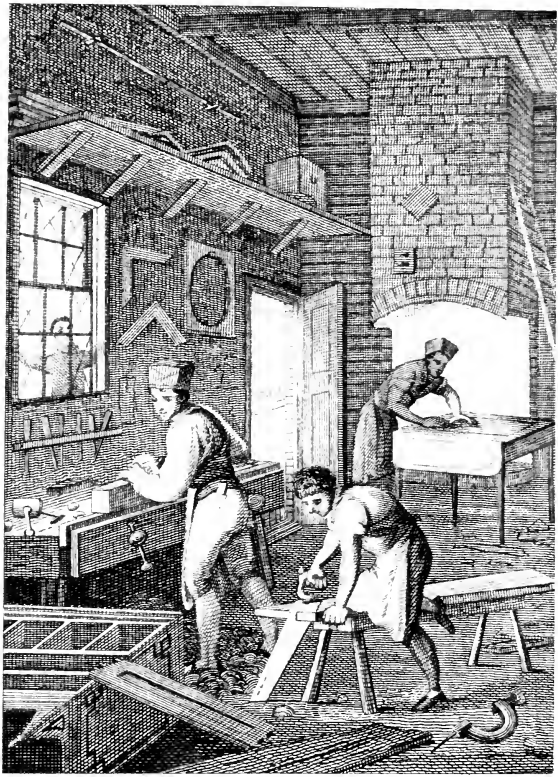

THE

CABINET MAKER'S GUIDE;

OR,

Rules and Instructions

IN THE ART OF

VARNISHING, DYING, STAINING, JAPANNING, POLISHING, LACKERING, AND BEAUTIFYING

WOOD, IVORY, TORTOISESHELL, & METAL.

WITH

Observations on their Management and Application.

INCLUDING AN APPENDIX,

CONTAINING SEVERAL VALUABLE TABLES.

FIFTH EDITION,

CONSIDERABLY AUGMENTED BY THE ADDITION OF SEVERAL NEW ARTICLES, RECEIPTS, &c.

By G. A. SIDDONS.

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MDCCCXXXVII.

ADVERTISEMENT

TO THE

FIFTH EDITION.

THE rapid sale of *Four Editions* of this work has induced the Editor to offer to the public a *Fifth*, which, from the many important additions made, he trusts will now form a complete pocket companion for the Cabinet Maker, as well as a necessary and useful addition to his tool-chest: and though the price is somewhat enhanced, from the plates and extra matter contained in it, still that will not be found,

on a comparison with the former work, to be such as will put it out of the workman's power to avail himself of the benefits a book of general reference like the present is calculated to afford.

There are many processes in the art of Cabinet-Making, which are of themselves simple, and materially useful to the workman, though not perhaps generally known. It is therefore the intention in this edition to fill up what was wanting in a former, by introducing some articles, which, though not strictly applying to this art, yet will be found of great benefit, and will materially assist him in his operations. For which purpose, besides a variety of new receipts in the articles already before the public, three entire new ones will be introduced, viz. *Lines or Drawing*, *Turning* and *Soldering*. The value of which, particularly to the country workman, must be allowed

to be of some consequence, as they will enable him to perform many operations which, without their assistance, would not only retard the work in hand, but in many cases prevent him undertaking the work itself.

As in the introduction to the former edition, some rules and cautions were laid down with respect to the chusing and management of his tools, so in this I shall give some further directions, to prove the truth and correctness of them; and show how some may be substituted for others, or in the absence of proper ones, particularly adapted to their several purposes, to apply other simple means to effect the same operations; and indeed in every thing that concerns the Cabinet Maker, or any thing connected, however remote, with his calling, it shall be our study to avail ourselves of every thing applicable to our purpose from

other authors, as well as our own practica experience; being careful to set down nothing but what is in practice found to be available.

INTRODUCTION.

NOTHING is more calculated to improve the mechanical arts than giving publicity to the various processes used among work men in their several trades; many have been the publications in which various receipts have been given; but in practice not a few have been found to fail, not perhaps because of themselves they were inapplicable, but owing to a want of some practical illustrations to enable the workman to ascertain, not only the proportion of the several ingredients, but the method of properly mixing them, and also the proper mode of application; another inconvenience, which, in many instances, is a

complete bar to the dissemination of practical knowledge, is the expensive nature of many works in which valuable receipts are interspersed. The Cabinet Maker's Guide is, perhaps, the only work that may properly be called a Manual of the Arts, and the rapid sale which it met with, is a proof of the estimation in which it was held, though even there, much room is left for improvement, particularly in the practical application of the rules and cautions necessary to be observed to ensure success; and many subjects connected with the general plan still remain untouched: the object of the present work is to embody all that is useful in the Cabinent Maker's Guide, and adapt to practice what is there given; as well as to enlarge on the original plan, so as to make it a compendium of general practical utility. The various trades of the Cabinet Maker, Chair Maker, Japanner, Gilder, and Lackerer, are so intimately connected, that there is scarce a handsome piece of furni-

ure where the combination of their joint efforts is not necessary; and this inconvenience, if it may be so designated. is particularly felt in country manufactories; and it is almost universally the case, that a workman in one branch is entirely ignorant of the methods used by another; for instance, the Cabinet Maker is, perhaps, generally speaking, unacquainted with the method to be used in giving his work the finishing stroke, by varnishing or gilding the several parts, which are necessary to add to the beauty of the whole: now a knowledge of how these different operations are performed, even in case it is put into other hands to finish, will enable him to leave his part in such a state that the utmost perfection will be attained by those into whose hands it is to pass for completion; the present work is therefore undertaken with a view of supplying what was thought deficient in the Cabinet Maker's Guide, and applying practical illustrations to those receipts where it was necessary,

either to the thorough understanding of the receipt itself, or showing on what its good or bad qualities depend.

I shall conclude this introduction by pointing out the characteristics of a good workman, and give some practical rules as concerns the ascertaining the good or bad qualities of the tools necessary for the trades to which this publication is more particularly addressed; and first, it is necessary, in order to form a good mechanic, that he should strive, with unceasing assiduity, to excel in that branch to which his labours are more particularly directed; that he should study truth and accuracy in the several parts, and beauty in the finishing strokes: in order to attain these several requisites he should observe with care the several methods used by other workmen, and if he can note down the various operations that contribute to the excellence of his art, by no means to neglect it, as he will in time gain a fund of knowledge necessary in his labours; with

regard to the truth and accuracy of his work, he should pay particular attention to keep his tools in proper order, for the time expended in being careful in that respect will be amply repaid by the ease and accuracy with which the several parts of his work will correspond. If careful in this respect, he will save a deal of trouble in the finishing operation, which must be conducted with great care and attention, not attempting to hurry its completion; as that, in many cases, would act in diametrical opposition to his wishes; but narrowly to observe the progress he makes, and if any accident should occur, it will mostly be soon remedied; on the contrary, if with hurry, and inattention to any thing but getting the work out of his hands, it will, in many cases, cost him more labour and trouble to repair, than the whole operation would do when conducted with care; these maxims will not only conduce to make a good mechanic, but what is of as great consequence, a ready workman.

With respect to choosing the tools used in the trades to which I have alluded as the most necessary, and in which all may be comprehended, are planes, saws, and chisels, and we will consider them with respect to the wood they are manufactured from, and the steel which form the cutting part of them; and first, beech is in general, and ought to be *always* used, for the purpose of the stocks, handles, &c., as it is of a tough texture, and not liable to split or warp so much as any other; now there are two kinds of beech, usually known by the names of black or red beech, and the white beech; the former is by far the best in every respect, and may be always known by its colour, and texture, which is darker and more hard in substance; the white is also more apt to warp, and soon wears with use; it should therefore always be rejected as improper; again, if you examine a piece of beech end-ways, you will perceive the grain runs in streaks, which among workmen, is called the *beat* of the

wood; and in all planes this grain or beat, which is the hard fibrous particles of the wood, should run in a direction perpendicular to the face of the plane, which in that case appears full of little hard specks; whereas, if the beat runs parallel to the face, it will appear in irregular streaks, which situation of the grain should always be avoided, as the face will be apt to wear uneven, and more subject to warp and twist: again, in saw handles, and stocks for bits, the beat should run in the same direction as the saw blade, or in the same direction as the stock, when laid on its side; in moulding planes it is very frequently the case, that pieces of box are let into that part of the face that forms the quirk of the mouldings, but that, when possible, should be avoided, as the texture of the two woods are very different, and the different temperature of the atmosphere will cause a difference in their contraction, and consequently the plane will be liable to cast: if it is at any time in

troduced, I would recommend only a small piece just at the mouth of the plane, firmly dove-tailed in, which will not be so apt to derange the accuracy of the plane.

With respect to saws, chisels, and other edge tools, their goodness depends upon the quality of the steel, which should be uniform throughout, and it is always better to have them tempered rather too hard than soft, for use will reduce the temperature; or if at any time it is necessary to perform the operation yourself, the best method I can recommend is, to melt a sufficient quantity of lead to immerse the cutting part of the tool in; having previously brightened its surface, plunge it into the melted lead for a few minutes, till its gets sufficiently hot to melt a candle, with which rub its surface, then plunge it in again, and keep it there till the steel assumes a straw colour, but be careful not to let it turn blue; when that is the case, take it out, rub it again with the tallow, and let it cool: if it should be too soft, wipe the

grease off, and repeat the process without the tallow, and when it is sufficiently hot, plunge it into cold spring water, or water and vinegar mixed; by a proper attention to these directions, and a little practice, every workman will have it in his power to give a proper temper to the tools he may use: if a saw is too hard, it may be tempered by the same means, but as it would be not only expensive, but, in many cases, impossible to do it at home, a plumber's shop is mostly at hand, where you may repeat the process when they are melting a pot of lead; but here, observe that the temper necessary is different to other cutting tools: you must wait till the steel just begins to turn blue, which is a temper that will give it more elasticity, and at the same time sufficient hardness.

With respect to choosing your brushes for varnishing, it is necessary that they possess elasticity combined with softness, and that the hairs are sufficiently fixed, so

that taking hold of one hair, it will not pull out or separate from the rest: the larger brushes are usually made of bristles, the smaller of camel's-hair: the former must be firmly tied to the handle, and the string well glued: the latter are best put into a tin case, and after being used must always be cleaned according to the directions given in the course of this work.

By paying proper attention to these directions, and a little care, the workman will be enabled to keep his tools in order, and to select such as are proper for the purpose they are intended.

G. A. S.

THE

CABINET MAKER'S GUIDE.

CABINET WORK.

GENERAL OBSERVATIONS.

As the beauty of Cabinet work depends on the care with which it is finished, I shall, as a proper introductory article, point out some methods of proceeding which will add much to its beauty, and furnish hints to the workman for perfecting his art. The usual method of cleaning off any piece of cabinet furniture, is simply by scraping and glass-paper; which in many instances, particularly if the grain is any ways soft, will not produce that face which is requisite for it to bear a good polish, either with wax or oil; another reason is, that it is

difficult at all times to meet with good glass paper, which is always requisite.

To make Glass-paper.

Take any quantity of broken window-glass, that which has rather a green appearance on the edge is best, pound it in an iron mortar, then have two or three sieves of different degrees of fineness, ready for use when wanted; take any good tough paper, fine cartridge is the best, and having levelled the nobs and bumps from both sides with pumice-stone, take it at each corner on a board, and with good clear glue, diluted with about one-third more water than is used generally for wood-work, go quickly over the paper, taking care to spread it even with your brush; then, having your sieve ready, sift the pounded glass over it lightly, but to cover it in every part; let it remain till the glue is set, take it from the board, and shake off the superfluous glass, again into the sieve, and hang it in the shade to dry: in two or three days it will be fit for use.

Note.—This paper will be much better than any you can buy, as sand is frequently mixed with the glass, and coloured to deceive the purchaser.

To make Strong Glue fit for Inlaying or Veneering.

Take the best glue, which is known by its transparency, and of rather a light brown, and being free from clouds and streaks, dissolve it in the usual quantity of water, and to every quart add one ounce of isinglass and a gill of the best vinegar.

To clean the face of soft Mahogany, or other porous Woods.

After scraping and sand-papering in the usual manner, take a sponge and well wet the surface to raise the grain, and with a piece of fine pumice-stone, free from stony particles, and cut the way of the fibres, rub the wood in the direction of the grain, keeping it moist with

water: let the work dry, then if you wet it again, you will findthe grain much smoother, and it will not raise so much; if you now repeat the process, you will find the surface perfectly smooth, and the texture of the wood, to appearance, much hardened: by this means, common soft Honduras mahogany will have a face equal to the finest Hispaniola.

Note.—If this does not succeed quite to your satisfaction, you may still improve the surface, by using the pumice-stone with cold drawn linseed oil, in the same manner as you have proceeded above with water, and this will be found to put a most beautiful, as well as a durable face to your work, which may then be polished or varnished as required.

Another way to Clean and finish Mahogany Work.

After having scraped and sand-papered your work as smooth as possible, go over every part with a brush dipped in the furniture oil, and let it remain all night; then have ready the powder

of the finest red-brick, which tie up in a cotton stocking and sift it equally over the work the next morning, and with a leaden or iron weight wrapped up in a piece of carpet, rub your work well the way of the grain backwards and forwards till it has a good gloss; if you think it not sufficient, or if the grain appears any ways rough, repeat the process, being careful not to put too much of the brick dust, as it should not be rubbed dry, but rather as a paste upon the cloth; after you have made the surface perfectly smooth, you may clean your work off with a rubber of carpet, and some fine mahogany sawdust. This process will give not only a good gloss and face to your work, but will make a surface that will improve by wear; indeed, by this process, soft Honduras mahogany will have the appearance of good hard Spanish. The only thing against this process that I am aware of is, that it tends to darken the mahogany, and, according to the present fashion of furniture, that process which is most calculated to preserve the light appearance of the wood is

preferred; but this is *taste*, and perhaps ere long it may be the fashion to admire dark in preference to light coloured wood, and then this process will be as much admired as that of polishing with wax is at the present day.

To darken light Mahogany.

It frequently happens in repairing of old furniture that we cannot match the old wood with any new of the same colour, therefore, in order that, after the repairs are completed, the pieces introduced should not appear as patches, it is usual to wash the new work with some soap-lees, or for want of which, dissolve some quick-lime in water and use in the same manner; but here we should be careful not to let either be too strong, or it will make the wood too dark; therefore it is best to use it rather weak at first, and if not dark enough, we have only to repeat the process till the wood is darkened to our mind

To raise old Veneers.

In repairing old cabinets, and other furniture, the workman is frequently at a loss to know how to get rid of those blisters which appear on the face, in consequence of the glue under the veneer failing or causing the veneer to separate from the ground in patches, and as these blisters are frequently so situated that, without separating the whole veneer from the ground, it is impossible to introduce any glue between them to relay it, the great difficulty in this case is to separate the veneer from the ground without injuring it, as it adheres in many places too fast to separate without breaking the veneer into pieces. I will here, therefore, show how this operation may be easily performed without any difficulty, and the veneer preserved perfectly whole and uninjured, ready for relaying the same as a new piece. First wash the surface with boiling water and coarse cloth, to remove any dirt or grease, then place it before the fire, or heat it with a caul, oil its surface with com-

mon linseed oil, place it again to the fire, and the heat will make the oil penetrate quite through the veneer and soften the glue underneath, then whilst it is hot raise the edge gently with a chisel, and you will find it separate completely from the ground: but here you must be careful not to use too great force, or you will spoil your work; again, if it should get cold during the operation, you must apply more oil, and heat it again, repeating this process till you have entirely separated the veneer; you may then wash off the old glue, and proceed to lay it again as a new veneer, either by hand or with a caul; but a caul is the better method

Glueing up and Veneering Card-table-tops, Secretary Fronts, &c.

It has always been a desideratum among workmen to veneer this kind of work in such a manner that it will stand, as almost every method commonly used will cause the piece either to warp in winding, or otherwise to get hollow, after the work is finished, on its upper-

side; and however careful the workman may be in laying his veneer this will frequently happen; indeed I have seen table-tops veneered upon a ground of old seasoned wood that have not stood better than if it had been on comparatively fresh timber; some workmen prefer cauls for laying their veneer, as they say it is not so apt to warp, there being no occasion in that case to wet the veneer; but this has its disadvantages, and will in general, I will venture to say, not succeed so well as when the veneer is carefully laid by hand; but which ever mode is adopted, more depends upon the manner of preparing the ground, than in that of laying the veneer. The method of doing it is as follows: select that piece of deal which is freest from knots, and having slit it down the middle, or, which is better, take a piece out of the heart, and place the boards cut to the required length in a warm place for two or three days, then joint them up, placing a heart edge and an outside edge together, when dry, cut your top again between each joint, and joint it fresh; then you will have

a top glued up of pieces about two inches wide, and if you have been careful in making your joints good, you will have a top which will not be liable to cast after it is veneered.

Note.—You may use wainscot or mahogany instead of deal, making your joints in the same manner, which some workmen prefer, but I have always found good strait-grained deal and free from knots answer very well.

It is also a good plan, after having veneered your top, &c. by hand, to lay it on the ground on some shavings, with the veneer downwards, as it then dries gradually, and is much less likely to cast than by drying too quick.

To cut Steel Plates for Scrapers.

Every workman knows that part of the blade of a broken saw is the best scraper he can use, but as it is very hard it is difficult to be cut into the form required for a scraper, as it is very tedious to cut it with a file; the best, and at the same time the most expeditious, is to mark out the size you wish, and place the piece of

the blade or steel plate in a vice whose chaps shut very close, placing the mark even with the face of the vice, and the part of the plate that is to be cut to waste above the vice, then with a cold chisel or a common steel firmer that has its basil broken off, holding it close to the vice and rather inclined upwards, begin at one end of the steel plate, and with a sharp blow of the hammer it will cut it, keep going on by degrees, and you will with a great deal of ease cut it to the shape required; you have only then to grind the edges of your scraper level, and rub it afterwards on your Turkey-stone, and it is complete.

To Set and Sharpen Saws.

It frequently happens, in the country particularly, that great inconvenience is experienced from the delay necessary in sending your saws to the tool-makers to be sharpened, and many a good saw is spoiled from not knowing how to set it as it ought to be; the general mode adopted by workmen is to use an instrument

with notches in it to receive the saw blade, and termed a *saw-set;* this method is very apt to break off the teeth, particularly if the saw is very hard; it may not therefore be unacceptable, particularly to the young mechanic, if I describe a method easy in its operation and not so liable to injure the saw. I will therefore describe the whole process of sharpening and setting a saw, which, with a little practice, will enable the workman, not only to save himself that expence, but do it equally well with any tool-maker.

The first thing to be done is to run a file down along the edge of the teeth till by looking along the edge you see them range in a direct line, you may then set your saw in the following manner: lay the blade on a smooth piece of lead, or for want of which, on the end of your trying plane, then with a square steel punch give a gentle tap on it with a hammer, after placing it on one of the teeth, do the same with every alternate tooth; then reverse the saw and punch the teeth on the other side, and look down your saw that the teeth are all equally set, then

begin with your file at the part of the saw nearest the handle; to sharpen or file the teeth to a good point you must hold your file so that it shall make an angle with the saw-blade of about thirty degrees, or two-thirds that of a mitre angle, observing to shift the file for every alternate tooth in an opposite inclination, and bringing each tooth to a very sharp point, and keep the upper edge of your file very nearly level and horizontal; every tooth will then represent a sharp chisel and cut as it goes, without tearing, as is often the case, from not paying attention to these particulars.

To make Paste for laying the Cloth, or Leather, or Table-tops, &c.

To every pint of the best wheaten flour add rosin, very finely powdered, about two large spoonfuls, of alum one spoonful in powder, mix them all well together, put them into a pan, and add by degrees soft or rain water, carefully stirring it till it is of the consistence of thinnish cream, put it into a sauce-pan over a clear fire,

keeping it constantly stirred that it may not get lumpy; when it is of a stiff consistence, so that the spoon will stand upright in it, it is done enough; you must be careful to stir it well from the bottom, that it does not burn, which it is very apt to do if not well attended to; you have now only to empty it out into a pan, and cover it over till cold, to prevent a skin forming on the top, which would make it lumpy and improper for use.

Note.—This paste will be found very superior for the purpose, as it is very adhesive. To use it for cloth or baize, spread it evenly and smoothly, or on the top of the table, and lay your cloth on it, pressing and smoothing it with a flat piece of wood; let it remain till dry, then trim the edges close to the cross-banding; as if you cut it close at first, it will in drying shrink and look bad where it meets the banding all round. If it is used for leather, the leather must be first previously damped, and then the paste spread over it; it is then laid on the table, and rubbed smooth and level with a linen cloth,

and the edges cut close with a short knife, to the banding. Some lay their table-cover with glue, instead of paste, and perhaps for cloth it is the best method, but for leather it is not proper, as the glue is apt to run through; and in using it for cloth, great care must be taken that your glue is not too thin, and that you rub the cloth well down with a thick piece of wood made hot at the fire, for the glue soon chills; you may in this method cut off the edges close to the border at once.

A Glue for Inlaying Brass or Silver Strings, Patteras, &c.

To every pint of common glue take about the quantity of two table-spoonfuls of finely powdered rosin, and the like quantity of finely powdered brick-dust, and incorporate the whole well together; it will hold the metal much faster than plain glue, which is generally used.

To take out Bruises in Furniture.

Wet the place well with warm water, then take brown paper five or six times double, well

soaked in water, lay it on the bruise, apply on that a hot flat iron till the moisture is evaporated, and if the bruise is not gone, repeat the same; after two or three applications, the dent or bruise will be level with the surface; or if the bruise is small, soak it with warm water, and apply a red hot poker very near the surface, keeping it continually wetted, and you will soon find the indentation vanished.

For taking Stains out of Mahogany.

Mix six ounces of spirit of salt and half an ounce of powdered salt of lemons. Drop a little on the stains, and rub it with a cork till it disappear, then wash off with cold water.

For Cleaning Mahogany.

To a pint of furniture oil (p. 182) mix half a pint of spirit of turpentine, and half a pint of vinegar, with which wet a woollen rag, and rub the wood the way of the grain, then polish with a flannel and soft cloth.

DYING WOOD.

It being necessary to say something as to the quality, nature, and texture of the wood

most fit for dying, I shall state my remarks in the following order:

First, the wood mostly used to dye black, is pear-tree, holly, and beech, all of which will take a beautiful black; it should at the same time be observed, not to take wood which has been long cut, or aged, but as fresh as possible; I have likewise found, that after the veneers have had one hour's boiling, and taken out to cool, that the colour has struck much stronger. It should likewise be noticed, that after the veneers are dyed, they should be dried in the air, and not by the fire, or in a kiln of any kind, as it tends to destroy the colour.

Secondly, in order to dye blue, green, red, or other colours, take clear holly; put the veneers first in a box or trough with clean water, and let them remain four or five days, changing the water once, or twice, as you find occasion; the water, acting as a purgative in the wood, will bring forth abundance of slime, &c.; let them dry about twelve hours before they are put in the dye; by observing this, you

will find the colour strike quicker, and be of a brighter hue.

Fine Black.

Have a chair-maker's copper fixed, into which put six pounds of chip logwood, and as many veneers as it will conveniently hold, without pressing too tight; fill it with water, and let it boil slowly for about three hours; then add half a pound of powdered verdigris, half a pound of copperas, and four ounces of bruised nut-galls, filling the copper up with vinegar as the water evaporates; let it boil gently two hours each day, till you find the wood to be dyed through; which, according to the kind, will be in more or less time.

Another Method for a good Black.

Procure some liquor from a tanner's pit, or make a strong decoction of oak-bark, and for every gallon of the liquor take a quarter of a pound of green copperas and mix them well together. After your veneers are prepared as

above shewn, put the liquid in your copper and make it quite hot, but not to boil; immerse your veneers in it and let them remain for an hour, take them out and let them be exposed to the air till nearly dry, then repeat the process as often as may be necessary to produce a good colour, or till you see it has penetrated its substance; you may then add some logwood to the solution, and place your veneers again in it, and let the whole simmer for two or three hours, let the whole cool gradually, and dry your veneers in the shade, they will be found to have acquired a very fine black.

Fine Blue.

Take a clean glass bottle, into which put one pound of oil of vitriol; then take four ounces of best indigo, pounded in a mortar into small lumps; put them into the phial (taking care to set the bottle in a basin or earthen glazed pan, as it will ferment); after it is quite dissolved, provide an earthen or wooden vessel, so constructed that it will conveinently

hold the veneers you mean to dye; fill it rather more than one-third with water, into which pour as much of the vitriol and indigo (stirring it about), as will make a fine blue which you may know by trying it with a piece of white paper or wood; put in your veneers, and let them remain till the dye has struck through.

Note.—The colour will be much better if the solution of indigo in vitriol is kept a few weeks before using it; also the best trough you can use, being either made of common stone, like a stone sink, but of proper dimensions, say about four feet by eight or nine inches, which will be sufficiently large for veneers intended to be stained; or you may procure one made of artificial stone of any dimension, which will not cost so much; also you will find the colour strike better if, previous to putting your veneers into the blue dye, you boil them in plain water till completely soaked through, and let them remain for a few hours to dry partially, previous to immersing them in the dye.

Another Blue.

Take any quantity of soft water and throw in pieces of quick lime, stirring it well; let it settle and strain or pour off the clear part, then to every gallon of this add ten or twelve ounces of the best turnsole, put the whole into your trough with your veneers, which should be of white holly, and prepared as usual by boiling in water; let them simmer gently till you find the colour sufficiently penetrated, but be careful not to let them boil in it, as it would injure colour.

Fine Yellow.

Take of the root of barberry four pounds, reduce it, by sawing, to dust, which put in a copper or brass trough; add four ounces of turmerick, to which put four gallons of water, then put in as many white holly veneers as the liquor will cover, boil them together for three hours, often turning them; when cool, add two

ounces of aqua-fortis, and you will find the dye strike through much sooner.

Another Yellow, much Brighter.

To every gallon of water necessary to cover your veneers, add one pound of French berries, in which boil your veneers till the colour has penetrated through; have ready the following liquid, which add to the infusion of the French berries, and let your veneers remain for two or three hours, and you will find the colour very bright.

Liquid for Brightening and Setting the Colours.

Take strong aqua-fortis, a sufficient quantity, and to every pint add one ounce of grain tin and a piece of sal-ammoniac, of the size of a walnut, setting it by to dissolve, shaking the bottle round, with the cork out, from time to time; in the course of two or three days it will be fit for use.

N. B.—This will be found an admirable

liquid to add to any colour, as it not only brightens it, but makes it less likely to fade from exposure to the air.

Bright Green.

Proceed as in either of the above receipts to produce a yellow; but instead of adding aqua-fortis, or the brightening liquid, add the vitriolated indigo, as much as will produce the desired colour.

Another Green.

Take of the best verdigris four ounces, sap green half an ounce, and indigo half an ounces dissolve them in three pints of the best vinegar, put in your veneers and gently boil till the colour is penetrated sufficiently.

Note.—You may vary the hue of the green by altering the proportion of the ingredient. and I should advise, unless wanted for a particular purpose, to leave out the sap green, as it is a vegetable colour that is apt to change, or turn brown when exposed to the air.

Bright Red.

Take two pounds of genuine Brazil dust, and four gallons of water, put in as many veneers as the liquid will cover, boil them for three hours; then add two ounces of alum, and two ounces of aqua-fortis, and keep it lukewarm until it has struck through.

Another Red.

To every pound of logwood chips add two gallons of water, put in your veneers, and boil as in the last; then add a sufficient quantity of the brightening acid till you see the colour to your mind, keep the whole as warm as you can bear your finger in it, till the colour has sufficiently penetrated.

Note.—The logwood chips should be picked from any extraneous substances with which it generally abounds, as bark, dirt, &c. and it is always best when fresh cut, which may be known by its appearing of a bright red colour;

for if it is stale it will look brown, and will not yield so much colouring matter.

Purple.

Take two pounds of chip logwood and half a pound of Brazil dust, add four gallons of water, and after putting in your veneers, boil them well, for at least three hours; then add six ounces of pearl-ash and two ounces of alum, let them boil two or three hours every day, till you find the colour struck through.

Note.—The Brazil dust in this receipt is perhaps superfluous, as it only contributes to make the purple of a more red cast, for the pearl-ash does not act upon it, to change it from a red to a purple.

Another Purple.

Take two pounds of logwood, either in chips or powder, and boil it in four gallons of water along with your veneers; then after boiling till the colour is well struck in, add by degrees some vitriolated indigo till the purple is of the

shade required, which may be known by trying it with a piece of paper; let it then boil for one hour, and keep the liquid in a milk-warm state till you find the colour has penetrated the veneer. This receipt, when properly managed, will produce a very brilliant purple, which will not be so likely to fade as the foregoing.

Orange.

Let the veneers be dyed, by either of the methods given, of a fine deep yellow, and while they are still wet and saturated with the dye, transfer them to the bright red dye, till you find the colour has penetrated equally throughout.

Silver Grey.

Take a cast-iron pot of six or eight gallons, and from time to time collect old iron nails, hoops, &c. &c., expose them to the weather till they are covered with rust; add one gallon of vinegar, and two of water, boil all well for an hour; then have your veneers ready, which

must be air-wood (not too dry), put them in the copper you use to dye black, and pour the iron liquor over them; add one pound of chip logwood, and two ounces of bruised nut-galls; then boil up another pot of the iron liquor to supply the copper with, keeping the veneers covered, and boiling two hours a day.

Another Grey.

Expose any quantity of old iron, or what is better, the borings of gun barrels, &c. in any convenient vessel, and from time to time sprinkle them with diluted spirits of salts till they are very thickly corroded; then to every six pounds add a gallon of water, in which has been dissolved two ounces of salt of tartar; lay your veneers in the copper, and cover them with this liquid; let it boil for two or three hours till well soaked, then add to every gallon of liquor a quarter of a pound of green copperas, keep the whole at a moderate temperature till the dye has sufficiently penetrated.

STAINING.

GENERAL OBSERVATIONS.

STAINING differs from the process of dying, inasmuch as it merely penetrates just below the surface of the wood, instead of colouring its substance throughout, as it does in dying; and the one is used for beautifying the face after the work is finished, while the other is employed on the wood before it is manufactured, in the state of veneers, to be cut into strings or bands to be used for inlaying borders, patteras, &c., and which has of late years got much out of use, principally owing to the fault so much complained of, of the colours flying, or fading, and which was in consequence of not taking that care in the operation which it required, and in not using any thing but simply the infusion of different colouring materials, without adding anything to set the colour, in the way we have recommended.

Staining is chiefly in use among chair-makers, and when properly conducted and varnished, has a most beautiful appearance, and is less likely to meet with injury than japaning.

Black Stain for immediate Use.

Boil half a pound of chip log-wood in two quarts of water, then add one ounce of pearl-ash, and apply it hot to the work with a brush; take half a pound of logwood and boil it as before in two quarts of water, adding half an ounce of verdigris and half an ounce of copperas; strain it off, and put in about half a pound of rusty steel filings, and apply as before.

To stain Beech a Mahogany Colour.

Take two ounces of dragon's blood, break it in pieces, and put it into a quart of rectified spirits of wine; let the bottle stand in a warm place, shake it frequently, and when dissolved it is fit for use.

Another Method for Black Stain.

Take one pound of logwood, boil it in four

quarts of water, add a double handful of walnut peeling, boil it up again, take out the chips, add a pint of the best vinegar, and it will be fit for use; apply it boiling hot.

Note.—This will be much improved, if, after it is dry, we take a solution of green copperas dissolved in water, in the proportion of an ounce to a quart, and apply it hot to the above.

To imitate Rose-wood.

Take half a pound of logwood, boil it with three pints of water till it is of a very dark red, to which add about half an ounce of salt of tartar, and when boiling hot stain your wood with two or three coats, taking care that it is nearly dry between each; then with a stiff flat brush, such as is used by the painters for graining, form streaks with the black stain above-named, which, if carefully executed, will be very near the appearance of dark rosewood.

Another Method.

Stain your wood all over with the black

stain, and when dry, with a brush as above, dipped in the brightening liquid, form red veins in imitation of the grain of rose-wood, which will produce, when well managed, a beautiful effect.

Note.—A handy brush for the purpose, will be made by taking a flat brush, such as is used for varnishing, and cutting the sharp points off the hairs, and making the edge irregular, by cutting out a few hairs here and there, you will have a tool which, without any trouble, will imitate the grain with great accuracy.

To imitate King or Botany Bay Wood.

Take French berries half a pound, and boil them in two quarts of water, till you have a deep yellow, and with it, boiling hot, give two or three coats to your work; let it be nearly dry, then, with the black stain, form the grain with your brush: to be used hot.

N.B.—You may, for variety, after giving it two or three coats of yellow, give one of strong logwood liquor, which will heighten the colour, and then use the black stain as directed.

A common Red for Bedsteads and common Chairs.

Archil, as sold at the shops, will produce a very good stain of itself when used cold; but if after one or two coats being applied and suffered to get almost dry, we brush it over with a hot solution of pearl-ash in water, it will improve the colour.

To stain Horn in imitation of Tortoise-shell.

Take an equal quantity of quick-lime and red-lead, mix it up with strong soap lees, lay it on the horn with a small brush, in imitation of the mottle of tortoise-shell; when it is dry, repeat it two or three times.

Another Method.

Grind one ounce of litharge with half an ounce of quick-lime, to the consistence of paint, with a sufficient quantity of liquid salt of tartar, put it on the horn with a brush, in imitation of tortoise-shell, and in three or four hours it will

have produced the desired effect; it may then be washed off with clean water: if not deep enough, it may be repeated.

Another Method still better.

Take a piece of lunar caustic, about the size of a pea, and grind it with water on a stone, and mixing with it a sufficient portion of gum arabic to make it of a proper consistence, you may apply it with a brush to your horn, in imitation of the veins of turtle or tortoise-shell.

Note.—It would, perhaps, be as well to mix with it a portion of red lead, or any other powder, to give it a body. This, if properly applied, will stain the horn quite through without hurting its texture or quality; only be careful when the horn is sufficiently stained, to let it be soaked for some hours in plain water previous to finishing and polishing it.

To stain Ivory or Bone Red.

Boil shavings of scarlet cloth in water, and add by degrees pearl-ashes till the colour is

extracted, add a little roach alum, which will clear the colour, then strain it through a linen cloth. Steep your ivory or bone in a solution of aqua-fortis, not too strong, then take it out and put it into your scarlet dye till the colour is to your mind; you must be careful not to let your aqua-fortis be too strong, neither let your ivory remain too long in it; try it first with a slip of ivory, and if you observe the acid has just caused a trifling roughness on its surface, you must take it out immediately, and put it into the red liquid, which must be warm, but not too hot; a little practice, with these cautions, will enable you to succeed according to your wishes; if you wish any white spots or marks to remain on your work, cover the places you wish to remain white with wax, and the stain will not penetrate in those places, but leave the ivory of its natural colour.

To stain Ivory or Bone Black.

Make a pretty strong solution of nitrate of silver, (lunar caustic) in water, and steep your

ivory or bone in it, take it out again in about an hour, and expose it to the sun-shine to dry, and it will be a perfect black.

Another Method for Black.

Steep your bone or ivory for three or four days in the following mixture: boil nutgalls bruised in water till all the virtue is extracted, add to this a small portion of pearl-ash; when you have taken the ivory out and it has got somewhat dry, put them into the black stain mentioned in the first part of this article, let them remain some time for the dye to penetrate, take them out and let them dry gradually.

To stain Ivory or Bone Green.

Steep your work in a solution of verdigris and sal-ammoniac in weakish aqua-fortis, in the proportion of two parts of the former to one of the latter, being careful to use the precautions mentioned for staining red.

To stain Ivory, &c., Blue.

Let your materials be first stained green, then dip them in a strong solution of pearl-ashes and water.

To stain Ivory, &c., Yellow.

Make a strong solution of allum in water put in your ivory, &c., and keep the whole some time near boiling, take them out and immerse them in a hot mixture of turmerick and water, either with or without the addition of French berries, letting them simmer for about half an hour, you will find your ivory stained of a beautiful yellow.

Note.—In staining all ivory or bone, be sure to let your work dry very gradually, or it will be apt to split or crack.

TO STAIN MUSICAL INSTRUMENTS.

Fine Crimson.

TAKE one pound of good Brazil, and boil it

in three quarts of water for an hour; strain it, and add half an ounce of cochineal; boil it again for half an hour gently, and it will be fit for use.

If you would have a more scarlet tint, put half an ounce of saffron in a quart of water, boil it for an hour, and pass over the work previous to the red stain.

Purple.

Take a pound of good chip logwood, to which put three quarts of water, boil it well for an hour; then add four ounces of pearl-ash, and two ounces of indigo pounded, and you will have a good purple.

Fine Black.

In general, when black is required in musical instruments, it is produced by japanning; the work being well prepared with size and lamp-black, take some black japan (which is sold at the varnish makers), after which, varnish and polish it.

Note.—A black stain is sometimes required, as for finger boards, bridges, &c., and flutes a resometimes stained; you may then proceed as directed in staining, but the wood ought to be either pear, apple, or box-wood; but the latter is preferable, which may be rubbed over, when dry, with a rag or flannel dipped in hot oil, which will give it a gloss equal to ebony.

Fine Blue.

Take a pound of oil of vitriol in a clean glass phial, into which put four ounces of indigo, and proceed as before directed in dying.

Fine Green.

Take three pints of the strongest vinegar, to which put four ounces of the best verdigris pounded or ground fine, half an ounce of sap green, and half an ounce of indigo.

Note.—Perhaps distilled vinegar, or verjuice, would be an improvement.

Bright Yellow.

There is no need whatever to stain the wood,

as a very small bit of aloes put into the varnish will make it of a good colour, and has the desired effect.

To stain Box-wood Brown.

Hold your work to the fire that it may receive a gentle warmth, then take aqua fortis, and with a feather, or brush. pass over the work till you find it change to a fine brown (always keeping it near the fire); you may then oil and polish it.

Note.—The wood most proper for musical instruments, such as violins, guitars, &c. is air-wood; or good sycamore, without blemish, when varnished, will look rich.

VARNISHING.

GENERAL OBSERVATIONS.

It is the custom, in order to heighten the beauty of fine wood, and give additional lustre

to furniture, &c. to varnish it; the simplicity of the process requires but little to be said on the subject, but that nothing may be wanted to benefit the workman, I shall endeavour, as clearly as possible, to lay down some rules and cautions necessary to be observed, both in the making, and method of using varnish, that the work may appear as beautiful as possible.

In London it is hardly worth while to make varnish, unless in large quantities, as there are several shops where it may be had very good, and at a fair price; but in the country, where the carriage is an object, and you cannot depend upon the genuineness of the article, it is necessary to be known by the practical mechanic. The varnish in general sold for varnishing furniture, is white hard varnish.

Cautions respecting the making of Varnish.

As heat in many cases is necessary to dissolve the gums used in making varnish, the best way, when practical, is to use what the chemists call a sand bath, which is simply placing the vessel

in which the varnish is, in another filled with sand, and placed on the fire; this will generally be sufficient to prevent the spirits catching fire; but in case of such accidents (which not unfrequently happens), it will be best to take a vessel sufficiently large that there shall be little danger of spilling any; indeed the vessel should never be more than two-thirds filled, but in case of accident, have ready at hand a piece of board sufficiently large to cover the top of the vessel in case of its taking fire, as also a wet wrapper, in case it should be spilt when on fire, as water by itself thrown on it, would only increase the mischief; and the person who attends the varnish pot should have his hands covered with gloves, and if they are made of leather, and rather damp, it will effectually prevent injury. I would particularly impress these cautions on the workman, as, from practical knowledge, I have several times witnessed shocking personal injury from the neglect of these cautions.

General Directions in choosing the Gums and Spirits used.

When you purchase a quantity of gum, first examine it, and see that it consists for the most part of clear transparent lumps without a mixture of dirt; next, when you get it home, select the clearest and lightest pieces for the most particular kinds of varnish, reserving the others, when separated from extraneous matter, for the coarser varnishes. In choosing spirits of wine, the most simple test is by immersing the finger in it, and if it burns quickly out without burning the finger, it is good; but if, on the contrary, it is long burning, and leaves any dampness remaining on the finger, it is mixed with inferior spirit; it may be also compared with other spirit, by comparing the weight of equal quantities; the lightest is the best; the goodness of spirits of turpentine may be likewise ascertained in the same manner by weighing it, and by noticing the degree of inflammability it possesses; the most inflammable is the best; and

a person much in the habit of using it, will tell by the smell its good or bad qualities; for good turpentine has a pungent smell, and the bad a very disagreeable one, and not so powerful.

To varnish a Piece of Furniture.

First observe the work to be clean; then see if any knots or blemishes require filling up, which must be done with cement of the same colour; have your varnish in an earthen pot, with a piece of wire diametrically across the top, slackened downwards, to stroke the brush against; then see that your brush is clean, and free from loose hairs, dip your brush in the varnish, stroking it across the wire, and give the work a thin and regular coat; soon after that another, and another, always taking care not to pass the brush twice in the same place; let it stand to dry in a moderately warm place, that the varnish may not chill.

When you have given your work about six or seven coats, let it get quite hard (which you will prove by pressing your knuckles on it, if it

leaves a mark it is not hard enough); then with the three first fingers of your hand rub the varnish till it chafes, and proceed over that part of the work you mean to polish, in order to take out all the streaks, or partial lumps made by the brush; give it then another coat, and let it stand a day or two to harden.

Note.—The best vessel for holding your varnish is commonly sold at colour-shops, called a varnish pan; it is constructed of tin with a false bottom; the interval between the two bottoms is filled with sand, which being heated over the fire, keeps the varnish fluid and flows more readily from the brush: there is a tin handle to it, and the false bottom comes sloping from one end to the other, which causes the varnish to run to one end, and with a wire across in the same manner as recommended in the above directions.

To keep your Brushes in order.

The brushes used or varnishing are either flat in tin, or round tied firm to the handle, and

either made of camels' hair or very fine bristles; in the use of which it is necessary to be very careful in cleaning them after being used. for if laid by with the varnish in them they are soon spoiled; therefore after using them, wash them well in spirits of wine or turpentine, according to the nature of your varnish; after which you may wash them out with hot water and soap, and they will be as good as new, and last a great while with care; and the spirits that are used for cleaning, may be used to mix with varnish for the more common purposes, or the brushes may be cleaned merely with boiling water and strong yellow soap.

To make the best white hard Varnish.

Rectified spirits of wine, two gallons; gum sandrach, five pounds; gum mastic, one pound; gum anime, four ounces; put these in a clean can, or bottle, to dissolve, in a warm place, frequently shaking it, if (when the gum is dissolved) you strain it through a lawn sieve it is fit for use.

To make Mastic Varnish proper for varnishing Pictures or Drawings.

To every quart of spirits of turpentine, put one pound and a quarter of the cleanest gum mastic, set it in a sand bath till it is all dissolved, then strain it through a fine sieve, and it is ready for use; if too thick, you may thin it with spirits of turpentine.

To make Turpentine Varnish.

To one gallon of spirits of turpentine, add five pounds of clear rosin pounded; put it in a tin can, on a stove, and let it boil for half an hour; when the rosin is all dissolved, let it cool, and it is fit for use.

To make Varnish for Violins, &c.

Take half a gallon of rectified spirits of wine, to which put six ounces of gum mastic, and half a pint of turpentine varnish; put the above in a tin can, keep it in a very warm place, frequently shaking it, until it is dissolved

strain it, and keep it for use. Should you find it harder than you wish, you may add a little more turpentine varnish.

To varnish Harps and Dulcimers in the Indian Manner.

Prepare the work with size and red ochre; then take ochre, burnt umber, and red lead, well ground, and mix up a dark brown colour in turpentine varnish, adding so much spirits of turpentine that you may just be able to work it, pass over your work fair and even; and while it is yet wet, take a muslin sieve, and sift as much Dutch metal (bronze) upon it as you think requisite to produce the effect; after which, varnish and polish it.

To Varnish Drawings, or any kind of Paper or Card Work.

Take some clear parchment cuttings, boil them in water in a clean glazed pipkin, till they produce a very clear size, strain it, and keep it for use.

Give your work two coats of the above size, passing quickly over the work, not to disturb the colours; proceed as before directed with your varnish.

Another Method still better.

Take one ounce of the best isinglass, dissolve it in about a pint of water by simmering it over the fire; strain it through fine muslin, and keep it for use.

Try the size on a piece of paper (heat it to a moderate heat), and if it glistens it is too thick; then add more water, if it soaks into the paper it is too thin; add or diminish the isinglass till it merely dulls the surface; then take your drawing, and give it two or three coats, being careful (particularly in the first coat) to bear very lightly on the brush (which should be a flat tin camel's hair), and plenty of size to flow freely from it, otherwise you may damage the drawing.

Then take the best mastic varnish and with it give at least three coats, and the effect will answer your most sanguine wishes.

Note.—This is the method used by many eminent artists, and is found superior to any that has been tried.

Amber Varnish.

Take amber eight ounces, in powder, and two of gum lac; melt the amber by means of heat, in a glazed pipkin, with half a pint of the best spirits of turpentine; and when melted, add the gum lac, place it on the fire again, and keep stirring it with a piece of wood till all dissolved, then add one ounce of the clearest cold drawn linseed oil; stir it well together, and strain it for use.

Oil Varnish

Take any quantity of the best linseed oil, let it boil for an hour, then to every pound of oil add a quarter of a pound of the clearest rosin in powder, stir it well till dissolved; then add for every pound of oil used, one ounce of spirits of turpentine, strain it and bottle for use.

Note.—This is a cheap and good varnish for

sash rames, or any work where economy is required; it has besides the property of bearing hot water without being damaged, and is not subject to crack or scratch.

Copal Varnish

Takes pirits of wine one quart, gum copal one ounce, and shell-lac half an ounce; reduce the gums to powder, put the spirits in a jar or bottle, add the gums, place the whole in a warm place, with the cork lightly in the bottle; shake it occasionally, and when the gums are quite dissolved, strain and bottle for use.

To make a Colourless Copal Varnish.

As all copal is not fit for this purpose, in order to ascertain such pieces as are good, each must be taken separately, and a single drop of pure essential oil of rosemary, not altered by keeping, must be let fall on it. Those pieces that soften at the part that imbibes the oil, are good; reduce them to powder, which sift through a very fine hair sieve, and put it into a

glass, on the bottom of which it must not lie more than a finger's breadth thick, pour upon it essence of rosemary to a similar height; stir the whole for a few minutes, when the copal will dissolve into a viscous fluid. Let it stand or two hours, and then pour gently on it two or three drops of very pure alcohol, which distribute over the oily mass by inclining the bottle in different directions with a very gentle motion; repeat this operation by little and little, till the incorporation is effected, and the varnish reduced to a proper degree of fluidity. It must then be left to stand a few days, and when clear, be decanted off. This varnish thus made without heat, may be applied with equal success to pasteboard, wood, and metals, and takes a better polish than any other; it may be used on paintings, the beauty of which it greatly heightens.

Turpentine Copal Varnish.

Take of gum copal, one ounce and a half, the very best oil of turpentine, eight ounces,

put the turpentine into a vessel, which place in a sand bath when it is very hot; but being cautious not to let it boil; then gradually add the gum copal, stirring it with a wooden spatula, adding fresh gum as the other dissolves, when all thoroughly incorporated, take the vessel off the bath and let it cool, let it remain covered over for a few days to settle, and decant it clear off.

Note.—In making this varnish it frequently happens that the gum will not melt so readily as it ought, which in general is owing to the turpentine not being sufficiently rectified, but when that is good it will always succeed. It is best also to let your turpentine be exposed for some time in the sun in a corked bottle, that the watery particles may be gradually dissipated; the bottle should not be stopped quite tight.

JAPANNING.

GENERAL OBSERVATIONS.

It frequently happens that japanned work receives damage, when it is very inconvenient (either from distance or other circumstances) to send for a japanner to repair it; therefore it may not be improper to lay down the most simple methods used in that branch.

First, provide yourself with a small muller and stone, to grind any colour you may require.

Secondly, provide yourself with white hard varnish, brown varnish, turpentine varnish, japan gold size, and spirits of turpentine, which you may keep in bottles for the purpose.

Thirdly, provide yourself with flake white, red-lead, vermilion, lake, Prussian blue, king's and patent yellow, orpiment, spruce and brown ochre, mineral green, verditer, burnt umber, and lamp black, to which may be added raw sienna and burnt sienna, with the best yellow

ochre and light red (or burnt ochre), and Vandyke brown.

Observe—That all your wood-work must be prepared with size, and some coarse material mixed with it to fill up and harden the grain of the wood (such as may best suit the colour intended to be laid on), which must be rubbed smooth with glass paper when dry; but in cases of *accident*, it is seldom necessary to re-size the damaged places, unless they are considerable.

With the foregoing colours you may match almost any colour now in use in japanning, always observing to grind your colours smooth in spirits of turpentine; then add a small quantity of turpentine and spirit-varnish, lay it carefully on with a camel-hair brush, and varnish it with brown or white spirit-varnish, according to the colour.

Note.—You will find a box filled with curriers' shavings useful for cleaning your stones and pallet with, for they should never be laid by dirty, as the beauty of the work depends a great deal on keeping all your colours

separated, and that before you grind another colour, the first should be well wiped off your stone.

For a Black Japan.

Mix a little gold size and lamp-black, it will bear a good gloss without varnishing over.

To imitate Black Rose-wood.

The work must be grounded black, after which take some red lead, well ground, and mixed up as before directed, which lay on with a flat stiff brush, in imitation of the streaks in the wood; after which take a small quantity of lake, ground fine, and mix it with brown spirit-varnish, carefully observing not to have more colour in it than will just tinge the varnish; but should it happen on trial, to be still too red, you may easily assist it with a little umber ground very fine; with which pass over the wh le of the work intended to imitate black rose wood, and it will have the desired effect.

If well done, when it is varnished and po-

lished, it will scarcely be known from rose wood.

Note.—Instead of the umber in the above, you may use a small quantity of Vandyke brown, as it is much more transparent than the umber.

INDIA JAPANNING.

GENERAL OBSERVATIONS.

THIS art has of late been successfully practised in this country, and many pieces of cabinet work executed that with difficulty could be distinguished from the real *India Japan*. I shall, therefore, endeavour to give some description of the art as now practiced. One great peculiarity in the Indian method is the embossing, or raising the figures, &c. above the surface or ground, and the metallic, or bronze-like hue of the several designs, also the grotesque appearance of the several ornaments, whether figures, landscapes, or whatever other designs

they are embellished with, being so totally different from every principle of perspective, and so opposite to every idea we have of correct drawing. Nothing but the study of Chinese models themselves will enable the workman to imitate with any degree of precision their several characteristics. I shall, therefore, content myself with giving such directions for preparing the ground, embossing the designs, and producing the peculiar effect of Chinese Japan, as will I trust enable the ingenious mechanic to execute any work of the kind, with truth and accuracy, according to any copy given, while it must remain with him to use his taste and judgment in producing original designs, characterizing this peculiar manufacture.

Ground for Chinese Japan.

Take any quantity of the finest whitening, and mix it up to the consistence of paint with isinglass size; lay on your wood two or three coats, observing to put it on evenly and smoothly, and not too thick; let it dry; and rub it gently

with a soft rag and water till the surface is quite level and polished; you may if you please add a small portion of honey to the mixture, which will render it less liable to crack or peel off. If your ground is to be black, which is the most usual one, you may give it a coat or two of the black japan mentioned in the common method of japanning, and it is prepared for your figures, &c.

Another Ground.

Take fine plaster of Paris, and mix it with size not too thick, and apply it quickly, for it soon gets hard; two coats in most instances will be sufficient: after it is quite dry, polish it with *fine* glass paper, and rub it with a wet soft cloth; you may now give it two or three coats of drying linseed oil, or as much as it will soak up; when dry it is ready for japanning.

To make Black Japan.

Grind ivory or lamp-black very fine with turpentine, and a little lac varnish or copal var-

nish, and temper it to a proper consistence with varnish for laying on your ground; you must give your work two or three coats at least, using a gentle heat as directed in varnishing.

To trace your Design on the Ground.

Having drawn what figures you please on a piece of white paper either with ink or pencil, rub the back of it with fine chalk or whiting, and shake all the loose powder off; lay it on your ground, and trace or go over every part of your outline with the end of a blunt bodkin, or other similar instrument; you will then have a sketch in faint outline on your ground; you may then proceed to put in your figures, &c. with any colour you wish, or bronze them.

To raise Figures on your Work.

Make a mixture of whiting and size; or some prefer the whites of eggs, of a consistence to flow freely from your pencil, the hairs of which must be rather long. Begin with a figure, or other part, but do not do too much at a

a time, and trace the outline correctly with a free hand; take then a piece of stick pointed at the end, and dip it into your composition, and fill up the inside of your outline; continue to put more of the mixture on till it is raised sufficiently above the surface, let it get quite dry, and then polish it with a soft camel-hair pencil and clean water, which will make it perfectly smooth and level. Care must be taken in this process, that your composition is not too thin, or it will spread beyond the bounds of your outline, but just so thick as to drop from the stick; some mix with the whiting a portion of flake white, or dry white lead. This is an improvement, and for very particular work should be adopted.

Gold Bronze.

Take any quantity of gold leaf, empty out of the book into a stone mortar, add a little honey, and a small portion of water, grind it well together, till the gold seems dispersed throughout the whole paste, add by degrees

more water till it is quite thin, keeping it continually stirred; let it settle, and pour the water off as near as you can without wasting your gold, then repeat the washing till you see the gold in the form of a fine powder at the bottom; then pour the water clean off, and turn the gold out on a piece of blotting paper, keep it from the dust, and when all the moisture is evaporated put it into a bottle for use.

Note.—This is a very expensive bronze and used only for those works which are very particular; however a very good substitute may be had by treating Dutch metal in the same manner, but you must be sure to keep this close stopped, or it is very apt to tarnish.

Silver Bronze.

This may be made with silver leaf treated in the same manner as above directed for gold; but this must be kept also well stopped in a bottle and wrapped in paper, as it also is as apt to change as the Dutch metal.

Copper Bronze.

Procure some very fine filings of copper, put them into an iron mortar, and beat them the same as that of the gold leaf or Dutch metal, except, instead of using honey, you may pound it dry with a portion of sal ammoniac, and then wash it as above; keep this also from the air. Brass filings may be treated in the same manner.

Tin Bronze.

Take any quantity of grain-tin and melt it in a ladle over the fire, when it is in a fluid state add by degrees quicksilver, and stir it well, it will be transformed into a greyish powder, which for the sake of variety you may use with others, either alone or mixed.

Note.—We may, by mixing these different bronzes together, produce a great variety, that will add much to the beauty of your work, and we may here remark that there is a variety of colours in gold leaf, all of which will produce a different coloured powder.

In London we can procure a variety of coloured bronze at the colour shops, and at less expence than we can make them, but for the sake of the country workman I have here set down those that are most generally useful.

Method of applying the Bronze.

Go over the part you intend to bronze with gold size or varnish, and when it is sufficiently dry, that is, when it feels tackey, as workmen term it, or does not adhere to the finger, but feels clammy, dip a piece of cotton, rolled hard into a ball, in your bronze powder, and dab on the places intended to be bronzed; or you may mix your powder with varnish and apply it at once to the parts intended; but the first method I prefer, as it not only saves material, but your bronze looks more brilliant.

To Japan Work-Boxes &c.

There is a very pretty method of ornamenting boxes, cabinets, &c. so that the figures, &c shall appear of the colour of the wood and th

ground black; this by many is produced by first tracing out your pattern, and then pricking in those parts which shall appear as the ground, either black or any colour at fancy. This is a very tedious process, and even when finished with the greatest care will not appear regular or well defined in the pattern; suppose, for instance, we wish to ornament our work with a plain trellis pattern, so that the cross bars shall appear of the colour of the wood, and the squares which they enclose of a black or any other colour; here would be no great difficulty in drawing the trellis bars with any colour, so as to leave the squares, but it is extremely troublesome and tedious to prick in the squares and leave the bars. The following method will be found very expeditious, and at the same time very correct; it is but very little known, and as such will to the practical japanner be the more acceptable; it may also be applied to many other purposes than the one here alluded to. The following preparation is necessary, and which I shall denomi-

nate by the term *stopping out mixture;* it is made by dissolving the best white bees-wax in spirits of turpentine till it is of the consistence of varnish; keep this mixture in a bottle, and when wanted for use mix sufficient for your present purpose with white lead in powder, or flake white, to give it a body, but not too thick, only so that it will flow freely from your pencil; having now traced your design, go over those parts which you wish to remain of the colour of your wood and let it dry; then mix ivory black in very fine powder with parchment or isinglass size, and go over evenly and smoothly every part of your work; it will now appear wholly black, or of whatever colour you have mixed with your size; let the whole get thoroughly dry, then with a stiffish brush, dipped in plain spirits of turpentine, rub the whole of the work well, and those parts that have been gone over with the stopping-out mixture will come off, leaving your black or other colour perfect; it will then appear as if you had pricked in your work, but much more sharp, and will

if carefully done, have a beautiful effect: you have now nothing more to do than varnish your work, as in general, and polish it as directed under the article Polishing.

Note.—In finishing your work in the manner of Indian japan, you must not be sparing of your varnish, but give it eight or ten coats, so that it will bear polishing.

Sealing Wax Varnish.

For fancy work this has of late years been much used, and if well applied, and your wax good, will be a very good imitation of Indian japan. The method of making the varnish or japan is very easy, being simply reducing the wax to a coarse powder and pouring the best spirits of wine on it in a bottle, and letting it gradually dissolve without heat, shaking the bottle occasionally till it is all dissolved. One shilling stick of wax will be enough for about a quarter of a pint of spirits

Note.—As much depends on the goodness of the sealing wax, the following is the best

method of preparing it. Take of shell or seed lac, the shell is best, two ounces, the best white resin one ounce, and vermillion in fine powder one ounce, melt the whole into a mass, stirring it well to make the colour even throughout, you need not for this purpose form it into sticks, but merely pour it out on a piece of marble in a cake to cool. If you wish your wax of any other colour, you must substitute any other colour powdered instead of vermillion; thus, for black substitute ivory black; for *green*, verdigris or crystals of verdigris; *blue*, verditer or smalt; *yellow*, turpeth mineral or mastico*t*; *purple*, vermillion and smalt mixed, and so for any other colour.

POLISHING.

GENERAL OBSERVATIONS.

First, the varnish for cabinet-work should be very clear and bright, otherwise it will give a dingy shade to all light-coloured woods.

Secondly, some persons polish with rotten stone, others with putty-powder, and I have seen varnish polished with common whiting and water; but Tripoli will be found to answer the best.

To Polish Varnish.

It has been considered by many as a matter of difficulty, they have furnished themselves with a quantity of materials, and as often failed of success, the process being rather tedious.

Take two ounces of Tripoli powdered, put it in an erthen pot or basin, with water to cover it; then take a piece of fine flannel four times doubled, lay it over a piece of cork rubber, and proceed to polish your varnish, always wetting it with the Tripoli and water; you will know when the process is done, by wiping a part of the work with a sponge, and observe whether there is a fair and even gloss; take a bit of mutton suet and fine flour and clean off the work.

Caution.—You must be careful not to rub

the work too hard, nor longer than is necessary to make the face perfectly smooth and even.

The French Method of Polishing.

Take a piece of fine pumice-stone and water and pass regularly over the work with the grain, until the rising of the grain is down then take powdered Tripoli and boiled linseed oil, and polish the work to a bright face, which will be far superior to any other polish, but it requires much more time.

To Polish Brass Ornaments Inlaid in Wood.

First, carefully observe to have your brass-work filed very clean with a smooth file; then take some Tripoli, powdered very fine, and mix it with linseed oil, and with a rubber made from a piece of old hat, or felt, you may polish the work as you would polish varnish, until you have the desired effect.

If the work is ebony, or black rose-wood, take some elder-coal powdered very fine, and

apply it dry after you have done with the Tripoli; it will produce a superior polish.

To Polish Ivory.

Ivory is best polished with putty and water, by means of a rubber made of hat, which in a short time produces a fine gloss.

To Polish any Work of Pearl.

Take pumice-stone, finely powdered (and washed to separate the impurities and dirt), with which you may polish it very smooth; then take putty-powder as directed for ivory, and you will have a fine gloss and a good colour.

To Polish Marble.

It frequently happens that the cabinet-maker has a table-top of marble to remount, which is scratched and requires repolishing; the following is the process used by the mason, and will perhaps not be unacceptable in a work like the present. Procure a piece of sandstone with a

very fine grit, then with that rub your slab backwards and forwards, using very fine sand and water, till your marble appears equally rough and not in scratches; next use a finer stone and finer sand, till its surface appears equally gone over, then with fine emery powder and a piece of felt or old hat, wrapped round a weight, rub it till all the marks left by the former process is worked out, and it appears with a comparative gloss on its surface; afterwards finish the polish with putty powder and fine clean rags, taking care as soon as the face appears of a good gloss not to put any more powder on your rags, but rub it well, and in a short time it will appear as fresh as when out of the mason's hands.

To Polish Tortoise-shell or Horn.

After having scraped your work perfectly smooth and level, rub it with very fine sand-paper or Dutch rushes, then with a bit of felt dipped in finely powdered charcoal with water, and lastly with rotten-stone or putty powder;

then with a piece of soft wash-leather, damped with a little sweet oil, to finish it.

FRICTION VARNISHING OR FRENCH POLISHING.

GENERAL OBSERVATIONS

The method of varnishing furniture, by means of *rubbing* it on the surface of the wood, is of comparatively modern date, though bees-wax has been used, either by itself, or mixed with spirits of turpentine, for a very considerable period, for that purpose, and which at first produces a very good gloss, though it does not wear well, and is particularly liable to spot with wet, and look smeary when touched with the fingers; to remedy these inconveniences, and put a harder face, which shall not be so liable to scratch as varnish, and yet have an equally fine face, the French polish was intro-

duced, and as it would be unpardonable in a work like this, to omit a full direction of the process, and also the various preparations of the different compositions necessary, it is here introduced that nothing might be wanting to make this work as complete as possible.

All the polishes are used much in the same way, therefore a general description will be a sufficient guide for the workman. If your work is porous, or the grain coarse, it will be necessary, previous to polishing, to give it a coat of clear size previous to your commencing with the polish, and when dry, gently go over it with very fine glass-paper, the size will fill up the pores and prevent the waste of the polish, by being absorbed into the wood; and also a saving of considerable time in the operation. Place your work so that the light may shine on it in an oblique direction, to enable to you see, by looking sideways, how the polishing proceeds.

Make a wad with a piece of coarse flannel or drugget, by rolling it round and round, over

which, on the side meant to polish with, put very fine linen rag several times doubled, to be as soft as possible; put the wad or cushion to the mouth of the bottle, containing the preparation (or polish) and shake it, which will damp the rag sufficiently, then proceed to rub your work in a circular direction, observing not to do more than about a square foot at a time; rub it lightly till the whole surface is covered, repeat this three or four times, according to the texture of the wood; each coat to be rubbed until the rag appears dry, and be careful not to put too much on the rag at a time, and you will have a very beautiful and lasting polish; be also very particular in letting your rags be very clean and soft, as the polish depends, in a great measure, on the care you take in keeping it clean and free from dust during the operation.

The True French Polish.

To one pint of spirits of wine, add a quarter of an ounce of gum-copal, a quarter of an ounce of gum-arabic, and one ounce of shell-lac.

Let your gums be well bruised, and sifted through a piece of muslin. Put the spirits and the gums together in a vessel that can be close corked, place them near a warm stove, and frequently shaking them, in two or three days they will be dissolved: strain it through a piece of muslin and keep it tight corked for use.

An Improved Polish.

Take a pint of spirits of wine, add, in fine powder, one ounce of seed-lac, two drachms of gum-guaiacum, two drachms of dragon's blood, and two drachms of gum-mastic; expose them, in a vessel stopped close, to a moderate heat for three hours, until you find the gums dissolved; strain it off into a bottle for use, with a quarter of a gill of the best linseed oil to be shaken up well with it.

Note.—This polish is more particularly intended for dark-coloured woods, for it is apt to give a tinge to light ones, as satin-wood, or airwood, &c. owing to the admixture of the dragon's blood, which gives it a red tinge.

Water Proof Polish.

Take a pint of spirits of wine, two ounces of gum-benzoin, a quarter of an ounce of gum-sandrach and a quarter of an ounce of gum-anime; these must be put into a stopped bottle, and placed either in a sand-bath or in hot water till dissolved, then strain it; and after adding about a quarter of a gill of the best clear poppy oil, and well shook up, put by for use.

Bright Polish.

A pint of spirits of wine to two ounces of gum-benzoin and half an ounce of gum-sandrach, put in a glass bottle corked, and placed in a sand-bath, or hot water, until you find all the gum dissolved, will make a beautiful clear polish for Tunbridge-ware goods, tea-caddies, &c.: it must be shaken from time to time, and when all dissolved, strained through a fine muslin sieve and bottled for use.

Prepared Spirits.

This preparation is useful for finishing after any of the foregoing receipts, as it adds to the lustre and durability, as well as removing every defect which may happen in the other polishes; and it gives the surface a most brilliant appearance.

Half a pint of the very best rectified spirits of wine, two drachms of shell-lac, and two drachms of gum-benzoin. Put these ingredients in a bottle, and keep it in a warm place till the gum is all dissolved, shaking it frequently; when cold, add two tea-spoonfuls of the best clear white poppy oil, shake them well together and it is fit for use.

This preparation is used in the same manner as the foregoing polishes, but, in order to remove all dull places, you may increase the pressure in rubbing.

Strong Polish.

To be used in the carved parts of cabinet-

work with a brush, as in standards, pillars, claws, &c.

Dissolve two ounces of seed-lac and two ounces of white rosin in one pint of spirits of wine.

This varnish or polish must be laid on warm, and if the work can be warmed, also, it will be so much the better; at any rate moisture and dampness must be avoide .

Directions for Cleaning and Polishing Old Furniture.

Take a quart of stale beer or vinegar, put a handful of common salt, and a table-spoonful of spirits of salt, boil it for a quarter of an hour; you may keep it in a bottle, and warm it when wanted for use; having previously washed your furniture with soft hot water to get the dirt off, then polish, according to the directions, with any of the foregoing polishes.

CLEANSING.

To Clean and Restore the Elasticity of Cane Chair Bottoms, Couches, &c.

TURN up the chair bottom, &c. and with hot water and a sponge, wash the cane-work well, so that it may be well soaked, should it be dirty you must add soap; let it dry in the air, and you will find it as tight and firm as when new, provided the cane is not broken.

To Clean Old Brass-work for Lackering.

First boil a strong lye of wood-ashes, which you may strengthen by soap-lees; put in your brass-work, and the lacker will immediately come off; then have ready a pickle of aqua-fortis and water, strong enough to take off the dirt, wash it immediately in clean water, dry it well and lacker it.

To clean Silver Furniture.

Lay the furniture, piece by piece, upon a charcoal fire, and when they are just red, take them off and boil them in tartar and water, and your silver will have the same beauty as when first made.

A Receipt to Clean Marble, Sienna, Jasper, Porphyry, Sicola, &c.

Mix up a quantity of the strongest soap-lees with quick-lime, to the consistence of milk, and lay it on the stone, &c. for twenty-four hours, clean it afterwards with soap and water, and it will appear as new.

Note.—This may be improved by rubbing or polishing it afterwards with fine putty-powder and olive oil.

To take Ink Spots out of Mahogany.

Apply spirits of salts with a rag, until the spot disappears, immediately wash with clear water.

A other Method.

To half a pint of soft water, put an ounce of oxalic-acid, and half an ounce of butter of antimony; shake it well, and when dissolved it will be very useful in extracting stains out of mahogany, as well as ink, if not of too long standing.

To take out Spots of Grease or Oil from Cloth.

Drop on the spot some oil of tartar or salt of wormwood, left in a damp place till it turns into a fluid; then immediately wash the place with lukewarm soft water, and then with cold water, and the spot will disappear.

Note.—This will be found very useful, as it frequently happens that the cloth of card tables, and the inside flaps of secretaries, are spotted and greasy, which by proceeding as above will completely take out every spot of grease.

To take out Wax Spots from Cloth or Silk.

Put on each spot a piece of soft soap, and place it in the sun, or gently warm it before the fire, let it remain some time, then wash it off with soft water, and the spot will have disappeared.

Another Method.

Drop spirits of turpentine or spirits of wine on the spot, then with a spunge rub it gently, repeat it till the spot disappears.

To clean Carpets or Tapestry.

Let your carpet be first well beat, and freed from dust; then tack it down to the floor; mix half a pint of bullock's gall with two gallons of soft water, then scrub it well with soap and this gall mixture; let it remain till quite dry, and it will be perfectly cleansed, and look like new, as the colours will be restored to their original brightness; the brush you use

must not be too hard, but rather long in the hairs, or you will rub up the nap and damage your work.

To clean Or Molu Ornaments.

When the expence of regilding these ornaments is an object, the following method will in a great measure restore them to their original beauty; but if very much worn the only way is to take off what remains of the original gilding, and clean them well, by immersing them in aqua-regia, or a mixture of muriatic acid and aqua-fortis, and repeating the original process which is similar to that of gilding buttons; however, if not in a very bad state, if you let your ornament lay some little time in a weakish mixture of aqua-fortis, and then wash them directly in water, lay them on your hot plate, and when sufficiently heated apply very pale gold lacker, and they will look very well, as what remains of the original gilding will not be injured by the aqua-fortis, though the other parts as well as the gold will be perfectly cleansed from every dirt or tarnish

SILVERING.

GENERAL OBSERVATIONS

THE art of silvering looking-glasses, or plate glass, when conducted in the large way, requires great care and practice, and is almost a trade of itself, and the apparatus necessary is very expensive, therefore not worth the while of any one's undertaking without a considerable business in that way; but for the sake of the mechanic, I will endeavour to explain the process which may be conducted in the small way, particularly when at a distance from London, with advantage by the cabinet-maker, who by the bye ought to combine the several trades of that with carver and gilder, as well as japanner and varnisher, for it is seldom in a country town that they are thought of as separate trades, therefore every thing in the furniture way is sent to the cabinet-maker to be

made or repaired; the requisites necessary are, first, a large stone, or plate of cast iron made perfectly smooth and level. Secondly, a sufficient number of square lead or iron weights of from seven to fourteen pounds weight each. Thirdly, a quantity of tin-foil. And, lastly, good distilled quicksilver, free from any impurities, for on the goodness of it depends the beauty of the silvering.

Method of Silvering Looking Glasses and Plate Glass.

Have your stone or plate fixed firmly on a strong table, spread your tin foil smoothly and evenly on it to the size of the plate you intend to silver, then take your quicksilver and pour it on the foil, spread it evenly and smoothly with a hare's foot, that it may adhere to the foil in every part, lay a smooth piece of strong blotting-paper on it, and on that your plate to be silvered, shoving it on from one end, that the air may not be included between that and the glass; now draw the paper gently and regu-

larly from between the plate and glass, and place your weights side by side, as the paper is withdrawn, till the glass is entirely covered: elevate the stone at one end, which will cause the superfluous silver to run from between the glass and foil, let it remain in that position for about a week or ten days, and taking off your weights, you will find (if the process has been conducted with care) it silvered to your mind.

Note.—The stone should have a groove round the top, that the superfluous silver can run to the bottom, from whence it may be taken to use for the same purpose again.

To make Liquid Foil for Silvering Glass Globes, Bent Mirrors, &c.

Take one ounce of clean lead, and one ounce of fine tin, melt them together in a clean iron ladle, then immediately add one ounce of bismuth, skim off the dross, remove the ladle from the fire, and before it sets add ten ounces of quicksilver; stir the whole carefully together,

observing not to breathe over it, as the evaporation of the quicksilver is very pernicious.

Another Method.

Take four ounces of quicksilver, to which put as much tin foil as to become barely fluid when mixed; have your globe (or bent mirror) clean and warm, and either inject the quicksilver by means of a clean earthen pipe at the aperture, turning it about till it is silvered all over, or, if a bent mirror, pour it gently into it, turn it about till the silver adheres all over, let the remainder run out, and hang it up.

BRONZE AND PAINTING.

To Bronze Figures.

For the ground, after it has been sized and rubbed down, take Prussian blue, verditer and

spruce ochre, grind them separately in water, turpentine, or oil, according to the work; mix them together in such proportions as will produce the colour you desire; then grind Dutch metal, commonly called bronze, in the same material you ground your colour; laying it with judgment on the prominent parts of the figure, it will produce a grand effect.

Note.—There are several different colours of bronze, which are best imitated by the powders, sold at almost all colour-shops, called bronze-powders, independent of the one here mentioned of Dutch metal, and are made, not without considerable trouble, by dissolving different metals in aqua-fortis, and precipitating the solution by means of sal-ammoniac, and washing the precipitate in water, and drying it on blotting-paper; the ingenious artist will suit the colour of the bronze, by mixing corresponding colours of paint for a ground.

To Bronze on Wood.

The carved and turned work in cabinet furniture is frequently done in imitation of bronze, which if well done has a very elegant effect, and adds much to the beauty of the article: it is thus performed. Having stained those parts intended for bronzing black, by any of the methods shewn under the article *Staining*, take japanners' gold size, and mix with a small portion of Roman ochre and Prussian blue go over the blacked parts lightly, then suffer it to dry till it feels just tackey or stickey to the finger, but not to come off, then with a hard ball of cotton, dipped in any of the bronze powder, rub those places that are prominent, and, if you please, give it a thin coat of japanners' gold size thinned with spirits of turpentine; you may alter the colour of your bronze by mixing either more or less blue, as also other colours, as verditer green by itself, but do not put your colour on thick over the black stain, but rather glaze it on,

for it is not wanted in a body, but should be rather transparent, as it makes it more of a metallic appearance.

To bronze Brass Figures or Ornaments.

After having lackered your brass work in those parts you wish to look like gold, you must for those parts that are intended to appear as bronze take any quantity of umber, either burnt or in its natural state, according to the colour you require, and grind it with a small quantity of spirits of wine: do the same with verditer, and also spruce ochre, keep these colours separate for use, and when wanted take of pale gold lacker, and mix with it a portion of these ingredients till you get the colour required; then apply this mixture in the same manner as you are directed in lackering brass work; you may also, if you please, mix with it any coloured bronze powder for the sake of variety; a little experience, and a few experiments with these compositions, will enable the workman to imitate any bronze colour he pleases.

To Bronze or Brown Gun Barrels, &c.

Let your work be well cleaned and brightened, then apply aqua-fortis or spirits of salts all over it, and lay it by for a week till it appears covered with rust, then with a cloth damped with boiled lintseed oil, rub it well till it is perfectly level and smooth; then with a hard brush, and bees-wax, rub it well till it has a good gloss; some put a very thin coat of very pale lacker over the whole, to preserve it more effectually.

Note.—It is frequently the practice to make the browning appear in streaks or veins; this is done by applying the aqua-fortis and spirits of salt with a flat brush, such as the grainers of wood use in painting; you may also vary the colours, either by mixing these two ingredients together in different proportions, or using them separately; the aqua-fortis producing a kind of grey, and the spirits of salts a deep brown or rust colour.

Graining or imitating Woods, Marble, &c.

This process, though more properly under the department of the Painter, than that of the Cabinet Maker, may not be unacceptae tobl the latter. I shall, therefore, shew the mode usually adopted; but at the same time must remark that nothing but practice, and a close attention to nature, will enable the workman to excel in this art, though by pointing out the necessary tools used, and the various processes made use of to imitate the natural grain of wood, or marble, will most materially assist the workman in his operations. The chief tools necessary are common brushes, as used by house-painters, sash tools of different sizes, camel hair pencils with long and short hair, camel hair flat brushes in tin for softening off; graining tools, which are flat brushes of a few hairs in thickness, and of different widths, fastened into wooden handles, and, lastly, horn combs made on purpose for graining; and these are chiefly used for imitating oak, or wainscot, though they will be found often useful

for other purposes; they are sometimes fixed into a wooden handle, in the same manner as a graining tool, though generally in the form of a common comb; they should be very thin and elastic, so as to adapt themselves to the several mouldings they are drawn over, in order to produce the grain so peculiar to oak or wainscot.

The first thing to be attended to, is to make a good ground, as much depends on this, in order that your work shall appear to the greatest advantage; you must, therefore, after having put on your priming, or first colour, when it is dry, rub it well with pumice stone, in order to make smooth all the lumps; next put on your colour for the ground, which must be adapted to the colour of the wood you wish to represent; thus having determined upon what wood it is to imitate, procure a piece for a model to work from, and let it be well scraped, sand-papered and polished; observe which is the lightest parts of it, which match as near as you can with paint, and lay that on evenly and smoothly for your ground colour, being careful that it has

been well mixed and finely ground in oil, with the neeessary quantity of drier, or sugar of lead ground in oil; let the ground then remain to get perfectly hard and dry, it is then ready to receive the finish by graining, which is done in two different ways, viz. either in oil colour, or in distemper; the first is certainly to be preferred, as it stands better, is more durable, and in most cases much handsomer, though at the same time more difficult to execute, and not so expeditiously performed. I prefer, in working by this method, to use mixed with the colour, which should be finely ground in oil, some japanner's gold size, to expedite the drying; and also to thin your colour to the proper consistence, to use good spirits of turpentine, as it makes the colour flow freely from your brush, and enables you to soften and blend the different shades of your grain together. The other method in distemper, is to have your graining colour ground either in very thin size, or stale beer; this method is very expeditious, and at the same time enables you very

easily to make any alterations in your work, as a wet sponge will immediately remove any parts that are not to your mind.

There is one particular, which I must mention in the art of graining, which is, that you must select those colours that are the most transparent, and at the same time, have sufficient body for your purpose, for if you use opaque, heavy colours, though they may appear to match the tint, or have the hue required, will, when applied, give your work a cloudy and muddy appearance, and the shades will not soften or blend with each other.

As an attempt to give a particular description of the methods used for each particular wood, would of itself form a volume, and swell this much beyond the limits of a pocket manual, I shall content myself by giving in general terms the usual process of applying the colour for graining, and suppose we have the pattern before us, and the ground prepared as above directed, as well as the graining colour. The first thing we do is to go over the ground

in a slight manner, with the grain colour made very thin with spirits of turpentine, and if necessary, a little drying oil mixed with it, by taking a little on your brush and scumbling it on; that is, rubbing the brush over it in all directions as thinly as possible; next, if it should be in imitation of oak or wainscot, we scrape it from top to bottom, or from side to side, according to the way we have fixed on in our minds the grain of the wood should run, going over repeatedly, gently shaking your comb, that the grain should not appear as perfectly strait lines; you will then have a perfect resemblance to the strait part of the grain of your wood; observe next, if there is any particular dark or light streaks you wish to imitate, the first is done with your colour flowing freely from a camel hair pencil, and softened off with your flat tin softener of camel's hair; if light, dip your brush in plain spirits of turpentine, and mark the light places, then gently brush them with your softener, or very soft dusting brush, and it will appear light to your mind; for your

dark irregular grain imitate nature as near as possible, with your flat graining brush dipped in the grain colour, which you may mend and touch up with your camel-hair brush; gently soften it off and proceed, if there is irregular light parts in the grain, to imitate them either with your graining brush, or camel-hair pencil dipped in turpentine, brushing gently over with your duster or softener; you may then proceed to finish by putting in stronger marks with your camel-hair brush. Sometimes you will find it convenient to rub off the colour in small patches, to imitate your pattern, which may be done with a piece of wash leather; at other times, as in imitating yew-tree or knotty and curly wood, you may twist up a piece of bladder or thin parchment, and by giving it a turn or twist on the ground, it will give a very good representation of a knot or curl. Your work is now to be suffered to get quite dry and if very particular nicety is required, you may glaze over those parts which require it. o

darken others at your pleasure; if you are not very particular, you may at once give it two or three coats of clear copal varnish, or more will be required if the varnish is to be polished.

Nearly the same methods as above may be resorted to when we grain in distemper, except using plain water instead of turpentine. The process is much the same for marbling, except it requires great dexterity in putting in the veins, and there is no occasion of scumbling in the colour in the ground, or even in many cases in letting the ground dry, but doing it all at once with opaque body colours, which you soften into one another as required; and in many cases it is necessary to sprinkle on different colours from the brush, such as in imitating porphyry, &c. These few rules, if joined with a close attention in studying from nature, will enable the ingenious mechanic soon to make himself master of an art which adds so much to the beautifying of our apartments, and which has lately become so much in vogue,

that a modern room can scarcely be said to be finished without these decorative embellishments.

Green Paint for Garden Stands, Venetian Blinds, Trellisses, &c.

Take mineral green and white lead ground in turpentine, mix up a quantity to your mind, with a small quantity of turpentine varnish for the first coat; for the second, you must put as much varnish in the colour as will produce a good gloss.

Note.—By adding a small quantity of Prussian blue you will have the colour much brighter.

GILDING.

GENERAL OBSERVATIONS.

GILDING on wood is performed in two different ways, and is called oil gilding when the

process is performed by means of oil or varnish, and is well calculated for out-door work, as it will stand the weather, and bear washing: the other, and by far the most beautiful, is that employed for picture frames, furniture, &c. and is called burnish gilding, which, when well executed, adds greatly to the ornamental work often introduced, either in the internal decoration of rooms, or the carved work and reeding in furniture. As both these methods are so necessary to the workman, I shall be particular in laying down such rules and directions, that, with a little care and practice, the ingenious mechanic will soon be able to execute any piece of work wherein the assistance of gilding is necessary, and where a regular gilder is not at hand.

Necessary Requisites to be provided with.

First, a sufficient quantity of leaf-gold, which is of two sorts, the high gold, as it is called, and the pale gold; the former is much the best, but the latter very useful, as being

of a different colour, you may introduce, if necessary, a variety; it is also cheaper, therefore to be preferred where expense is an object.

Secondly, A gilder's cushion, which is an oblong piece of wood, covered with a piece of what the bookbinders call rough calf-skin, and is stuffed with flannel several times doubled, and a border of parchment, about four inches deep at one end, to prevent the air blowing the leaves about when taken from the book and placed on the cushion.

Thirdly, A gilding knife, with a strait and very smooth edge, to cut your gold in the pieces necessary.

Fourthly, Several camel-hair pencils of different sizes, and some tips, as they are called, which is a few long camel's hairs put between two cards in the same manner that the hairs are put into tin cases for brushes, making, as it were, a flat brush with a very few hairs.

Lastly, A burnisher, which is a crooked piece of agate set in a long wooden handle.

To make Size for preparing your Frames, &c

Take half a pound of parchment shavings, or cuttings of white leather; add three quarts of water, and boil it in a proper vessel till it is reduced to nearly half the quantity; take it off the fire and strain it through a sieve: be careful in the boiling to keep it well stirred, and do not let it burn.

To prepare your Frames or Wood-work.

First, with the above size alone, and boiling-hot, go over your frames in every part; then take a sufficient quantity of whiting and mix with some size, to the consistence of thick cream; go over every part of your frame, and give it six or seven coats, carefully letting each coat dry before you proceed with the next, and you will have a white ground fit for gilding on nearly, or quite, the sixteenth of an inch in thickness.

Note.—You must not have your size too thick, and it need not be put on, when mixed

with the whiting, so hot as the first coat is by itself: it will be better, in order to separate the dirt or coarse parts of the whiting, to strain it through a sieve.—Vauxhall whiting is the best.

Polishing.

When the prepared frames are quite dry, proceed to clean and polish them; wet a small piece at a time, and take a smooth fine piece of cloth dipped in water, rub the part till all the bumps and inequalities are removed, and for those parts where the fingers will not enter the mouldings, &c. wind the wet cloth round a piece of wood adapted to the moulding or quirk; by this means you will make the surface all smooth and even alike.

Note.—Where there is carved work, &c. it will sometimes be necessary to bring the mouldings to their original sharpness, by means of chisels, gouges, &c. as the preparation will be apt to fill up all the finer parts of the work which must be thus restored; it has sometimes

been the practice, after polishing, to go over the work once with fine yellow or Roman ochre, but in general this is hardly necessary.

Gold-Size.

Take fine boll-ammoniac, what quantity you please, grind it fine with a muller and stone, scrape into it a little beef suet, grind all well together; after which, mix in with a pallet knife a small proportion of parchment size with a double proportion of water.

Another Gold-Size.

Take a lump of tobacco-pipe clay, and grind it into a very stiff paste with thin size; add a small quantity of ruddle, and fine black lead ground very fine, and temper the whole with a small piece of tallow.

To prepare your Frames, &c. for Gilding.

Take a small cup, or pipkin, in which put as much gold-size as you judge sufficient for the work in hand, add parchment-size, till it is just

sufficient to flow from the brush; when quite hot, pass over your work with a very soft brush, taking care not to put the first coat too thick; let it dry, and repeat it twice or three times more, and when quite dry, brush the whole with a stiff brush, to remove any nobs, &c. that there may have been in the size: your work is now ready for applying the gold.

Note.—Your parchment-size should be of such a consistence, when cold, as the common jelly sold in the shops; for if too thick it will be apt to chip, and if too thin it will not have sufficient body.

Laying on the Gold.

This is the most difficult part of the operation, and requires some practice; but I shall endeavour so to describe the method that, with a little caution and attention, it may be easily performed.

Turn your gold out of the book on your cushion a leaf at a time; then passing your gilding knife under it bring it into a convenient

part of your cushion for cutting it into the size of the pieces required; breathe gently on the centre of the leaf, and it will lay flat on your cushion; then cut it to your mind by bringing the knife perpendicularly over it, and sawing it gently it will be divided.

Place your work before you, nearly horizontal, and with a long-haired camel-hair pencil, dipped in water (some use a small quantity of brandy in the water), go over as much of your work as you intend the piece of gold to cover; then take up your gold from your cushion by means of your tip; by drawing it over your forehead, or cheek, it will damp it sufficiently to adhere to the gold, which must then be carefully transferred to your work, and gently breathing on it, it will be found to adhere; but you must mind that the part you apply it to is sufficiently wet; indeed, it must be floating, or you will find the gold apt to crack: proceed in this manner by a little at a time, and do not attempt to cover too much at a time, till you find by experience you are able to handle your gold

with freedom. Be careful in proceeding with your work, if you find any flaws, or cracks appear, to take a corresponding piece of gold and apply it immediately; sometimes, also, you will find it necessary, when your gold does not appear to adhere sufficiently tight, to draw a pencil quite filled with water close to the edge of the gold, that the water may run underneath it, which will answer your expectation.

Burnishing.

When your work is covered with gold, set it by to dry, it will be ready to burnish in about eight or ten hours; but it will depend on the warmth of the room or state of the air, and practice will enable you to judge when to seize the proper time.

When it is ready, those parts which you intend to burnish must be dusted with a soft brush, and wipey our burnisher with a piece of soft wash-leather (quite dry); begin to burnish about an inch or two in length at a time, taking care not to lean too hard, but with a gentle and

quick motion apply the tool til. you find it all over equally bright.

Matting.

Those parts of your work which look dull from not being burnished, are now to be matted, that is, are to be made look like dead gold; for if left in its natural state it will have a shining appearance, which must be thus rectified:

Grind some vermillion, or yellow ochre, very fine, and mix a very small portion either with the parchment-size or with the white of an egg, and with a very soft brush lay it even and smooth on the parts intended to look dull; if well done, it will add greatly to the beauty of the work.

Note.—The work must be well cleared of superfluous gold, by means of a soft brush, previous to burnishing or matting.

Finishing.

All that is now necessary is to touch the parts in the hollows with a composition called ver-

milie; it is made by grinding vermillion, gamboge, and red lead, very fine, with oil of turpentine, and applying it carefully with a small brush in the parts required, and your work is completed.

Note.—Sometimes the finishing is done by means of shell-gold, which is far the best method; it should be diluted with gum-arabic, and applied with a small brush.

To make Shell Gold.

Take any quantity of leaf gold, and grind it, with a small portion of honey, to a fine powder; take a little gum-arabic and sugar-candy, with a little water, and mix it well together, put it in a shell to dry against you want it.

Silver Size.

Take tobacco-pipe clay, grind it fine with a little black lead and Genoa soap, and add parchment-size as directed for the gold-size.

Note.—Any soap would most probably answer as well as Genoa soap; but I have made it as here directed, and found it answer very well.

Silvering.

Silvering is at present but little in use, though I have seen some old works that still looked very well, and I think it might be introduced with advantage in many works; the great fault is, that it is apt to tarnish; but which may be preserved with very little diminution to its beauty, by applying a thin coat of the cleanest copal or mastic varnish. The process for silvering is exactly the same as for gold; but the matting must be done by mixing a small quantity of flake white in powder, with a little Prussian blue (just sufficient to tinge it) along with plain size or white of egg.

To Gild the Borders of Glass.

The art of gilding upon glass, which is a revival and improvement upon attempts made many years ago, is chiefly used for decorating the borders of prints, in executing name plates, and inscriptions for various purposes; as also for ornamental decorations in a variety of

elegant works, with different coloured grounds; but as black is the most general in demand, I shall first proceed to treat on that, in two ways of performing it.

You are to procure some of the finest isinglass, which you will distinguish by holding between you and the light, when that which is white and transparent is the best, and the contrary is totally unfit for this purpose. You are to dissolve it in very clean water, pretty thick, and strain it through a linen cloth; then into a tea cup, full of very clean milk warm water, put about the size of a pea of this isinglass jelly, which let gently incorporate with the water; then, having your glass that is to be gilt quite clear and free from any dirt or grease, get some leaf gold, the less porous in the beating the better, put it on a gilding cushion, and cut it in pieces sized for your purpose, according to the breadth you want to have your work gilt; then touch with a hair pencil, dipped in the thin isinglass water, on the glass; and while moist, lay on your leaf

gold, piece by piece, until you have the parts you want covered. The leaf will instantly adhere to the glass; then place it within air of the fire, in a slanting position, until it dries, which will be in a few minutes. While it is gently warm, take a piece of clean cotton wool, and rub the gold on the glass smartly, until you not only find the superfluous pieces of leaf gold gone, but that likewise the part gilt receives a kind of polish; then proceed to lay on a second coat of gold, in the same manner as the first, drying it as before, and polishing it; and so a third coat, which is fully sufficient, and to gild properly cannot be dispensed with. Then take the size of your print or drawing, which is to be framed, and laying it on the gilt part of the glass, mark where the corners are to come, with a hair pencil, and some dark colour; after which, being provided with a long wooden ruler, and a pointed piece of ivory, draw two parallel lines out of your gold, and with a mahogany or deal stick, pointed cautiously, work away the superfluous parts, leaving the

gold fillet which is to encompass your picture, sharp and neat; when, if you have a mind to ornament it by any other lines, to appear black in the centre, lay on your ruler, and with your ivory point scribe them, and then varnish; having some black japan, to which a little burnt lamp black has been added to deepen its colour. Paint it all over the gilt part of your glass, and the space between it and the edge, then set it to dry, which will take place in a few hours; when you are to lay out the breadth of your black line that is to be inside your gilding, scribe it with a sharp point, and cut away the waste black with a graver or some sharp instrument.

If you want to cut figures, or any kind of ornament out of your gold, after your glass is gilt, have a drawing of your design on paper, at the back of which rub some powdered red chalk, and the smallest quantity of fresh butter; lay the paper on the gold, and with a bluntish ivory point, go over the lines of the drawing, and they will be nicely transferred on the gold;

when you can, with an ivory point, trace them out of the gold, and shade them agreeable to your fancy, or from the drawing you have by you; and then, by mixing any colour you choose with white copal varnish, you may vary your ground as you think proper.

But the most important secret in the glass gilding, is the method which only two or three persons in London are acquainted with. In an instant, after your glass is blackened, taking away the parts where the gold is to appear, and the remainder of the black to stand fast, by which means the black gilding work is done in one half the time, and with half the gold leaf. The process is simple, and is thus performed:—You are to get the very best black japan varnish, such as is used for the roofs of carriages, to which you may add a very small share of burned lamp black, very finely ground in spirits of turpentine, then, with a large flat varnish brush, give your glass one even thin coat, holding it between you and the light, observing it does not appear a thick dead black, but

exhibits a degree of transparency, and not too much, so as to prevent its appearing a good black on the right side of the glass. After this, you are to have your letters or ornaments, drawn on paper, as before mentioned, and trace it in the same manner on your black varnish, when it is perfectly dry; the drawing will be very critically transferred to the black. You are then to get a very fine needle, and fix it in a wooden handle firmly; with which you are to scribe the outlines of what black is to come out, through the varnish, so as not an edge hangs to the main body of the black; then take some thick brown paper, dip it in water, and squeeze it gently, and spread it over the parts of the varnish you wish to detach from the glass; and in a few minutes, by raising one edge of the black, it will all peel away as clean from the glass as if it never was on it. When all the black you want is taken out, lay your glass to the fire, and the remaining par of the varnish will instantlybecome as hard a ever, and ready to have the gold put on.

LACKERING.

GENERAL OBSERVATIONS.

THE art of lackering is so nearly allied to that of japanning, that it is scarcely necessary to say much as to its application; however, as some directions may be thought necessary, I will endeavour to explain shortly the process.

If the work is old, clean it according to the directions given under the article *Cleaning;* if new, it will require nothing but being freed from dust, and well rubbed with a piece of wash-leather to make it as bright as possible. Have a hot plate, or, for want of which, the hob of your fire-place will be a good substitute; lay your brass work on it till moderately heated, but not too hot; for that will blister your lacker; then, according to the colour you wish, take any of the following preparations, and making it warm, lay hold of your brass-work with a pair of pincers or pliers, and with

soft brush apply the lacker, being careful not to rub it on, but stroke the brush gently one way, and place your work on the hot plate again, till the varnish is hard; but do not let it remain too long, experience will best tell you when it should be removed (some, indeed, never place it on the stove or plate a second time); if it should not be quite covered, you may repeat it carefully, and if pains be taken with your lacker, will look equal to metal gilt.

To make Gold Lacker for Brass.

Take of rectified spirits of wine two quarts, and three pounds of seed-lac (picked particularly clean and clear of all black and brown specks and pieces, as upon that depends entirely the beauty of the lacker); add them together, keep them warm, and shake them often: when the lac is dissolved, it is fit for use.

Another Lacker.

Take of the clearest and best seed-lac one pound, of dragon's-blood one ounce, pound

them well together; add a pint and a half of the best spirits of wine, set it in a warm place to dissolve, strain it and it is fit for use.

Pale Gold Lacker.

Dissolve in a pint of spirits of wine as much gamboge as will give it a bright yellow, then add three quarters of a pound of seed-lac, finely powdered and sifted, set it in a sand-bath to dissolve; wen that is the case, bottle and stop it well till wanted for use.

Superior Lacker for Brass.

Take of seed-lac six ounces, amber or copal ground on porphyry two ounces, dragon's-blood forty grains, extract of red sandal wood thirty grains, oriental saffron thirty-six grains, pounded glass four ounces, very pure alcohol forty ounces. To apply this varnish to ornaments or articles of brass, expose them to a gentle heat, and dip them into the varnish; two or three coatings may be applied in this manner, if necessary. The varnish is durable,

and has a beautiful colour. Articles varnished in this manner may be cleaned with water and a bit of dry rag.

Note.—Not having myself tried this lacker, I cannot speak as to its good or bad qualities, or why the pounded glass is introduced, unless it is under the idea that it adds to its hardness, which it may probably do, though it appears to me to be a useless ingredient, unless the varnish is exposed to a degree of heat sufficient to make the glass run, which would assuredly very much hurt, if not altogether spoil the other ingredients; however, as it is a composition that has been recommended, I here insert it, that the workman may judge for himself.

Lacker, with Spirits of Tuperntine.

Take seed-lac four ounces, sandarac, or mastic, four ounces, dragon's-blood half an ounce, gum gutte, thirty or forty grains, clear turpentine two ounces, and the best spirits of turpentine thirty-two ounces.

Note.—This lacker, though certainly, no

equal to those made with spirits of wine, is, from its cheapness, often very useful for the more common purposes; it does not dry so quick, nor is it so durable; but for such purposes as lackering silvered leather, &c. it answers very well; we may here remark, that we may vary the colour of our lackers, by using more or less, or altering the proportion of the colouring material; and at the same time, notice that all the colouring substances that are of a resinous quality, or that will give out their colouring matter when infused in spirits, are proper to be used in the composition of lacker; we may, therefore, make lackers of almost any colour, by selecting different colouring materials, and mixing with the other compositions used as the basis of all lackers, such as seed-lac, shellac, &c.

BUHL WORK.

GENERAL OBSERVATIONS.

Is a term of modern date, applied to the

art of *inlaying* with turtle or tortoiseshell, with brass or silver, and when well executed, has a most beautiful effect. I shall endeavour to furnish the workman with such practical directions, that I trust will soon enable the ingenious mechanic to accomplish that which has hitherto been chiefly monopolized by foreigners, but which, in my opinion, only wants some familiar direction and practical instruction, to enable British artists to equal, if not outdo, their rivals.

The chief difficulty seems to be in the proper mode of cutting out the pieces for inlaying, and the method of veneering the work when the several pieces are cut out.

To prepare your Shell and Brass ready for cutting out.

Being furnished with a thin piece of brass, of the usual thickness of a veneer, or as thin as can be conveniently worked, make the faces on both sides rough with a coarse file, or tooth plane, and also a veneer of shell of the dimen

sions requisite, tooth that also; then warm your plates and veneers, pass a coat of glue first over a plate of brass; place over that a thin sheet of paper, glue that and place your shell veneer on the top; place them between two smooth and even boards, either kept down by a heavy weight, or squeezed tight together by hand screws; let them remain till dry, when they will be found to adhere together sufficiently tight.

Cutting out your Veneer.

Having drawn the pattern you intend on your shell; or, if it will not appear sufficiently plain, paste a piece of paper on its surface, and let it dry, on which draw your design; being now provided with a bow-saw, the blade of which is very thin and narrow, such as may be made with a watch-spring, cut into about six strips, and the stretcher of the frame at a sufficient distance from the blade to enable you to turn in any direction, according to your pattern, and all made extremely light, begin by making

a small hole in your veneer in a part where will not so much be observed (unless the pattern comes quite out to the edge), and invert your saw; then very carefully follow the lines of your pattern till it is all cut through; you will then have two pieces, which may be again separated by exposing them to steam or warm water; then take the two corresponding pieces, one of brass and one of shell, and when glued together according to the following direction, you will have two veneers, the counterparts in pattern with each other, only where the brass is in one, the shell will be in the other.

To glue up your Pattern.

Take two boards of sufficient dimensions and heat them before the fire, and rub them well with tallow to prevent the glue sticking to it; take a sheet of paper, on which lay your veneer, and having well rubbed some strong glue into the vacancies where the pattern is to be inserted, put it carefully in its place, rubbing

it down with a veneering hammer, over which place another sheet of paper; place the whole between the hot boards, and press or screw them together with hand screws; let them get quite dry, they will come out quite clean from the boards, and appear as one piece of veneer; you may then scrape the paper clean off, it is then ready for laying, or applying to your work.

Laying your Veneer.

Having made your work perfectly level with a tooth-plane, apply to your veneer the glue recommended under the article *Cabinet Work*, and lay it on your work; then with a hot board, termed a call, fasten it well down by means of hand-screws, and let it remain till perfectly hard. It then only remains to be cleaned off and polished, according to the directions given under the article *Polishing*.

Note.—In order to add to the beauty of your work, and produce a variety in the shade, it is necessary, before laying your veneer, to give

that side intended to be glued a coat or two of some colour ground in oil, or varnish, and set by to dry thoroughly before you lay your veneer, as red lead and vermillion ground together; king's yellow, Prussian blue, or any colour you may fancy; and sometimes the sheet is gilt on the side which you intend to lay on your work; this produces a very brilliant effect, and even the common Dutch metal applied will have a very good effect.

The method here given for tortoise-shell and brass is equally applicable to woods of two different colours, only then you need not use any other glue but that in common use, which must be good.

Inlaying with Shaded Wood.

As the method of cutting out and veneering has been shewn in the former part of this article; we shall only here shew the method used to produce that shady brown edge, on works inlaid with white holly, and which, though now lately revived in our cabinet work,

is of very antient date, and when well executed, has a very pleasing and ornamental effect; the method most commonly adopted is as follows: provide yourself with a shallow iron or tin-pot, in which put a sufficient quantity of fine dry sand, to be level with the top edge of it, place it on the fire till it is quite hot, then having your veneer cut out of the required pattern, dip the edges into the hot sand, and let them remain till the heat has made them quite brown; but be careful not to burn them; it is best to bring them to a proper colour, by repeatedly renewing the operation, than all at once, as you then do not injure the texture of the wood, and by immersing more or less of the edge, you produce a shaded appearance to your satisfaction. I would here recommend the workman, previous to beginning the operation, to have his pattern before him, shaded with umber, or any brown colour, in those parts you wish your wood to be stained, as then he will be enabled to copy as he proceeds the various shades of the pattern, as the wood when once shaded

cannot be altered ; and as much of the beauty of this work depends on a proper judgment in placing your shadows, it is best always to have a guide to go by, that we may produce the best possible effect; sometimes it is requisite to give a shadow in the centre or not on the edge of your wood, and as this cannot be done by dipping it in the sand, you must do it by taking up a little of the hot sand, and sprinkling it, or heaping it up on those parts required to be darkened, letting it remain a short time, then shaking it off, and, if necessary, apply more where the colour is not deep enough.

To imitate Inlaying of Silver Strings, &c.

This process is sometimes employed in the stocks, &c. of pistols, and if well executed has a very good effect; the first thing is to determine as to your pattern, which you must carefully draw upon your work, and then engrave, or cut away the different lines with sharp gouges, chisels, &c. so as to appear clean and

even, taking care to cut them deep enough, and rather under, like a dovetail, to secure the composition afterwards to be put in the channels. The composition to resemble silver, may be made as follows: take any quantity of the purest and best grain tin, melt it in a ladle or other convenient receptacle; add to it, while in fusion, the purest quicksilver, stirring it to make it incorporate, and when you have added enough that it remain in a stiff paste, if too soft, add more tin, and if not sufficiently fluid, add quicksilver; grind this composition on a marble slab, or in a mortar, with a little size, and fill up the cuttings or grooves in your work, as you would with a piece of putty; let it remain some hours to dry, when you may polish it off with the palm of your hand, and it will appear as if your work was inlaid with silver, instead of tin; you may make a paste of silver leaf and quicksilver, and proceed as above directed; you may also, for the sake of variety in your work, rub in wax of different colours, and having levelled the surface and

cleaned off your work, hold it at a moderate distance from the fire, which will give your strings a beautiful gloss.

CEMENTS.

To make Cement Mahogany Colour.

TAKE two ounces of bees' wax, half an ounce of rosin, melt them together; then add half an ounce of Indian red, a small quantity of yellow ochre, to bring it to the colour you desire; keep it in a pipkin for use.

Portable Glue, or Bank-note Cement.

Take one pound of the best glue, boil and strain it very clear; boil likewise four ounces of isinglass, put it into a double glue pot, with half a pound of fine brown sugar, and boil it pretty thick; then pour it into plates or moulds:

when cold, you may cut and dry them for the pocket.

Note.—This glue is very useful to draftsmen, architects, &c. as it immediately dilutes in warm water, and fastens the paper without the process of damping; or it may be used by softening it in the mouth, and applying it to the paper.

Cement for Turners.

Take bees' wax one ounce, rosin half an ounce, and pitch half an ounce, melt them together, and stir in it some very fine brick-dust to give it a body; if too soft, add more rosin, if too hard, more wax: when nearly cold, make it up into cakes or rolls, which keep for use.

Note.—This will be found very useful for fastening any piece of wood on your chuck, which is done by applying your roller of cement to the chuck, while going round; it will melt the cement; then apply the piece of wood you

wish to affix to the chuck, and it will adhere with sufficient force.

A Cement for Broken Glass.

Take one ounce of isinglass, steep it in half a pint of spirits of wine, for twenty-four hours, then let it dissolve over a slow fire (always keeping it covered, or the spirit will evaporate); then take six cloves of garlic, bruise them well in a mortar, put them in a linen cloth, and squeeze the juice into the isinglass, mix all well together and keep it for use, it being excellent to join glass ornaments, &c. &c.

A Cement to stop flaws or cracks in Wood, of any Colour.

Take any quantity of fine saw-dust, of the same wood your work is made with, put it into an earthen-pan, and pour boiling water on it, stir it well together, and let it remain for a week or ten days, occasionally stirring it; then boil it for some time, and it will be of the consistence of pulp or paste, put it into a course

cloth, and squeeze all the moisture from it; keep it for use, and when wanted, mix a sufficient quantity of thin glue to make it a paste; rub it well into the cracks, or fill up your holes in your work with it, let it remain till quite hard and dry; you may then clean your work all off together, and you will scarcely discern the imperfection, if carefully done.

A Cement for Joining China, &c.

Take any quantity of the white of eggs, and beat them well to a froth, let them settle, add soft grated or sliced cheese and quicklime; beat them well together, and apply a little to the broken edges; it will endure both the heat of the fire and water.

Another Cement.

Take rosin half an ounce, gum-mastic four ounces, pound them, and put them into a pipkin on the fire to melt, stir them well; to this add about half an ounce of finely powdered glass, and half an ounce of quick-lime; stir the whole

well together: when nearly cold, form it into sticks, on a stone, in the same manner as sealing wax is made; when you want to cement any article, you must heat the broken edges sufficiently to melt your stick of cement, which rub over thinly on both edges; bring them accurately together, pressing them close, and let them cool; which, if carefully done, your work will sooner break in any other part than that where the cement has been applied.

A Strong Glue that will resist Moisture.

Dissolve gum-sandarac and mastic, of each half an ounce, in half a pint of spirits of wine, to which add half an ounce of clear turpentine, then take strong glue, or, if you please, that in which some isinglass has been dissolved; then putting your gums into a double glue pot, add by degrees your glue, constantly stirring it over the fire till the whole is well incorporated, strain it through a cloth, and it is ready for use; you may return it into the glue-pot, and add half an ounce of very finely powdered glass

use it quite hot, and if you join two pieces of wood together with it you may, after it is perfectly hard and dry, immerse them in water, and your joint will not separate.

Another Glue for the same Purpose.

To two quarts of skimmed milk add half a pound of the best glue, melt them together, taking care they do not boil over, and you will have a very strong glue that will resist damp or moisture.

TURNING.

GENERAL OBSERVATIONS.

As most pieces of cabinet work are somewhat indebted to the turner for their embellishments, some few hints to the cabinet-maker may not be unacceptable in this particular branch; though to enter fully into the art

itself, would not only be foreign to our purpose, but would extend our pages much beyond th scheme of the present undertaking; indeed, s much has been written on this subject by othe. writers, that a moderate volume would not be sufficient to contain every minutia of the art; all I shall therefore here attempt, will be, to guide the workman to those sources whence he may be able to gratify his curiosity, and give a few hints in the mechanical operations themselves; and I shall here suppose the cabinet-maker acquainted with the lathe itself, as well as the most common chucks and tools used in the art.

First, then, with respect to the works already written on the subject of turning. It is somewhat surprizing, that we find in the English language very few authors who have at all written on the elementary part of the art; and, perhaps, the only work that contains any thing of the operative part of common turning, or that describes the several kinds of laths, &c. in use, is one that has now become extremely

scarce, but as far as it goes it gives a very good insight into the different methods, and shews some curious operations that may be performed; I allude to Moxon's Mechanical Exercises published in the year 1677, and of course, does not describe the many improvements the lathe and apparatus has from time to time undergone, but leaves it in the state it was at that day; it is a work, however, that is rarely to be met with, and may be considered rather as a curiosity than of great utility. The next work we shall mention, is Martin's Circle of the Mechanical Arts, which, as far as it goes, gives a pretty clear insight into the various operations of turning; there are also some short descriptions in the various Encyclopedias and Dictionaries of Art and Science; the best work on the subject, but which only treats on excentric turning, is one lately published by an ingenious amateur turner, Mr. Ibbetson, a new edition of which has lately been published by W. Wetton of Fleet-street, Bookseller; to which is added, a very good description of the

construction and application of the excentric chuck and slide rest; and here I must take occasion to notice the various useful purposes to which this species of turning may be applied in cabinet-work; for instance, patteras, and handles of drawers, &c. may by this process be beautifully ornamented, and, to the workman who wishes to advance his art, his time will not be ill bestowed in perusing this useful publication, as it will furnish many hints that will materially assist him in the decorative part of his business. But while so few works are to be found of modern date in the English language, our neighbours, the French, seem to be considerably before us in noting down and publishing every thing curious in the art; the two principal works are L'Art de Tourneur, and Manuel de Tourneur, the last a very elaborate one, being in two volumes quarto, besides a quarto volume of beautiful plates; the first is a folio of more ancient date, but well worth the perusal of the mechanic; but from the very expensive manner in which these and

almost all others are got up, it is out of the power of most mechanics to spare sufficient for their purchase; and, indeed, the major part of them are now become extremely scarce; there are also some minor works that give but short, and far from clear descriptions of the various methods used by the turner, even in the common-place operations of his art; however, from the encouragement this work has met with, I propose to continue a series of guides adapted to different trades, and shall, at least it is my present intention, give one more particularly adapted to the turner in all its various branches, both in wood and metal, should the one which follows this, and which is already in the press, meet with the approval of the public; it is called the Builder's Pocket Manual, and embraces the arts of carpentry, joinery, masonry, and bricklaying, and is intended as a pocket manual for the builder in general.—But to return to our subject, much depends on the manner of holding and applying the different tools to our work; and, also, we must take into account the

nature of the wood we are working on, whether it is soft or hard; there are two methods of reducing our block in the lathe to the form required; the first is by shaving, and the second, by scraping: soft wood must be formed by the former method, and hard wood generally by the latter; for shaving, the rest must be elevated somewhat above the centre of the piece we are operating on, and the chisel or gouge must be held in a slanting direction, so as to take off a curly shaving as the wood goes round, and the revolution must be pretty quick; being careful that the tool does not take too deep a hold, as it will endanger the splitting of the stuff; for hard wood, the rest must be elevated as near as may be to the height of the centre of the mandrill, and the tool applied square and horizontal to your wood in the lathe, making the surface smooth by scraping off shavings, till you reduce the stuff to the form required; and the lathe need not revolve so quick, as the hardness of the wood, and the friction would, in that case, soon spoil the

temper of your tools. The basil edge of your tools should be nicely ground on a small stone, that they may be ground rather concave, somewhat like a razor, that it may the more readily touch your stuff, particularly in shaving soft wood; the edge of your chisels should be ground to a basil on each side, and in a slanting direction, forming an angle of about thirty degrees; the handle must be long, in order to have a good purchase, for otherwise, if you encounter a hard knot, your work will be gulled, or in holes and hollows; it requires some judgment in the first instance, for one not used to the process of turning, to prevent his tool catching, and as it were digging out a piece whenever any obstruction presents itself; to guard against which, the best method is to take off as little as possible at a time, and to proceed cautiously, keeping your tool firm against the rest, and raising or lowering the handle of your tool, till you find you have it in a proper position to work easily and freely. In general, in turning, your work revolves to

you; but you will ofter find it of advantage, particularly in turning deal, or other wood that is apt to splinter, to make it revolve in a contrary direction, that is *from* you; but, then, you must be careful to keep your tool firmly down on the rest, or by placing your rest somewhat above the centre of your work, and at a little distance from it; hold your tool so that the handle is elevated above the edge or point; these, and similar knacks are, however, to be attained only by practice and attention to the different effects observed.

To turn Screws.

In some lathes, there is a contrivance, for the purpose of cutting screws, by holding the screw tool steady on the rest, while the mandril moves backward and forwards, and forms the screw; but the best and most usual method, is to move the screw tool as the mandril revolves; but here great care must be taken that you move or slide the tool on the rest, proportionate to the velocity of the revolution of the mandril;

the best method, is to have a small pulley on the axis of the treddle wheel, of less diameter than the mandril pulley, which causes the lathe to revolve very slowly; by which means, we are enabled better to guide our tool, and enter it again and again in the same worm of the screw, till it is deep enough.

To turn Black Reeds or Mouldings in Chair Legs, &c.

In turning chair or table legs, &c., where we wish some of the mouldings to appear black, it would be a difficult matter to stain them after the work is finished; therefore the following method is used: having first turned a cylinder of the dimensions of the largest part of your leg, &c., turn the mouldings required to be stained, leaving the rest of your work rough; then, as your work revolves, apply the black stain to those parts, and, when dry, polish them with bees' wax, and a few of the shavings from your turning bench; you may then proceed to finish turning the other parts, and your

mouldings will appear clean and neat. as they were formed of ebony, and fixed on the other parts of your work.

To make Anti-attrition.

According to the specification of the patent, it is made of one part of plumbago or black lead ground very fine, and four parts of hogslard or other grease mixed well together; this mixture prevents the effects of friction, much better than oil or other grease, and will be found very useful to the turner to apply to the mandril, where it works in the puppet as well as to the different centres, and will be found to make the lathe work much easier, as well as be a great saving in oil, which, with constant use grows stiff, and sensibly impedes the motion; while this preparation once applied will last a long time without requiring renewal.

Polish for Turner's Work.

Dissolve your sandarac in spirits of wine, in the proportion of one ounce of sandarac to

half a pint of spirits, next, shave bees'-wax one ounce, and dissolve it in a sufficient quantity of spirits of turpentine to make it into a paste; add the former mixture by degrees to it, then with a woollen cloth, apply it to your work while it is in motion in the lathe, and with a soft linen rag polish it; it will appear as if highly varnished.

LINES.

GENERAL OBSERVATIONS

As a knowledge of some of the principal practical problems in geometry are essentially necessary to the mechanic, particularly where such nicety exists as is required in many parts of cabinet-making, I have thought proper, in order to render this edition of the Cabinet Maker's Guide as complete as possible, to introduce some of the most useful, and have

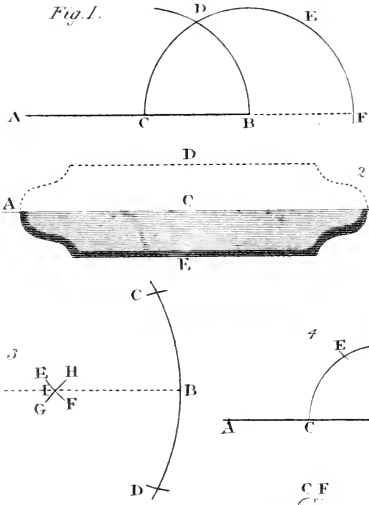

Plate 1

CABINET MAKER'S GUIDE.

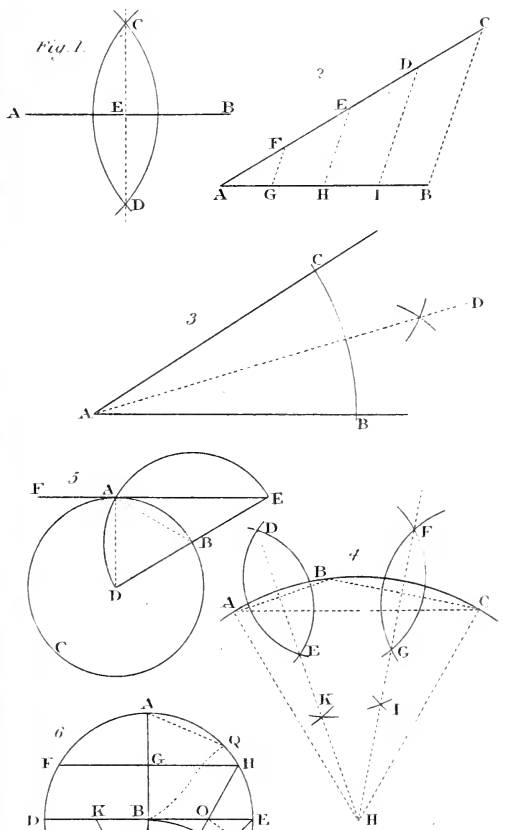
Fig. 1.
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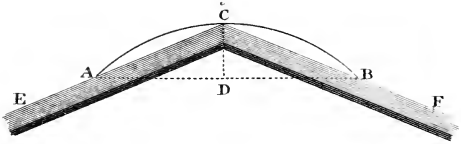
Fig. 1



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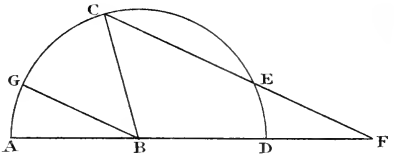
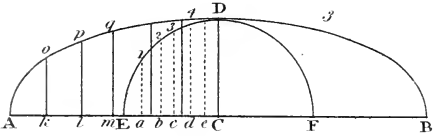




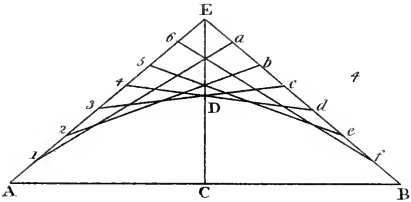
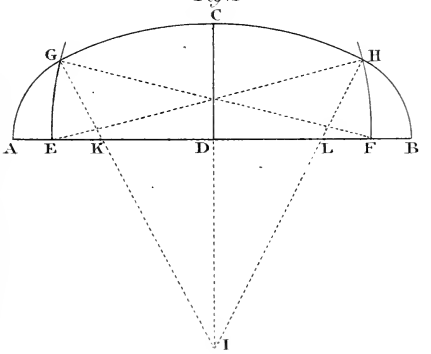
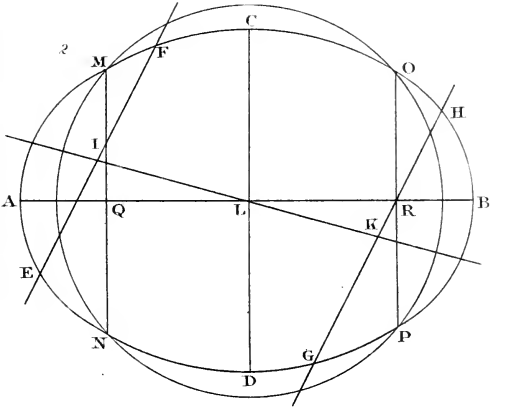


Plate 3.

Fig. 1





endeavoured to illustrate them by reference to mechanical operations; such as ascertaining the truth or correctness of the tools and work itself, and by the assistance of this kind of knowledge, the workman need never be at a loss for a method of setting out his work, or of substituting, in the absence of tools particularly adapted to certain purposes, the compasses and ruler for finding bevel lines, or drawing particular curves. I have here adopted the the term *Lines*, as it carries with it not that difficulty which the title of geometrical problems do, and because some of the examples, though depending on geometrical knowledge for the proof of their accuracy, are more in the nature of mechanical operations, and, hence, easily understood by the workman; our intention being more to shew how the thing may be done, than endeavouring to prove the truth or correctness of it by a scientific demonstration; and as the term *Lines* is amongst workmen, in common use, to denote any mechanical operation performed by the help of the rule and com-

passes, I have chosen it in preference to any other that might, from its high sounding title, deter those unacquainted with geometry from referring to this article. I may perhaps, hence, incur some censure; but that will not deter me from endeavouring to place in as clear a light, and clothe in as simple a garment as possible, some of the beautiful truths elicited from the study of geometry as a science, and apply them to the wants of the practical mechanic.

EXAMPLE I.

To extend a given strait line at pleasure.

Let A B, (*Fig.* 1. *Pl.* 1.) be the given line, and let it be required to extend it towards F, in the same strait direction.—Fix your compasses on any point of the line A B, as at C, and open them to the distance C B, and strike part of a circle as D B, then with the same opening, and making the point B a centre, describe part of a circle, (more that half a circle) as C D E F, now place (with the same

opening of the compasses) one point in D, turn the other over to E, and over again to F; then, if you join the points B and F, B F will be a continuation in the same strait direction of the line A B, and the three points A B F will be all in the same strait line.

Note.—This will be found useful if you wish to draw a strait line, and you have not a strait edge long enough, for you may by this means draw a line of any length, by first drawing it the length of your rule or straight edge, and then continue it at pleasure.

EXAMPLE II.

To ascertain whether your strait edge is correct.

Lay your strait edge A C B E, (*Fig.* 2. *Pl.* 1.) on a smooth level board, and draw a line as A C B along its edge, reverse it in the position as shewn at A D B; then, if its edge still coincides with the line A C B it is correct; or you may stick three fine needle points,

one nearly at each extremity, A and B, and another any where near the middle, as at C; then, if the strait edge touches all three points, and on being reversed, still touches them, you may be sure your instrument is correct.

EXAMPLE III.

Between two points to find another point that shall be in the same strait line with them.

Let A and B, (*Fig.* 3. *Pl.* 1.) be the two given points; open your compasses to the distance A B, and strike part of a circle as C B D, then fix one point on B, and set off any two distances, as B C and B D equal to each other; then from C as a centre, and with any distance or opening of your compasses, (more than half the distance from C to D,) draw a portion of a circle as E F; then with D as a centre, and the same opening of your compasses, strike another portion of a circle as G H, and where these portions or arches of circles cross, or intersect each other in I, the point I is the

point required, and the points A I and B are all in the same strait line.

Note.—The same observation will here apply, as in Example the First; you may also verify or prove the correctness of your strait-edge by this method, for having drawn your line as A B, find a point between them by this method, and if this point falls in the line drawn by your strait-edge, you may be sure it is correct; or, to make *surety double sure*, you may find any number of points between A and B, by only shifting the opening of your compasses when you strike the arches intersecting each other, for the wider the opening, the nearer the point will approach to A, and the contrary.

EXAMPLE IV.

From any point in a given line to draw another line which shall be perpendicular, or square to it.

Let A B (*Fig.* 4. *Pl.* 1.) be the given line,

and B the point of the line from which we propose to draw another line square to it; fix the point of your compasses in the point B, and with any opening, describe or draw a portion of a circle as C E D, then with the same opening, fix one point at C, the other will reach to E, there make a mark, and turn the leg which was at C over to D, then if from E and D as two centres, we strike two arches of circles with the same or any other opening of the compasses, crossing each other at F, if we draw a line from F to B, that line will be perpendicular or square to the line A B.

Note.—It is plain, we might have taken any other point than B in the line, but I chose that; as if we can draw a perpendicular from the extremity of a line, we shall not want any other meth to draw it from any other point.

EXAMPLE V.

From any point above a strait line, to draw another strait line that shall be perpendicular to it.

Let A B (*Fig. 5. Pl.* 1.) be the given strait line, and C the given point above it. From C as a centre, and with any opening of your compasses that will extend beyond the line A B, strike a portion of a circle, cutting the line A B in D and E, then make D and E two centres; from which, strike two portions of circles (with any other opening of the compasses than that by which you struck D E,) crossing each other in F; then, if you lay your ruler or strait-edge on the points C and F, and draw the line C F G, it will be perpendicular or square to the line A B.

Note.—If the opening of your compasses had been greater than that by which you struck the circle D E, the point F would have been above C, but the truth of this method would

have been still the same, or you might, without altering your compasses have struck two arches below the line A B, and it would equally have answered the intended purpose.

EXAMPLE VI.

To ascertain whether your square is correct.

Having shot the edge of a board quite strait, which we will suppose to be represented by the line A B, (*Fig.* 6. *Pl.* 1.) place your square against the edge, as represented in the plate at C D E, and draw a line along the edge of the blade as C D, then reverse the position of your square, as shewn at F D G; then, if the edge F D corresponds to the line C D, it is correct, if not, it must be altered; thus, supposing the end F does not touch the line while the point D meets it, you must take off a shaving from the blade near the stock, and try it again till the square in the two positions perfectly corresponds to the line drawn along the edge of the blade; again if the point F overhangs or

crosses the line drawn along C D, a shaving must be taken from the blade near the end D, till your instrument is properly adjusted.

Note.—It is plain that you may also adjust your square, by drawing a correct perpendicular line by the two former cases or examples; and, also, that you may by the help of them, square any piece of stuff, should you not be provided or have handy a proper *square* for the purpose.

EXAMPLE VII.

To draw a line parallel to, or equally distant from another line given, and through a given point.

Let A B (*Fig.* 7. *Pl.* 1.) be the given line, and C the point through which we wish to draw another line parallel to, or equi-distant from A B. Fix one point of your compasses on the point B, and extend the other to C, the given point, and draw the portion of a circle as C D; then, with the same opening, and taking any other point A as a centre, strike the arch F E;

now take the distance D C in your compasses, and place it from E to F, where make a mark, then through F and C, draw the line F C, and it is parallel to, or equi-distant from the line A B.

Note.—This problem is readily performed by the workman by means of a gauge, but it often happens, that you have not a gauge whose stock is long enough to reach the required distance, or you may not have a gauge handy; you will then find that this will be a ready and useful method of supplying the want of a tool, which will either not answer your purpose, or which you have not at the moment at hand; though you may have your compasses and rule ready, if not a strait-edge, and which the first example will enable you to shift without.

EXAMPLE VIII.

To make an angle or bevel equal to a given angle or bevel.

Let C A B (*Fig.* 8. *Pl.* 1.) be any angle or

bevel given, and it is required to make any other angle or bevel equal to it. From A as a centre, and with any opening of the compasses strike an arch as C B, cutting A C and A B in C and B, and let D E be a line on which we are to draw another meeting, it is the same angle as C B meets A B; with the same opening of the compasses as the arch C B was struck, make D a centre, and describe or strike the arch E F, then take the distance B C in your compasses, and apply it from E to F, and join F D, then is the angle F D E equal the angle or bevel C A B.

Note.—This example may be practically useful to the workman, when he is unprovided with his tool or instrument called a *bevel*, for if the two ends of a board are to be cut equally bevelling, he may cut the one to the bevel required; and, by this example, he may without the assistance of his *bevel*, make the other equally bevelling. *Or*, he may find the bevel of any angle into which he wishes to fit a piece of stuff, and cut his wood he wishes to fit into it

at the required bevel or angle, without the assistance of any other instrument than his square and compasses; and here I would take occasion to remark, that to the workman who is at all acquainted with lines, the great utility and benefit he would experience in always being provided with the most useful of all tools, a pair of compasses, as he must, I am confident, already have seen the great assistance they will be to him, in a great measure, superceding the use of other tools fitted to particular purposes; at least, they will furnish him with the means of proceeding with his work; though, not perhaps quite so readily as without their assistance.

EXAMPLE IX.

To divide a given line into two equal parts, or to bisect a given line.

Let A B (*Fig.* 1. *Pl.* 2.) be the given line, which we wish to divide into two equal parts; open your compasses to any distance greater

than the half of the given line, and with A and B the two extremities of the line, as centres draw two portions of circles crossing each other in C and D, then draw a straight line from C to D and where it crosses the line A B in E is the point required, and the distance A E is equal to B E, or the line A B is divided into equal parts.

Note.—It will be here observed, that the line C D is perpendicular to A B, and hence another method is shown of drawing a line square or perpendicular to another, besides that shown in Example 4.

EXAMPLE X.

To divide any strait line, into any number of equal parts.

Let A B (*Fig.* 2. *Pl.* 2.) be the straight line, to be divided into any number of equal parts (say four) from either end of the line, as at A draw another line of any length, as A C bevelling to it, or making any angles C A B, take any opening in your compasses and set off the

distance A F, then turn the legs over from F to E, and from E to D, and from D to C, then the line A C will evidently be divided into four equal parts; now join the points C and B and from D E and F, draw the lines D I E H and F G parallel to C B, and the points G H and I will divide the line A B into the required number of (four) parts.

Note.—This Example may practically be performed thus; after having drawn and divided, or set off the line A C the number of parts required, set your bevel to the angle, the line B C makes with A B, which we will suppose the strait edge of your stuff, and with it thus set, draw D I E H and F G, then is your edge divided as required. We may here also observe that by this method we may divide a line into any number of unequal parts that shall be in the same proportion to each other, as another line is divided into, for supposing the line A C divided into any number of unequal parts, for instance, A F equal 3 inches, F E equal 4 inches, E D equal 5 inches, and

D C equal 6 inches, that in the whole line A C of 18 inches is divided unequally in these proportions we have only to join C B and draw the parallel lines as before, and the line A B will be divided into the same number of parts, and each part bearing the same proportion to each other as the part the line A C is divided into. This may be practically useful to the cabinet-maker in setting out the distances for the partitions of a chest of drawers, where the drawers diminish in depth from the bottom drawer, which is the deepest; for instance, if we have a chest of drawers three feet six inches high, and the drawers are required to diminish gradually, each drawer an inch less than the next in depth; and suppose there is four drawers, and the partitions four in number, each three quarters of an inch wide, we set out our work as follows, shoot the edge of a board straight, which we suppose A B in the figure, then draw A C, and set off A F any number of inches, F E an inch wider, E B another inch wider, and D C still another inch wider; then will the dis-

tances, as A C, be each an inch wider than the one next to it, we have only to join C B and set your bevel to it, and draw I D H E, and G F, then if A B is the height of your drawers, it will be divided in the proportion required, the whole length of A B must be equal to the height of the chest without the partitions.

EXAMPLE XI.

To divide, or bisect a given angle into two equal parts.

Let C A B (*Fig.* 3. *Pl.* 2.) be any angle, which we wish to divide into two equal parts, with any opening of the compasses strike an arch C B from A as centre, then form C and B as two centres, strike two arches with any opening of the compasses, crossing each other in D, and from A draw the straight line A D, which will divide the angle C A B into two equal parts.

Note.—This example may be applied to finding the mitre of a cross-band or any piece of stuff; thus, divide the angle the two edges

make with each other as here shown, and set your bevel to this line; you may also prove the correctness of your mitre square by this method; by accurately squaring your stuff and dividing the angle as shown, then if applying your mitre square to the edge, its blade corresponds to this line, you may be assured your mitre square is correct.

EXAMPLE X.

To find the centre of any arch of a circle.

Let A B C (*Fig.* 4. *Pl.* 2.) be any arch or portion of a circle, make a mark at any point, B; then with B and C as two centres, strike two arches crossing each other in F and G; then with A and B as two other centres, describe two other arches across each other in D and E; then draw the line F G and D E, and produce them till they cross each other in H; then is H the centre of the circle of which the arch A B C is a part of its circumference.

Note.—It is plain by the same means we

may draw a circular arch, which shall pass through three given points, provided these points are not in the same straight line, for if we proceed as directed in drawing the lines D E and F G to meet in H, if we set the compasses to the distance H A it will, if we strike a circle with opening, pass through the other point B and C; this will also be found practically useful in a variety of operations; for instance, we frequently, in working, obliterate the original centre, from which we struck our circle, which by this method we can at any time easily find again, or if we wish to fit a piece of work into a circular bow or recess, which we will suppose to be A B C, we lay down the distance A C for the opening, and measure the straight distance A B and B C, and make the triangle A B C; we have immediately the three points A B C, to find the length of a line or lath, to strike an arch which will enable us to work by so as to fit the recess. We may also find the centre of a circle, without drawing any lines without its circumfer

ence, thus having drawn two arches from B and C as centres, crossing each other in G, open the compasses still wider, and draw two arches crossing each other in I; do the same from A and B at E and K these lines drawn through G I and E K, will cross each other in H, which is the centre required; this will be found useful for recentreing a piece of turned work, as the pillar of a table, when the centre is lost or cut off.

EXAMPLE XIII

To draw a tangent or line, which shall meet a circle in any given point.

Let A B C (*Fig.* 5. *Pl.* 2.) be the circle, and A the given point, join A and D, the given point and the centre of the circle, and draw a line as D B E, making A B equal to A D; then on B as a centre with the opening A D draw a semi-circle D A E; then through E and A draw the line E A E, which will be a tangent to the circle in the point A.

Note.—We have here another method of drawing any line perpendicular or square to another given line, for let A D be the given line, assume any point as B, and with B A as the radius, strike a circle passing through A and cutting A D; then from where it cuts A D (which we here suppose at D) draw through D and B a line, cutting the circle drawn in E; then if we join E A it will be perpendicular or square to A D.

EXAMPLE XIV.

To draw within a circle a polygon, or regular figure, whose sides shall be each equal to each other.

Let A E C D (*Fig.* 6. *Pl.* 2.) be the circle, draw a diameter as D B E, and draw another diameter at right angles, a square to it as A C, divide A B into two equal parts in G and draw F G H parallel to D E, join H C and E C, then is the line H C the side of a triangle of equal sides, drawn in the circle, and the

line E C the side of a square in the circle; now divide D B into two equal parts in K, and draw K C, set one foot of your compasses on K, and with the opening equal to K B draw the arch B L; again with one foot of the compasses as C and the opening equal to C L, draw the arch L M and join M C, make M N equal to M C and join N C, then is the line N C equal the side of the pentagon or figure of five equal sides; next, with the centre C and distances C B, draw the arch B I and join I C, then is I C equal the side of the hexagon or figure of six equal sides; again if we divide C H the (side of the inscribed triangle) into two equal parts in the point O, and strike the arch O P from the centre C and draw C P, it will be the side of the heptagon or figure of seven sides very nearly, for we have no perfectly correct method of doing it; however this is so near, that it approaches the truth by a quantity less than the thousandth part of the radius of the circle: and lastly, if we bisect or divide the angle A B E into two equal parts, and draw

the line B Q and draw A Q, it will be the sides of the octagon required.

Note.—I have here shown all the methods of drawing polygons from three to eight sides, which is amply sufficient for the workman, and which I would advise him to draw at large in separate figures, that he may always have them at hand; and should he ever want figures of a greater number of sides than here shown, he may find them by dividing the side of a polygon of half the number of sides he wants, into two equal parts, and drawing a line through the point of division from the centre of the circle till it cuts its circumference, he will have the length of the sides required.

EXAMPLE XV.

To describe any arch whose altitude or opening is given, and likewise its opening without knowing its centre.

Let A B (*Fig.* 1. *Pl.* 3.) be the opening

of the arch, C D its height or spring; get out two laths, E A C and C B F, whose length shall be each equal at least to A B, and fasten them together so that they shall form an angle at their joining equal to the angle A C B, then in the points A and B fix two nails or pins; now if we slide the laths along, against the pins or nails, the point C will describe an arch of the required altitude.

Note.—This will be found not only a very ready but accurate way of striking arches of very large circles, where it is either impossible or inconvenient to draw them with a long lath, or string from the centre of the circle; you may also by this means readily ascertain whether any recess is the portion of a circle, for if with your bevel or two laths we fix them to the angle A C B, if by keeping the end always close at A and B the meeting of them in C always touches the concavity of the recess, you may rest assured the recess is a portion of a circle

EXAMPLE XVI.

To trisect or divide any given angle into three equal parts, or angles.

Let A B C (*Fig.* 2. *Pl.* 3.) be any angle which we wish to divide into three equal parts, with any opening of your compasses describe or strike a semi-circle from B as a centre; having produced or continued the line A B towards F, take a lath of any convenient length, and having marked a distance from one end equal to A B, place one end on the line A F, and having placed a pin or nail in the point C, slide the lath backward and forward till E F the distance on the lath equal to A B is in such a position that the point E falls in the circumference of the semi-circle, then is the angle E F D equal to one-third of the angle C B A; we have only therefore to draw the line G B parallel to C F, and the line G B divides the angle C B A into three parts required.

Note.—This example will enable the work-

man mechanically to draw in any circle a polygon or figure of nine sides, called an enneagon, for if we have described an equilateral triangle within the circle, we trisect or divide the arch each side includes, we shall have the enneagon required.

EXAMPLE XVII.

To draw any arch of an ellipse or oval by means of ordinates, or by finding a number of points through which we may draw the curve by hand.

Let A B (*Fig.* 3. *Pl.* 3.) be the opening of the arch C D. its spring or rise, on C as a centre strike the semi-circle E D F, with the opening of your compasses equal to C D, divide E C into any number of equal parts, and draw the perpendiculars *a* 1, *b* 2, *c* 3, *d* 4, and from these points divide also A C into the same number of equal parts you divided E C into, and draw perpendicular lines from these points, as *k o l p m q*, &c. then transfer the lines

a 1, *b* 2, &c. to *k o*, *l p*, &c., and through the points *o*, *p*, *q*, and draw with a steady hand a curve line, which will be the elliptic arch required. The same may be done in the other half of the arch C D B, or you may make your mould to half the arch, and turn it over on D B, which is the usual method.

EXAMPLE XVIII.

To draw a circular arch by means of the intersection of lines.

Let A B (*Fig.* 4. *Pl.* 3.) be the opening o the arch on the centre or middle point between A and B; at C erect a perpendicular C D E equal to twice the spring of your arch: join A E and B E and divide these lines into any number of equal parts as 1, 2, 3, 4, &c., and *a*, *b*, *c*, *d*, &c.; then join *a* 1, *b* 2, *c* 3, &c., and if you have divided the lines A E and B E into a number of parts pretty close together, their intersection will form a neat curve line very nearly circular, particularly if it is a flat arch.

Note.—This kind of arch amongst builders is termed a scheme arch.

EXAMPLE XIX.

To draw an ellipse or oval, with a pair of compasses of any required length and breadth.

Let A B P (*Fig.* 1. *Pl.* 4.) be the given length, C D half the width of the oval; with the distance A D or B D in your compasses, and with C as a centre, draw two arches cutting A B in the points E and F, which are called the two foci of the oval, next with F and E as centres, strike the arches E G and F H, with the distance in your compasses equal F G and E H, also with E and F, as centres, and the distance in your compasses equal twice A E, or twice F B, strike two arches crossing G E and H F in G and H, again with the distance H E or G F, and the centres G and H, strike two arches crossing each other in I, join G I and H I, then with the centre I and distance I C strike the arch G C H, and with

K and L as centres, and distance K G or L H, describe the arches G A and H B and half the ellipse or oval is drawn; you may then do the same on the other side the line A to complete the oval.

Note.—The method here shown has not, I believe, been in any other work, shown as a method of drawing ellipses, it is perhaps the most accurate method that can be adopted with the compasses only, as according to the method of construction, the points G and H will always be in the circumference of a true ellipse.

EXAMPLE XX.

To find the centre and two diameters of any ellipse, having only the circumference given.

Let A C B D (*Fig.* 2. *Pl.* 4.) be the circumference of an ellipse of which we wish to find the two diameters, draw any two lines as F E, and H G parallel to each other and cutting the curve in four points. Divide F E and H G into two equal parts in the points I and K, and

draw the line I K, divide it in two parts in L, and from L as a centre strike any circle that will cu tthe curve in four points, as at M N O P; divide O P and M N in two parts in Q and R, and through Q and R draw a straight line, which will cut the curve in A and B, and A B is the largest diameter or length of the oval, and the point L, the centre of the ellipse; then if through I we draw C D perpendicular to A B it will be the shortest diameter or width of the oval.

Note.—This example will be found particularly useful to the cabinet-maker, as it enables him at any time to assertain with accuracy the two diameters of any elliptic table top or skreen, should the original diameter be obliterated, which must be the case when finishing our work; and in the case of skreens it enables us to draw a line, whereby to fix on the spring or ring, so that when mounted it shall stand quite perpendicular.

SOLDERING.

GENERAL OBSERVATIONS.

It may seem somewhat unconnected with the business of the cabinet maker to introduce an article in this work, that has a reference more to the workers in metal, than to those in wood; but having experienced the want of a knowledge how to repair broken brass work by soldering the parts together, I am induced to give this article a place, that nothing may be wanting to assist the workman, in all the operations that may fall in his way to execute. And as in the country it frequently happens either that your brass work wants some alteration, or some accident has happened in the carriage, that requires a little repair by means of soldering, it is not only a great saving of time, but o fexpense, to be enabled to do it one's self;

particularly when the operation is so easily performed; in fact our tools frequently need, from accident or otherwise, the help of this most useful operation. I shall therefore, without further apology, introduce some useful receipts and directions for this purpose; but first I must remark, that the pieces you would join together, whether brass, lead or, iron, must be clean filed or scraped, and fit each other as exact as possible, and that no grease or extraneous substance be on the parts intended to be joined together, and that the joints must be held firm togethe either by twisting wire round them, or otherwise, that they shall not slip when put into the fire, to melt the preparation which is to hold the joint together: for many purposes a common fire or a little charcoal will answer our purpose; but in every village we have a smith's forge at hand, which sometimes will be necessary; and if the workman has at hand, and is at all practised in the use of the blow-pipe, almost all small jobs may be accomplished with its assistance, for many purposes, a soldering iron, which is a

piece of copper like a wedge, but rather pointed at the end, rivetted into a piece of iron, which is fixed into a wooden handle, will be very useful, particularly when we are putting a brass beading round chairs, &c., it frequently happens that the pins, by which it is affixed, either break off or are not in the exact place we wish them; we can then, with the help of the soldering iron, either replace them or fix others in the situation required, and thus make our work firm and neat, without the delay and expense incident to sending it again to the brass founders; again, as the leading the inside of cellarets, wine coolers, sarcophagases, &c., is a part of the cabinet maker's employ, though often sent to the plumber, who if not careful, often does great damage to the work entrusted to him. I shall therefore show how to solder or make the necessary joinings in the lead used for linings, as well as jobs and repairs, that often are necessary, particularly with the country workman; for in London it is scarcely necessary for the workman to attend to anything but merely the

particular branch in which he works, as the necessary assistance towards finishing his work s always at hand.

Brass Solder for Iron.

Thin plates of brass are to be melted between the pieces that are to be joined; if the work be very fine, as when two leaves of a broken saw are to be joined together, cover it with powdered borax, melted with water, that it may incorporate with the brass powder or filings, which are laid on the joint. The piece must then be exposed to the fire, without touching the coals, and heated till you perceive the brass to run, take it immediately from the fire and leave it to cool gradually.

Common Solder for lead or tin.

Put into a crucible or iron-ladle, two pounds of lead; and when melted throw in one pound of tin. This composition is what is generally known under the name of solder. The method of using it for lead, is to pour it on the joints,

which are previously scraped clean, to some little distance from the joint, and then with a hot iron spreading it evenly and smoothly, and with a coarse cloth or piece of felt, making it as level as possible, occasionally heating it with your hot iron, till you have made your joint to your mind.

Note.—This will be found very useful in soldering the joints of the lead linings of cellarets, &c. But as the lead used for that purpose is very thin, you must be careful not to let your solder be poured too hot on your lead, as it may cause that to run or melt, and you must also prepare a groove in your work to receive the joint, that when soldered it shall all be level on the surface.

Hard Solder.

Melt together two pounds of copper and one pound of tin. The tin must be added after the copper is melted; you may then either cast it into a flat plate, to be filed into powder for use, or granulated by pouring it through a

wire sieve into cold water, or else hammered into thin leaves or plates.

Note.—This mixture requires less heat to melt it, and, consequently, does not injure your work so much as using brass filings, and has also a whiter appearance.

Soft Solder.

Melt in a pan of iron or crucible, one pound of lead and two of grain tin, cast it into cakes for use; this will be found very useful for soldering tin plates or pins on brass work, such as beadings and mouldings; it is best done with a soldering iron, as described in the general observations, as when heated quite hot, and applied to the plate or lump of solder, some of which will adhere to the copper end of the soldering iron, which is rubbed on the joint intended to be soldered, having previously sprinkled it with a little powdered resin.

To Solder with Tin Foil.

This method is particularly useful for small

articles in brass work, and mathematical instruments, as it is very readily done, and makes a very neat joint. The method is, after having your metal filed to as close a joint as possible, wet the edges with a solution of borax or sal ammoniac in water, and insert a thin leaf of tinfoil, fasten altogether by means of a piece of wire or a hand vice, and apply the flame of a candle or lamp, by means of a blowpipe, to the joint, and as soon as the foil appears to run, your joint is completed; or should the joint be too large, you may place it over a charcoal fire, and by blowing with a pair of bellows till the solder runs, then take it off the fire and let it cool gradually.

MISCELLANEOUS.

To make Black-wax.

TAKE two ounces of bees'-wax, half an ounce of Burgundy-pitch, melt them together,

then add one ounce and a half of ivory-black ground very fine and dried.

Green-wax.

Take two ounces of bees'-wax, melt it, and add one ounce of verditer; let the pipkin be large enough, as it will immediately boil up; stir it well, and add one quarter of an ounce of rosin; it will be sufficiently hard, and fit for use.

To make Furniture Paste.

Scrape four ounces of bees'-wax into a pot or basin; then add as much spirits of turpentine as will moisten it through; at the same time powder a quarter of an ounce of rosin and add to it; when it is dissolved to the consistence of paste, add as much Indian red as will bring it to a deep mahogany colour: stir it up and it is fit for use.

Another Method.

Scrape four ounces of bees'-wax as before,

then take a pint of spirits of turpentine in a clean glazed pipkin, to which add an ounce of alkanet root, cover it close and put it over a slow fire, attending it carefully, that it may not boil, or catch fire; and when you perceive the colour to be drawn from the root, by the liquid being of a deep red, add as much of it to the wax as will moisten it through; at the same time add a quarter of an ounce of powdered rosin, cover it close, and let it stand six hours, and it will be fit for use.

To make Furniture Oil.

Take linseed-oil, put it in a glazed pipkin, with as much alkanet-root as it will cover; let it boil gently, and you will find it become of a strong red colour; let it cool, and it will be fit for use.

Another Method.

Boil together, cold drawn linseed-oil and as much alkanet-root as it will cover, and to every quart of oil add two ounces of the best rose pink; when all the colour is extracted, strain it

off, and for every quart add a gill of spirits of turpentine: and it will be a very superior composition for soft and light mahogany.

To Soften Ivory.

Slice a pound of mandrake, and put it in a quart of the best vinegar, into which put your ivory; let it stand in a warm place for forty-eight hours, you will then be able to bend the ivory to your mind.

To Bleach Ivory.

Take a double handful of lime, and slack it by sprinkling it with water, then add three pints of water, and stir it up together; let it settle ten minutes, and pour the water into a pan for your purpose; then take your ivory, and steep it in the lime-water, twenty-four hours, after which boil it in strong alum-water one hour, and dry it in the air.

To Solder or Weld Tortoise-shell or Horn.

Provide yourself with a pair of pincers or tongs, so constructed that you can reach four

inches beyond the rivet; then have your tortoise-shell filed clean to a lap-joint, carefully observing that there is no grease about it; wet the joint with water; apply the pincers hot, following them with water, and you will find the shell to be joined as it were one piece.

To Gild Leather for Bordering Doors, Folding Screens, &c.

Take any quantity of clear brown sheep skins, damp them with a sponge and water, and strain them tight, with tacks, on a board sufficiently large; when dry, size them with clear double size; then take the whites of eggs, beat them with a whisk to a foam, and let them stand to settle; then take books of leaf silver, a sufficient quantity, and blow out the leaves of silver on a gilder's cushion; pass over the leather carefully with the egg size, and with a tip brush lay on the silver, closing any blister with a bit of cotton; when dry, varnish them over with yellow lacker till they are of a fine gold colour; your skins being thus gilt, you may

then cut them in strips as you please, and join with paste to any length.

Observe—To perform the foregoing operation in the height of summmer, when the air is clear, dry, and warm, that the skins may dry well before you size them, and the size may have the desired effect upon the pores, and no farther, and that the silver may not tarnish before you lacker it.

To Damask Leather for Table Covers, &c.

Provide yourself with a block, glued up, two feet six inches long, and two feet wide, faced with pear tree (or box is still better) five eighths of an inch thick, upon which have some handsome pattern drawn, that has a good effect in light and dark shades only, but it must be divided so that it will match end for end, and side for side; which pattern must be then cut in relief in the same manner as the blocks for printers or paper-stainers, and may be done by any one who knows a little of chair carving; then strain your leather, dry on the block with

tacks (face upwards), and with a glass ball rubber of about four pounds' weight, pass to and fro over the leather, rubbing hard till you produce the pattern perfectly glazed on the leather.

Note.—If your cover is larger than the block, you must be very careful in shifting it, that you may not injure the pattern.

If from your wood-block you have a pattern cast in brass, and nicely touched up by an engraver, and fixed on a block of wood, it will answer much better, and the pattern will come off much sharper and cleaner.

To make Parchment transparent.

Take a thin skin of parchment and soak it in a strong lye of wood-ashes, often wringing it out till you find it become transparent, then strain it on a frame and let it dry.

Note.—This will be much improved, if after it is dry you give it a coat, on both sides, of clear mastic varnish diluted with spirits of turpentine.

To make Composition Ornaments, for picture Frames, &c.

Take any quantity of whiting, as much as you think you shall have occasion for, for present use, mix it up with thinnish glue to the consistence of putty, and having a mould ready, rub it well all over with sweet oil, and press your composition in it; take it out and you will have a good impression, which you may set by to dry, or if wanted, you may, before it gets hard, apply it to your work with thick glue, and bend it into the form required for the angles of your frames, &c.

Note.—If you have not a mould at hand, you may make one of the composition from any leaf or pattern you may wish to copy, and letting it get quite hard, use it as a mould, first oiling it well.

You will find this composition of great use for copying any pattern you may wish from good moulds.

To imitate Wood, &c. for internal or external Decorations.

Having prepared your wood of a proper ground with common oil-paint, prepare the colour for the graining, by grinding, very fine, with stale beer, the colour you require, using this in the manner of distemper, or drawing in water-colours; let it get quite dry, and give it two of these coats of clear copal varnish.

An excellent Receipt for Burnish Gold Size.

One ounce of black lead, ground very fine, one ounce of deer suet, one ounce of red chalk, and one pound of pipe-clay, gound with weak parchment-size to a stiff consistence, to be used as directed under the article *Gilding*.

Note—This receipt is by an excellent practical workman.

To clean Pictures.

Having taken the picture out of its frame,

take a clean towel, and making it quite wet, lay it on the face of your picture, sprinkling it from time to time with clean soft water; let it remain wet for two or three days, take the cloth off and renew it with a fresh one; after wiping your picture with a clean wet sponge, repeat the process till you find all the dirt soaked out of your picture; then wash it with a soft sponge, and let it get quite dry; rub it with some clear nut or linseed oil, and it will look as well as when fresh done.

Another Method.

Put into two quarts of strong lye a quarter of a pound of Genoa soap, rasped very fine, with a pint of spirits of wine; let them simmer on the fire for half an hour, then strain them through a cloth, apply it with a brush to the picture, wipe it off with a sponge, and apply it a second time, which will remove all dirt; then with a little nut-oil, warmed, rub the picture and let it dry; this will make it look as bright as when it come out of the artist's hand.

To silver Clock Faces, the Scales of Barometers, &c.

Take half an ounce of old silver lace, add an ounce of the best aqua-fortis, put them in an earthen pot and place them over a gentle fire till all is dissolved, which will happen in about five minutes, then take them off and mix it in a pint of clear water, after which pour it into another vessel, and free it from sediment; then add a spoonful of common salt, and the silver will be precipitated in the form of a white powder or curd; pour off the acid, and mix the curd with two ounces of salt of tartar, half an ounce of whiting, and a large spoonful of salt mix it up together, and it is ready for use.

In order to apply the above composition, clean your brass or copper plate with some rotten stone and a piece of old hat; rub it with salt and water with your hand, take a little of the composition on your finger and rub it over your plate, and it will firmly adhere and completely silver it, wash it well with water:

when dry, rub it with a clean rag, and varnish it.

Note—This silver is not durable, but may be improved by heating the article and repeating the operation till the covering seems thick enough.

Varnish for Clock Faces, &c.

Take of spirits of wine one pint, divide it into four parts, mix one part with half an ounce of gum mastic, in a bottle by itself; one part of spirits, and half an ounce of gum sandrac in another bottle; and one part of spirits and half an ounce of the whitest part of gum Benjamin, mix and temper them to your mind; if too thick, add spirits; if too thin, some mastic; if too soft, some sandrac or Benjamin when you use it, warm the silvered plate before the fire, and with a flat camel-hair pencil, stroke it over till no white streaks appear, and this will preserve the silvering for many years.

Crystallized Tin.

Take sheet tin, the best, and thickest covered

with the metal you can get, clean it well with whiting and water till the face is well polished; warm it, or lay it on a hot plate, and with a sponge or brush wet it well with strong spirits of salts, you will soon see it shoot into beautiful patterns; as soon as this happens, plunge it into cold spring water; you may then varnish it with any colour you please, or leave it in its natural state and varnish with clear varnish.

Note.—This has of late been much introduced into furniture, and when well executed has a beautiful appearance; you may use it as a veneer in a manner directed for buhl work, having first given the side you intend to be glued to your work a good coat of paint.

Size for Oil Gilding.

Grind calcined red-ochre, with the best and oldest drying oil, and mix with a little oil of turpentine when used.

Note.—When you intend to gild your work, first give it a coat of parchment size; then apply the size where requisite, either in patterns or

letters, and let it remain till by touching it with your finger it will just feel sticky; apply your gold-leaf and dab it with a piece of cotton; let it remain for about an hour, and wash the superfluous gold off with a sponge and water, and, when dry, varnish it with copal varnish.

General Directions for dying Ivory or Bone.

First, let them be soaked for about twelve hours in lime-water; take them out and immerse them in weak aqua-fortis for about two or three hours; you may then proceed as in dying wood, only be careful not to let your dye be too hot.

The Method of Gilding the Borders of Leather Tops of Library Tables, Work Boxes, &c.

The tops of library tables, &c. are usually covered with Morocco leather, and ornamented with a gilt border, and are usually sent to the book-binder for that purpose. The method by which they perform it is as follows:—They first go over that part intended to be gilt with a sponge dipped in the glare of eggs, which is the

whites beaten up to a froth and left to settle; and the longer made or older it is, so much the better; then being provided with a brass-roller, on the edge of which the pattern is engraved, and fixed as a wheel in a handle, they place it before the fire till heated so that, by applying a wetted finger, it will just hiss; while it is heating, rub the part with an oiled rag, or clean tallow, where the pattern is intended to be, and lay strips of gold on it, pressing it down with cotton; then with a steady hand run the roller along the edge of the leather, and wipe the superfluous gold off with an oiled rag, and the gold will adhere in those parts where the impression of the roller has been, and the rest will rub off with the oiled rag.

To prepare Plaster Figures.

Having trimmed your figure or ornament from all superfluous knobs, &c. set it in a warm place to get thoroughly dry; then have a vessel large enough to contain it, which fill so much, as when the plaster figure is placed in it, it will

oc quite covered, with the best and clearest linseed oil just warm, let it remain in the vessel for twelve or fourteen hours; then take it out, let it drain, and set it in a place free from dust; and when the oil is quite dry, the ornament, or whatever is thus prepared, will look like wax, and will bear washing without injury.

To make Transparent, or Tracing Paper.

Dissolve a piece of white bees'-wax, about the size of a walnut in half a pint of spirits of turpentine; then having procured some very fine white wove tissue paper, lay it on a clean board, and with a soft brush dipped in this liquid, go over it on one side, and then turn it over, and apply it to the other; hang it up in a place free from dust, to dry; it will be ready for use in a few days; some add a small quantity of resin, or use resin instead of wax.

Note.—This will be found very useful to the workmen for copying any ornaments or figures, as by merely laying it on the work, you can with a pencil trace every line, and if you

please copy it correctly on fair paper, at your leisure; or if it is a pattern for Buhl work, you may paste your tracing paper on the work you wish to cut, and follow your pattern, as directed under the article Buhl work; it will be also found very handy for copying sketches or drawings.

Or-Molu.

This beautiful method of preparing brass-work is much in use amongst the French, and till lately, scarcely applied to ornamenting of furniture in this country; perhaps, more owing to the great expence in doing it, when compared with the usual process of lackering: the method by which it is performed, is somewhat similar to that of gilding metal buttons, which is by applying an amalgam of gold and quicksilver to your brass-work, when well cleaned, burnished &c., and by means of heat evaporating; or more properly volatilizing the quicksilver, leaving a coat of gold on your work, which is again burnished, and the colour

heightened by a chemical process. But as it is not only expensive, but very deleterious to the health of the workman, it would be useless to describe minutely the whole process.

To Gild Metal by dissolving Gold in Aqua Regia.

Dissolve gold in aqua regia, and into the solution dip linen rags; take them out and dry them gently; then burn them to tinder; after you have well polished your work with this, take a cork and dipping it into common salt and water, and afterwards into the tinder, rub your work well, and its surface will be gilt.

Note—Aqua regia is composed of two parts of nitrous acid (*aqua fortis*) and one part of marine acid (*spirits of salt*) mixed together.

To clean Mirrors, Looking Glasses, &c.

Take a soft sponge, wash it well in clean water, and squeeze it as dry as possible; then dip it into some spirits of wine, rub over the

glass, then have some powder blue tied up in a rag, and dust it over your glass, rub it lightly and quickly with a soft cloth, afterwards finish with a silk handkerchief.

To silver Ivory.

Take a small piece of nitrate of silver (lunar caustic), and pound it in a mortar; add soft water to it, and mix well together; keep it in a phial for use, and when you wish to silver your ivory, you must either immerse in this solution and let it remain till it turns of a deep yellow colour, and then place it in clear water, and exposed to the rays of the sun; or if you wish any figures, as cypher, &c. on your ivory, dip a camel-hair pencil in the solution, and draw what you desire on your ivory; after it has turned a deep yellow, wash it well with water, and place it in the sun-shine, occasionally wetting it with pure water; in a short time it will turn of a black colour, which if well rubbed will change to a brilliant silver.

APPENDIX.

In order to render the Cabinet Maker's Guide a complete Pocket Manual for the workman, as well as a book of reference, it has been thought that the addition of some useful Tables would not be unacceptable in a work of this nature.

The following have, therefore, been contrived, and will show, by inspection, the superficial content of any board or plank, without having recourse to duodecimals, or cross-multiplication; and will enable any one at all acquainted with the simple rules of arithmetic, to find the content sufficiently accurate for any practical purpose, though they might have been extended to show the fractional parts of inches to any degree of accuracy required.

Explanation of Tables I. and II.

Table I.—If we call the left hand column feet, and the top row inches, all the other columns will show

TABLE I.

Inches in Width.

Feet or Inches in Length.

1	2	3	4	5	6	7	8	9	10	11	12
1	0·2	0·3	0·4	0·5	0·6	0·7	0·8	0·9	0·10	0·11	1·0
2	0·4	0·6	0·8	0·10	1·0	1·2	1·4	1·6	1·8	1·10	2·0
3	0·6	0·9	1·0	1·3	1·6	1·9	2·0	2·3	2·6	2·9	3·0
4	0·8	1·0	1·4	1·8	2·0	2·4	2·8	3·0	3·4	3·8	4·0
5	0·10	1·3	1·8	2·1	2·6	2·11	3·4	3·9	4·2	4·7	5·0
6	1·0	1·6	2·0	2·6	3·0	3·6	4·0	4·6	5·0	5·6	6·0
7	1·2	1·9	2.4	2·11	3·6	4·1	4·8	5·3	5·10	6·5	7·0
8	1·4	2·0	2·8	3·4	4·0	4·8	5·4	6·0	6·8	7 4	8·0
9	1·6	2·3	3·0	3·9	4·6	5·3	6·0	6·9	7·6	8·3	9·0
10	1·8	2·6	3·4	4·2	5·0	5·10	6·8	7·6	8·4	9·2	10·0
11	1·10	2·9	3·8	4·7	5·6	6·5	7·4	8·3	9·2	10.1	11·0
12	2·0	3·0	4·0	5·0	6·0	7·0	8·0	9·0	10·0	11·0	2· 0

TABLE II.

Parts of Inches in Width.

Feet or Inches in Length.

l	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$
2	0 · $\frac{1}{4}$	0 · $\frac{1}{2}$	0 · $\frac{3}{4}$	1 · 0	1 · $\frac{1}{4}$	1 · $\frac{1}{2}$	1 · $\frac{3}{4}$
3	0 · $\frac{3}{8}$	0 · $\frac{3}{4}$	1 · $\frac{1}{8}$	1 · $\frac{1}{2}$	1 · $\frac{7}{8}$	2 · $\frac{1}{4}$	2 · $\frac{5}{8}$
4	0 · $\frac{1}{2}$	1 · 0	1 · $\frac{1}{2}$	2 · 0	2 · $\frac{1}{2}$	3 · 0	3 · $\frac{1}{2}$
5	0 · $\frac{5}{8}$	1 · $\frac{1}{4}$	1 · $\frac{7}{8}$	2 · $\frac{1}{2}$	3 · $\frac{1}{8}$	3 · $\frac{3}{4}$	4 · $\frac{3}{8}$
6	0 · $\frac{3}{4}$	1 · $\frac{1}{2}$	2 · $\frac{1}{4}$	3 · 0	3 · $\frac{3}{4}$	4 · $\frac{1}{2}$	5 · $\frac{1}{4}$
7	0 · $\frac{7}{8}$	1 · $\frac{3}{4}$	3 · $\frac{1}{8}$	3 · $\frac{1}{2}$	4 · $\frac{3}{8}$	5 · $\frac{1}{4}$	6 · $\frac{1}{8}$
8	1 · 0	2 · 0	3 · 0	4 · 0	5 · 0	6 · 0	7 · 0
9	1 · $\frac{1}{8}$	2 · $\frac{1}{4}$	3 · $\frac{3}{8}$	4 · $\frac{1}{2}$	5 · $\frac{5}{8}$	6 · $\frac{3}{4}$	7 · $\frac{7}{8}$
10	1 · $\frac{1}{4}$	2 · $\frac{1}{2}$	3 · $\frac{3}{4}$	5 · 0	6 · $\frac{1}{4}$	7 · $\frac{1}{2}$	8 · $\frac{3}{4}$
11	1 · $\frac{3}{8}$	2 · $\frac{3}{4}$	4 · $\frac{1}{8}$	5 · $\frac{1}{2}$	6 · $\frac{7}{8}$	8 · $\frac{1}{4}$	9 · $\frac{5}{8}$
12	1 · $\frac{1}{2}$	3 · 0	4 · $\frac{1}{2}$	6 · 0	7 · $\frac{1}{2}$	9 · 0	10 · $\frac{1}{2}$

their products in feet and inches; thus, supposing we have a board 8 feet long and 7 inches broad, the meeting of the horizontal row at 8, and the perpendicular column at 7, will be expressed thus—4 · 8; which is, that the superficial content of such board is 4 feet 8 inches; and so of any other.

If we call the left-hand perpendicular column inches, and we wish to find the content of a piece of wood 9 inches by 7 inches, look at the meeting of the corresponding columns to 9 and 7 for the answer 5 · 3, which is 5 superficial inches and 3 parts, or twelfths of an inch.

TABLE II.—Is exactly upon the same principle; thus, if we wish the content of 11 feet by $\frac{5}{8}$ of an inch, we shall (by carrying our eye horizontally from 11 to where it meets the perpendicular column marked $\frac{5}{8}$) find $6 \cdot \frac{7}{8}$; that is 6 inches and $\frac{7}{8}$ of an inch superficial.

I might have given another table for parts of inches by parts of inches, but in real practice this can be but very seldom required, and in general the measurement of a board or plank is not taken nearer than half or quarter inches, and that only in the width, as when the plank is long in comparison to its width, the fraction of an inch would make but very little difference.

The following example will shew the use of the tables to those unacquainted with cross-multiplication:—

Required the superficial content of a board 11 *feet* 7 *inches by 5 feet* $3\frac{1}{2}$ *inches.*

	Ft.	In.
First, 11 feet multiplied by 5 feet, is.....	55	0
Second, 11 feet by 3 inches, by table I, is $2 \cdot 9$..	2	9
Third, 11 feet by $\frac{1}{2}$ an inch, table II, is $5\frac{1}{2}$..	0	$5\frac{1}{2}$
Fourth, 5 feet by 7 inches, table I, is $2 \cdot 11$..	2	11
Fifth, 7 inches by 9 inches, table 1, is $1 \cdot 9$..	0	$1\frac{9}{12}$
which added together, is equal.....	61	$2\frac{1}{2}$ & $\frac{9}{12}$

Note.—The same example, worked by cross-multiplication, would be equal to not quite $\frac{1}{2}$ a superficial inch more than here given; a quantity of inconsiderable magnitude.

TABLE III.

Ins.	Ft.	Ins.	Ins.	Ft.	Ins.	Ins.	Ft.	Ins.	Ins.	Ft.	Ins.	Ins.	Ft.	Ins.	Ins.	Ft.	Ins.
6	0	3	9	0	6¾	12	1	0	15	1	6¾	18	2	3	21	3	0¾
¼	0	3¼	¼	0	7	¼	1	0½	¼	1	7¼	¼	2	3¾	¼	3	1½
½	0	3½	½	0	7½	½	1	1	½	1	8	½	2	4½	½	3	2½
¾	0	3¾	¾	0	8	¾	1	1½	¾	1	8¾	¾	2	5¼	¾	3	3½
7	0	4	10	8	8¼	13	1	2	16	1	9¼	19	2	6	22	3	4¼
¼	0	4¼	¼	0	8¾	¼	1	2¾	¼	1	10	¼	2	6¾	¼	3	5¼
½	0	4½	½	0	9	½	1	3	½	1	10¾	½	2	7½	½	3	6
¾	0	5	¾	0	9½	¾	1	3¾	¾	1	11¼	¾	2	8½	¾	3	7
8	0	5¼	11	0	10	14	1	4½	17	2	0	20	2	9¼	23	3	8
¼	0	5½	¼	0	10½	¼	1	5	¼	2	0¾	¼	2	10	¼	3	9
½	0	6	½	0	11	½	1	5½	½	2	1½	½	2	11	½	3	10
¾	0	6½	¾	0	11½	¾	1	6	¾	2	2¼	¾	2	11¾	¾	3	11

Explanation of Table III.

TABLE III.—Is continued for readily computing the content of trees according to the common method of measuring timber; viz. by taking the girth and dividing it into four equal parts, and is thus used:—Seek in the first column (or the other columns marked inches, and enclosed between double lines) the length of the quarter girth; take out the opposite number and multiply that number by the length of the tree in feet, &c. the product will be the content in solid feet, &c.

The following example will shew its utility:—

What is the content in solid feet, &c. of a tree, whose length is 9 feet, and the quarter girth 16¼ inches.

	Ft.	In.
In the table, opposite 16¼, is.....	1	10
which, multiplied by 9.....		9
The content is therefore equal.....	16	6

Note.—The method here shewn will, in general, be within an inch or two of the true measure as given by the usual method, and will not only be found very ready, but sufficiently accurate for most practical purposes.

TABLE IV.

Hundredth parts of a foot.	Inches and 12th parts.		Inches and 8th parts.		*Hundredth parts of a foot.*
1	0	1	0	1	1
2	0	3	0	2	2
3	0	4	0	3	3
4	0	6	0	4	4
5	0	7	0	5	5
6	0	9	0	6	6
7	0	10	0	7	7
8	1	0	1	0	8
9	1	1	2	0	17
10	1	2	3	0	25
20	2	5	4	0	33
30	3	7	5	0	42
40	4	10	6	0	50
50	6	0	7	0	58
60	7	2	8	0	67
70	8	5	9	0	75
80	9	7	10	0	83
90	10	10	11	0	92
100	12	0	12	0	100

Explanation of Table IV.

Table IV. will be found very useful for changing feet decimally divided into inches and parts of an inch, and the contrary; by means of which, dimension taken either way may be readily changed to the other; an example in each case will show its utility.

Example 1. *To change 56 hundredth parts of a foot into inches and parts.*

In the first column, opposite 50, is 6 · 0, and opposite 6, is 0 · 9, which added to the former is 6 inches and 9 twelfths of an inch.

Example 2. *To change* $10\frac{3}{4}$ *inches into hundredth parts of a foot.*

In the column on the right of the double line marked inches and eighth parts, we find opposite 10 inches 83, and opposite $\frac{3}{4}$ (that is six-eighths) is 6, which added to 83, gives 89 hundredth parts of a foot.

TABLE V.

Measures of different Counties.	Parts.	Ft.	In.	Lin.	Pts.
English	1440	1	0	0	0
Amsterdam	1335	0	11	1	5
Berlin	1428	0	11	10	8
Brussels	1299	0	10	9	9
China (Imperial Foot)	1513	1	0	7	3
Constantinople	1678	1	1	11	8
Copenhagen	1511	1	0	7	1
Dantzic	1329	0	11	0	9
Denmark	1508	1	0	6	8
Florence	1433	0	11	11	3
Genoa (the Palm)	1170	0	9	9	0
Hamburgh	1343	0	11	2	3
Leghorn	1428	0	11	10	8
Leipsic	1489	1	0	4	9
Lisbon	1371	0	11	5	1
Madrid	1319	0	10	11	9
Moscow	1337	0	11	1	7
Naples (the Palm)	1240	0	10	4	0
Paris (the Foot)	1535	1	0	9	5
—— (the Metre)	4731	3	3	5	1
Riga	1343	0	11	2	3
Rome (the Palm)	1055	0	8	9	5
Stockholm	1545	1	0	10	5
Venice	1638	1	1	7	8
Vienna	1492	1	0	5	2
Warsaw	1684	1	2	0	4

EXPLANATION OF TABLE V.

TABLE V. will be found very useful for changing the different measures of foreign countries to that of England, and the contrary; and is a selection from a very extensiv

one given by Dr. Hutton in his Mathematical Recreation, and needs no explanation; but that the second column is calculated on the supposition, that the English foot is divided into 12 inches, and each inch into 12 parts, called lines, and each line into 10 parts, making 1440 parts in the English foot; and the foot of all the other countries contains the number of the same parts they are equal to, when compared to the English foot.

French Measures.

The English foot is to the Paris foot, as 1 to 1·065977.
The English square foot is to the Paris, as 1 to 1·136307.
The English cube foot is to the Paris, as 1 to 1·211277.

Practical Rules, &c. for finding the Superficial Content or Area of Plain Figures and Solid Bodies.

1. *The Diameter of a Circle being given to find Circumference.*

Rule.—As 7 is to 22, or as 113 is to 355, so is the diameter taken in any dimension, as feet, inches, &c. to the circumference in the like measure.

2. *The Diameter of a Circle being given to find the Area or superficial Content.*

Rule.—Find the circumference by the first rule, then

multiply half the circumference by half the diameter, and the product will be the area.

Note.—For practical purposes you may measure the circumference with a string, and half that length multiplied by half the diameter is the area.

3. *Any Sector of a Circle being given to find its Area.*

RULE.—Measure the arc with a string; then half that measure multiplied by the radius of the circle (of which the arc is a portion) is the area required.

4. *To find the Area of an Ellipsis or Oval*

RULE.—Multiply the longest diameter by the shortest, and the product by the decimal ·7854.

5. *To find the Area of a Triangle.*

RULE.—Multiply the length of the base by the perpendicular altitude of the triangle, and half that product is the area.

RULE 2.—When the length of the three sides are only given, from half the sum of the three sides, subtract each side severally; multiply the half sum and the three remainders continually together; then extract the square-root of the last product, it will give the area required.

6. *To find the Area or superficial Content of a Globe.*

RULE 1.—Multiply the circumference by the diameter, and the product is the superficies or area

RULE 2.—Multiply the diameter of the globe by itself and the product by 3·14159 for the area.

7. *To find the Area of a Cylinder.*

RULE.—Multiply the length by the circumference; this will give the area of the curved surface, to which add the area of the circle at each end (by Rule 2) and you have the whole superficial content of the cylinder.

8. *To find the Superficial content of a Cone.*

RULE.—Multiply half the circumference at the base, by the slanting height, it will give the curved surface of the Cone, to which add the area of the circle at the base and you will have the whole superfices

9. *To find the Solidity of a Sphere or Globe.*

RULE.—Find the surface (by rule 6,) multiply that by the sixth part of the diameter, and you have the solid content.

10. *To find the Solid Content of a Pyramid.*

RULE.—Multiply the area of the base by the perpendicular height, and divide that product by 3 for the solid content.

11. *To find the Solid Content of a Cylinder.*

RULE.—Multiply the area of one end (found by Rule 2) by the length, and the sum is the solid content required.

TABLE VI.

Weight of a Cubic Foot of	lb.	oz.	
Oak	57	13	925
Oak, heart of, very old	73	2	1170
Cork	15	0	240
Elm Plank	41	15	671
Ash ditto	52	13	845
Beech	53	4	852
Alder	50	0	800
Walnut	41	15	671
Willow	36	9	585
Male Fir	34	6	550
Female ditto	31	2	498
Poplar	23	15	383
Apple Tree	49	9	793
Pear ditto	41	5	661
Quince ditto	44	1	705
Medlar	59	0	944
Plum Tree	49	1	785
Cherry Tree	44	11	715
Filbert Tree	37	8	600
French Box	57	0	912
Dutch ditto	83	0	1328
Dutch Yew	49	4	788
Spanish ditto	50	7	807
Spanish Cypress	40	4	644
American Cedar	35	1	561
Pomegranate Tree	84	10	1354
Spanish Mulberry	56	1	897
Lignum Vitæ	83	5	1333
Orange Tree	44	1	705

Explanation of Table VI

The only part that requires to be explained in this table is the right-hand column, which expresses the comparative weight of the different woods, the weight of a cubic foot of river water being 1,000, and those numbers also express the number of avoirdupois ounces in a cubic foot, supposing the wood to be well seasoned, and free from knots.

FINIS.

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