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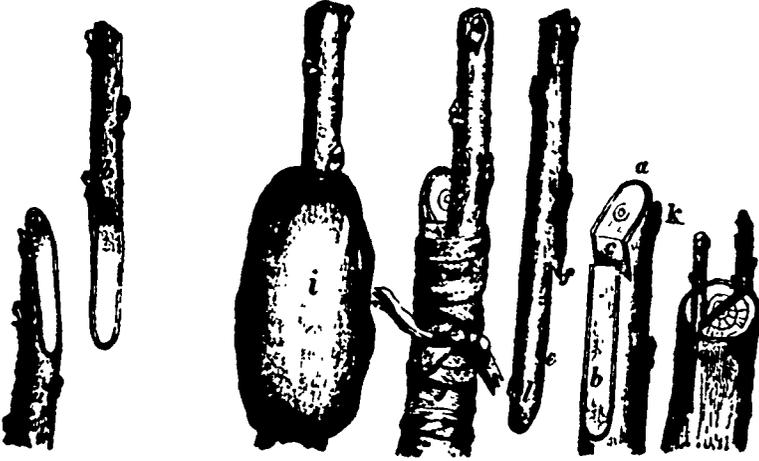


Fig. 2—Splice Grafting.

Fig. 4—Tongue Grafting.

Fig. 5.

FRUIT TREES—GRAFTING, &c.

In our last number we made some observations on the state of Canada, with reference to Fruit Culture, and expressed our opinion of its importance, and our intention to collect and publish such information upon the subject as the wants of the agricultural population require. As the Spring is near at hand, we are anxious to lay what we intend to publish before our readers in sufficient time to enable them to digest it, previously to the arrival of the period when operations should be commenced, and shall accordingly devote a considerable portion of our Agricultural space to that object. We feel satisfied that the value of the information contained in this number is equal to ten times the price of our paper, to every man who owns or expects to own an apple tree. We hope our subscribers will appreciate its value, and not only make an effort to extend the benefit to their neighbours, by inducing them to subscribe for the paper, but carefully preserve each number, so that at the end of the year the whole may be bound together, forming a book, than which a more useful, various, interesting, and instructive volume could not be purchased.

We have extracted below so much of Mr. Downing's work as explains the operations of Grafting, cutting scions, making grafting clay and wax, &c. &c.; and in our next number shall proceed to explain that of Budding, a mode of propagation in some respects preferable to Grafting, and within the last few years very extensively adopted:

PROPAGATION OF VARIETIES—GRAFTING—BUDDING—CUTTINGS—LAYERS AND SUCKERS.

After having obtained a new and choice kind of fruit, which in our hands is perhaps only a single tree, and which, as we have already shown, seldom produces the same from seed, the next inquiry is how to continue this variety in existence, and how to increase and extend it, so that other gardens and countries may possess it as well as ourselves. This leads us to the subject of the propagation of fruit trees, or the continuation of varieties by grafting and budding.

Grafting and budding are the means in most common use for propagating fruit trees. They are, in fact, nothing more than inserting upon one tree, the shoot or bud of another, in such a manner that the two may unite and form a new compound. No person having any interest in a garden should be unable to perform these operations, as they are capable of effecting transformations and improvements in all trees and shrubs, no less valuable, than they are beautiful and interesting.

Grafting is a very ancient invention, having been well known and practised by the Greeks and Romans.

The uses of grafting and budding, as applied to fruit trees, may be briefly stated as follows:—

1. The rapid increase or propagation of

valuable sorts of fruit not easily raised by seeds, or cuttings, as is the case with nearly all varieties.

2. To renew or alter the heads of trees, partially or fully grown, producing in two or three years, by heading-in and grafting, a new head, bearing the finest fruit, on a formerly worthless tree.

3. To render certain foreign and delicate sorts of fruit more hardy by grafting them on robust stocks of the same species native to the country, as the foreign grape on the native. And to produce fine fruit in climates or situations not naturally favorable by grafting on another species more hardy; as in a cool climate and damp strong soil, by working the Peach on the Plum.

4. To render dwarf certain kinds of fruit, by grafting them on suitable stocks of slower growth, as in the case of the Pear on the Quince, the Apple on the paradise stock, &c.

5. By grafting several kinds on the same tree, to be able to have a succession of fruit, from early to late, in a small garden.

6. To hasten the bearing of seedling varieties of fruit, or of such as are a long time in producing fruit, by grafting them on the branches of full grown, or mature bearing trees. Thus a seedling pear, which would not produce fruit on its own root in a dozen years, will generally begin to bear the third or fourth year, if grafted on the extremity of the bearing branches of a mature tree.

The proper time for grafting fruit trees is in the Spring, as soon as the sap is in motion, which commences earliest with the Cherry and Plum, and ends with the Pear and Apple. The precise time of course varies with the season and the climate, but is generally comprised from February to the middle of April. The grape vine, however, which suffers by bleeding, is not usually grafted until it is in leaf. The most favorable weather for grafting is a mild atmosphere with occasional showers.

The scions are generally selected previously; as it is found in nearly all kinds of grafting by scions, that success is more complete when the stock upon which they are placed is a little more advanced—the sap in a more active state than in the scion. To secure this, we usually cut the scions very early in the spring, during winter, or even in the autumn, burying their lower ends in the ground in a shaded place, or keeping them in fine soil in the cellar till wanted for use. In cutting scions, we choose straight thrifty shoots of the last year's growth, which may remain entire until we commence grafting, when they may be cut into scions of three or four buds each. In selecting scions from old trees it is always advisable to choose the most vigorous of the last year's shoot growing near the centre or top of the tree. Scions from sickly or unhealthy branches should be rejected, as they are apt to carry with them this feeble and sickly state. Scions taken from the lower bearing branches will produce fruit sooner, but they will not afford trees of so handsome a shape; or so vigorous a growth, as those taken from the thrifty upright shoots near the centre or top of the tree. Nurserymen generally take their scions from young grafted trees in the nursery-rows, these being usually in better condition than those taken from old trees not always in a healthy state.

The stock for grafting upon, is generally a tree which has been standing, at least for a year previously, on the spot where it is grafted, as success is much less certain on newly moved trees. In the case, however, of very small trees or stocks, which are grafted below the surface of the ground, as is frequently the practice with the Apple in American nurseries, the stocks are grafted in the house in winter, or early spring, put away carefully in a damp cellar, and planted out in the spring; but this method is only successful when the root is small, and when the top of the stock is taken off, and the whole root is devoted to supplying the graft with nourishment.

The theory of grafting is based on the power of union between the young tissues, or organizable matter of growing wood. When the parts are placed nicely in contact, the ascending sap of the stock passes into and sustains life in the scion; the buds of the latter, excited by this supply of sap and the warmth of the season, begin to elaborate and send down woody matter, which, passing through the newly granulated substance of the part in contact, unites the graft firmly with the stock. "If," says De Candolle, "the descending sap has only an incomplete analogy with the wants of the stock, the latter does not thrive, though the organic union may have taken place; and if the analogy between the albumen of stock and scion is wanting, the organic union does not operate; the scion cannot absorb the sap of the stock and the graft fails."

Grafting therefore is confined within certain limits. A scion from one tree will not, from the want of affinity, succeed on every other tree, but only upon those to which it is allied. We are, in short, only successful in budding or grafting where there is a close relationship and similarity of structure between the stock and the scion. This is the case with varieties of the same species, which take most freely, as the different sorts of Apple; next with the different species of a genus as the Apple and the Pear, which grow, but in which the union is less complete and permanent; and lastly with the genera of the same natural family, as the Cherry on the Plum—which die after a season or two. The ancients boasted of Vines and Apples grafted on Poplars and Elms; but repeated experiments, by the most skillful cultivators of modern times, have clearly proved that although we may, once in a thousand trials, succeed in effecting these ill assorted unions, yet the graft invariably dies after a few months growth.

The range in grafting or budding, for fruit trees in ordinary culture, is as the following: Apples, on apple or crab seedlings for orchards (standards,) or on Paradise apple stocks, for dwarfs; Pears, on pear seedlings for common culture, or Quince stocks, for dwarfs, and sometimes on the thorn for clayey soils; Peaches on their own seedlings for standards or for orchards; on Almonds for hot and dry climates; on Plumbs in cold or moist soils, or to secure them against the worm; Apricots, on Plum stocks, to render them hardy and productive, or on their own seedlings to render them long-lived. Nectarines are usually worked on the Peach or Plum; and Cherries on mazzard seedlings; or sometimes on the Perfumed Cherry for dwarfs.

The manual operation of grafting is performed in a very easy and complete manner when the size of the stock, or branch to be grafted, corresponds precisely with that of the scion. In this case, which is called splice grafting, it is only necessary with a smooth sloping cut, upwards on the stock *a*, and downwards on the scion *b*, Fig. 2, to make the two fit precisely, so that the inner bark of one corresponds exactly with that of the other, to bind them firmly together with a strand of matting, and to cover the wounds entirely with grafting clay or wax, and the whole is finished. In this, which is one of the neatest modes, the whole forms a complete union nearly at once; leaving scarcely any rounded part to heal over. But as it is only rarely that the stock is of so small a size as to fit thus perfectly to the scion, the operation must be varied somewhat, and requires more skill. The method in most common use to cover all difficulties, is called tongue grafting.

Tongue grafting, (or whip grafting,) Fig. 4, resembles very nearly splice-grafting, ex-

cept, instead of the simple splice, a tongue is made to hold the two together more firmly. In order to understand this method let us explain it a little in detail.

Having chosen your stock of the proper size, cut it off at the point where, *a*, it appears best to fix the graft. If the stock is quite small, it may be within three or four inches of the ground. Then, with a very sharp knife, make a smooth cut upwards *b*, about two inches in length. Next make a slit, from the top of this cut about one fourth of the way downwards, *c*, taking out a thin tongue of wood. Cut the scion four or five inches long, or so as to have three buds; then shape the lower end with a single smooth sloping cut, *d*, about the same length as that on the stock, and make the tongue upwards *f*, to fit in the downward slit of the stock. Now apply the scion accurately to the stock making the inner bark of the scion fit exactly the inner bark of the stock, at least on one side. Without changing their position, tie them together carefully with a piece of bass-matting, or tape *h*. And finally cover the wound with well prepared grafting-clay or wax, *i*. This ball of clay should more than cover the union, by an inch above and below, and should be about an inch thick. If grafting wax is used, the covering need not be above half an inch thick.

In a month's time, if the graft has taken, it will be expanding its leaves and sending out shoots. It will then be necessary to rub or cut off all shoots between the ball and the ground, if it is a small stock, or all those which would rob it of a principal share of nourishment, if upon a large tree. If the scion or stock is very weak, it is usual to leave one or two other buds for a time, to assist in drawing up the sap. About the middle of July, after a rainy day, you may remove the ball of clay, and, if the graft is securely united, also the bandage; and the angle left at the top of the stock, *a*, should now be cut off smoothly, in order to allow the bark of the stock and the scion to heal neatly over the whole wound.

Though it is little attended to in common practice, the amateur will be glad to know that the success of a graft is always greatly insured by choosing the parts so that a bud is left near the top of the stock, *k*, and another near the bottom of the scion, *l*. These buds attract the rising sap to the portions where they are placed, form woody matter, and greatly facilitate the union of the parts near them; the upper part of the stock, and the lower part of the scion, being the portions soonest liable to perish from a want of nourishment. [In grafting large quantities of young trees when stocks are scarce, it is not an unusual practice in some nurseries to tongue or whip-graft upon small pieces of roots of the proper sort of tree, planting the same in the earth as soon as grafted. Indeed, Dr. Van Mons considers this the most complete of all modes, with regard to the perfect condition of the grafted sort; 1st. because the smallest quantity of the stock is used; and 2nd. because the lower part of the scion being thus placed in the ground, after a time it throws out fibres from that portion, and so at last is actually growing on its own roots.]

Cleft grafting is a very easy though rather clumsy mode, and is in more common use than any other in the United States. It is chiefly practiced on large stocks, or trees the branches of which have been headed back, and are too large for tongue-grafting. The head of the stock is first cut over horizontally with the saw, and smoothed with a knife. A cleft about two inches deep is then made in the stock with a hammer and splitting knife. The scion is now prepared, by sloping its lower end in the form of a wedge about an inch and a half long, leaving it a little thicker on the outer edge. Opening the cleft with the splitting-knife, or a small chisel for that purpose, push the scion carefully down to its place, fitting its inner bark on one side to that of one side of the stock. When the stock is large, it is usual to insert two scions, Fig. 5. On withdrawing the chisel, the cleft closes firmly on the scions, when the graft is tied and clayed in the usual manner.

Apple stocks in many American nurseries, are grafted in great quantities in this mode—the stocks being previously taken out of the