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WOOD FINISHER

A Series of Practical Treatises

ON
HARDWOOD FINISHING AND ALL ITS BRANCHES, INCLUDING MATERIALS USED; TOOLS AND APPLIANCES; FORMULAS FOR STAINS AND THEIR APPLICATION; OIL AND SPIRIT STAINS; WOOD FILLING; SHELLACKING; VARNISHING; RUBBING; POLISHING; FINISHING FLOORS; OIL POLISHING; WAX POLISHING; SOFT WOOD FINISHING; CHARACTER OF VARIOUS WOODS; ETC.

Each Treatise is followed with Test Questions

: : : : for the Student : : :

By F. MAIRE

ILLUSTRATED

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PREFACE

The Wood Finisher, the sixth volume of the Red Book Series of trade school manuals, covers a subject matter which has been gaining in importance from a very humble origin less than fifty years ago, until the hard wood finishing has become for many, a trade by itself, from being at first a very small side line in most paint shops.

The advent of finishing interiors with hard woods instead of white pine was the real beginning of its growth. It is true that it was known before that, but its use was mainly confined to furniture manufacturers, and then its processes were far from being what they are today. The old French polish done with endless rubbing of shellac, varnish and linseed oil was still king and surfaces brought to the fine mirror like condition in which good finishing is done
today may be said to have been unknown then. The statistics of varnish manufac-
turing have kept pace with the develop-
ment of hardwood finishing. The older
men who were familiar with the conditions
of the varnish trade fifty years ago, can
well remember the few factories which in
an humble way, did the business for the
whole country in Newark, N. J., and Long
Island suburbs of New York City. Even
their output was mostly confined to car-
riage varnishes, and such as the cheap No.
1 Coach and furniture grades. Had any
one prophesied that in 1911, several single
establishments would have an annual out-
put greater than that of all the varnish
manufacturers combined did in 1860, he
would have been looked upon as a dreamer.

The same system has been adopted in
the arranging of the subject matter of this
manual, as in the former volumes of the
graded lessons from the very
foundation of the processes onward toward
the completion of the work. Questions upon the subject matter contained in each lesson will be placed at the end of each lesson. The numbers at the beginning of each question, correspond to a similarly numbered paragraph which contains the answer to the question asked. F. MAIRE.
The Wood Finisher

LESSON I.

PRELIMINARIES.

1. It has been the practice at the beginning of the various books composing the Red Series of trade manuals, to give a synopsis as it were of the "How" the subject matter would be treated in subsequent lessons. This serves to cut up the subject into smaller bits supposed to be sufficiently independent of each other, to be treated separately from each other. This of course is only partially true, as all connect together to form the whole.

2. It is possible to finish wood in several ways—some better than others—but cheaper and quicker in execution. It is intended in the course of this manual to give all the various processes for doing
good work from the ground up, then to state where some omission can be made in order to cheapen the process; also to state in what manner the cheaper process is inferior to the other.

3. As it is essential that the students should have a fair knowledge of wood structure in order to know how they should be treated and why they should be treated as described further on; a short study of them will be given in lesson II, as otherwise some might get mixed up as to the "why and wherefore" of the several operations. The study of hardwood finishing without an intimate knowledge of the growth of woods would otherwise be on a par with that of a would-be surgeon who should fail to study anatomy upon which his art is based.

4. The preliminary operations in wood finishing are important ones. They consist, first, in absolute cleanliness of the surfaces, previous to filling, which is the one all important operation for the durability
of the superadded work. Then the perfect sealing of the filled pores by the shellac coats, and finally the real lustre giving operations caused by the applying of the varnish coats. The perfect levelling of the coats of varnish by the "rubbing" and afterward of the polishing of the same to bring out the full lustre or a partial amount of the same as may be desired.

Stains and how to make them if desired, will be taken up and formulas will be given for making the principal ones in either water, oil or spirits.

French polishing, while now almost obsolete, is sometimes demanded by some of the men who have good bank accounts and are not afraid of consequences in the shape of "big bills."

The proper treatment of floors will form a separate section, and as far as space permits any additional matter of interest to a wood finisher will be included in that.

This lesson being merely an outlining of
the contents of the following ones, need not to be studied with a view of answering the questions which follow at the end of it.

PARAGRAPHS IN LESSON I.

1. Gives synopsis of the arrangement of the subject matter in the following lessons.

2. Follows in the same description.

3. Continues in the same vein.

4. The same to the end.

LESSON II.

A STUDY OF WOOD CONSTRUCTION.

5. As stated in lesson I the study of the peculiarities of the various woods must be well understood by the would-be hardwood finisher, if he desires to act intelligently in the performance of his work. He should be able to give a reasonable account for everything that he does and why he does it in preference to any other method, whereby the same might have been done.
Until he is able to do that, he is working in the dark and guessing at things. There is no room for guess-work in wood finishing. That stage is past where a man can stumble into it and awake up a full fledged finisher, simply because he has daubed a barn with paint and oil. It requires a more intimate acquaintance with the requirements of surfaces than that possessed by the ordinary house painter.

6. All woods, no matter how they may look, are composed of filaments either large or small, straight or curly, or contorted; between each of the filaments is a small duct through which the sap flows upward from the root to the outer extremities of the smallest branches of the tree. When these small ducts or canals are cut across, either squarely or at an angle, they show up usually darker in tone than is shown by the filaments and are then known as pores.

7. In the preceding paragraphs it was stated that the filaments grew eithe
straight or crooked, and to that should be added, that besides the filamental growth may be very thick or very thin, and that the conduits between them, which from now on will be called pores, are either large or small to correspond to that of the filaments adjoining them. This coarse growth is known to wood-workers as "Open grained"—the close fine growth as "Close grained." All woods are usually classed into one or the other of these two divisions.

8. The "open grained" woods—All woods of coarse growths are included in this category. They have coarse pores which are open, and it is a very hard thing to determine exactly the dividing line between woods which are known as close grained. Many woods come so near this dividing line that they may partake of some of the characteristics of the two divisions and should be treated with that end in view. It stands to reason that woods which have their surfaces deeply pitted with
coarse open pores will require to be treated differently from woods of close growth. This difference is greatest, however, in the preliminary operations of staining and filling, of which much more will be said under their proper headings.

9. It may well be surmised that the woods which are classed as "close grained" are not uniformly so either and that the line of demarcation between them and the "open grained" division is as hard to rigidly establish as was stated in the preceding paragraph for open grained ones. This difference is noticeable mainly in the preliminary operations of staining and filling. Yet it may be truthfully said of all woods, that aside of the difference existing in the two principal divisions, each and every one of the various woods has an individuality of its own which belongs to it and to no other just in the same manner as they have it. This individuality is sometimes very hard to de-
fine and only those familiar with wood finishing in all kinds of wood are really aware of it, and have given it sufficient thought to vary their treatment of it so as to get the best out of it.

10. Again there is a deal of difference between woods of the same growth. Such at least as are capable of being classed into "quarter sawed" show a marked difference in many respects from the same wood which is sawed straight through the log full length as is done ordinarily. Oak, sycamore, the former an open grained wood and the latter a close grained wood showing that peculiarity. But it would be anticipating to dwell upon these peculiarities here and such will be noted at the proper time and place.

QUESTIONS ON LESSON II.

5. Why should a wood finisher have an intimate knowledge of the growth of the various woods?
6. What are "wood pores?"
7. Into what two general divisions may the various woods be classed?
8. What is said of the "open grained" woods?
9. What is said of the "close grained?"
10. What is said of the "quarter sawed" woods?

LESSON III.

MATERIAL USED IN WOOD FINISHING.

11. The material used in wood finishing is composed of colors, of substances suitable for filling the wood, for the rubbing of it level after varnish coats, for the polishing of the surfaces after rubbing and principally of the varnishes themselves. Besides there is some which is used occasionally for various purposes mainly in the preparing of stains, etc., which can be properly placed under the designation of miscellaneous material; then there are also the various thinners used for the stains
and the fillers and liquids which are used in connection with rubbing and polishing.

12. Colors—The use of colors in wood finishing is for the purposes of coloring the wood either as stains or for the filler. One object must be kept in view in their selection: They must be as nearly transparent as possible, as neither the stains nor the filler must be so opaque as to cover over or hide any of the details of the wood. Therefore only those colors which are transparent or semi-transparent can be of any use to the wood finisher. The earth colors fill this requirement to perfection, at least in the finer qualities of them. The list is a limited one and comprises Raw and Burnt Umber, Raw and Burnt Sienna, Vandyke Brown. Among the blacks, ivory or bone black is semi-transparent and is the only one that can be depended upon for stability. Some of the aniline blacks are being improved until they can be relied upon. For stains, of course, they are far
superior to the ivory black as they are perfectly transparent. All the various yellow and red browns, enumerated before, are now also obtained from coal tar colors.

13. The coal tar colors well deserve a separate paragraph in describing them. There was a time, not so very long ago either, when all this class of colors were very fugitive and so unreliable that their use was limited to the cheapest work on account of their fugitiveness. Since then the field of discovery in this class of colors has been advanced greatly and dyes of alizarin, purpurine and paraline extraction are as good as those extracted from madder and it will, if it has not already done so, displace the use of the semi-transparent pigments enumerated in the preceding paragraph at least for the making of stains. It is very unfortunate that at the present time there is no nomenclature in use for coloring extracted from coal tar which is in universal use. Every manu-
facturer has a proprietary name for the various colors and grades, of such that he puts out and it is sometimes difficult for one who is not familiar with each one's product to know how to call for what he wants. The best way when writing to a manufacturer or his agents is to plainly state what the color is; what it is wanted for; what liquid it is desired to dissolve it in, and also a few questions as to its proper treatment, if soluble in water for proper mordants.

14. Besides the above, which are now thought to be sufficient to the trade, the old time finisher has recourse to the whole U. S. Pharmacopoeia for material to be boiled down for 48 hours and to macerate for ten to twenty days in order to prepare his stains. This has become nearly obsolete now as life is too short to spend it uselessly in making stains which can be bought ready made. However, as some still want to know how to make these
old-fashioned stains a few recipes will be given for the leading colors used, and if the student is desirous to try the way his grandfather used to make stains he can do so once! that's all.

**QUESTIONS ON LESSON III.**

11. What is said of material used in wood finishing?

12. What is said concerning the colors used in wood finishing?

13. What is the character of coal tar dyes?

14. What is said of the old-time boiled down stains?

**LESSON IV.**

**MATERIAL CONTINUED.**

15. The material required for the compounding of the filler must be inert, incapable of a change under the conditions it is placed and at the same time it must not attack or injure the various compounds
which are placed over it. In the past corn starch and such vegetable substances were used as fillers, but such have been abandoned and replaced by "silica." The only form of this is in that whose atoms are angular and of sharp-edged construction for the forms of it with rounded atoms are of very little good. Silver white, silicate earths, English calcimine when of proper construction in their atoms are of this character, but quartz which has been crushed, ground and pulverized is better than any of the above.

16. *Pumice stone;* the Italian sort, pulverized in many degrees of fineness and free from grit. This is all important, as upon its good working quality in a great measure, the success of the rubbing operations depend. There has been a great deal of American pumice stone from Utah and the West which has been put on the market in competition to the Italian article. While it is desirable to use a home-grown
and made article as much as possible when it is really good, it is feared that in this regard it will be a long time before we shall discover a good substitute for the Italian sorts. The American pumice stone contains grit which will invariably give trouble in rubbing, while the Sicilian article is even and free of it.

17. Shellac—is indispensable in good finishing. In the past many substitutes have been compounded and sold in the market as destined to replace "shellac," lauding these make-shifts away beyond their real usefulness to the trade, with the consequence that the slop work which one had to turn out who made use of such has cured the public from any desire to look for a substitute when they can obtain the genuine article at any reasonable figures. Alcohol (denatured), the solvent for shellac, has been so reduced in cost in the past two or three years that it has more than balanced the higher cost of the shellac itself.
This is in part due to the increased cost of producing it, the cheap labor of India gradually becoming a thing of the past and the time when shellac could be bought for 16 2/3 cents per pound at retail will never come back again.

18. The Varnishes—play a most important part in wood finishing; but for the help received from them at almost every stage of his work, the wood finisher would be in a tight fix. It is not necessary that they should all be of the highest quality possible as will be seen in the lessons which are to follow, especially for the cheaper finishes.

The varnishes used mostly in wood finishing are known as "interior" and "exterior" qualities, the former being a harder drying and less elastic than the latter, but should rub down with pumice stone and water. Varnishes called "interior" which will not bear that test are not fit to use as a support to the flowing or
finishing coat. The classes of varnish which will not rub down are better known as Coach, Extra Coach, No. 1 Coach and also under the name of furniture varnish. Besides these there are a number of varnishes, some fair, but many poor, which are best known as "hard oil" which is really a misnomer for they are not what they claim to be. Floors require a varnish made from very hard gums and all manufacturers of varnish put out a line of house wood finishing goods which include all the above, including the floor varnish.

19. Rubbing oils are many. Recipes for the preparing of them will be given in subsequent lessons. They are used in what is known as "oil rubbing."

Rotten stone for polishing, felt rubbing pads to use in connection with pumice stone, chamois skins and sheep wool sponges should always be included in the make up of the wood finisher's "kit" of material.
20. The liquids used in connection with the spreading of the material named in this lesson, aside of the varnishes, consist of raw linseed oil, turpentine, benzine or naptha, paraffin oil, vinegar, etc.

QUESTIONS ON LESSON IV.

15. What is said of the material required in compounding fillers?

16. What is said regarding the pumice stone used in rubbing?

17. What surfacing should the surfaces receive after the filling?

18. What is said of varnishes in a general way?

19. What other additional material is named here?

20. What other liquids besides varnishes are used at times in wood finishing?
LESSON V.

TOOLS AND APPLIANCES.

21. By far the most important of the tools required in wood finishing are the brushes used to spread the material used in staining, filling, shellacking, varnishing, rubbing and polishing. Each operation requires brushes which are better adapted to the one operation than any of the other and the whole field of brush stock is covered and drawn upon in the make up of the brushes that are used in wood finishing. Some are such as are used in general painting and varnishing, and again there are others which are especially designed for the purpose for which they are intended and which are used only by the wood finisher.

22. The larger bristle brushes will be first noted, examined and illustrated. The brush used for the spreading of stains is shown in Fig. 1. It is a flat brush and, ac-
cording as it is a wide or a narrow surface, may be anywhere from 2 inches up to 4 inches wide. A brush about one-third worn is better than either a new one or one worn out more than that.
22. In Fig. 2 is shown a brush of much the same shape to be used in the spreading of "filler." It should be fuller stocked than that used for stains and should be about half worn out as sometimes it has to
be used vigorously, especially when the 

filler is rather thick in the bottom of the pots.
23. The oval chiselled varnish brush represented by Fig. 3, may be called a general utility brush; as a special brush for the laying of shellac spirit varnish it is hard to beat. Yet many finishers would object to it, preferring a flat brush from 2 to 3½ inches wide, and for very large surfaces even of 4 inches in width.

24. Fig. 4 shows the well known cluster. There is a flat variety of it, and as in shape it looks very much like Fig. 1 there will be no need of illustrating it.

25. Fig. 5 represents one of the forms of the furniture picking brush for cleaning up or the removal of the filler in mouldings, etc.; also very useful for cleaning up pumice stone powder in the same mouldings, etc.
26. Under Figs. 6 and 7 are shown, respectively, a fitch flat varnish brush and a badger hair chiselled flat varnish brush. The fitch and badger brushes come in sin-
gle and double thick and in chiselled edge.

The one showing of the chisel edge will suffice however for both.

27. Fig. 8 shows the usual shape of the
bristle flat varnish brush which also comes in single and double thick and chiselled in single and double thick also.

Fig. 8

28. No kit will be complete without some few artists' bristle brushes, both flat
and round as shown in Fig. 9. They are used mainly in putting in heavy veinings and mottlings in imitation of mahogany with stains and will be found useful in other ways as well.

29. Fig. 10 shows the camel's hair varnish brush or mottler according as it is more or less furnished with hair—the mottler having the most.

Fig. 10

QUESTIONS ON LESSON V.

21. What is said of tools, especially of brushes and of Fig. 1?

22. What use is made of brush shown in Fig. 2?

23. What brush does Fig. 3 represent?
24. What is represented by Fig. 4?
25. What use is made by the brush represented by Fig. 5?
26. What brushes are represented by Figs. 6 and 7?
27. What does Fig. 8 represent?
28. What brush is represented in Fig. 9?
29. What brush does Fig. 10 represent?

LESSON VI.

TOOLS AND APPLIANCES CONTINUED.

30. The brushes constitute the largest item in the cost of fitting out a kit for the wood finishing business. The best of brushes will cost a trifle more, but it will be real economy in the end. The other tools useful to the wood finisher are neither numerous nor costly.

31. Rubbing felt pads—these should be of the best felt. The rubbers in the large furniture factories prefer the pad made
from 1 inch thick stuff. This is, of course, a matter of opinion only, many preferring a \( \frac{1}{2} \) inch pad. Felt can be bought of any thickness and of many qualities. In this, as in brushes, there is no economy in buying a poor quality.

32. It is of the utmost importance to the wood finisher that his brushes should always be in good working condition, not only for his varnish brushes which should

![Fig. 11](image)

be kept in an individual keeper, but also for all his other brushes where they can be suspended and high enough so that the
ends of the brushes shall not touch the bottom of the keeper. In Fig. 11 is shown one which is dust proof. Fig. 12 shows a spring arrangement which can be placed on top of a pail and from which brushes can be suspended at any height desired.

33. A good supply of cotton waste and flax tow waste especially will be found the best thing yet in cleaning up filler. Many use excelsior for this purpose and again rs use saw dust. But of all the ones
named over, the tow will be found the most effective and cleanest of an otherwise dirty job.

34. It will be found of good use to have some small hickory sticks, some whittled down to a chisel edge and others rounded of different forms in order to clean the filler in mouldings and corners where it is not easy to dislodge it with the ordinary means at hand. These sticks can be made at leisure from discarded buggy spokes and are known to the trade as "picking sticks."

35. Some few galvanized pails to hold clean water, used in rubbing varnish coats, a few good pots to hold filler and stains, and some extra good varnish pots, the latter with a wire across the top to clean the brush upon and to lay it upon. This device is good for all other pots used, even for the filler cans. It will cost but little, if anything, to solder on a dozen wires across the tops of that many cans.
36. Some boxes to hold the ground pumice stone, not too large but just the right size to dip into with the pad in the hand without hurting the knuckles every time one takes a dip.

37. There should be some few handy "horses" to lay doors upon when these can be readily unhinged as it will greatly facilitate the rubbing and cleaning if they can be laid flat upon them. It happens very frequently that good step ladders are needed to reach up to the top of door casings and window frames. Remember that none are too good, or too safe to use and that a poor ladder has frequently been the undoing of some poor fellow and the crippling of many for life.

QUESTIONS ON LESSON VI.

30. What is said regarding the selection of tools?

31. What is said concerning rubbing felt?
32. What are good brush keepers?
33. What material is recommended in cleaning up filler?
34. What other tools are mentioned for cleaning up filler?
35. What is said regarding pails, etc.?
36. What is the best form for pumice boxes?
37. What other contrivances are useful on a wood finishing job?

LESSON VII.

THE STAINING.

38. The artificial coloring of the wood is of frequent occurrence and woods are finished under all sorts of garbs utterly foreign to their natural colorings. This is produced by the operation called "staining." As people will have it, it is a painful duty to have to tell the student "how it is done" no matter about the questionability of the taste of the persons who resort to it.
39. The above is said mainly of such outlandish coloring as blue, green, and unnatural coloring for oak, etc. There is a legitimate excuse for anticipating old age and the darkening effects of it upon woods which can be produced by the staining of the wood. It is perfectly proper and right. So the antique oak, golden oak, and so called weathered oak effects are not out of place. The darkening of the natural tone of the wood is pleasing and harmonizes well with most colors used in wall tinting and carpets.

40. The aging effect of time upon mahogany is another instance where stains have a proper function to perform, as new mahogany is anything but prepossessing in tone. So if the darkening and reddening process due to age can be imparted by stain and the effects produced at once—why not?

There are but few woods which are not affected by age, in so far as the darkening
goes, and the reproduction of these brown tones, even when a trifle out of the reality, may be indulged in without reflecting upon good taste.

However, as the owner of a building has the right to pay for anything he wants in this free land of ours, it will fall to the lot of the average wood finisher to have to use the full gamut of outlandish coloring in staining at some time or other and he should know how to proceed to do so.

41. Staining should be done before the filler has been given the wood to be finished, for the reason that when the pores are once filled the stain would be unable to penetrate into the wood and if done afterward then but a very faint part would remain on the surface where usually it is not desirable that it should stay and where it is most likely to be subjected to scratches, marrings of various kinds, which would show the underwood unstained and as blemishes upon the wood work.
42. Stains are known as "oil stains" when that with which they are thinned and applied is composed of any kind of oil fixer of volatile. If they are soluble in alcohol and applied through that medium they are known as "spirit stains." If on the other hand they are soluble in water, then they are known as "water stains."

43. Each one of the above sorts of stains has some good quality which belongs to them alone, and every wood finisher is anxious for a fourth division to spring up which shall combine the good qualities of each class, free from the faults which belong to it. Oil stains also have the good quality of being easily applied. They do not double up easily in other words, the color does not show the lap when the next brushful goes on and an even surface is easily obtained from their use. The drawback is that they are not as penetrating as the water stains or spirit stains. The spirit stains are not used to the same
extent that they were. They are more costly and present no advantage over the water stains. Water stains have a long list of good qualities: they penetrate deeply; they are usually very clear-toned and the figuring of the wood will show through without hiding any of its details.

QUESTIONS ON LESSON VII.

38. What is said of stains in a general way?
39. What is said of the imitation of wood ageing—with stains?
40. What is said of mahogany and other aged woods being imitated by stains?
41. Why should stains be applied before the wood has been filled?
42. How many kinds of stains are there?
43. Describe the properties of the various stains.
LESSON VII.

FORMULAS FOR STAINS AND THEIR APPLICATION.

44. It was stated in the preceding lesson that there were three divisions of the stains, according to the liquids which held them in solution, to wit: The "water stains," where water is the solvent; "oil stains" where benzine, turpentine or linseed oil is the solvent; "spirit stains" are such as are soluble in alcohol. It is to be understood that the solvent liquid is also made use of for the application of the stain.

45. Water stains are penetrating, clear toned, and usually so transparent as to add nothing of their own to the looks of the wood but coloring matter. They are the stains "par excellence" notwithstanding that they have some grave faults of their own. The deep penetration enables the wood to absorb it so that surface mar-
rings of ordinary occurrence do not usually affect them. On the other hand, many of the woods absorb it so very fast that by the time the operator comes on with the next brushful and tries to join on to the parts which have been gone over before, he will be unable to do so without showing a joint where the new has covered over the former and "doubled up" upon it, making it appear much darker than the rest.

46. All woods do not possess this peculiarity of quick absorption and setting—the softer woods being more subject to it than hard woods. By care one can apply them so that but little inconvenience will be had from this peculiarity. If the surface is a partition, the stain should be applied evenly up to the edge of one of the boards forming it and no wider than can be readily and continuously brushed down. If it be paneled work, the panels should be done first, including the moldings upon it, then the rails to the edge of
the stiles, taking care not to run over the line farther than the stiles themselves. In that way there will be no trouble experienced in the staining of the softest of woods. In any other situation where there is an impossibility of using the edge of a board as a guide line, the operator can sponge a place with clear water and brush up to the middle of it, taking care to join on to it while it is still fresh. This will in a great measure prevent the absorption of the stain and its "doubling up."

47. As said before, most of the water stains are coal tar products. Each of them has its own peculiarities of mordanting, which are usually given by the manufacturer. Most of them are readily soluble in warm water or even cold when sufficient time is given them.

Many of these are prepared and compounded from various kinds of colors and soluble material by manufacturers of stains; all that there will be
necessary for the operator to do being their solution and application. As these prepared stains are usually made from formulas, they are supposed to be always alike and but few wood finishers at the present time go to the trouble of compounding them themselves.

48. The old-fashioned stains obtained by maceration, percolation, etc., it has already been noted in the previous lesson, have had their day of use, no matter how well they may have served before the introduction of the coal tar colors; they are too troublesome to make today. Below are given a few of the best, one each for each color, with an idea of how they are prepared rather than with the expectation that they will be much used:

FORMULAS.

49. Light oak—Asphaltum gum, \(\frac{1}{4}\) pound; turpentine or benzine, 1 pint. Dissolve stain and brush over.
50. Dark oak—Burnt turkey umber, \( \frac{1}{2} \) pound; Aqua ammonia sufficient to mix into a stiff paste; thin with water until it is of the shade wanted; strain and apply.

51. Cherry stain—Spanish annotto, 1 pound; concentrated lye, 1 ounce. Boil for half an hour. If not deep enough to suit, boil down to concentrate it. Gamboge added will darken it.

Another for cherry—Any of the mahogany stains reduced with water will make a cherry stain.

52. Ebony—Extract of logwood, 3 pounds; concentrated lye, 1 pound; water, 7 pounds. Dissolve by boiling, strain and apply either hot or cold. When dry go over the work with a strong solution of vinegar and iron.

Another ebony—Sulphate of iron, \( \frac{1}{2} \) pound; chinese blue, 2 ounces; nutgalls, 3 ounces; extract of logwood, 2 pounds; vinegar, 1 gallon; carbonate of iron, \( \frac{1}{4} \) pound.
Boil over a slow fire for two or three hours, strain and apply either hot or cold.

53. Mahogany—Fustic chips, 8 ounces; madder root, 1 pound; water, 2 gallons. Boil for 2 or 3 hours, strain and apply boiling hot.

Another mahogany—Make a decoction of logwood chips by boiling them in a closely covered vessel in twice their bulk of water, for 2 hours, strain, add a small quantity of chloride of tin; this will give it redness. Be your own judge when to stop. Apply two coats.

54. Rosewood—Any of the mahogany stains will make a rosewood stain if repeatedly applied. If stained to a dark mahogany tone, the job is gone over lightly with an ebony stain. Load a camel’s hair pencil with ebony stain and run over the surface with that haphazard, straggling style, peculiar to the growth of rosewood.

55. Walnut—Permanganate of potash, 1 ounce; epsom salt, 1 ounce; water, 1
quart. Dissolve, strain and apply, repeating till dark enough to suit.

Another—walnut—Nutgalls (crushed) 3 ounces; concentrated lye, 4 ounces; Vandyke brown (dry), 8 ounces. Boil, strain and apply hot.

Another walnut—Vandyke brown, 4 ounces; burnt turkey umber, 3 ounces; aqua ammonia, 1 pound. Mix and apply after straining. It may be left a few days to kill the pungent smell.

It will be noted that none of the tedious macerating and percolating sorts of stains are given. The above are the easiest of reproduction and cover all the leading sorts of wood.

All other fancifully colored stains are left out. They can be made by dissolving some of the coal tar colors or, in smaller quantities, by dissolving diamond and other dyes of the color required.
QUESTIONS ON LESSON VII.

44. Into what three divisions are stains placed?
45. What are the properties and defects of water stains?
46. How should they be applied so that they will not double up?
47. How are water stains prepared?
48. What is said of the old-fashioned stains?
49. Formula for light oak stain?
50. Formula for dark oak stain?
51. Formula for cherry stain?
52. Formula for ebony stain?
53. Formula for mahogany stain?
54. Formula for rosewood stain?
55. Formula for walnut stain?

LESSON VIII.

OIL AND SPIRIT STAINS.

56. *Oil stains.* But that oil stains are not as penetrating as they might be and
also that they form a film which in time dulls and somewhat serve to hide the finer details of the wood, they would be the *ideal stains*. They are very easy to apply, allowing the operator ample time to do his work properly without any fears of doubling up. Another trouble which belongs especially to the water stains of which it is free is that the grain of the wood is not raised when they are used. This, however, while troublesome, is not an unmitigated evil and much can be said in favor of it as well as against it.

55. They are easily prepared, too, being usually made from colors ground in oil. These must be very transparent and finely ground. The earth colors, such as raw and burnt siennas, raw and burn umbers, Vandyke brown, ivory blacks. By using these, either alone or in combination with each other, will form nearly all the standard staining colors required. Rose lake, or what is better for permanency,
madder lake, added to some of the above will enrich them to some of the fanciful ripe cherry tones which are so much admired by a certain class of people, and the Prussian blues, which are so transparent when added to such transparent yellows as a good Italian raw sienna should be, will produce all the flemish weathered effects which one could desire, especially when darkened up with ivory black.

58. Their application, as it has been already hinted at, is of the easiest. As to the quantity of the thinner used, the stains will be either light or dark, with all the intermediate range between the two extremes. There being no danger of the color doubling up, it will not matter any about commencing or ending at any particular parts, although just to keep up the good habit it should be kept up for practice. It requires some little time for oil stains to become perfectly dried. It is better to put the stain on rather thick, and to rub it out to
the thinness desired, so that the least amount of oil may be used; but unless one will take trouble to rub it out thin, it will be safer to apply it thinner to obtain uniformly good results.

59. In staining over soft woods, such as pine, etc., and also over floors which have been painted over with a ground, all of which are usually finished in a cheap way, a varnish stain is used which should be classified with the oil stains, as the principal liquids in the varnishes are volatile oils and linseed oil. These varnish stains set much more rapidly than the oil stains mentioned above. They require to be worked rapidly in order that the joining of the color may not show the lap. They are but a make-shift after all, and but that they have been persistently advertised and the dear public beguiled into buying with the lure that "any one can put them on," one would not hear from them very often.

60. Besides the oil colors referred to be-
fore, many of the oil stains which can be purchased ready made in the market, as well as those which the wood finisher may wish to prepare for himself, are readily made in every color known, from the coal tar colors now made which are soluble in oil. They have the advantage over the earth colors ground in oil, that they are perfectly transparent and unless badly managed never speck. To offset this advantage it must be owned that as a rule they are not as permanently unfading as the old time oil colors are.

SPIRIT STAINS.

61. *Spirit stains*—are made from colors or coloring matter extracted by, or soluble in alcohol. They are but seldom used at the present time, only upon special occasions where oil or water is inadmissible, as in musical instruments, etc., where it is supposed that the others would hurt the sounding properties of the wood, or where
it is desired to finish the job in a hurry, or without the use of varnishes other than that of the shellac varnish which is used ordinarily to carry the stain. Inside window blinds, etc., which are or were formerly done largely in shellac finish, indicate the class of work upon which spirit stains are used. Many of the coal tar colors are soluble in alcohol—all such can be used in preparing spirit stains. Below are given a few formulas for making the old-fashioned kinds:

62. Yellow spirit stain—Turmeric powder, 1 ounce; alcohol, 1 pint. Digest four days, shaking the mixture occasionally and strain for use. Brush over the wood two or more times until the depth of coloring wanted is obtained.

63. Yellow red spirit stain—By adding an alcoholic solution of dragon's blood to the preceding formula, any degree of redness can be obtained to an orange.

64. Mahogany spirit stain—Dragon's
blood, 1½ ounces, carbonate of soda, ½ ounce; alcohol, 1 pint. Digest a few days to make it dissolve, filter and after applying the following wash, brush it over. Take diluted nitric acid and wash the wood with it before applying the stain.

65. Ebony spirit stain—Dissolve extract of logwood in wood alcohol to the desired strength, strain and apply. Develop the color by going over the work with tincture of muriate of iron.

QUESTIONS ON LESSON VIII.

56. What is said of oil stains in general?

57. How are oil stains prepared?

58. How should they be applied?

59. What are varnish stains?

60. What is said of coal tar colors soluble in oil?

61. What is said of spirit stains?

62. Formula for making yellow spirit stain?
63. Formula for making yellow red spirit stain.
64. Formula for making mahogany spirit stain.
65. Formula for making ebony spirit stain.

LESSON IX.

FILLING THE WOOD.

66. Filling is that operation which as the name indicates enables the operator to stop the suction of the pores by shutting them up and completely filling up and sealing the cavity of the pores. To prepare the way for the complete filling and how to do it rightly is all important, for if this filling be imperfectly done, the job must show it at some point or another before its completion, or if perchance one manages to go through with it to an acceptable ending, its lasting quality as such will be greatly shortened.

67. The sanding machine frequently
leaves the openings of the pores shut up on account of the endings of the lint of the filament being bended into the pores instead of being severed clean off as it should be. When it has been squeezed into the pores as stated above, it seals it, at least partly, if not wholly, and the filler cannot penetrate into it properly. Much has been said against the raising of the grain but this much can be said in favor of it, and that is that it does open up the pores for the entrance of the filler as nothing else will. It is true that it does cause some extra trouble to level down afterward, but when the good it has done is taken into consideration, it will more than make up for the extra trouble given. So that the use of water stains, or alcoholic stains which are sure to produce it and which is the one greatest objection which many advance against their use—is really one of the reasons, if not the main one, why many others use it.
68. If the wood has not been stained and is to be finished in its natural color, it must be sanded. In all probabilities it has been sanded by machinery and by pressure, with the result of having had the endings of the filaments pressed into the orifice of the porous pit. It was explained in the preceding paragraph that it prevented the proper filling. Many finishers who do not mind a little extra work will take a sponge, put it into hot water and squeezing nearly all the water out of it, will sponge over the surface of the job to be filled and after an hour or so proceed to sandpaper it down when perfectly dry. It will be found that the ends which have been pressed in will straighten out and raise up above the surface and the sandpapering given them will greatly reduce it down if it does not entirely remedy it; so much so, at least, that the sanding of the surfacing coatings put over the filler coat will usually finish the removal of the rest which the first sanding
did not remove. The use of water stains will produce the same effects as the sponging does, only much more so, and when it has dried, the surface must be carefully sandpapered as directed for the sponged surface of the wood to be finished in its natural color.

69. It has already been hinted as to what are the requirements needed in the material composing the filler, but in order to bring it out more fully the same will be reviewed, as this filling operation is the foundation upon which the rest of the work will either stand or fall. The solid part of the filler must be unalterable, either from moisture or by coming into contact with any material that may be placed above it. Under the head of material, it was seen that silica, with atoms of a fragmentary sharp form, was the best material to use and for the reasons given above. This is best obtained from quartz crushed and powdered. There should be enough lin-
seed oil used in the preparation of the filler to make a slight binder to it, but not nearly enough to enable one to spread it with a brush—the thinning should be some volatile oil; it does not matter what it is, either turpentine, naphtha or benzine.

70. It will be noted in dark colored woods that the pores are always a trifle darker than the general tone of the wood is, so the filler should have enough of some of the oil colors ground in oil named as useful for the preparing of stains—incorporated into them to give them the right color wanted; just a trifle darker than the stain used and no more.

71. The application of the filler is not a difficult nor a delicate operation. It requires thoroughness of good rubbing in and some evenness, but it need not be laid off as for painting, as it would be a waste of time. As for the thinner used, composed mainly of volatile oils, the color sets rather quickly and no more should be cov-
ered over than will permit the operator if he is working alone to _rub off_ the filler before it will dry too hard to do this properly. As long as the filler has not changed its color from a wet looking surface to a flat dull one it is too wet to _rub_, and there is danger of commencing to do the rubbing, as it may be worked out of the pores, but after it has turned flat there is little chance of this.

72. The _rubbing off_ may be done with sawdust, excelsior, wood chaff or planer mill shavings, or with cotton waste or with flax or hemp tow, the last being the best and cleanest, although good rubbing off will and can be done with all the forenamed material. It is needless to state that whatever material is used should be dry and entirely free from moisture. The operator should commence at one corner and gradually work his way cleanly to the end, removing all surplus filler from the surface. Mouldings and parts which may have carv-
ings and corrugations should be cleaned with a good picking brush and mouldings with the hickory picking sticks mentioned in paragraph 34. This completes the filling and ample time should be given it to dry hard before proceeding to the next step; surfacing over it with shellac varnish.

QUESTIONS ON LESSON IX.

66. What is said of the operation of filling in a general way?
67. How should the surfaces be prepared for the filling?
68. What is the best method for cleaning out the pores for the filling?
69. What is the best way of preparing the filling?
70. Should the filler be colored for dark wood?
71. How should the filler be applied?
72. What is the best manner of "rubbing off" the filler?
LESSON X.

SURFACING OVER THE FILLER—SHELLACKING.

73. All woods do not require the same treatment in the way of filling. This much no doubt the student must have inferred when the description of the make-up was under consideration. It was there explained that some of them were "open grained," or coarsely porous while others were "close grained" with little porosity. There are, however, no such woods as "non-porous," as some would have one believe. The porous ones need the filler more than the others, but all need it in a greater or lesser degree. The close grained sorts need a filler made up from extra fine atomed material, and this should be applied thinner than for the coarser pored woods; that is all the difference. The practice of some to dispense with it and to depend upon the surfacing shellac coats for close grained woods is not sound, and while it
is possible to do fair work without the filling, it is safer and surer to give it.

74. Presuming, then, that the surface of the job to be surfaced has been filled and rubbed and that it has stood sufficiently long to insure its perfect drying, there is yet a chance that for all its seemingly level appearance, and solid looking surface that, if varnish was applied directly over the filling it would find small, imperfectly filled spots or weak places in the filler through which it would sink into the pores. Now this would spoil the looks of the mirror-like surface, which is one of the goals which the art of good wood finishing is aiming to reach. This danger of the sinking in of varnish must be removed beyond the possibility of a doubt, in order to attain the above object, and this is only possible by surfacing over the surface of the filler in such a manner, and with such material that this possible sinking in of varnish will made an impossibility.
75. While the prevention of the sinking in of varnish is the main reason why surfacing should be done, there are secondary ones which make this operation desirable also. Only one will be noted here in such a manner and with such material, however, as it is the only one of great importance, and that is, that it gives the operator a chance to surface down and to sand paper the raised grain which may not have been cut down properly before the filler was applied.

76. Shellac varnish seems to fill the requirements of a good surfacer to perfection. Many substitutes have been brought out, whose only recommendations were that they were cheaper, but none ever came really near to it. One does not hear of them so much now that denatured alcohol has made the cost of the real thing as cheap or cheaper than was asked for the make-believe substitutes. Shellac dries with little porousness and sandpaper well when
thoroughly dry and it is very transparent. Two coats usually suffice to make an excellent surface for varnishing.

77. A good oval bristle chiselled edge varnish brush makes an excellent tool to lay shellac varnish with. 'The operator should be quick and try to level up as he goes without going over his work more than absolutely necessary, for if he does his delays will cause the varnish to double up on him and give him extra work to sandpaper it level. A few trials will soon teach him how to lay it quickly and level and therein lays the good shellacing.

78. Shellac varnish dries, or rather sets, very quickly, but it does not harden sufficiently for sandpapering under 12 to 18 hours. It is then ready for sandpapering and after that for the second coat of shellac. This too should be sandpapered with fine paper and great care exercised not to scratch with it.

79. Orange shellac is stronger than the
bleached or the white. It should be used on all dark woods, but never on the light colored ones as it will darken them considerably more than the white does.

80. Many of the close grained woods and nearly all the soft woods only receive these two surfacing coats of shellac to prepare them for the varnishing as it has been stated before—but it should not be encouraged.

QUESTIONS ON LESSON X.

73. What is said of surfacing over filler in a general way?

74. What are the results aimed at by surfacing?

75. What other good reason is given why surfacing should be done?

76. What is said of shellac as surfacing material.

77. How should the shellac varnish be applied?
78. How soon should shellac varnish be sanded?

79. What difference is there between orange and white shellac?

80. What is said of the practice of surfacing close grained woods without filling?

LESSON XI.

VARNISHING.

81. Under the above title a great deal is included in wood finishing. There are so many different ways in which to close the finishing that it will be well to first make a general review of the most usual methods of finishing in use, and then to take them up subsequently one at a time, noting how each system should be conducted. There are also the operations of applying the varnish which belongs alike to all systems. The description of the "how to do the work" will be given at length before the separate reviewing of the different sys-
82. There can be no good varnishing done where there is dust flying about nor when the temperature is too cold. The temperature must not fall below 70° Fahr. But this can be easily remedied by "firing up" while the other must be closely and carefully attended to before the varnishing is commenced. The first step towards the cleaning up with many is to go to work with the duster and to ply it for all it is worth. This, of course, only scatters the dust and displaces it so that in time it will come down and settle upon the fresh varnished surface. Much the better way is to dampen a chamois skin—not wet it, mind! then to rub it all over the surfaces to be varnished. It will gather the dust and hold it. The chamois can be rinsed in clean water occasionally and the work is to go on in a similar manner until it has been gone all over. Then the floors must be attended to. If swept out in the ordinary way, the same trouble of the dust rising
and settling would occur. Dampening the floor would of course settle the dust, but dampness is an undesirable factor and great care must be exercised that but little of it remains, if any, before varnishing commences.

The patent floor dustless compounds are much better to use. They contain some oily stuff which gathers the dust and collects it instead of scattering it, and it will not rise if used in the sweeping of a room.

83. As to the heating of the room, it will be a harder problem to solve if the house is not steam or hot water heated. If the heating has to be done by a stove, great care will have to be taken that the room be properly heated to the right temperature and that the supply of fuel in it will last long enough to finish the room and let the varnish set free of dust before its doors are thrown open to supply more fuel. Much of the new work is done in cold weather and in the smaller buildings which
are stove heated it is a hard matter to supply the proper temperature with stoves. Hot air furnaces are but little better although with them the registers can be closed while the varnishing is going on.

84. Applying varnish. This operation is much easier to speak about than to properly execute. It is not a hard thing to the man who "knows how," but it is not everybody who know how by a big majority. Some men can apply one-fourth more varnish upon a given space than others and it will not sag for them, while another will have his work dripping down in garlands with 25 per cent less of it. There are a few rules which a man can learn by heart and which, if he will practice faithfully, will lead him on to have the proper amount of confidence in himself to make him a good varnisher—in time.

85. These rules are given below and numbered according to their importance.
RULES FOR VARNISHING.

1. Never skin on your varnish.
2. Never finish off a flowing coat cross-wise.
3. Always use the brush full of varnish.
4. Always finish laying off varnish with the grain of the wood.

The above rules are but few and really when reduced down could be compressed into two, as the affirmative ones are simply the reverse of the negative, but they should remain as they are, as too much emphasis cannot be laid upon them.

86. Rule 1—By skinning varnish is meant a scanty use of it, which is very common to operators who are learning "how" and who having had some experience with sags endeavor to get rid of them by using it too scant and rubbing it out too much. There are few causes which produce more sagging of varnish than overworking it with the brush, especially of the flowing finishing sorts.
87. Rule 2—This is a but a continuance of the former. If the varnish is applied full as it ought to be, the poor varnisher is afraid of it and works it to the limit till it commences to set and for fear of its sagging will finish by cross-laying with the false hope that “it will prevent the sagging.”

88. Rule 3—By using the brush full of varnish a good space can be covered at once and laid off uniformly with the least amount of brushing and all ended right before the setting has commenced.

89. Rule 4—If the varnish is laid off with the grain of the wood, the varnish will not sag if it has not been overworked or worked after it has commenced to set. There is a limit to the amount of varnish that can be flowed on even by the best of varnishers.
QUESTIONS ON LESSON XI.

81. What is said of varnishing in a general way?

82. What should be done to the wood work preparatory to the varnishing?

83. How should the room be heated to insure the proper temperature?

84. How should the varnish be applied?

85. What rules are given for good varnishing?

86. What explanations are given of rule 1?

87. What explanations are given of rule 2?

88. What explanations are given of rule 3?

89. What explanations are given of rule 4?

LESSON XII.

VARNISHING CONTINUED

90. In this lesson all the best known systems of wood finishing are examined
into and the same examined in details afterwards. The details of how to apply the varnish having been given in the preceding lesson, there will be no need of again doing so and it will greatly facilitate the understanding of the several operations mentioned.

91. First of all is the one coat of varnish job over the filler and shellac coat.

Second—The same with two coats of varnish.

Third—One or two coats of rubbing varnish to be rubbed and followed with a flowing coat—or to be left with a dead finish.

Fourth—The same as above with the last coat rubbed and afterward polished.

Fifth—One or two coats of varnish over filling and shellac to be followed with a coat of dull varnish (which contains wax).

Sixth—The same as above only instead of wax varnish a coat of "hard wax" is given and polished over.

The last two methods try to imitate the
dead rubbed finish mentioned in No. 3 section of this 91st paragraph.

The above comprise about all the really different systems. French polishing is not mentioned, as it must be handled entirely by itself and is really not varnishing, as is understood by that term in all the above systems.

92. The system mentioned as "First" is one intended for cheap work—but if the surface has been well filled, shellacked and sanded, one good coat of flowing varnish makes a very good finish. It must be stated here that it is not always the greater number of coats of varnish which produce the finest finish. On the contrary, the least number of coats of varnish that can be used to produce a certain effect, the better it will look, so that if one coat of varnish put on flowing will produce a good gloss, the finish will be better and the details of the wood will be better than the same would with two or three coats. This
is because every coat of varnish obscures the details of the wood over which it is placed—no matter how transparent it may look. In time, too, varnish has a tendency to darken and to become more opaque, so that the work which has been covered with the least number of coats will be the brightest.

94. The only good reasons that can be given for using two coats or three coats of varnish is where one coat or two coats have failed to produce the effect wanted. What is said above applies strictly to lustre coats and not to rubbing varnish, which is applied with a view of surfacing to a mirror-like level. So number two, or the second system is really no better a finish than the first described, and while architects will specify two coats of lustre varnish to follow each other, they had better spend more time in specifying the proper surfacing, and then one coat of varnish well put on,
would have been sufficient to produce the plain lustre wanted.

95. The third system mentioned is that where two coats of rubbing varnish is given to be followed up with a flowing lustre coat. It is not often used at the present, but a very fine lustre can be obtained over two rubbed coats by a skilled varnisher. In the next lesson will be given full details as to the "modus operandi" of doing good rubbing. This operation should produce a perfect surface to varnish upon—but the finish will lack the elegance of a varnish-polished one. This last coat may be left out, or rather can be applied to the first coat of rubbing varnish, dispensing with the second and may be rubbed to a dead, or semi-dead, and polished slightly afterward. It will make a very tasty soft finishing. This is more expensive than lustre coats and is usually done on good work.

96. The fourth is practically the same as the above, only that the last coat of flow-
ing varnish is fully polished, an operation which will be described in a subsequent chapter. It is calculated that this system will turn out as good a finish as it is possible, except by the use of French polishing.

97. This is a make, believe system. It is used by people who wish to make believe that they have paid for something they think takes the place of "rubbed" work, but it does not—not even in looks to an expert. The wax deadens the gloss of the varnish and roughness of the surface does not strike one as does the same in a lustre finish, but there is a vast difference between the two. These deadening wax varnishes are now prepared by all the leading varnish makers. They are applied with a brush in the usual manner and show a gloss then which gradually dulls as it sets.

98. The sixth is nearly the same as the fifth with this difference: that instead of a wax varnish coat being used to dull the
gloss coat over which it is applied, hard wax is used instead. It is smeared over the work with a brush or cloth, as this wax is usually in a soft paste form. After it has set, woolen cloths or a lamb skin mitten is used to polish it by running over it back and forth until the job has an even looking polish, which has then the general appearance of rubbed work.

QUESTIONS ON LESSON XII.

90. What is said in general about the different manners of finishing wood works?

91. Name over some of the principal systems of wood finishing?

92. What is said of system No. 1?

93. What is said of system No. 2?

94. What is said of system No. 3?

95. What is said of system No. 4?

96. What is said of system No. 5?

97. What is said of system No. 6?
LESSON XIII.

RUBBING VARNISH COATS.

98. Rubbing varnish coats and their subsequent rubbing down with pumice stone forms a very important part of wood finishing, for it depends in a great measure upon the good or bad execution of the rubbing down—whether all the former well done work is to go for nothing, or else become a pleasing sight to both the owner and the wood finisher. Its office is to cut down any inequalities that may be present upon the surface of the varnish. It is of course possible to rub upon one coat of varnish, but it is a very risky business, as the chances are that it may cut through to the bare wood, so two and even sometimes three coats of varnish will be required to safely rub upon. The latter is very seldom required, but all coarse grained woods will require no less than two and one of them "Cypress" on account of its circling
growth which seems to curl up no matter how well it may have been surfaced—may require as many as four or five coats of varnish to give a good level, but this is an exception.

99. "Rubbing" is not so very difficult an affair, but there is more in it than many persons would think there was merely to be looking on. It can be much easier mastered than good varnishing can, common sense and conscientiousness being required mainly. Below are given a few rules taken from Maire's Modern Wood Finisher. If followed they will render the task much easier.

100. Rules for good rubbing.

1. "Avoid rubbing crosswise of the grain, as this gives the work a scratchy appearance."

2. "Do not let your strokes bear heavily at the beginning and ends; if you do you 'll rub the wood to an unsightly bare spot the edges."
3. "Always rub with the grain of the wood; up and down, lightening the stroke at either ends."

4. "Never attempt to rub until the varnish is thoroughly dry, for if such a course has been pursued it will be sure to sweat through and it will have to be rubbed over again when dry. Bear in mind that there is nothing gained by hurrying but a 'loss of time' as some of our Irish friends would put it."

5. "If the varnish resists the impression of your finger nails it is safe to rub, but not before it has attained that degree of hardness."

101. It has already been noted that only the best Italian pulverized pumice stone should be used, as the American, or Utah variety contains some grit which frequently ruins the surface. Coarse pumice stone powder cuts faster than the finer grades, but is not so safe to use as the lat-
ter, for beginners, nor will it really do as good work.

102. Patience and elbow grease are the principal elements with good pumice stone and carefulness that are required in doing good rubbing. The tools required are but few—if they may be so called. A piece, or pieces of good rubbing felt, 3 x 5 and 4 x 5; ¾ to 1 inch thick for large surface rubbing and some smaller ones for small panels. For mouldings, a piece of wood should be prepared that will fit them and then a piece of felt shaved off from the pads should be glued on to it, then with it the moulding will rub as easily as a flat surface.

103. The "rubbing" may be done with either water or with "rubbing oil," a petroleum product. It takes longer to rub with water than with oil, as the pumice stone will not cut so quick with the former. The operator must therefore be more cautious, as it may cut beyond what he in-
tended if he is not constantly on the look out.

104. As to the rubbing proper nothing better in the way of instruction can be given than is given in paragraphs 92 to 97, to which may be added that too much pumice stone should not be used. Dip the rubbing felt pad into the liquid, either water or oil, then into the box containing the pumice stone, lifting out what will stick to it and transfer it to the surface to be rubbed, using it in the manner stated. Rubbing the palm of the hand over the surface frequently, and noting the finish, will tell when the operation is complete.

105. The cleaning up is very important for it may be the means, if it has been neglected of scratching up the surface of the job in the polishing if the pumice has not been thoroughly removed. It should never be delayed after the rubbing, but should take place immediately after its completion before the pumice has dried on the surface.
Conscientiousness more than great skill is required to do this well. The large flat surfaces usually will take care of themselves; it is in the mouldings, corners and carvings that it will be apt to be overlooked, and the picks and picking brushes must be brought into requisition and used in every part, especially when hidden out of sight, for it is there that it will lodge and where the careless man is likely to leave it undisturbed. Damp wood saw-dust will gather it up and keep it from scratching; then it can be cleaned up with soft cotton waste. Upon perpendicular surfaces it is hard to use the damp saw dust so cotton wadding split in two and the soft interior can be used to clean up with. It can be poked into all parts of moulding corners and carvings and its soft sides will hold damp particles of pumice stone either in water or oil rubbing.
QUESTIONS ON LESSON XIII.

98. What is said of the rubbing of the varnish coats in a general way?
99. What is further said of rubbing?
100. What rules are here given for "good rubbing?"
101. What is the best pumice stone to use?
102. What is said of the rubbing felt?
103. What difference is there between water and oil rubbing?
104. What is said of the rubbing proper?
105. How should the rubbing be cleaned up?

LESSON XIV.

POLISHING THE RUBBER COAT.

106. Practically the wood finishing operation is completed after the "rubbing" is done. More than nine-tenths of all interior finish is concluded when it has ar-
rived to this stage and rightly so. The surface of the wood then should be perfectly leveled and give out a soft glow, which in the estimation of nearly everybody is just the thing for the interior where everything should have a subdued look and be subservient to its object, which is to please without forcing itself into the notice of the people who live there and are forced to be associated with their surroundings day in and day out. There is then no glare to jar upon the nerves (all kinds as well as optics). It will then accord without a jar with everything else that may occupy the room, furniture, carpets and walls—but some with plentifully filled pocket books are not satisfied to let well enough alone and desire a still finer finish, i.e. a piano polish. This indeed is far superior to a simple glaring varnish lustre coat. The leveling process which the finish has gone through and the polished subdued glow of a well polished job is very much superior
to ordinary varnish glare and should not be compared even with it, but it has none of that "home look" to it that the dead finish, so-called, carries and seems to call for one to be on his "best behavior" at all times, which is not what the average mortal desires when at home. It is simply too good for everyday use and should be seen only on grand gala days. As it is wanted, however, one must know how to produce this polish and that in the cheapest, as well as the best way in which it can be produced.

107. There are two general methods in which this may be done: By polishing over rubbed varnish surfaces and by French polishing. As the latter will take up a special lesson of its own in the explanations of its execution, this one will be the only one with which this lesson will be concerned.

108. The materials used in polishing the rubber surface which was described in the preceding lesson are not numerous nor are the tools needed to execute it. The o
material used is rotten stone and the liquid used in connection with it is sweet oil and alcohol mixed in the proportion of half of each. The sweet oil, however, may be dispensed with if a good quality of fresh cottonseed oil be substituted. Peanut oil also when fresh and limpid will make a good substitute for it. This with a good supply of clean soft cotton rags and of silk cloth will be all that will be needed.

109. There are two different methods in use in "polishing," one called the slow and the other the fast method. Either one will give good results, but the slow will show up the best of the two and when it has been well done, it will puzzle the average onlooker to tell it from French polish.

110. Polishing by the quick method is done as follows: The surface to be polished is supposed to have been leveled and rubbed as described in the previous lesson, and thoroughly cleaned free of any speck of lime stone and dust; the operator
should take a handful of soft clean cotton batting, and having dipped it into the half and half mixture of sweet oil or its substitute and alcohol, he should proceed to rub the job over with it by a rotary motion until the lustre desired has been obtained. It takes some little time to accomplish it, but it will appear if patiently adhered to.

110. The slow method of polishing is done in the following manner: The job having been rubbed and cleaned, as stated before, proceed to give it an extra coat of flowing finishing varnish which should be rubbed again with the finest number of powdered pumice stone F. F. Clean this up very thoroughly; then with a chamois skin rub powdered rotten stone over the whole surface by a circular motion of the hand. This should be continued until assured that it has been rubbed enough. Let the rotten stone dry upon the surface and when it has thoroughly dried, proceed to
wipe it off the surface of the wood with the bare palm of the hand. Every time the hand has passed around in its circular motion the hand should be wiped off clean with a piece of cloth held in the left hand. An old silk cloth can be substituted for the chamois skin in rubbing over the rotten stone if desired. The above gives the nicest polish of the two. It may also be given over the rubbed varnish in the same manner as the quick without giving the varnish coat, but of course, it will then look but little better than that done by the quick method.

QUESTIONS ON LESSON XIV.

106. What is said of polishing in a general manner?

107. How many various kinds of polishing are there?

What material and tools are in polishing?
109. What are the different methods generally in use?
110. What is the quick method?
111. How is polishing done by the slow method?

LESSON XV.

FRENCH POLISHING.

112. French polishing has been known a much longer time than the varnished rubbed polish described in the preceding lesson. It has a very fine finish, which is durable and reliable, and under the name of Vernis Martin is receiving some little attention even now, although the name is misapplied to much of the stuff that is sold as having been finished with it. It has qualities of its own and as may be surmised, also it possesses some faults of its own.

113. The whole of the operation of French polishing can be stated in a very few words: It is the gradual filling of a piece of wood by means of an alcoholic solu-
tion of shellac until the same is brought to a high polish by rubbing.

It is very simple indeed—to read about—but there is where the simplicity ends. All that has been written so far as to all the various operations of filling, surfacing, varnishing, rubbing and polishing may have looked complex enough to many of the readers of this manual, but all of them put together amount to little or nothing as compared with what is really contained in that sentence in italics at the beginning of this paragraph.

114. There is really but one way of doing “French polishing” and that is by taking the wood just as it comes from the joiner before filling and to commence the operation upon the fair face of it, and to continue the operation from start to finish. That only can be called genuine French polishing.

But there has been a compromise made since the introduction of the silicate fillers,
under which the process is very much shortened, which consists in commencing the operation after the wood has been filled, as already fully described. This, of course, shortens the time required to bring the job being polished to completion and it looks just as good as that done in the genuine way.

115. It will be well to remind the reader that the condition of the wood before the filling is a succession of small pits called pores, and of ridges between them composed of filaments of wood, and that these inequalities must be filled up or there would be a rough surface. As the process of French polishing is the same by both the true and the short system; the description given of it will be that of the true or the long one as that also includes the other. The shorter commencing after the filling only shortens it that much, while the longer method includes it. The material used being the same for both and consists of either
the orange or the white shellac alcoholic solution known as "shellac varnish only. Linseed oil is used as an adjunct necessary in applying the shellac, but forms no part of it, as it has to be removed entirely before the polish appears.

116. The appliances or tools, if they may be so called, used in the application of the shellac consist of the following articles: The pad is the one all important tool needed, as the brush cannot be used in the application of shellac as will be seen farther on. There is a wide difference of opinion as to how the pads should be made and as to their forms, but the one given in Fig. 13 will give one a very good idea of their construction, as it shows the face as it should look when complete, Fig. 14 showing the same with the face downward. Procure woolen cloth from which tear strips from 1/4 to 2 inches wide. These strips should be rolled around over each other to a convenient size to handle and
tied in the center to secure them. A single thickness of soft linen or cotton cloth which has had the size washed off it—old, well used—but absolutely clean cotton rags are best, as they are soft. This should be drawn tight across the face of the pad.
without wrinkles and the ends and sides drawn up tight to the middle, where they will form a projection by which the fingers can take hold of it and make a handle to use it by. This pad is and can be used only upon flat surfaces.

117. For mouldings and rounded surfaces a different pad must be made as follows: Take some fine smooth even cotton batting, make a ball of it, then envelop it with a clean cotton rag, as noted for the flat pad, smooth it and bring up sides to the top to be used as a handle in rubbing.

QUESTIONS ON LESSON XV.

112. What is said of French polishing in general?
113. What is really meant by the term "French polishing?"
114. How many different methods are there of doing French polishing?
115. What difference is there between the long and short way of doing the work?
116. What material is used? Describe the flat pad's construction?

117. How are pads made for use on mouldings and rounded surfaces?

LESSON XVI.

FRENCH POLISHING—CONTINUED.

118. As was noted, the cotton covering over the pads must be very smoothly drawn over them, and in the smaller sized ones the ends will form the handle, but in the large ones the palm of the hand must be used to propel them over the work.

119. If the shellac was applied over the work with a brush it would sink into the pores and would also lay upon the tops and sides of the filaments and form a series of hills and hollows, and no matter how many coats might be applied there would still be a succession of valleys and ridges.

120. The proper thing now is to charge the pad with shellac. This is particular
work which must be done carefully. For the proper regulating of it, the shellac should be placed in a bottle and a goose quill inserted into the cork stopper in order that the flow can be regulated to counted drops if necessary. Only enough should be permitted to flow—to moisten the wadding and never sufficiently to come through the rag except when it is pressed upon. It is most important that too much shellac should not be allowed to flow, as will be seen later and it is a mistake that most all novices are apt to make.

121. The surface of the wood to be covered should be wiped up clean with a cham ois skin which has been slightly dampened, in order to remove any dust or dirt that may be upon it, then after having filled the pad with shellac in the manner described in the preceding paragraph it should be applied to the wood. The first operation consists in applying the shellac to the surface as equally as possible, then proceed to rub
it with the pad back and forth in such a manner that the next stroke will cover over half of the surface gone over by the preceding one. After this has been done all over the surface, proceed to rub it in a series of circular motions over and over again until all the shellac has been squeezed out of the pad. It will be necessary to apply a few drops of linseed oil to the face of the pad as a lubricant to prevent it from sticking. As it has already been hinted at, this is the only reason why it is used at all in connection with this work, and every trace of it must be removed by the operation known as "spiriting off." The other whereby the shellac is supplied to the job being known as "bodying in."

122. The operator must bear in mind that under no consideration must the pad rest a single moment of time upon the surface of the job. It must be "kept constantly in motion." If left a second only upon the surface it will "stick" and it will
roulhen it. This means hours of extra work in rubbing it afterward to remedy the defect. In taking the pad off of the surface, slide it gently upward, but while it is still in motion. While the shellac is wet, a gloss usually will show which, however, quickly disappears as soon as it sinks in and dries. When a piece of work has been gone over in the manner described above, it should be given 48 hours to thoroughly dry and the same treatment should be again given it and continued until the job has attained to the degree of perfection desired. It is a matter of guess work as to the number of times the job may require to bring it to the right ending, as it depends not only upon the kind of wood, its porosity, etc., but also upon the ability of the polisher. The "know how" enabling a man to use more stuff than a greenhorn could do. When a film of gloss remains without its sinking in, then the process may be stopped, as it is a sign of completion.
123. Spiriting Off.—This operation as was stated before, is needed in order to remove and clean up any linseed oil present on the surface of the job. It is also needed in order to remove any inequalities and to level up the surface perfectly. This consists in gradually adding alcohol to the shellac and rubbing over the surface with the pad, proceeding along until the last cleaning up is done entirely with alcohol. The last or alcoholic rubbing should be given with a perfectly clean rubbing pad. Too much alcohol might soften the shellac coats, so one must be very careful not to overdo it. It requires some experience to do the work just right. While it is important in the bodying coatings that only one thickness of the cotton rag should cover the face of the rubbing pad, in spiriting off two or three and even four thicknesses of the face rag should be given; but the same care must be given that it has no wrinkles
or creases showing upon the face of the pads.

The use of the pad in spiriting off is the same as indicated for the bodying in coats. At the finish, however, the rubbing should be done with the grain of the wood.

As it has been said from the beginning, the process of French polishing is too slow and too difficult for the average American, and but little of it is done at the present time; and many first class finishers have never done any of it—but as it is a part of "Wood Finisher," a manual treating upon it would have been incomplete without a fairly full description of its procedure.

QUESTIONS ON LESSON XVI.

118. How should the pads be held when in use?

119. Why is not the shellac applied with rush?
120. How should the shellac be applied to the pads?

121. What is said of the manner of applying the shellac to the job?

122. How does the "polishing" proceed?

123. What is said of the "Spiriting Off?"

LESSON XVII.

FINISHING FLOORS.

124. Finishing floors when done with varnish, rubbing and polishing really differ but little from the same operation upon wood surfaces other than floors, except that specially prepared varnishes are used instead, but there are other methods of treating them in use and as the wood finisher is often called upon to do this work, it is proper that they should be all mentioned and explained.

125. There are many ways in which floors may be finished, The simplest and
easiest of all of them consists in "oiling them." Simple as it is, there are a number of different ways of "doing it" and of opinions as to which of them is the best. But for all of them it is very important that they should be clean. By clean is meant not only that dirt and dust of every variety made by carpenters, plasterers, plumbers, painters, etc., should be swept out—but remove all traces of them as far as it is possible to do so. This is done by careful scrubbing.

126. After a floor has been properly cleaned and dried, which will require at least 12 hours in moderately warm weather, it may then be oiled. As to what the oiling may consist of is a matter of opinion. It may be pure raw linseed oil to which should be added some drying japan. Or it may be a mixture of two-thirds linseed oil and one-third kerosene oil or even half and a half of each or a mixture of linseed oil and some volatile oil in about the same proportions.
In applying it the first coat will usually sink into the wood and leave the surface apparently free of it unless an unusually large quantity of it has been used, which, if it has, must be removed. After several days a second coat of the oil should be given and well rubbed in—but in no case must any surplus oil be left upon the surface, for if it is, it will form a skin which will gum and become rough and wrinkled up, becoming anything but an ornament. Occasional rubbings may be given the floor with the same material as needed—but with the same caution as to the removal of any superfluous oil.

Oiling floors does not produce a very showy finish, but is very useful for kitchen, pantries, back halls and in public institutions. Spots and marrings are readily cleaned and the cost of going over them is insignificant.

12. Floors are frequently finished by waxing. This produces a very fine looking
finish, which in the eyes of many is far preferable to the lustrous finish of un-rubbed varnish. While it is easier marred than varnished surfaces—the remedy to restore them is an easy one and the surface then looks as good as it was originally, which cannot be said of the other.

128. The same care must be had in cleaning the surface of the rooms as was noted in paragraph 125, as this is of the utmost importance and any dirt will readily show through the "waxing." When dry it is ready for "the waxing." Now it is customary to first fill the floor and to even stain it, if so desired, before the filling and to apply a couple of coats of hard wax, polishing them with a weighted brush made especially for this purpose or it may be finished by the old style "French wax polish" which is an alkaline aqueous solution of wax requiring no previous filling of the floor. This as well as the hard wax can be applied with either a brush or with rags,
and both will polish by the use of the floor brushes mentioned. By both systems an occasional coat should be given and a weekly going over the floors with the weighted brush usually will keep the room in excellent condition. It takes but little time to go over the rooms and repolish them—not much more than an ordinary sweeping. The finish is a softer glow somewhat on the order of "dead rubber varnish."

128a. It is quite usual now to fill floors after a stain or without staining—then give them two coats of floor varnish which should be haired off, then to give the floor one or two coats of hard wax and polished afterward. This is an excellent way of finishing them which is substantial and lasting. It can be easily kept in good order by giving it an extra coat of hard wax and an occasional rubbing over with the weighted brush.

129. Beside the above which are all dif-
ferent from any other methods heretofore noticed in wood finishing, the floors may be finished in all the various ways which have been described for general wood finishing before, either by filling and one or more coats of varnish; or filling with one or more coats of varnish with the same rubbed with pumice stone to a dead polish or rotten-stoned polish afterward, and in all other manners mentioned. As all these processes of finishing have been fully described, the reader is referred to the former descriptions given of the "how to do it." This covers up about all that is essential in regard to floors.

QUESTIONS ON LESSON XVII.

124. What is said about floor finishing in a general way?

125. How many various methods are there of finishing floors?

126. What is said concerning the oiling of floors?
127. What is said of the various systems of wax finishing?

128. How are varnished and wax floors to be treated?

129. What is said of all the other methods of finishing floors?

LESSON XVIII.

OIL POLISHING—WAX POLISHING.

130. Oil polishing is the oldest method of polishing on record, antedating all others. But that it requires infinitely more time than can be usually afforded to give to it there is no doubt, but that much more polishing would be done with it than there is, at least, for the purposes to which it is best adapted, i.e. bar counter tops, table tops and for all objects which are likely to be covered over with hot or even cold liquids in inordinate quantities. The polish is not a loud one, but it is fair and will stand any amount of abuse from the
spilling of liquids, which none of the others can be depended upon to do so.

131. There is no skill required to do this work— but patience and plenty of time and elbow grease. It consists simply in using raw linseed oil and rubbing it into the wood and then rubbing, rubbing, rubbing, not only around and around, but with a square stone whose face has been covered with woolen cloth and rubbed with might and power. The first coat should be left to dry good and hard and should be followed up with daily rubbings for 2 or 3 months, when it will show its polish. When to quit polishing is hard to say, as it will improve all the time by continuing the rubbing, and in England and continental Europe, where oil polishing is done to a greater extent than it is here, men pick up a living by going a certain round of customers and giving a weekly rubbing over to counter tops and such other fixtures as they can gather up.
WAX POLISHING.

132. There was a time not much over three scores years ago, when wax polishing was resorted to much more than it is today, when the furniture of the better class was nearly all done in this kind of polish, at least, all such as was not French polished, and that was within the reach of the upper 400 alone. The wax finish has a good appearance and but that it is subject to be marred more easily, would compare well with that of dead rubbed varnish—but while it is easily marred, it is also very easily restored. It requires more care on the part of the one having the furniture in charge. and that is probably the only reason why it has fell into disuse today.

133. There are a number of ways for the "doing" of wax polishing. Some of them have already been reviewed and but little more can be added. Either used alone all the way through after the wood has been cleaned or stained without filling, or after
the wood has been filled, also it may be done with hard wax or by the liquid aqueous French wax, or again by applying varnish coats, and simply waxing over that to produce the impression of a rubbed polish.

134. It does not really matter much about the surface being wax polished, being filled, as the polishing will level up the finished job if two or three coats of the wax are given, but for the sake of the wood, and in order to keep it in good condition and to insure against any warping, etc., it is better for it to be oiled, or what amounts really to a priming. The oil may be applied with either a cloth or brush, but the operator should be very careful that no surplus oil be left on the surface, and he should wipe it off as dry as he can with soft rags after he has rubbed the oil in. This priming must be allowed to dry hard, when it may be coated over with either hard wax or French liquid wax, and the same
polished with a lamb's wool mit or some woolen rags. It usually takes two coats to produce a good polish.

135. Again the job may have been stained and afterward filled with hardwood filler, cleaned off, and in 24 hours it may then be given two coats of either hard or French liquid wax, as noted in the preceding paragraph and treated in exactly the same manner.

136 Much waxed work is done over a gloss varnished surface to imitate rubbed work. The wood is filled, shellacked and one or two coats of varnish that has been rubbed over with hair cloth is the preparation given for the waxing. It is much more expensive than any of the former methods related before, and really does not look any better nor is any better for wear than the others. The coats of wax are as easily marred and require the same sort of treatment to restore. This is easy, however, and therein lies the superi-
ority of the wax finishes, in that a marring which in varnished polished work would required a complete refinishing in wax finish can frequently be restored by a simple brushing over and always by a coat of wax polished over.

**QUESTIONS ON LESSON XVIII.**

130. What is said of oil polishing in a general way?
131. How is oil polishing done?
132. What is said of wax polishing in a general way?
133. How is wax polishing done?
134. Describe the various methods of wax polishing?
135. May the wax polish be applied over filling?
136. What is said of wax finish over varnishing.
LESSON XIX.

SOFT WOOD FINISHING.

137. Much soft wood finishing is used in the cheaper class of buildings, also for upper rooms in many of the medium grade of houses. Where this is done in yellow pine, it is usually finished in its natural color. If in white pine, it is frequently stained to some of the darker tints before the finishing takes place. Nearly all the woods used in finishing are classed as "soft." It is hardly consistent, however, for yellow pine comes certainly much nearer being hardwood than cottonwood, basswood and others. It matters not, however, for the same principles govern the finishing of woods, be they soft or hard. White pine is always stained because its white surface does not show a good tone when finished, but its requirements to produce a good surface are the same as that of any other wood.
138. Filling soft woods requires the same care as stated in the former lessons. But as the finish of these cheaper rooms partakes of the same desire to lessen cost has induced the use of a non-expensive wood, instead of filling with hardwood filler —unless the wood is porous, when it becomes a necessity—that is, dispensed with, and either without a stain previously applied or with one, the work after having been sandpapered is gone over with shellac varnish and a good strong coat of it is given, or a substitute for the same in the shape of what is, or was known as liquid fillers. Sometimes by giving the surface two coats, a moderately open grained surface may be put in fair shape to receive the varnish coat or coats.

139. After the "filler" has become dry, it should be sandpapered and then finished in one or two coats of varnish, which may or may not be rubbed in very much the same manner as has been related of hard
woods. It is the universal practice nearly, to give one coat of varnish only and a fairly good looking job is usually had with that kind of finish. If the reader will bear in mind that the less of the varnish that is used the better the finish, surely it will be foolish to give an extra coat that will not make it look any better. Varnish always darkens with time, the linseed oil in its composition will in time become brown, so the less there is of it the less of this brown tone will appear. This will, of course, make but little difference to wood that has been stained dark, but when left in its natural tone, as yellow pine usually is will surely show it, and many buildings finished with that wood and heavily varnished begin to show dingy in a very few years.

140. The above finishes with varnish are much improved by rubbing when done by the regular systems as explained in former lessons, and the wax polishes in
imitation of rubbed work look also very well upon them.

141. There is a class of wood finishing that really should have been included with the lesson on floor finishing, but that it belongs to soft wood also and that it belongs as much to painting as it does to wood finishing. It is used chiefly over old pine floors. It is not often the case that old floors are in good condition; on the contrary, they have knot holes, widened openings at joints and at sides of boards, with many depressions caused by constant wear of the feet in tramping over the floor.

142. These can be leveled, in fact, must be leveled in order that they may look decent when the work has been completed. Anderson’s water putty is an admirable article to fill up these inequalities. It is a powder which should be mixed with water and used freely to fill up cracks, holes and worn-out depressions. This adheres firmly to the wood and will not shrink away from
terior parts of house finishing. It
be filled with hardwood filler, sur-
with shellac, when it may be finished
by manner desired.
4. Cherry—Is a quiet looking wood
carries an idea of repose in its unob-
sive character of either its veining or
ring. Library, bedrooms of elderly
people and in all situations where quiet is
sired, its use may well be indulged in.
Cherry takes a good polish, it is fairly
ose grained, but it is the better for having
been filled with hardwood filler, surfaced
and afterward finished in any manner de-
sired, looking best however in either a
dead rubbed or rubbed polish.

QUESTIONS ON LESSON XX.

147. What is said of the character of
the various woods in general?
4. Give the characteristics of

What is said of birch and its many...
the woods which, it is desired should be the finished. Each coat should receive ample time to dry well and the second coat should be rather flat. The whole floor can thus be painted if it is desired to finish the whole surface of the room, or it may be painted with a strip only wide enough to prevent any of the central part of the floor which is to be covered with a room rug—from showing. The rug should cover fully 8 to 12 inches over the painted strip.

145. This painted surface is usually covered over with some colored varnish stains intended to represent the various woods. It requires usually two coats to produce a good effect—but it is a make shift after all to produce a grained effect of the wood their colors sail under.

146. A better way is to prepare some graining color of the kind wanted, apply it over the boards and proceed to grain it over each successive board, thus
obtaining a greater variety of effects and of not of overdoing the veining. When dry, this should be varnished with two coats of good floor varnish, when much better and more lasting results will ensue than if done as related in paragraph 145.

QUESTIONS ON LESSON XIX.

137. What is said of soft wood finishing in a general way?
138. How are soft wods filled?
139. What is the most common methods of finishing them?
140. What other methods of finishing are used?
141. What is said of painting floors?
142. How should old floors be leveled up?
143. What is the composition of floor putty?
144. What should be done after the leveling?
145. How should they be finished?
146. What is said of graining and varnishing the surfaces?

LESSON XX.

CHARACTER OF THE VARIOUS WOODS.

147. While the operations which have been explained in the preceding lessons are applicable in a way to all woods, some require slight modifications and look better for being finished in one, rather than another of the various systems enumerated. Again some kinds of wood are better adopted to certain situations and places than others, so it was thought best to give a short description of the various woods, the conditions where they are best adapted and the kind of finish that is best suited. Much sentiment enters in classifying them, and in deciding what kind of wood is best adapted to certain purposes than others. A misappropriation of certain woods to places to which they are not suited is
not a crime, but it certainly shows a poor knowledge of propriety or good taste. As an instance a bank which is or should stand for security, strength, virility, etc., would not be served in choosing Mahogany for instance as indicative of the above; on the contrary, there is a strong feeling of femininity and elegance attached to that wood that is just the reverse of the qualities it is desired should be represented. On the other hand, oak with its strong growth is admirably well suited in helping to create the thought which the other does not suggest, consequently oak is the logical wood to use.

148. *Ash*—Is an opened grained wood, of rather straight plain growth. Some of it resembles the heart growth of oak, but lacks that muscular nervy growth usually seen in that wood. It is employed sometimes to good advantage in connection with other highly figured woods which are used in panels or other show places—by being
used in the styles as a frame for such, enhancing their showiness by their very plainness. Ash requires filling with hardwood filler, shellacing and any of the other finishings to suit the rooms where it is being employed. It is best adapted to upper halls and bedrooms, but where the matter of expense is a material consideration, may be used for better rooms also.

149. Birch—Is a close grained wood of great value either to furniture manufacturers or in house construction. It is not only useful in its own dress, which is simple and neat as well as pleasing, but also as a ground upon which feathered or mottled mahogany may be imitated with great naturalness; as its pores are almost of the same character as that of the more aristocratic woods. This imitation is done with dyes or stains used over the wood as in graining and applied with camel’s hair pencils. It is adapted to be used in parlors, living rooms and girls’ bedrooms. It is un-
obstrusive in its own natural dress and is usually stained. Being close grained, hardwood filler may be dispensed with it, but then it should receive two coats of shellac varnish, but subsequent finishes are best rubbed polished.

150. Basswood or Linden—Is anything but ornamented and it is not suggestive of anything unless it be cheapness. It may be used in bedrooms, when it should be stained, filled with hardwood fillers and shellaced and varnished. Being undesirable and used only on the score of necessity, costly finishes are not to be thrown away upon it uselessly.

151. Beech—This wood deserves a more extended use than it has received in the past. It makes a good finish in either dead rubbed, or rubbed polished, and when quartered sawed, it presents a beautiful appearance. It may be stained cherry and presents a fair imitation of that wood. There is the same range of usefulness for it
that there is in cherry—quiet situations, as library rooms where nothing gaudy can be tolerated.

152. *Butternut*, or white walnut, is very inferior to its black relative and splitting easily is not so desirable as other woods to stain into an imitation of that wood. In its own natural finish but few parts of a board have anything desirable about them and being scarce and consequently costly there is no chance of its ever occupying a prominent place in house construction. It takes a good polish and it can be finished in any of the various methods in use in wood finishing.

153. *Chestnut*—Is a coarse very opened grained wood. Its figuring is somewhat on the order of oak, only much more straggling and of less pleasing forms of growth. It is a common wood in some parts of the United States and therefore not very expensive. It carries an idea of vulgarity about it however and should be used mainly
in inferior parts of house finishing. It should be filled with hardwood filler, surfaced with shellac, when it may be finished in any manner desired.

154. Cherry—Is a quiet looking wood and carries an idea of repose in its unobtrusive character of either its veining or coloring. Library, bedrooms of elderly people and in all situations where quiet is desired, its use may well be indulged in. Cherry takes a good polish, it is fairly close grained, but it is the better for having been filled with hardwood filler, surfaced and afterward finished in any manner desired, looking best however in either a dead rubbed or rubbed polish.

QUESTIONS ON LESSON XX.

147. What is said of the character of the various woods in general?
148. Give the characteristics of ash.
149. What is said of birch and its uses
150. What uses are made of basswood or linden?
151. What are the uses made of beech?
152. What is said of butternut?
153. What uses are best made of chestnut?
154. What is said of cherry?

LESSON XXI.

CHARACTERISTICS OF THE VARIOUS WOODS CONTINUED.

155. Cypress—Swamp or Southern cypress is greatly used all through the Middle West and South as finishing lumber. It has already been noted that on account of its carved growth it is a very hard wood to fill and surface, so much so that it should not be used where it is desired to use a rubbed polish, as it is very expensive to do a good job over it without much trouble. It requires a hardwood filler, surfacing and can then be finished in any manner. Some
parts sawed from the knees are very highly ornamental and well repay the extra trouble of surfacing and rubbing down in order to level up the surface properly.

156. *Elm*—Especially some sorts as rock elm, red swamp elm, etc., are highly sought after in their best specimen. Ordinary elm is not very pretty in its growth and is used principally in cheap furniture. Elm of highly figured, sound growth is mainly desirable for bedroom panel work as it presents a cheerful contrast, and for furniture it is rather opened grained in its growth and requires to be filled with hardwood filler surfaced and then may be finished in any way desired.

157. *Eucalyptus*—Is not much used east of California were it is known as blue gum and California mahogany, to which wood it bears some resemblance; when stained it makes a fair imitation. The uses it may be put to are similar to those mentioned under
mahogany and the reader had better read what is said under that head.

158. *Gum*—The true gum tree of the South has a very pretty form of growth which is of a quiet unassertive character which makes it quite acceptable for use in bedrooms, libraries, dining rooms and living rooms as well as for quiet people. It is a middling close grained wood not absolutely needing filling with hard wood fillers, but the better for it. It should be surfaced with two coats of shellac, then it may be finished as desired but will look best rubbed and polished.

158. *Hemlock*—Is so seldom used in house finishing aside of some of the home-made lumber districts of the extreme north that it is hardly worth considering as a finishing wood and certainly does not deserve a very high finish.

159. *Oak*—That king of woods cannot be spoken of too highly. In its many varieties it covers a multitude of various
colorings and stained into the darker colors of antique, weathered and golden oak gives a range of tones which are acceptable for many purposes. For public buildings, fixtures of banks and other institutions it is unexcelled. Its growth no matter what its forms may be, cannot be surpassed for such purposes and for halls, dining rooms, etc., or for any other interior work and furniture it is always in good taste where a show and look of strength are desired. It is a rather coarsely grained wood which must be filled and surfaced when it may be finished in any of the methods mentioned in the foregoing lessons.

160. Mahogany—If oak is the king of woods, mahogany is easily the queen of them all. It is rather effeminate in its forms of growth but like a pretty woman it seems to be unconscious of it and there is nothing loud or harsh about it. Its elegance fits it principally for parlors and best rooms in the house; it is rather close
grained, the better however for having being filled, surfaced, and looks best when rubbed polished.

161. Maple—Is also a wood which has a soft effeminate look, especially the mottled and bird's eye variety, which fits it for girls' bedrooms and nursery rooms where a cheerful aspect is desired. It is close grained, filler may be dispensed with, but it should receive two coats of white shellac in order to surface it, when it should be finished in varnish and rubbed polished.

162. Pine, yellow—May be used in all but the best rooms of a medium priced home. It will be sufficient to shellac it and varnish over that in one or two coats. It will pay, however, to rub it, in looks at least.

163. Poplar—Is seldom used except in some of the Southern states and there only in houses where there is no pretense made to have the best to be had. It is really better painted, grained and varnished and if
used in the natural finish it should be stained as it has no character of its own to loose and being close grained should be surfaced with shellac and finished with varnish.

164. *Rosewood*—Is too dark and costly to use in quantity in room finishing. It is a rich wood better adapted to articles of fine furniture than to being used in large masses. Being close grained two coats of shellac rubbed and polished is the only finish that will bring it out at its best and it is well worth it.

165. *Sycamore*—It is not so long ago when this wood was not thought worth the while of the house builder, but it is gaining daily in importance for this purpose. It certainly deserves well of being used more extensively. Its form of growth being a great variety of small mottlings which makes it look cheerful and adapts it for use in bedrooms and living rooms. It is a close grained wood and should be given at least
two coats of shellac if it is not filled; when it may be finished in any finish desired.

166. *Walnut*—There was a time when this wood was used much more extensively than it is now. Its high cost and also the dark gloomy effect it has upon the mind of people constantly in full sight of it and also because Dame Fashion has decreed it, it is no longer the fad and for this reason, and that the supply is far too short to go around if it should once more come to the front, it is seldom now that it is used at all in the finishing of rooms. The plain growth varieties, as well as what is known as "burlled walnut" which is obtained by sawing stumps or knotty parts of the tree, take a good finish and polish. The wood is rather coarse grained and requires to be filled with hardwood filler which should be colored with burnt umber and after having been surfaced over with two coats of shellac well sandpapered it should be var-
nished, rubbed and polished in order to bring out all its beauty.

167. *Redwood*—This is chiefly used in bungalow interior building. It has little, if any characteristics worth mentioning of its own. It is best left in its plain dress, which is already dark enough for most purposes. It is one of the woods which should never be left in a gloss coat of varnish. It should invariably be rubbed dead or waxed to an imitation of it.

**QUESTIONS ON LESSON XXI.**

155. What is said about the treatment of cypress?

156. What treatment should elm receive and what is it best adapted to?

157. What is said of the use of eucalyptus?

158. What uses may gum (Southern) be put to in wood finishing?

159. What is said about oak?
Here is the text for mahogany:

1. What is it used for?

2. What is it used for maple?

3. What are these for yellow?

4. What is it used for poplar?

5. What may redwood be put

6. Is this concerning sycamore?

7. Is this and uses for walnut?

8. Is this of redwood finishing?
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