, we could not pass any reading, however sensible, that did not find some justification in the picture.

A few competitors spoiled their chances of success by introducing short lines, principally at the fourth and ninth, *e.g.*,

"This simple, young, and country maid,"

and

"Dear Joan, both nations were to blame."

Is it possible that they did not see the famous Sonnet Puzzle of a few years ago, beginning—

"A sonnet must consist of fourteen lines,
And every line must have of feet just ten"?

If so, the folly of being only partially acquainted with THE GIRL'S OWN PAPER becomes clearly apparent.

By the way, as to the ninth line, some alternative solutions were offered which were entirely satisfactory, but many others failed to account for the devout attitude of the maid.

Others again grasped the idea, but unwarrantably transposed the words—

"This simple, young, and pious country maid."

It was a pious maid who was depicted, and not a pious country!

Taking it all round, this puzzle may be characterised as one of the most difficult of the series. Imagine our astonishment then at finding an admirable and nearly perfect solution from a child, aged eight years! To crown it, the lines were indented correctly, whereas many of the most expert solvers broke down on this point. It can hardly be indiscreet to say that such a solution could not have been as a whole, or in any great measure, the work of so young a child. Now, we have never stipulated that each solution should be the unaided work of the sender, but, while our new conditions are in force, we strongly hold the opinion that no girl should receive help from an adult. We are confident that our readers will appreciate the fairness of this restriction, and will see to it that it is honourably enforced.

FOREIGN AWARDS.

SUNDROPS.

Prize Winners.

Elsie V. Davies, Wheatland Road, Malvern, Victoria, Australia.

Annie C. Duguid, Stellenbosch, Cape Colony.

Anna I. Hood, Wimille, Pas de Calais, France.

Very Highly Commended.

Elizabeth M. Lang (France), Polly Lawrence (Barbados), Mrs. Manners (India), James Scott (Belgium).

Highly Commended.

Mrs. Fred. Christian (Bengal), Ethel Bevan (Ceylon), Nellie M. Dartford (Portugal), Mrs. S. F. Moore (Australia), Mary Pullen (Italy), Mrs. Sprigg (Cape Colony), Annie G. Taylor (Brisbaue).

FIVE O'CLOCK IN THE MORNING.

Prize Winners (Half-a-Guinea Each).

M. R. Laurie, Strathclyde, Barbados, B.V.I. Mrs. H. Ogilvie, Bolareen, Deccan, India.

Very Highly Commended.

Elsie Binns (U.S.A.), Mrs. Fred. Christian (India), J. J. Coulthard* (Shanghai), Nellie M. Dartford (Portugal), Fontilla Greaves (Barbados), Anna I. Hood (France), Agnes L. Lewis (Switzerland), Mrs. E. B. Manners (India), Mrs. Sprigg (Cape Colony), Gladys Wilding (New Zealand).

Highly Commended.

Lillian Dobson (Australia), Mrs. A. E. Jones (Hungary), Mina Knop (India), Elizabeth M. Lang (France), Mrs. G. Marrett (India), Nellie B. Muir (Cape Colony), James Scott (Belgium).

* Very glad to hear from you again.—ED.

HOW TO GROW APPLES AND PEARS.

By B. WELLS, F.R.H.S.

PART V.

VARIETIES AND LAND—continued.



THE last paper treated of unsuitable varieties and the result. This one shows a photo of a young tree that appears to be a suitable variety, for it has grown where the others have gone to decay.

But this is only one variety out of more; among which is the Beauty of Bath, the Prince Bismarck, and others. But it would be of no use to enumerate the varieties that are unsuitable and suitable for this particular spot of land; since another spot of land would very likely require quite another variety, as land is so very variable. It is perhaps only by actual experiment with a few trees that it would be quite safe to invest in large quantities of any variety to the district without a practical knowledge of those which would suit and those which would not suit the soil. For instance, there is a district in Charlwood Parish, in Surrey, where the Winter Queening grows well and with extra luxuriance, while there is another spot in Ifield Parish, in Sussex, in which it does not appear to do nearly so well, although the land in Ifield would be set down, by a general observation of the soil and the growth of the forest trees on it, to be better land than Charlwood, and should therefore produce better Winter Queening trees than the Charlwood land. But so far as observation has gone, it has not been so. It is true that more trials might reveal something more, but, exclusive of that, the

best trees of the Winter Queening grow on the Charlwood land. This shows the need of close observation and the safety of experimentation for guidance in the selection of varieties to suit soils. The highest art in fruit-growing does not always consist in the selection of land on which to grow the fruit, but in the selection of varieties to suit the land which is in the power of a planter to plant. The desired land is not always to be had, while in many cases there is land in hand that would grow fruit profitably if the right sort and varieties are selected; and commercial fruit-growing does not consist in the production of any particular fruit so much as it does in the production of that which is profitable. It is the profits that commercial men or planters are seeking for, and that alone, although in the case of planting gardens for home consumption, it is a different thing, but even then it is useless to attempt to grow that which will not grow; it would only result in vexation.

Now for a very little bit of personality. When I was a young man fifty years ago, I used to sit and hear a lot of old farmers talk about crops, and what would suit their own particular soils. One would say, "Oh, yes! You can grow Taleveria wheat, but my land is best suited to Golden Drop; that is the sort I can make most out of." Another would say, "My land will grow white Scotch oats, and grow a good sample too, but I know your land will not begin to grow such a sample as I can grow," and more particular was this difference in land observable in the production of malting barley, and is so to-day. And so with almost every crop that land is made to produce. I know I thought this all a lot of rubbish, and that these illiterate dunces had a

lot of fads, and liked to hear themselves talk about the peculiarities of their land. For to all outward appearance the land seemed much alike, and I thought the chief difference in the productiveness of the land was more to be found in the manner of culture, and there is no doubt that there is a difference to be made in that line. I then thought it made perhaps all the difference, and so I set them down as a lot of gibbering dullards, even as so many inexperienced persons are apt to set down illiterate persons just because they cannot write their own name. So youth and inexperience is too often apt to value apparently ignorant age and experience. But I have learned something else since then. I have had time to think and observe. And I now know that many of those apparently ignorant men were shrewd, and keen observers of what they are about. They took great notice of the growth of their crops as they walked over their land, perhaps more than they would have done if they had been literary men. Not having to think about much else than the work in hand, the native energies of their minds were wholly concentrated on the one thing in hand, and they learned it well. Literary training does not produce native brain power; it may and does polish and expand intellects, and so gives increase of knowledge, but native acumen is a born force, and many of these despised veterans of "ye olden time" had as good brain force as a good many of the moderns, and they were keen enough to observe the difference in the producing powers of their lands, and what crops suited their soils. I have learned a little of this since. And such keen observation is quite as necessary in fruit-growing, and more so, as in corn-growing. It is always best to take hold of

the smooth end of the stick to beat the dog with! It makes much of the difference between success of failure. The only chance to exercise such observation, and gain the knowledge it can impart, is to have practice, and that extensively. I have had some of this since I propagated my first tree, now near fifty years ago, although it now stands within a hundred yards of where I write. Since then I have seen a good many trees, both on this side of the Atlantic, and the other; and I have had the chance to learn that the selection of varieties to suit soils is quite as important as the selection of land to plant, and perhaps more so. Therefore I would teach this: be careful in the selection. I have treated somewhat of this in *Fruit-Growing*, which Mr. Buchanan so favourably noticed in the "G. O. P." of March, 1898 (I wish I could write like him), but it may be written again that a good way to choose what varieties to plant, is to carefully take stock of the land to be planted by a thorough examination of the subsoil, whether it be clay, gravel, or anything else, and set it down that such land as will grow good oaks will as a rule grow good apples; but it must be borne in mind that some varieties, as Cox's Orange Pippin, Lord Suffield, and many others, will not grow on cold wet clays, nor should strong-growing varieties be planted on rich light soils where very strong elms grow, because they will grow so fast to wood that there will be but very little fruit for many years to come, and another thing is that the trees on such land are apt to cease growing rather suddenly, and to begin to age before they have done what fruiting they should do. Therefore it will be a good way to plant more dwarf-growing and prolific varieties there, such as the Domino, the old Hawthornden, and some others which in clay ground will scarcely grow at all. By such judicious selection the forces of the different

lands may be equalised with good results. It is quite an impossibility to write here a prescription for the planting of all soils, but just a few broad lines may serve to roughly guide to a few ideas, showing the need of good



FIG. 5.

selections, guided by experience. A good way is to notice what varieties grow well in the district to be planted, and to select something of the same kind of variety, and then to consider the requirements of the markets or

home use of the fruit, and plant as near as possible accordingly.

The illustration shows a photo of a young Duke of Devonshire apple tree (Fig. 5), planted in one of the failing orchards mentioned two papers back. The failures were noticed in the last paper with a suitable photo. This is to show the difference between the failure and success. The contrast is very great, as one may see. They were growing within sixty feet of each other at the time the photographs were taken. The failure tree has been planted more than twice the time of the success here shown. It speaks for itself, but a point or two may be noticed. It is plain that the shoots on the young branches are nearly a yard long. The points of growth are easily seen, as on the young shoots there are only leaves, while on that of the year before there is a thick cluster of leaves, and some young side shoots as well. This is something like good growth, and it will not take many years for the tree to be twenty feet high. It has been planted since 1890, and at the time was no thicker than one's little finger, and about a yard high. There are hundreds more now as good in the same orchard, and had the first planting done as well as this, there would have been a great deal of difference in its present value. That there is a great difference in growth is evident. There is a cause or causes for this, and this is the secret to know, as it makes a difference to the profits, and that very great. This tree is healthy as may be seen. Its head is growing, and its roots are strong in the land. This cannot be wiggled in the ground as the other, nor could a horse well draw it out, which would be easy with the other. The secret lies in the roots, and this is by reason of planting a young tree of the right variety.

(To be continued.)

MORE ABOUT PEGGY.

By Mrs. GEORGE DE HORNE VAIZEY.

CHAPTER XX.



WO days before Eunice was expected at Yew Hedge, Peg was summoned from the garden to receive a mysterious visitor, and stared in bewilderment to see Rosalind herself awaiting in the drawing-room. No one else was present, and in the very

moment of entering Peggy realised that the news which she had expected so long was an accomplished fact. There was suppressed excitement in Rosalind's manner, an embarrassment in her glance, which told their own tale; and the kiss of greeting had hardly been exchanged before she was stammering out—

"Mariquita, I came—I wanted to tell

you myself—I thought you ought to know——"

"That you are engaged to Lord Everscourt!" said Peggy, with one last pang for the memory of Arthur's loss, but keeping her hand still linked in Rosalind's, in remembrance of her promise to that dear brother. "I have been expecting it, Rosalind, and am not at all surprised. I told you, you remember, that it was bound to happen. I congratulate you, and wish you every happiness."

"Thank you," said Rosalind meekly; so meekly that the other raised her eyes in astonishment, to see whether the expression emphasised or contradicted so unusual a tone. The lovely face looked down into hers, wistful and quivering, and the blue eyes softened with tears. "Oh, kiss me, Peggy!" she cried. "Be kind to me! I have no sister of my own, and mother is away, and I came to you first of all! I made an excuse and came down for two nights, just to have a talk with you and to ask you to help me!"

"Help you!" echoed Peggy blankly. She was alternately amazed and embarrassed by the manner in which Rosalind leant upon her in every difficulty, but now, as ever, the spell of the winsome presence proved irresistibly softening, and it was in a far gentler tone that she continued. "If everything is settled, in what way do you want my help, Rosalind?"

Rosalind sat down upon the sofa, still retaining her grip of her friend's hand, and drawing her down on the seat by her own. She stared aimlessly up and down the room, opening her lips as if about to speak, and closing them again in despair of expressing her thoughts, until suddenly the words came out in a breathless rush.

"I promised to mawwy him and I mean to keep my word, but it is harder than I thought. It would be easier if he were different, but he loves me so much, and believes in me, and thinks I must care for him too. If he knew I had taken him for his position, he would

HOW TO GROW APPLES AND PEARS.

PART VI.

PRUNING.

OF all the operations in the management of fruit-trees, there is none upon which a greater variety of opinion is held among those who profess to know all about the work than this. If the teaching of all professors is taken as correct, it reduces the knowledge appertaining to it to a chaotic confusion. The teaching of some is in direct opposition to that of others. For one says all the young outside shoots should be cut off as hurtful to the tree, while another says it does irreparable damage to cut them. One will say that the roots of all trees should be pruned to induce fertility, and another will say that to cut the roots will tend to kill the tree. One will go into an orchard with bill-hook and saw, and slash away, apparently desirous to get a pile of wood to burn, while another will take the greatest care that no main limbs are injured at all. There are all these opposing differences, with many others which would be enough to puzzle a lawyer.

Now, it must be evident that such opposite teaching so indiscriminately given without proper limits cannot be very instructive in the way pruning should be done. There is no doubt there is virtue and truth in all these methods, but they need separation to be applied according to the varied circumstances of each case for operation. And the truth seems that very little real knowledge exists as to what is proper according to the nature of the trees to be operated upon. Therefore it becomes necessary to carefully observe the growth of trees generally, and extract all the knowledge that can be gained from close scrutiny. To begin with, a little botanical study may be helpful so as to get at the true principles of growth, as a knowledge of that is very essential. For example, the study of the physical growth of the "growing point" of the branches, and the growth of the side buds into branches and fruit spurs, as has been slightly noticed in some of the early papers of this series; a re-reading of them at this point may be helpful.

If a student will take the trouble to go out into the garden or orchard, and closely examine the young growth of the trees, he will find a young bud at the base of every leaf in the axil of the leaf stem, even from the growing point, all the way down the branch to its base; this is, of course, when the leaves are growing. And he will observe, when the leaves have dropped and left a scar, that the bud will be left just above the scar. Then if these are examined again in the spring, just before the buds burst forth into leaf again, that the young shoots of the previous summer will have buds of different shapes and colour; some will be rather dark and pointed, while others will be more rounded and of a lighter colour. The first will grow into wood-buds, while the rounded grey ones will produce bloom, and grow into fruit-spurs. There are varying habits in varying sorts of apples, some producing but few fruit-buds, and these only on the tips of the young branches; but the first is the most general appearance. The young wood-buds, of course, produce young side-shoots, while the others produce fruit, and grow into fruit-spurs, bearing fruit for a short succession of years. The subject is a little intricate, and that is perhaps why so little is really known about it; but to know these intricacies and their purposes is to know the subject in hand. And to fully grasp the laws of their natural development is to grasp the key to the knowledge required in pruning. Drawings and photographs serve some purpose to teach, but they alone are not sufficient

to do it like the natural bough of the tree itself. And there is something to be learned all the year round in the varying phases of growth.

Next it will be observed that, when the trees are in full fruit, on all naturally grown standard trees the fruit is all on the outside, or chiefly so, and that it is on young wood, which all grows there too, in the sunlight where there is plenty of fresh air, and all that is on the inner branches is poor, undersized, uncoloured, flavourless fruit, and all the young growth there is weakly too. The best wood and fruit too are all on the top and outside of the tree. All this should teach a lesson on pruning, that all the central growth should be cut out, which is of no good, and that, as the best fruit grows on the young wood on the outside, all that wood should be carefully preserved and encouraged, and by no means should any of it be cut off, for it is the only fruitful part of the tree. But this is in exact opposition to the usual practice of garden pruners generally; they cut it off with the idea of, as they say, "throwing the strength of the growth into the buds at the base of the young shoots," as that is the place they

as shown. This is necessary in the formation of a dwarf tree, but should not be done if a standard is desired; it may then be left alone to grow upward. But as dwarf trees are most in request to plant between standards, they may be most noticed. The young tree B shows the same tree after the next summer's growth, after having been cut in the winter before as at A. It will be observed that the side buds have produced several young branches. These young branches may be cut again in the winter at the points D, which will again cause them to produce a greater number of young side-branches from the few buds left on cutting at D. A second pruning to shape may be made if desired, according to the vigour of the tree and whether the branches are strong and stout, or thin or slender or weakly. If strong and stout they may be left, or cut if thin and drooping. Trees vary in habit of growth, and this must be taken into account, also the nature of the soil and the time of year at planting. If late and a poor soil, it may be best to postpone the pruning entirely the first year of planting. In the case of weakly branches not inclined to grow, or others growing across others, these

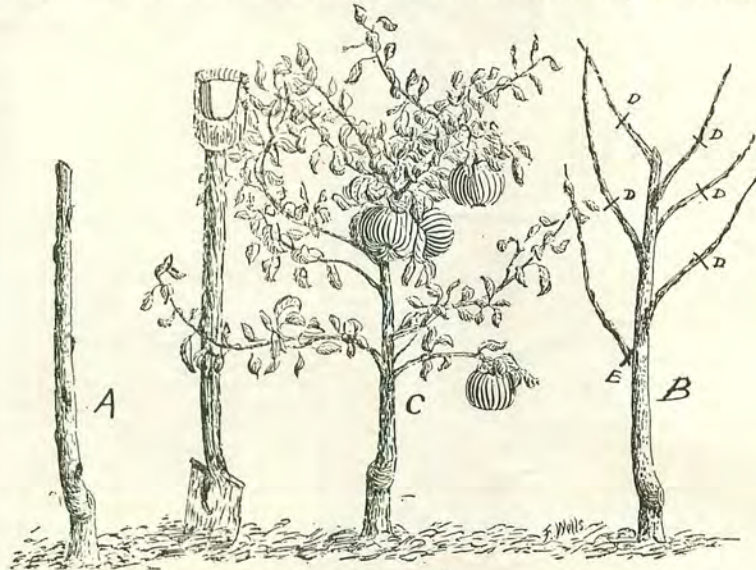


DIAGRAM 6.

intend that fruit-buds and spurs should form. To cut off the young shoots, as is usual, is to rob the tree of all its relay of young wood for its natural extension and support for the new relay of young fruit-buds and spurs, and, of course, render it more barren. All this may appear too simple to write, but simple as it is, it is too little observed, hence the want of that fundamental knowledge which is so essentially required in pruning. It may seem almost slightly declamatory, but it is not alone; the first-known apostle of this doctrine was the famous horticulturist, Mr. Shirley Hibberd, now deceased.

The above should point out that much care is needed in pruning. But as it is necessary that trees should assume such shapes as are convenient, it will be found necessary to prune them to induce such shapes. This may be done as follows, for dwarf trees. The diagram 6 represents three stages of growth in the same tree. The middle tree C is an exact drawing from nature, the spade being a measure of height and growth, or thickness of stem. The young tree A shows a tree of one year's growth, generally called a maiden tree, with the top cut off about eighteen inches above ground, and all the wood-buds upon it

may be cut away as not doing good. And in doing this the cut may be quite close to the stem to prevent young rushy growth from developing, and for the advantage of having the cut healed over the more quickly. A line at E shows the position of cut.

If trees are managed like this for three or four years, they will form graceful heads, with enough branches to hold a lot of fruit-bearing wood, which should be the aim. But after they have received the shape desired, they may be left almost alone, only taking care to keep the middle of the boughs clear of useless wood, ever remembering that the continual natural extension of young branches forms a continual relay of young fruit-bearing wood, which, if cut away, will continually retard that relay, and thwart the object for which the tree was planted, namely, to bear fruit. If kept cut back there will be a continual conflict between the tree and the pruner. The tree will continually throw out young branches at every cut, and the result will be a mop-headed tree without that full crop of fruit it should bear. An illustration of this may be reserved until the next paper.

B. WELLS, F.R.H.S.

(To be continued.)

HOW TO GROW APPLES AND PEARS.

By B. WELLS, F.R.H.S.

PART VII.

PRUNING—continued.

HAVING shortly treated of the proper way to shape and prune dwarf trees, the diagram (7) here given represents a verification of the statement in the last paragraph of the last paper, that a properly pruned tree will respond as desired, while the abused tree will continuously carry on a conflict with the pruner who abuses it.

Fig. A is a correct drawing from nature of a young Cox's orange-apple tree of about six years old, which was pruned to shape according to the method pointed out in the last paper. The point C is where the young tree was cut asunder in the first place, leaving the buds to form branches as before described in diagram 6. Here they are shown grown as they should be. The body and limbs have naturally become stouter, and developed the side branches, forming a beautiful head, well-balanced and open. It is much more handsome to see growing than any ordinary drawing or photograph can make it. Where this grows there are hundreds more of similar appearance. They were planted in 1894, being part of an orchard of ten acres. The drawing was made in 1898, so that in four years from planting, the progress is very good. The point D shows where the young branches were cut to cause them to spread out more thickly. Some of these trees in that very poor apple year of 1898 had a very fair crop of fruit, enough to pay for the cost of the tree at planting. But as it was such a poor time for the bloom in the spring of 1898, the crop on the whole was not good; but the fruits were good. The great danger is that when they do fruit, they may break down the limbs with the weight of fruit; but this must be attended to, by thinning the fruit in time, the same as with grapes, and so prevent the accident. The only pruning they will receive now will be just an occasional look over to cut out weakly central growth, or those which cross one another; in fact, the following out the teaching of Mr. Shirley Hibberd, before noticed. If this part of the orchard is well looked after with culture and manure, and the blooms do not get cut off too much by frost, it cannot fail to be a highly remunerative investment.

As the origin of these papers was the notice of fruit-growing for ladies, by Mr. Buchanan, in *THE GIRL'S OWN PAPER* of March 12th, 1898, it may not be amiss to state here that it was just such an idea which was the occasion of this planting. For it was to improve a small inheritance, and find profitable employment for three young sons, which is still carried out, having begun the matter in 1885, and now there are many acres of thriving young orchards on the land. And whatever it has done, it has held the family together, and perhaps saved from various misfortunes as well as acting as a continual ready savings bank, which appears likely to pay a heavy interest for outlay and energy. For what was in 1884 only poor unremunerative farming land is now (a lot of it) converted into thriving prosperous orchards, which can hardly fail in the near future to become very valuable, if proper care and culture is given to them. What one man can do, others can surely attempt.

Fig. B shows another picture. It is a diagrammatical sketch, as true to nature as possible, in making two phases on one tree. It is representative of many more similar trees in the same garden not a mile from the other picture A. It was planted about

twenty years ago in good land, and has had every attention of culture, manure, and pruning; nothing has been neglected, and so far as symmetry of growth is concerned, when the trees are in full foliage there is nothing to be desired, except fruit, to embellish the picture. It is what is called a Pyramid tree. The points E, E, E, show the first tipping of the young branches, and the points F, F, G, G, etc., show the continuation of the same process every year, which takes place about February. This has been done for many years all over the trees with great diligence; they now need a ladder to reach the top which makes it very laborious, and dangerous, but this difficulty has no deterrent effect. The assiduous care is persistent. The tipping of the outer growth of the tree is supposed to reduce the rank growth, and prevent the sap being wasted in the production of a useless overgrowth of rank wood, and to retain the sap to nourish the base of the branches, where the pruning is supposed to induce the production of fruit spurs. How it

produce hawberries, which is the natural fruit. The effort of the hedge is entirely absorbed in the production of young shoots, for the purpose of natural extension to bear fruit, which is its natural proclivity, but which it never can, on account of the clipping shears. If such a hedge is left alone, as is sometimes the case, it may be observed that it quickly grows up and spreads, after which it becomes fruitful according to its nature. It is exactly the same with regard to apple and other fruit trees; the continual pruning of the trees destroys the relay of young wood which should ripen into fruit-bearing wood, which being continually pruned it cannot. If left alone it would do so, and produce the fruit, in place of so much twig growth and leaves. The matter is simple enough, but it is not well observed, hence the evil pruning, and disaster of barren trees.

A considerable volume might be written on this head, but space is of importance, else many illustrations might be given of fruitful trees that have been observed. A short extract from my book *Fruit-Growing*, 1896,



DIAGRAM 7.

is that the error cannot be detected it is hard to say, for it is plain to see that the trees are continually making an effort to further extend their outward growth in a natural way, which being an impossibility, on account of the pruning, the only way remaining is to produce a thick growth of weakly young shoots, much more numerous than if left alone. This growth absorbs all the energies of the tree, making a dense growth of leaves and twigs on all its outside, completely shutting out all sun and air to the great injury of what little fruit is produced, which is chiefly on the inside, in the shade. This, of course, destroys all colour and fine flavour.

A number of trees set close together and treated in this manner would form an excellent hedge to break the wind from any bleak place, and damson trees are sometimes so planted for the purpose. But for fruit it is thoroughly destructive. In fact, a good illustration of such treatment is to be found in every well-kept common hawthorn hedge, being regularly trimmed to shape once or twice a year. A hedge of this description is never seen to

may not be amiss; it is that of "a small orchard where the trees have never been pruned at all: in this instance the boughs grow from the bottom of the trees, quite up in a wild manner, they look rough and uncomely, but the boughs are often borne quite down to the ground, heavily laden with fruit: in 1895 the boughs lay along the grass around the trees with lumps of fruit piled up on one another; the picture was quite unique." The sketches of some of these trees are very interesting, as showing the success of the non-pruning system for several years past in this orchard. The management of it was by simple observation alone, without any outward teaching. It is situated about four miles from Crawley.

Now as a support of this teaching it may be good to recite a little from Mr. Shirley Hibberd's teaching, as found in the *Journal of the R.H.S. of 1888: British Apples*, now out of print. It is from a paper he was called upon to prepare and read before the great apple and pear conference at Chiswick in 1888. At which time he stood up in his place to declare before the world, through the most

learned horticulturists there assembled, that the pruning-knife was a deadly enemy to apple and pear trees. He said: "We begin with standard orchard trees that bear abundantly, as many orchard trees do. It will be observed that pruning neither augments the vigour of these trees nor does it promote their fruitfulness, for, as generally speaking they are not pruned at all, they teach a bold lesson of the non-necessity of pruning." Then

follows a word picture of "Pyramids," similar to the one above. Again: "Pursuing the comparison, it will be observed that pruning tends to produce secondary growth, which is often immature when the season closes. This growth therefore has been obtained by a false system, and its uselessness is a proper commentary on the violence done to nature. . . . The free bushes that are not pruned at all, or but moderately pruned, are as a rule vastly more

prolific than the pyramids, and the free standards are more fruitful than either." "Fruitfulness is in exact inverse ratio of pruning." "The pruning-knife is a deadly enemy to apples and pears." He writes in 1876, "I had the honour of reading before the Society of Arts a paper on the fallacies in fruit culture," and "exposed myself to what I may now recall as a shower of hot shot," etc.

(To be continued.)

A MIDNIGHT VISITATION.

By W. M. WILCOX.



THE Rev. William Stone stood with his back to his study fire, gazing reflectively at something which lay upon his writing-table. Though his sixty blameless years had left their mark in the bent frame and white hair,

if his labours had not been altogether in vain, as if there were some who really appreciated his efforts, and were glad to have him among them. As he looked on the massive and beautifully chased gold paten and chalice reposing on a bed of blue velvet, which had formed the subject of the presentation, his pleasure in being the recipient of such a gift was subordinate to the joy of the thought that it had taken the form of something to be used in the service of his Father—that it was also a gift to God; and as his mind dwelt on various names that had appeared in the long list of subscribers—names that he had never thought to see in such a connection—a great wave of thankfulness swept over him for this sign that the seed which he had endeavoured to sow was bearing fruit in unexpected places.

As the clock on the mantelpiece chimed the quarter past the hour of eleven, his reverie was suddenly broken by the noise of the front door bell. It was quite usual, however, for the bell to be rung at all hours of the day and night, and therefore the sound occasioned the Vicar no surprise. He waited a moment or two, and then, rightly surmising that his servants had retired to rest, proceeded into the hall, unlocked and unbolted the front door and threw it open.

The hall light fell on a figure standing on the doorstep—a figure of a man clad in the rough clothes of the labourer, his face almost entirely hidden by a thick muffler drawn across the mouth, and a peaked cap pulled down over the brow.

"Well, my man," said the Vicar pleasantly, "what can I do for you?"

The other raised his hand, and with a tug at the muffler partially removed it from his mouth.

"T' parson?" he muttered in a hoarse whisper. The Vicar was aware of a sickening odour of spirits and a strong feeling of aversion.

"Yes," he answered.

"There's a bloke down Weston way, took awful bad quite sudden-like. T' doctor 'e ses as 'ow 'e's a goner, can't last till t' mornin', an' as I 'appened to be a-going to pass 'ere, 'e sed would I arsk yer if yer'd come an' bring them things fer—fer—"

"You mean the poor fellow wishes to receive the Sacrament before—"

"That's it!" put in the man quite eagerly, evidently relieved that he should have been so readily understood.

"Of course I'll come," said the Vicar kindly, his great compassion overcoming his recent feeling of repulsion. "I'll be ready in about ten minutes, and then you can show—"

"I ain't a-goin' that way," interrupted the other sulkily.

"Oh, you don't live there too. Well, where shall I find the sick man?"

"Number fower, Common Cottages," said

the man, making an evident effort to speak distinctly.

"Common Cottages?" queried the Vicar. "Where are they?"

"Them new 'ouses t'other side o' t' Weston Common," explained the man.

"Right down there," said the Vicar with a suspicion of a sigh. "I didn't know anyone was living there. Well, my man, I'll be there as quickly as I can. Good night!"

"Night!" said the man as he moved away.

The clergyman closed the door and proceeded to busy himself with preparations for his expedition. It was approaching twelve o'clock, and the place indicated was situated at the furthest extremity of his parish. Moreover there were every sign of a dirty night; but William Stone, though it was not within the limits of human nature to refrain from thinking with regret of the repose which must now be indefinitely postponed, had always put his own personal convenience last where the welfare or happiness of anyone among his parishioners was concerned.

The necessities for the solemn service he was called upon to perform were soon complete, and the Vicar, having exchanged his slippers for a pair of thick boots, and donned a warm overcoat and scarf, was about to open the drawer where he kept the Communion set he had hitherto been accustomed to use in cases of this kind, when his eyes suddenly fell on the presentation gift. Surely here was a fitting occasion, on the very night of the presentation, to dedicate it to the Lord's service. No thought of the danger of carrying articles of such value about with him by night through such a district entered his head. It seemed to him that it would be the wish of those who had given him this beautiful thing that he should take it to-night, that the opportunity had been vouchsafed to him to bring into immediate use this mark of his people's love.

He carefully closed the morocco case and slipped it into his coat-pocket. Then, taking an umbrella out of the rack, he opened the door and stepped forth into the night.

There was no moon, but occasionally a star peeped out for one moment, only to be hidden the next by the thick masses of clouds that rolled across the heavens in rapid succession, flying headlong before the pursuing wind.

An icy blast struck the solitary traveller as he turned a corner, causing him to pull up the velvet collar of his overcoat more closely round his throat. Half an hour's brisk walking brought him to the portion of his parish known as Weston, and threading his way down a narrow street of workmen's cottages, from which here and there a dim light struggled feebly, he found himself on the borders of the common—a dark, dreary, ominous piece of waste ground.

Just the place for some secret deed of bloodshed or violence! Few would care to

though the last twenty, spent in a squalid and mostly unproductive vineyard, had furrowed the once rounded cheeks and noble brow with the lines of anxiety and disappointment, the clergyman's face still preserved the expression of a little child, his perfect trust and faith in Him Whose servant he was having stamped for all time on his countenance that look of confiding innocence with which we all come into the world, but which, alas! so many of us lose after coming in contact with the jagged corners of life.

As he gazed on the object, glittering in dazzling beauty on the table before him, he mentally reviewed the chief incidents of his twenty years' ministry in the poverty-stricken parish over which he had been placed, incidents which seemed to have their culminating point in the presentation of that evening.

Since the day when he had taken over the charge of this district, which lay like a huge parasite on the outskirts of one of the largest of our midland towns, his life seemed to have been made up of alternations between hope and disappointment, of which, however, the latter appeared to loom the biggest. He called to mind his fervent prayers at the outset that his ministry might be blessed, his despair when after five years he seemed to have done so little; then with a feeling akin to shame, he remembered a period when his disappointments seemed to have almost, as it were, swamped his faith, when he wondered whether it was any good going on with it at all. That was a terrible time, when he broke down in body as well as spirit, but it appeared to him afterwards in the light of a blessing, for after a rest he had returned to his labours with renewed vigour and—thank God!—with doubly-renewed faith; and now it seemed as

HOW TO GROW APPLES AND PEARS.

By B. WELLS, F.R.H.S.

PART VIII.

RENOVATING ORCHARDS.

OF all the thousands of acres of orchards in England there are but a very few worthy of the name. Whatever may have been the state of orchard culture in years gone by, they are in a degenerate state now. Go into any county one will, and keep an eye on the orchards, this conviction is forced home, "the glory is departed." And what is worse is that enterprise seems almost entirely wanting to renovate or plant new! When a fitful effort is made, the ignorance of the principles of growth is so lamentably apparent that it can only be likened to a thick agglomeration of darkness which seems likely to for ever keep out the light of research. By what encouragement one gets, the effort to penetrate this mass seems hopeless. When one goes to the greatest leading shows of the country regularly, as the Royal Agricultural, the Royal Counties, and others similar, there is almost no responsive inquiry from the landed interest, in reference to fruit, to encourage one in the effort to promote fruit-growing. It is true that now and then one will look at what is exhibited, and ask a few questions, especially now and then one from abroad, who sees an opening in the English markets for the sale of foreign produce, and are willing to supply the great demand, and now and then an old planter will walk around, and see what is to be seen; else the interest is almost *nil*.

No doubt a few nurserymen could be found who, by way of boasting of the trade they do, would say this is not so, but that their sale of trees is increasing by leaps and bounds. But in riding the country about from south to north, and from east to west, if a dispassionate view is taken of the millions of acres of grass, grass! grass!! and the few acres of corn, and the almost absence of orchards, the truth is then apparent. Leaving statistics alone, a guess from appearance would lead one to think that where there is one acre of orchard there must be at least ten thousand acres of land under poor grass and worse corn, which produce, not profits, as most farmers would say, but losses. And as to the state of the old orchards which want renovation, well, the least said perhaps the soonest mended.

It is true there is a spirit abroad against renovation of old orchards and the planting of new, and much argument is truthfully adduced in support, but the fact remains, apples are in demand.

Why is it the great midland pastures of the country are not covered with millions of acres of orchards, and all the old orchards of the

country renovated? The only reasonable answer that can be given is that those interested in land really do not know these things, or else they are culpably negligent. There is room for thousands of millions of apple trees that could be profitably planted in this country, and every old orchard that is not past remedy should be renovated, and made to produce its utmost. There is room for hundreds of millions of bushels more apples every year, if they were rightly treated. And it would be a very long time indeed before their production became unremunerative.

treated of in *Fruit-Growing*. These great orchards are famous both for age and size; they are in the Sussex Weald.

The illustration is that of an old Caldwell apple tree in my garden. It is from fifty to one hundred years old, is twenty-seven feet in spread, is twenty feet high, and thirty-seven inches round the body. It had been much neglected, but as it bore a good lot of fruit in 1893, being ten bushels, it seemed worthy of care. It was therefore pruned, dressed with lime-wash to kill the lichen, and the land was dug about it and manured. It responded with



Diagram 8.

The way the orchards at Lower Beeding are managed is, that when they appear to require it by showing stagnation, they are ploughed up under the trees, fallowed, manured, sown with some green crop to be consumed by sheep on the ground, which are cake or corn fed; the trees are pruned and lime washed, and then after about two years like this, the land is again sown with fine grass seeds, and left for pasture for a time, and it is wonderful how the trees respond to this treatment. They are entirely renovated, and become fruitful and growing. This is more fully

eleven bushels of fine fruit in 1895, and now looks prosperous, bearing good crops, and is growing. This is only a sample of several others in the same garden.

Such old trees require similar treatment, and they would pay well for it. An acre of such trees containing sixty trees of such fruit, which sold for six shillings per bushel, would amount to £180 per acre on a good year, such as those which occurred so close. There are close on sixty pieces of land of twenty-seven feet square in an acre.

(To be continued.)

VARIETIES.

A LITTLE WOMAN.—In a Birmingham churchyard is buried Nanetta Stocker, a midget, who died in 1819, aged thirty-nine years. The epitaph concludes: "The smallest woman ever in this kingdom, possessed with every accomplishment, only 33 inches high; a native of Austria."

IN ANGER AND GRIEF.—Consider how much more you often suffer from your anger and grief than from those very things for which you are angry and grieved.

LUCKY AND UNLUCKY.—"Our outward fortune, lucky or what is called unlucky, we cannot command; but we *can* command our own behaviour under it, and we do either wisely or unwisely; and *that* in real truth makes *all* the difference, and does in reality stamp us as either 'lucky' or else 'unlucky.' For there is nobody but she that acts foolishly and *wrong* that can in the end be called 'unlucky'; she that acts wisely and *right* is before all mortals to be accounted 'lucky,' she and no other than she."—*Carlyle*.

HAVE COURAGE TO BE HAPPY.—How many people I have seen, writes Théophile Gautier, who would have plucked cannon-balls out of the muzzles of guns with their bare hands and yet had not the courage to be happy!

WAIT TILL THEY DRINK IT ALL.

Mistress (to newly-engaged servant): "Mary, have you given the goldfish any fresh water?"

Maid: "No, mem; they haven't drunk all as they've got."

clothes till a siege you had nothing to do with was raised, or a battle you couldn't influence was fought, but I do think Sir Walter Manny, Queen Philippa's young page, may have found it a spur to his courage when he swore to wear a black patch over his eye till he had proved himself a brave soldier, for if ever he was tempted to be a coward, that little sign would shame him."

"I daresay it was very becoming!" said mischievous Kitty. "Patches are very fetching in old pictures; much nicer than red wafers, Cynthia!"

"Well, I'm going to seal my forehead with a wafer," said Cynthia stoutly. "I'm going to Fisher's to get a box. And mind, you'll have to respect it, Kitty!"

"Oh, I'll respect it! I wonder how Frank would look with a little star of father's sticking-plaster above his left eyebrow! If it's a soldiery thing to do, he'll be sure to want to do it, and if I can hunt up the sticking-plaster I'll set him up with a stock this very night."

"You'd better find the plaster first! You've only a week."

"Oh, you'd wonder how things turn up if you only look in unlikely enough places!" said Kitty cheerfully. "You tidy people make the mistake of looking for things where they ought to be. But that reminds me, Cynthia; if it's really only a week till Frank comes back, I wish you'd help me to clear out the workshop. It's in an appalling mess! I don't mind a scrap for Francie, but there's that Colquhoun boy he's bringing with him. Anybody with a name like that—three whole letters wasted—must be rather fearsome. People shouldn't set traps with their surnames."

"If he's Francie's friend he must be nice."

"What's his first name?"

"Archie."

"H'm! that mends the matter a little. Archies are generally dear, good chaps; but, if he's the best that ever breathed, there's not an inch of room for him in the workshop till it's cleared."

"I'll help you," said Cynthia, with

rather a resigned sigh. She knew that workshop! "To-morrow is father's Torbridge day—would it do if I came in the afternoon?"

"Capitally. Come to lunch, Cynthia. I can promise you something to eat, if we've to make a raid on the larder for it!"

Cynthia thought the Terry picnics rather fun, but she was expected to lunch with Lady Considine, with several yards of table-cloth and a great array of flowers and glasses and silver between them. Grandmamma, perhaps because she was so old, always made Cynthia feel as if she were in pinafores, and didn't know how to hold her spoon, and she always talked "down," improvingly.

"I trust, when your dear brother comes, Cynthia, that he will not have any cause to be ashamed of you before his friend," she began with the pudding.

"I hope not," said Cynthia, rather hotly.

"Ah," said grandmamma, "that is just what I feared! Always impetuous, Cynthia! Thomas, you may put the sifted sugar on the table and leave the room. Frank is your senior by more than two years, and at his age young men begin to be very fastidious about the behaviour of their sisters. I *hope*"—but her tone belied her—"he will find you improved. Your manner to Francie's friend ought to blend politeness with reserve; but he will, of course, not expect to see much of a young girl who is still in the school-room. He is, I may tell you, a cadet of a very good house, with excellent prospects."

Cynthia felt too helpless to respond. And only yesterday she had been rejoicing that the hay was so early, that they might have some fun among the cocks! She went rather dejectedly to the rectory, where the task that awaited her was certainly somewhat herculean. The workshop was in a glorious state of confusion; thither had wandered all the articles that could not be accommodated in the house, or that were waiting for repair. There, too, neglected hobbies

found a refuge, until re-warmed enthusiasm took them up again.

"It is rather a disadvantage," said Kitty, poking a finger exploringly into a jam-pot which had once held some pond specimens, "to have to make one shed do as coal and bottle cellar and carpenter's shop and laboratory and attic; but, on the other hand, you do make such surprising discoveries of forgotten treasure! I've just found father's dumb-bells that he made sure were left behind."

The girls worked with a will, and presently Mrs. Terry came to them with two odd tumblers and a breakfast-cup on a tray, and in her hand a rare old Venetian flask. "It's only home-made lemonade, dears," she said; "but I'm sure all this dust must make you thirsty."

"Oh, motherie, that's good!" cried Kitty. "We could drink an ocean; but Cynthia declared we ought to act up to our wafers, even if we didn't put them on, and not let tea interrupt us till we had finished. But that meant going to the house, and washing and brushing, and all that. It ought to be different when lemonade comes to us, oughtn't it, Cynthia?"

The Rector presently burst in in search of his wife, but forgot what he came for, and sat swinging his legs from the carpenter's bench, and drinking turn about with Kitty out of the cup. Mrs. Terry had a packing-case to sit on, and a lump of coal for a footstool; the cushion Cynthia made for her back out of a bundle of shavings rather added to the litter, but they talked and laughed and told stories, till the Rector suddenly became grave and absent-eyed and said he must go back to his sermon. "Search diligently," he murmured as he went; "search—till ye find it."

And Cynthia wondered if it was his text he was thinking of, and hoped it might be so, for his sermons were full of a plain and practical wisdom that made religion seem very real.

She was glad that with these kind friends, at least, she did not need to "blend politeness with reserve!"

(To be continued.)

HOW TO GROW APPLES AND PEARS.

By B. WELLS, F.R.H.S.

PART IX.

VARIOUS ITEMS.

THE foregoing papers have been arranged and written under particular headings. It now becomes necessary to draw the subject to a close, but several items have not yet been touched, such as manuring, culture of various fruits, comparison of methods of planting, insect pests, and gathering, selection, and packing of fruit. These may be treated of in a condensed and mixed form, as so many able writers have treated very well of many of them, and the continuance of any subject beyond proper limits wearies general readers, and as well so many of the great principles of all fruit culture have been given in connection with the apple-tree, which is of the greatest

use and of the widest application, that it may be wise to so condense the remainder.

MANURING.

The whole art and science of manuring consists of putting into the soil such plant foods as are required, and which are not there in sufficient quantities. This is an essential principle. To place there what is not required or what is there already in superabundance, would be a waste of material, labour, and money; while to withhold that which is not there in sufficient quantities would occasion loss by the starvation and consequent stagnation of the plant, which, if judiciously applied, would put all requirements in train, resulting in healthy and remunerative growth. The problem is to find this matter out and apply

what is required. *E.g.*, if the soil contained every element necessary to the healthy growth of the tree except one, say lime, then the plant, although living and making a poor growth, would not grow well or healthily until lime was supplied. But if it could be ascertained what was required and a proper quantity was applied, then the progress would be altered in a degree almost wonderful to one not acquainted with the subject. Such cases do occur in practice, but it is not always lime that is deficient. It may be potash, or phosphorus, or some other mineral. The way some scientists proceed to find out is to manure different plots with different manures and watch the result. It takes time, but there is no way so sure. But this is the work of associations and colleges, rather than for

private enterprise. It has been done to a considerable extent, and in the majority of instances it has been discovered that potash, phosphorus, and lime are the elements most wanting, with but few cases where other elements are short. And some crops, specially cereals, require nitrogen, which is found in farmyard manure, nitrate of soda, and sulphate of ammonia; while all the pod-bearing crops, called "leguminous crops," are found to obtain them from the air in plenty, so that to use nitrogenous manures for this class of plants is quite a waste. The chief element of all nitrogenous manures or compounds being the nitrogen of the air, such should not be considered as mineral manure, but gaseous compounds, or, in short, gaseous elements in a line with carbon. Mineral

pound's worth of the minerals appears to do much more good than two pounds' worth of stable manure. This shows that trees require minerals more than nitrogen.

The first principles of the absorption of plant foods by roots and leaves is fairly well treated of in the early papers. It may be esteemed a great blessing to consider that trees require chiefly only such a small supply of food elements from human culture as are purely mineral in their nature, and that all the remainder, as carbon and nitrogen, are collected by them from the air, leaving but little to supply by labour, except a moderate culture to keep the ground stirred and clean. Carbon, nitrogen, and water come from the air free, and they form the chief supply of plant food as required by apple-trees. Thus

penny for the well-grown tree, while the culture could not have cost much. Therefore if such procedure was applied in breadth, in numbers, the result could hardly fail to be very remunerative. The same would apply to apples. It has done so at Crawley. But it must be noted that such knowledge is only obtained by care and time, which having been got, it should be considered good to use it.

METHODS OF PLANTING.

The leading idea of all commercial planting should be "profits." That method which promises these the quickest is plainly the one to choose. It has been proved that trees grow best on cultivated land. One instance is very conspicuous indeed; it is that of Glewstone Court, and it is said that there are eight and a half acres, containing 5,500 trees, planted at distances of six, eight and nine feet apart. They produced in 1895 765 pounds of fruit, within ten years of planting, which no doubt was enough to pay the entire costs of the orchard.

Now if the old method of planting trees of from fifteen to forty feet apart as recommended by Dr. Bull in his *Herefordshire Pomona* had been followed, *i.e.*, if they had been planted, say, twenty-five feet apart, they would have occupied near ninety acres, which in ten years would have required a very much larger sum than £765 to have paid the continuous costs of rent, tithes, taxes, and rates on it, to say nothing of culture and other costs of fencing round the trees, etc., which would have entirely done away with the opportunity of early profits, and so have thwarted the object of the work entirely.

Another acre at Crawley in 1898 has produced about ten pounds' worth of apples, and a good lot of gooseberries, besides a growth of young nursery trees between the permanently planted trees, which were only planted in 1894. This also must be considered excellent in such quick time on such young trees. The entire produce has paid many times the cost of planting and all else. This is by reason of what may be called intensive planting and culture. This would appear to be the most economical method for "ladies in village homes," as well as more extensive commercial planting.

If the area to be planted should be small, if it is done well, and the trees planted not more than six feet apart, they will soon yield a crop of fruit that will amount to a sum worthy of consideration, and an income will the sooner result with a small amount of outlay than if you have strawberries and other annual crops, although such things may be planted for a quick return, to be removed quickly to give room for the trees. By this method a continued income would be near at hand, of a permanent kind, and at comparatively little cost per annum; of course when the trees became thick, they also would require thinning. There is no apparent reason why this method should not be the most profitable for large planters as well as for small culture.

(To be continued.)

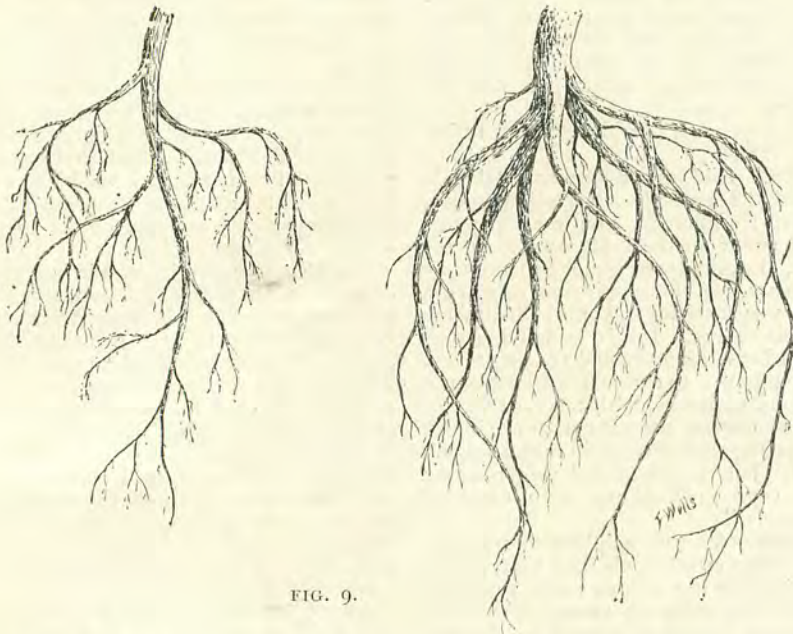


FIG. 9.

phosphates and potash are most cheaply found in kainite and basic slag. Lime all know about, and old English farmers used it largely and wisely. Its place is now filled with superphosphate, which contains lime and phosphate. The presence of lime may be fairly well determined by washing the hands in water taken from a ditch; if it curdles the soap freely and feels rough in the hands it indicates lime; if not, the soil should be proved by other means, either by growth or analysis. Applications of kainite and basic slag will soon prove useful or not. As to nitrogenous manures, personal use indicates that apple-trees do not respond to the applications of either stable manure, nitrate of soda, or sulphate of ammonia well enough to encourage their use so much as a more free use of the mineral manures. A

the whole cost of manure and culture is reduced far below the comparative returns, and as compared with other crops. And, sad to say, those who have orchards therefore neglect their orchards too much.

This item may close with the illustration taken from the proceedings of the horticultural college at Gensheim, in Germany. It is that of the roots of two pear-trees. They were planted there a few years ago, of a size and age, in similar land, a clay soil; one was manured with one pound of kainite, and one pound of basic slag; the other had no manure. They remained three years, and then were dug up, and the roots were washed clean, and a photograph was taken (see Fig. 9). Comment is not needed. This contrast was obtained at a cost of something less than a



CHARACTERISTIC CHURCH TOWERS OF ENGLISH COUNTIES.

PART IX. LANCASHIRE.

OF course Lancashire cannot be regarded as a county rich in ecclesiastical architecture

when we compare the remains of mediæval churches with the present enormous population, but when we take into consideration the fact that the huge manufacturing towns

which are spread over the whole land have been the outgrowth of the last century, before which time it was a purely agricultural district, we shall not be surprised at finding that the

went just outside. And away in the camp where the Leinsters now are, we heard it too. The sick were all attention in a moment, for they were soldiers. "That means the Boers," they said. And the orderlies sprang from all parts, and the non-commissioned officers, and were accoutred in a few minutes, and marched off to different posts. Those who have been on duty all day in the wards are away on guard all night to-night. So strange to see one's orderlies, who were so hopeless at making beds, smart soldiers in a moment at the cry of danger, and our protection at once. Corporal —, whom one had only thought of as the cook, and the Sergeant-Dispenser, etc., all military men in a moment.

The hospital is guarded to-night; soldiers with loaded rifles marching up and down all night round it. And pickets are everywhere not a soul allowed to pass unchallenged. Even in the short distance from the hospital here, I was challenged twice to-night.

"Halt! Who goes there?"

"Friend."

"Pass, friend."

It is really quite exciting and thrilling, though I daresay it's only a false alarm after all. But the idea is that the rebels all round are rising. Sterkstroom itself is rebel really; so are all the farmers round, and could easily unite and seize the stores at the camp. There is only a small company here now; only about a hundred on Bushman's Hock; and the troops have been removed from Dordrecht, so we are fairly unguarded.

I'm glad to have the dog sleeping under my bed, and I've even got the door shut to-night; and have nailed a big red-cross badge on it outside. Now, I'm writing in bed, instead of out on the "stoep," by moon and candle-light. I wonder if anything will really happen! Good-night. Hope I sha'n't be shelled in my sleep. But anything would be better than being looted, and left with nothing to put on! I'm wondering how the prisoners manage, and if they are lent a change of clothes? Suppose I sha'n't be able to ride about the country now for a few days.

April 11.—It all proved a false alarm, for the moment, though it is still rumoured that none of this part of the country is safe.

May 3.—I went a long ride over the veldt this afternoon to the Baileys' farm; am so tired of the confines of the village, and refuse to be intimidated any more by the idea prevalent here that it's unsafe to roam the mountains and ride the veldt alone. I'm not afraid of the Boers—should rather like to go to Pretoria—and the Kaffirs wouldn't overtake me on a bicycle. If there's no one to go with, it's better to go out alone for air and exercise than not at all, though the Colonials boarding at our house were horrified.

"But what happens if you go out alone?" I asked.

"No woman ever does go alone out of sight of the village in this country," they said. "But I shall," and I did, and found it perfectly safe, and shall certainly go again.

I'm beginning to see some beauty in miles and miles of open veldt, undulating almost as the sea, with tier on tier of blue mountains always beyond it, and, when there are clouds, the reflection of them as floating shadows on the bare mountain-side. And when the sunlight is slanting under a cloud, just before sunset, there's a Leader-like effect all up the mountain-side—you know, that touch of light on moss. Only here it is not moss, but coarse grass, which looks green in the distance with the light on it. You ride on and on through rifts of sand, over an uneven pathway, and all around the limitless veldt. There is some mimosa-scrub, nothing else to break the landscape; perhaps a herd of cows grazing or a Kaffir hut with the natives in their ochre-coloured rugs, and sometimes an ox-wagon passes. If a military transport-van, there are fifteen or twenty oxen, sometimes a line of a dozen waggons, with coloured drivers walking beside, a long lash-whip in their hand which will reach from end to end of the team. Then a Kaffir woman, with the inevitable bundle or bucket on her head, and baby tied on her back. Or again, you might go all day, I suppose, and never meet a living thing.

I had a letter from a lad in charge of a mine in a lonely spot two hundred miles north of Bulawayo. From our home arm-chairs it sounds so delightfully romantic to read of roughing it at some lone mining station in the heart of Africa, seeing white faces only a few times in the year, and the sole furniture of hut or tent a biscuit-box and packing-cases. But you want to be here to realise how utterly lonely it must be, and maddening almost in its monotony. And the fever, and the drought, and the sand-storms which are ever hovering near. He writes, "How are you faring in this inhospitable country? Isn't it horrid? And you can realise more now how eagerly we look for the mail out here. Life on the mine is hard and monotonous, even for me in charge of it—full of sameness and work, Saturdays and Sundays alike."

Yet, however much people revile the country and the climate, it is said they always come back. I suppose it's the sunshine which is irresistible. But after the war, if English people with energy and capital settle here and farm all the land, the whole colony might be a garden. If only the bare mountains could be planted with forest (just imagine all this wooded!) which would bring the rain, and some sort of irrigation scheme set on foot for the plains, the ground would yield whatever you asked it. And there is no malarial swamp

to combat here. It's all healthy upland. It only wants tilling and sowing and watering.

We're hoping to get to Stormberg on Sunday and ride over the battlefield, if the Munsters camped there can lend us six horses. Of course, I only write you of the off-duty, such as it is; one is still on duty from early morning till 9 P.M., with two or three hours off in the afternoon. It wouldn't interest you to hear of a constant repetition of fever crises, but they still go on. S. and Tiny both say they are losing their enterics terribly, as they are so pulled down by having been through Ladysmith. The Ladysmith cases go to the Natal hospital. We are still hoping to get on soon. Who ever thought of being three months at Sterkstroom?

It is strange how, though almost winter, we have hot summer afternoons, and everyone lives out-of-doors; then a lovely sunset at five, and suddenly a winter evening. Such long evenings dimly lit by a candle. And no fire, however much you may want it. But it's queer to be in August at 4.30 P.M. and December after 5 P.M. Just now I'm drying my hair on the stoep in the scorching sun. In an hour it will be quite dark.

May 10.—Exciting telegram this morning! Three of us to proceed at once to Dewetsdorp, ever so far up, indeed seven hours by cart from the rail at Edenburg.

What will be the luck of war this time, I wonder! It's to join the 16th Field Hospital, who were here when we came. There'll be many more privations up there, of course: a terrible country, they say, flat and bare, and the few dwellers are Dutch. But I would far rather go into a tent than into a Dutch household again.

It is something to start so very fit and well for the tough work we shall have to do. I hope it will be as healthy there. We shall still be isolated from human kind—no church, no shops, no English. But it will be pretty much "front" again, which is our consolation. The wounded from Mafeking and Wepener will be there, I believe.

Even for this spot, once so cheerless, there have grown little home-ties, and there will be faint regrets to leave. My sunny little bedroom and balcony, my wards, and the familiar faces of patients who always grow dear when one has nursed them, the surrounding mountains purple and pink at sunset—well, these have been more or less home for three months.

And now we ship anchor and sail into unknown seas once more! I'll tell you of the port at which we anchor in my next.

P.S.—Those who know the Free State say that Sterkstroom is a paradise compared with what Dewetsdorp will be. Hope there's a chance of getting letters.

(To be continued.)

HOW TO GROW APPLES AND PEARS.

By B. WELLS, F.R.H.S.

PART X.

INSECTS AND PESTS.

So much has been written on this head that the subject seems worn threadbare; but as they so persistently exist, in spite of cultural care, a continual effort must be made to cope with them.

Diagram 10 shows five pests. A, is a sketch of the canker; B, the apple scale; C, the larvæ of the codlin moth; D, the woolly aphid, also called the American blight; and E, the black currant mite. These are well

treated of by the Board of Agriculture on some well-illustrated leaflets, giving the life histories of each, with the classical names, and the best known remedies to destroy. They are free, and a post-card will secure all of them and many more on other pests; therefore only a short treatment of these need be given here.

Canker is a well-known pest, most persistent and common, yet this is not treated of by the Board of Agriculture, although its treatment is to be found in every corner of horticultural works, and no one has yet found a

true remedy for it. It is too well known to need much description; but it appears in the form of great galls on all parts of trees, often at the base of branches. It has many times a raw edge similar to a great raw wound; at other times it appears as a dead swelling, covered with dead bark. It kills to the centre of the tree, and its infection runs down the body a long distance, often quite to the roots; no remedy can there reach it. It often encircles the entire trunk of young trees. When that is the case the wood above it dies; and if the tree is dug up, and sections cut off, or the

body split, it can be traced quite down to the roots in the centre of the tree. It is not always so bad as that; and trees recover, becoming healthy and fruitful after a time. Some do this and others do not. As there is no known cure, and it is known that some varieties are more subject to attack than others, especially in different localities, it is wisdom to select such as are known to be the most free from the disease. The Ribston Pippin cankers all over England, but is said to grow healthy in Canada, from whence some splendid ribstons come. Coming nearer home, the Lord Suffield will not grow on cold clays in England, but will grow on warmer and drier soils, as good sand and light loam. There is one variety not known to have cankered yet, and only one; that is the Forge. It appears to be the only really healthy apple-tree as yet known, besides the native crab. The Forge, so far as is known,

scale. This is seen chiefly when the trees are not very old, but have stagnated in growth, while yet the bark is young and should be smooth and healthy. It does not appear that health and vigorous growth are compatible with the growth of the scale. The stagnation of trees is, as before hinted at, generally by reason of planting "fine healthy, strong trees, with six feet stems"; in a word, the popular tree so much sought for, and mostly propagated on the free stock. These stagnate as a rule and then become infested with scale. It appears as a very small mussel shell, as B 1. This is thickly spread on the body and limbs of the tree, as at 2. If this is raised with a needle at the right time of the year, there will be found a mass of what appears like a lot of eggs, as at 3. From these come a coccus-like insect; as shown at 4, which goes on producing its kind indefinitely, until the tree is badly infested

furnished with mandibles strong enough to attack the seed or pips, which it then does; when these are devoured, the fruit drops, because it is of no further use for the purpose for which it grew, namely, to reproduce its kind. The larva then eats its way out, as the fruit lies on the ground, and buries itself in the soil, there to undergo its chrysalis state, and in the spring again emerges, to do the same thing. This points out the need of picking up all dropped fruit and using or destroying them. Then to either dig or otherwise to cultivate the ground under the trees in the winter, so that the birds may get the insect for food, which they would do if they had the opportunity. The next is to wash the trees with a weak solution of Paris green when they are in bloom, or quickly after, before the fruit grows, and turns its eye down. Later there would be no chance of getting at the pest, as it would be protected by the downward direction of the fruit, or would then have passed into the fruit itself, and out of harm's way. Good culture is the best remedy.

Woolly Aphis or American Blight (D 1) is a small insect covered with a woolly cotton-like growth. The appearance of it on trees is like masses of cotton wool, very white. It is found on the under side of branches in small openings and crevices of the bark, and on quite young bark of the shoots, and on the bodies of trees in small wounds. In fact anywhere that it can find a tender place to insert its proboscis to suck the sap of the tree. It is very persistent in its ravages, and is very injurious. It soon causes a swelling of the part, which is very unsightly and hurtful. When it becomes plentiful it infests all parts, even to the buds, as seen at D 2, and hinders their growth. Happily, if the tree has a good constitution on the crab stock, and is attended to by good culture, plenty of manure, and a liberal dressing with lime wash, in which some soft soap and a little carbolic acid is stirred, its ravages may be so much reduced that the harm will not be noticed, but where neglect is the order, the cultivator should be heavily punished, as he only spreads contagion to his neighbours. D 3 is the male insect, and it is said that it alone can fly from place to place, and infest where it settles. Various washes will destroy it. Paraffin emulsion is effective.

Black-currant Mites are pests which infest the buds of black-currants. It is first detected by a swelling of the buds, in a round form. It is called "The big bud" and "The bud." If one of these large buds is examined under a microscope, a mite will be found similar to E 2. It cannot be seen with the eye, or by a common magnifying glass, it is so small. It is there safely ensconced in the young embryotic leaves of the bud, and there it does the mischief. There is no cure but a persistent cutting down of the trees until it disappears. Many acres of trees have been entirely grubbed up, and unless someone capable can watch its life history every day in the year, and notice its habits, it seems a hopeless task to think of ever removing or curing it. And if not, then it means extermination of the black currant. It is a dreadful pest. There has been a partial experimentation on its development, but it has not found the remedy. It is most desirable that the matter should receive Government attention at the hands of a competent man, even if he was paid ten thousand pounds to find out all about it, which could be done by persistent watchfulness in a regular manner every day in the year, and several times in the day when it is found to be on the move and increase. It is a pity the English should not do this before the Germans, for the honour of it.

(To be concluded).

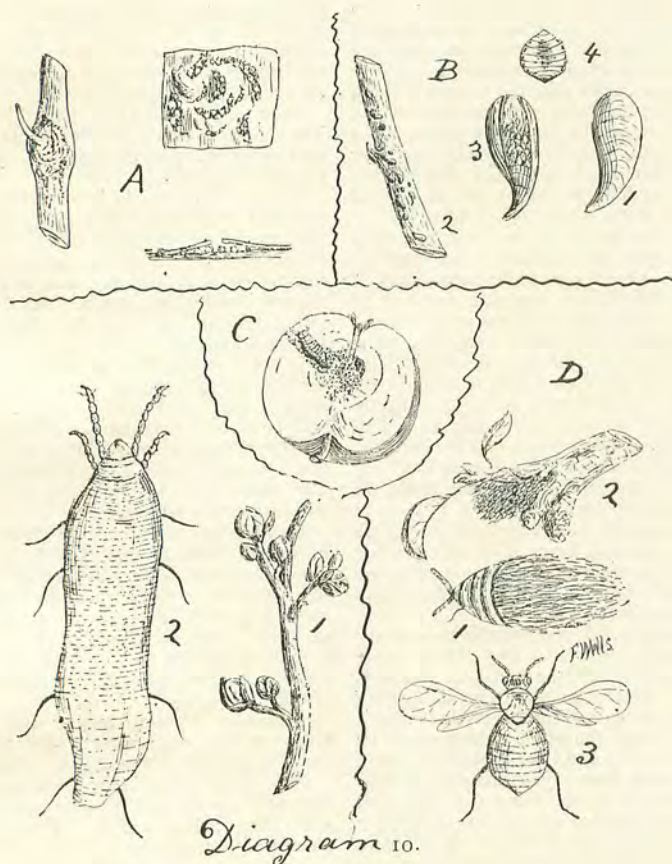


Diagram 10.

will grow healthy in every known situation where it has been planted. There are others that do not suffer much. To name them is more the work of a good catalogue. Of catalogues there are plenty, but the descriptive display of trees is chiefly in praise of good points and leaving out the bad ones.

Much has been written about canker, some noticing a microscopic fungus accompanying the disease; but whether the canker encourages the fungus or the fungus makes the canker, is a point not satisfactorily decided for all minds. The best way, so far, is to plant such varieties as are the most free, taking into consideration their value when grown. Good culture by drainage, and a liberal supply of manure, appears to be the best way to battle with the disease.

Scale is a pest infesting other trees as well as apple-trees, and each kind of tree has its own scale. The one here shown is the apple

with the pest. The remedy is, as to many other pests, comparatively easy so far as removal by a wash of paraffin emulsion, or, if the bark is stout enough to stand it, a slight brush over with pure paraffin, and better culture, but the instalment of a constitution to a tree on the free stock is an impossibility, nor can the evil be ever overcome entirely of the planting of large trees at the beginning.

Codlin Moths are frequent. They occasion what is vulgarly known as "maggoty apples"; the maggots are the larvæ of the moth. The insect comes out early in the spring, when the apples are in bloom, and deposits its eggs among the stamens and pistils in the bloom. The larva quickly hatches out, and lives on the delicate parts of the bloom around it, gradually becoming stronger, and buries itself in the epicarp of the ovary, which comes to the fruit as time goes on. It lives on the most tender parts until it has grown, and becomes

HOW TO GROW APPLES AND OTHER FRUIT.

By B. WELLS, F.R.H.S.

PART XI.

FRUITS AND PACKING.

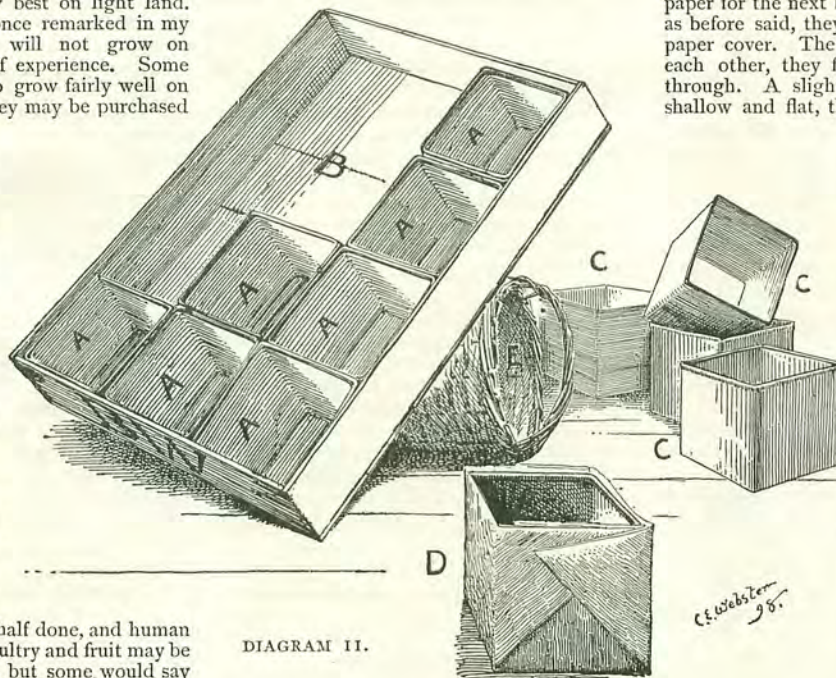
THE culture of various kinds of fruit besides apples, as pears, plums, cherries, nuts, raspberries, blackberries, gooseberries, currants and strawberries, requires the practice of most of the principles of culture and manure as for apples. But a most important point for consideration is the adaptability or choice of each kind to suit locality and soil.

It is not every place that is suitable for every kind of fruit, although there are not many places where apples will not grow by proper selection to suit soil. Other fruits are not of such general growth. What will suit apples may not suit raspberries. Plums may also grow where gooseberries and currants will not grow, and where these last grow best apples will grow worst. Apples require a good clay, while the bush berries do not like clay at all, and will grow best on light land. A good Kent grower once remarked in my hearing, "Gooseberries will not grow on clay." He was a man of experience. Some varieties may be made to grow fairly well on clay at great cost, but they may be purchased in the market cheaper, and so with currants. If the spot to be planted is fixed, then it is wise to plant it with such kinds and varieties as will grow kindly upon it, or profits will not come so easy. But if the locality is not fixed, then all circumstances may be well considered, and the spot chosen that will suit desires best. Extent of operations by ability, not only of the chief person but of capital, may be thought out. But in choosing it may be well to remember the old saying, that too many irons in the fire get burnt; one or two departments well carried out are better than many half done, and human energy has its limits. Poultry and fruit may be reckoned good by many, but some would say there is enough in either for any one person to look after well, at any rate one would detract from the good development of the other, in either case. A few hens with a few chickens to run in the orchard for table use is one thing, but to spend time and money on them and devote the whole energies on the most profitable part, fruit, is an utter impossibility.

In planting it will be well also to think about frost, avoiding the planting of early blooming kinds of fruit where frosts hang about late in the spring. The culture of pears is a matter of geography almost entirely. They do not form a very conspicuous article of commercial planting in England at all. It was his non-success with this fruit which prompted Mr. Blackmore's tirade against fruit-growing in general about five or six years ago. His data were that he had cultivated ten acres of pears for forty years, and that he could only make them meet their costs twice in the time, and that the loss had been great. This is very possible, for he had a great number of varieties on trial, and in the

valley of the Thames at Teddington, of all places in the world. Had he planted them a thousand feet above the sea-level it is possible he would have told another tale. People do not place enough importance on what many think small matters. It is a generally-recognised idea that frosts hang more to the valleys than they do to higher and clearer air about the hills. Hardly late-blooming fruits only should be planted in the low-lying valleys. And hills should be sought if possible, although no place escapes late frosts at times. Of course it is of no use to discard fruit-culture entirely on account of frost, but it is well to try to contrive so as to suffer as little loss from it as possible.

The illustration is that of the method of packing strawberries. Diagram 11 shows one of these boxes as used in the Brighton market. It is supposed to hold twelve



quarts. The usual plan has been to keep the quarts separate by the use of cabbage leaves, which is still done, but it is inconvenient for large quantities. It therefore became necessary to use paper, which was done as follows: The box is drawn by the artist just as it appeared with my name on it; it is rested, for the convenience of placing the measures, in a slanting position on one of the empty picking-baskets, E. The letters A represent seven zinc measures placed in position in box; B shows the remaining space for five more, as shown at C, three of which are on the board, with one set up showing it is without bottom; D shows one covered with the paper to be used, ready to be placed in box in the space B, similar to those marked A. The paper used is the best white parchment-paper, the same as is used by grocers for butter, etc., generally called "grease proof." It is clean and looks well, and when handed out into a lady's fruit-basket prevents all mess of dripping juice, etc. Nothing could be more

cleanly and elegant; it prevents all smashing and other messing the fruit as is so common in the London shops by weighing from a smashed heap mixed up with dust, juice, strigs and a host more. When filled with measure covered with paper, as seen at D, it is placed level on the board, and is filled from the picking-baskets direct without handling, the baskets on the barrow being simply emptied gently over the broad entire open box of measures which are evenly filled very easily. The entire box then receives a slight shake to reduce all to level firmly without bruising. They are just levelled fairly, are left without topping so that the fruit is all alike quite through. This soon creates confidence. A paper is nicely lifted out to the purchaser, who goes away pleased, which has its effect. When the box is filled, the measures having a slight rim turned inward around the top, they are easily withdrawn ready to dress with paper for the next box. This is easy, because, as before said, they have no bottom but the paper cover. The papers all being against each other, they form a mutual support all through. A slight lid covers all, and being shallow and flat, the fruit cannot be pressed by the crushing weight, as is so common in the peck baskets of the London market. And any number of these boxes may be piled on each other for transit by either van or rail; and all being light there need be no heavy lifting and bumping on the ground, as is the case with the London boxes of chip punnets. This manner of dealing with the salesman and the public soon establishes confidence, and many thousands of these boxes have been sold from the Crawley fruit plantations, and only praise has been said of them. As to economy, it is the cheapest method of any, as only a little paper is lost, the boxes being rigidly charged half cost on sale, the money being

returned when the box is returned, so that one thousand boxes have carried many scores of tons of fruit to Brighton, and few only have been lost and broken. The measures are thus: the box is twenty-one by fourteen inches surface, and four inches deep inside, being made of half-inch deal board with a thin lid. The measures are five inches by three and a quarter over, and four inches deep, made of zinc with a slight rim turned inwards on top to lift them out by; each tin holds one quart as close as possible, and great praise has been given for good measure. The method is free to the public.

The grading and storage of apples are most important matters. They should be picked, with care not to bruise them, in proper picking-baskets, brought to a shelter, and there selected according to size and placed in boxes of about eighteen inches square and nine inches deep with a slatted bottom to allow the air to go through them; if these are piled in a convenient storehouse or barn which

is sheltered from frost, they will remain for months without injury. Some of the greatest fruit merchants simply pile them in the market-baskets on the ground on which the trees stand from which they were gathered until a convenience arrives to remove them, or cover them up with straw and tarpaulings to keep them from the wet until they are sent

to market. It is the worst way in the world to shoot them down in a heap on a floor, as they cannot keep dry by reason of evaporation; in that state they quickly become warm, prematurely ripe, and soon pass on to the rotten stage. All they need is keeping from the wet and the frost, in not too thick storage so as to avoid pressure and bruises.

But the way some treat fruit by rough handling is enough to cause it to rot. It should be carefully gathered, and then as carefully handled from the picking-baskets into the storage boxes, as if each apple was an egg. What will crack the one will bruise the other, and then it must pass on to rotting.

[THE END.]

LADY DYE'S REPARATION.

By SARAH DOUDNEY.

CHAPTER XXI.



HE gardens seemed to be fast asleep in the afternoon sunshine. Birds were silent; but the bees, hovering over the great beds of mignonette, filled the air with a drowsy hum. Angelique let her needlework fall on her lap, and looked at the

housekeeper with eagerly inquiring eyes; she, at any rate, was wide awake and anxious to hear all that there was to tell.

"Of course, there is a story about the footstep," she said.

"Of course," the housekeeper answered, "and a sad tale it is. It was in the latter years of Elizabeth's reign that two brothers, John and Christopher Walton, lived in this old house together. They came of a Catholic family; but John cared little about religion, and passed as a Protestant to suit the times, while Christopher clung to the ancient faith, and was for some years absent from England. On his return, John welcomed his brother kindly, and presented him to a certain Lucy Norreys, a beautiful girl who had promised to become his wife."

The housekeeper paused a moment, as if the story had awakened some sad remembrance in her own mind. She went on in her quiet voice, which seemed to tone well with the ceaseless hum of the bees; and Angelique sat still and listened.

"All went well at first, and then John began to think that Christopher was stealing Lucy's love from him. It might have been a jealous fancy, or it might have been a truth, I cannot tell; but it turned John's heart against his brother, and made him as cruel as the grave. At that time there was a great fear in Oxford of a Catholic revival, and so many were turning back to the old faith that severe measures were taken against those who spread the doctrines of Rome. And John all at once became

very zealous for the reformed religion, and accused Christopher of spreading error in the neighbourhood; more than that, when Christopher resented his words, he went privately to those in authority, and gave information against his brother. I have often thought that he must have been maddened just then, and did not foresee the results of what he did. I cannot believe that he sought Christopher's life; it seems more likely that he wanted to drive him out of the country. But those were bitter days, and Christopher was arrested under that very roof, and executed at Tyburn."

She pointed, as she spoke, to the old grey walls, and diamond-paned windows deeply embedded in the massive masonry; and Angelique shivered in the sunshine. It was as if she felt the chill breath of a coming woe.

"There was no peace for John after that dreadful death," the housekeeper went on. "His promised bride fled from him in horror, and ended her life as a nun in a convent in France. So he lived on, heart-broken and alone, in the old house for many a weary year. It is said that, in his last days, he dragged his tired body up and down the narrow passage that is shut off from your room; and the step grew slower with his failing strength. Now and then, at long intervals, it is heard in the stillness of the night, and it is always a fore-runner of sorrow."

"Have you ever heard it?" Angelique asked in a hushed voice.

"Only once; six years ago. A few days afterwards Mr. Harfield's losses came suddenly upon him, and he has been a poor man ever since. In his father's time, and in his grandfather's, the step was heard, and trouble and sickness came after it. I cannot explain these things, Miss Ray: I don't know what it is that makes the sound. Perhaps the explanation is very simple, after all."

"I think it must be," Angelique said cheerfully. "Old houses are full of echoes, you know. Anyhow, we won't anticipate calamities. Here are May and Violet, fresh from their siesta! I am glad the step did not pass their door."

The two children came dancing towards her with radiant faces, asking if she would tell them another story before bed-time. Then they went indoors to tea, and afterwards Angelique made up such a gorgeous fairy-tale that Mrs. Cross would not have lost a word of it

for the world. They all slept peacefully that night, and nothing more was said about the footstep.

After breakfast Mrs. Cross made her appearance with an open letter in her hand. She had just heard from Mrs. Harfield, who was paying a few visits before starting for Switzerland.

"It seems that we are to have some unexpected guests," she began. "And I am afraid that their coming will unsettle you and the children, Miss Ray."

"Oh, we shall get on very well," said Angelique. "Our rooms will be wanted, perhaps," she added, ready to help the housekeeper out of a difficulty.

"I hardly liked to say so," Mrs. Cross confessed. "But I don't know how we can manage without disturbing you. Mrs. Harfield suggests that the three rooms in the matted gallery shall be given up to the two ladies and their maids. The two maids, she thinks, may occupy the children's room. They will have a great deal to do for their ladies, touching up costumes, and that sort of thing. It isn't every day that an earl's son comes of age, and Lord Grandon's majority will bring crowds of visitors into this neighbourhood."

"Lord Grandon! Oh, that's the Earl of Waterleigh's heir," Angelique said. "How far is their place from this?"

"Not more than a mile and a half. It is rather a small house, but charmingly situated. When I heard that there were to be such grand festivities, I thought we might have to accommodate some of the guests."

Mrs. Harfield had probably felt that she could do as she liked with her cousin's children and their governess. Angelique relieved the housekeeper's mind by saying that they would be quite happy to move into the older part of the house; and Mrs. Cross set about her arrangements at once. There was a good deal to be done, for the ladies were expected to arrive on the following evening; and the day was full of business from beginning to end.

The housekeeper established Angelique and the Edgells in the best of the older rooms. The low ceilings were supported with oaken beams; the walls were very thick, and there was a quaint cupboard and press. Ivy and roses clustered round the old windows, and birds flew in and out as if the place belonged to them. An arched doorway connected the two rooms, and May and