

The "cleft-graft."—Saw off the branch of the stock, being careful not to tear the bark; pare the cut surface smooth with a strong knife. If the stock is an inch or less in diameter, cut away about half with a slope as in figure 8. Then, by means of a strong, thin knife, or the grafting knife, and a blow of the mallet, make a split across this slope. Prepare the cion, which may have 2 to 4 buds, by whitening it to a long even wedge, as in figure 9, beginning at a bud (A) and tapering to an edge, making one side of the wedge somewhat thicker than the other, as seen in the section at B. Open the split in figure 8 with the point of a knife or a wedge, and insert the cion, as seen in figure 10, taking care that the vital parts, as before, come in contact, leaving the bud, A, just above the top of the stock. This bud is not absolutely necessary, but it is a center of active growth, and increases the chances of success. The slope in the stock is made because it will become covered with new wood and bark, and heal more completely than a cross-cut. When the stock is two or more inches across, two cions may be put in; the stock being sawed square across and trimmed, is split as in figure 11, with the grafting knife (fig. 2), the curved edge of which cuts the bark before the wood. The cleft is sprung open by means of the chisel point of the knife, while the cions are being inserted, and when they are in place (fig. 12), this is taken away, and the springing together of the cleft holds them firmly.

Fig. 8. CLEFT GRAFTING. Fig. 9.

Fig. 9, beginning at a bud (A) and tapering to an edge, making one side of the wedge somewhat thicker than the other, as seen in the section at B. Open the split in figure 8 with the point of a knife or a wedge, and insert the cion, as seen in figure 10, taking care that the vital parts, as before, come in contact, leaving the bud, A, just above the top of the stock. This bud is not absolutely necessary, but it is a center of active growth, and increases the chances of success. The slope in the stock is made because it will become covered with new wood and bark, and heal more completely than a cross-cut. When the stock is two or more inches across, two cions may be put in; the stock being sawed square across and trimmed, is split as in figure 11, with the grafting knife (fig. 2), the curved edge of which cuts the bark before the wood. The cleft is sprung open by means of the chisel point of the knife, while the cions are being inserted, and when they are in place (fig. 12), this is taken away, and the springing together of the cleft holds them firmly.

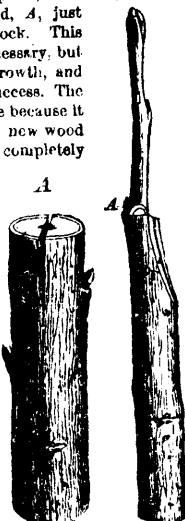


Fig. 11. Fig. 10. CLEFT GRAFTING. Fig. 12.

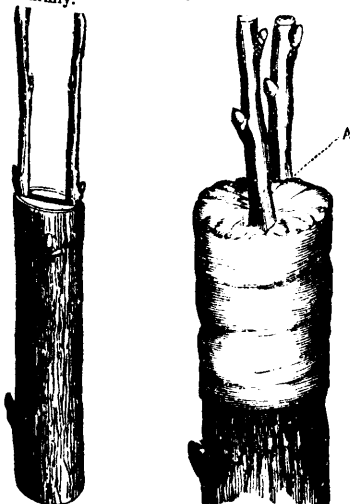


Fig. 12. TWO GRAFTS. Fig. 13.

Fig. 13. When finished it will appear somewhat as in figure 13. It is well to put a bit of waxed cloth on the top of the cions, to prevent the cut surface from drying.

To wax this graft, take a strip of the waxed cloth an inch or more wide, begin below the cleft, and in two or three turns bring the edge sufficiently above the stock to lap over and cover the cut surface; having the part around the stock closely applied, bend in the free edge to cover the top, tearing it if need be, to fit around the cions; if any portion of the cut surface of either stock or cion is exposed,

The Wholesomeness of the Orange

Julia Colman, Superintendent of the New York cooking school, gives the *Phrenological Journal* the following: Not a few of those who wish to be careful as to the quality of their food have doubted the wholesomeness of the orange as it is found in the markets. A fruit, they have said, which is picked so green and kept so long can not be very desirable food. These queries, however, have mostly died away before the experimental proofs of its wholesomeness. Invalids and all sorts of well people eat of it freely without known ill effects. Many have gone to the other extreme and attributed to it health-giving properties, which they deem almost marvelous. For example, it is said to be a sort of insurance against disease to eat two oranges before breakfast for three months in the spring, say from March to May inclusive. We admit that such a course, if generally pursued, might turn many doctors out of employment.

Another prescribed use is to cure a longing for alcoholic drinks. The sufferer must eat an orange the first thing in the morning. We have faith in the remedy, so far as it goes, but to make it effective the subject must earnestly desire to give up the drink, be determined to do so, and then the orange will be a natural help to quench thirst, to aid in healing the stomach and to induce a wholesome tendency in the system generally. This much ought to be understood to prevent any one from supposing that it acts like a charm or philter to take away the unnatural craving. That will return again and again for some days, and if the subject understands this, instead of being discouraged, he will take another orange, and calling to his help, he will be much more likely to succeed.

If in hot, unhealthy countries generally, men would eat an orange in place of drinking a glass of gin, brandy or other alcoholic liquor, the result would be most advantageous. And if some juicy fruit were eaten always in place of taking unwholesome water or any other drink whatever, the malaria of the worst localities might become almost harmless. If the water be wholesome, oranges or other fruit juice mingled with it makes it very much more satisfactory, both in taste and results. If we took half the pains to provide ourselves with fruits that we do to provide ourselves with alcoholic drinks, we should soon see a beneficial change on the face of affairs.

A SUBSTITUTE FOR TIN.—It is stated that columbium has been found in large quantities in Marion, U. S., and in the Amazon stone of Colorado. In color it stands midway between nickel and tin. It can be applied to the surface of other metals like the two just named, and the *Manufacturer and Builder* prophesies that we shall soon hear of columbium-plating. It is slightly lighter than tin, and in its chemical properties, while somewhat similar to the latter, are more nearly allied to those of bismuth and antimony. At present there is little immediate prospect of its becoming an article of commerce. But we must remember that aluminium was not many years ago as little known and rarely seen as columbium, *alias* niobium.

LOST FREIGHT.—The item of lost freight in rail road affairs amounts to a good deal in the course of a year. The Pittsburg, Fort Wayne and Chicago road employs four clerks to look after lost freight. Much of it is found and restored to owners, but the losses in one year to the road amount to about \$20,000. This includes goods of all kinds, principally boots, shoes, and the finer grades of dry goods.

DOSE FOR RODENTS.—The following cheap and simple method is said to be used in Germany: A mixture of two parts of well-bruised common squills and three parts of finely-chopped bacon is made into a stiff mass, with as much meal as may be required, and then baked into small cakes which are put down for the rats to eat. Several correspondents of the *German Agricultural Gazette* write to announce the complete extirpation of rats and mice from their cow-stalls and piggeries since the adoption of this simple plan.

MATHEMATICS AND MEDICINE.—Mark Twain, in *Atlantic* for November, says: Among other talks to-day, it came out that whale ships carry no doctors. The Captain adds the doctorship to his own duties. He not only gives medicines, but sets broken limbs after notions of his own, or saws them off and sears the stump.

The Pernicious Habit of Drinking.

An English physician, Dr. Duckworth, writes as follows: "Medical men may fairly tell the healthy, robust, well-fed and well-housed to give up stimulants if they fully maintain their health without them. Total abstainers are generally large eaters, and the ultimate textural effects of excess in eating or drinking, if any, may not be very dissimilar. I think it is proved that the addition of a little alcoholic food to a meal secures a more moderate ingestion of solids, and where it agrees, which it does not always, promotes a more satisfactory digestion of them. But a large number of persons suffering chiefly from dyspepsia or insomnia are better without stimulants of any kind. A daily allowance of alcohol is manifestly wrong; more to-day and less to-morrow may be needed or instinctively called for. The rational individual must honestly and conscientiously find out for himself what the special needs of his system are, and where a right-minded christian individual is in earnest in such a matter and has a proper control over his appetite, he is not likely to go far wrong in the matter of stimulants.

"Medical men should urge teetotalism upon the nervous classes of drunkards, persons who are careless and self-indulgent or who by their lives or callings are much in the way of drink. Stimulants should be always taken at meal times, and only then.

"I am confident that, as a body, our profession is unanimous in condemning the modern American habit of taking odd glasses of stimulants at all hours and laments the grievous multiplication of the means of gratifying this mischievous custom, for truly the conduct of masses of young business men in our cities and large towns in this respect is becoming disgraceful and the practice is fast gaining in other circles and communities. Our countrymen of these classes have no excuse for this, for they are well-fed and have liquors with their meals in addition to their hourly drinks, while Americans, who are notoriously the worst dietitians in the civilized world, are water-drinkers at meal time."

SOLDER AS AN AID TO CHUCKING.—Prof. Sweet in his last talk on lathe working in the *Polytechnic Review* gives the following hint: Very few machinists appreciate the advantages gained by the use of a little solder. Often irregular pieces can be soldered to a block or casting, and chucked easily; and after finishing, a little heat melts it loose. I have seen various straps, bolts and clamps put around the two halves of a brass box to hold them for boring out, when the application of a little solder would have held them together like a solid box. It is well enough to remember that if you have a piece of work which you can neither chuck on the lathe nor hold in the vise, to solder it to a piece you can hold. In setting work in a four-jawed chuck, much time is saved in adjusting it first in one direction, that is by adjusting the first and third screws, entirely disregarding the other two; then when the piece is true in one direction, turn to the second and fourth screws and adjust these in like manner.