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FURNITURE REFINISHING

by

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A professional paper submitted in partial fulfillment  
of the requirements for the degree

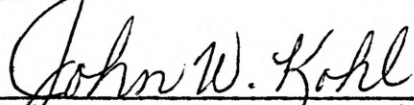
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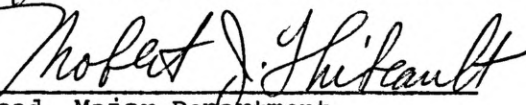
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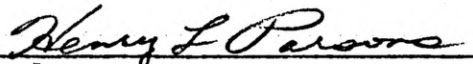
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ABSTRACT

This project dealt with the problem of developing a teaching tool for use in conducting furniture refinishing workshops.

The author produced a package program which includes a lesson plan, a slide-tape series showing detailed steps in refinishing furniture, a set of samples showing various finishes on several types of wood, posters and hand-out materials.

In the process of producing the package program, a detailed plan of the development of a slide-tape presentation has been included.

The slide series covers the following categories of furniture refinishing and repair: inspection of the article, removal of the old finish, removal of stains, replacement of broken parts, repair of veneers, raising of dents, filling of cracks, sanding, and the application of the new finish.

## Chapter 1

### INTRODUCTION

Finishing and refinishing articles made of wood has been practiced for thousands of years.

In "Genesis", Chapter 6, Verse 14, the Bible tells us that God instructed Noah to: "Make thee an ark of gopher wood; rooms shalt thou make in the ark, and shalt pitch it within and without with pitch." This pitch was very likely the for-runner of modern day wood finishing, which has been an honored craft for many centuries.

Earth and vegetable colors were used for decorative finishes long before the wood finishes which appeared in Egypt and surrounding areas between 1500 and 1000 B.C. Finishes have been noted on furniture and other wooden articles found in the ancient Egyptian tombs. (Johnstone, 1974, p. 4)

It is thought that painting, as an art, was practiced in Egypt as early as 3500 B.C. It is noted that the ancient Romans used white lead, which is the most widely used white pigment in the making of paint today. Mineral pigments were also known in ancient times and linseed oil has been used for centuries. (Soderberg, 1969, p. 3)

The real differences in yesterday's finishes and the ones used today lie in how modern chemistry has changed the finishing industry. It has produced more beautiful, easier to apply, and quicker drying finishes and has made the craft more appealing to the average person.

A finish is the final coating or treating of a surface for the purpose of protecting and/or decorating. (Soderberg, 1969, p. 3) It is a most important step in the production of a beautiful and serviceable piece of furniture and also in the restoration of an antique.

In this day of the nostalgia craze, people everywhere have taken up the art of refinishing furniture. There are a number of reasons. For some it is a hobby or means of self satisfaction and to others it is an economical factor. If one refinishes the furniture themselves, up to nine-tenths of the cost of having it done professionally is saved and it is self satisfying to see others' admiring glances at the refinished article. (Savage, 1975)

Yearly people throughout the state request training, from the Extension Service, in how to refinish furniture. In 1977 alone, the inhabitants of one-fourth of Montana's counties were being offered workshops of this nature by their Extension Agents.

Some Extension Agents have vast experience in refinishing furniture while others are only beginners in an educational vein.

Teaching packets, which include a slide set and other supportive materials, have proven to be most helpful in other subject matter areas. A preliminary survey indicated an interest also in a furniture refinishing package program.

The problem lay in producing a teaching packet that would be useful to the Extension Agents for:

1. a keynote kick-off for a workshop.
2. a self-directed learning packet.
3. a provider of assistance to agents and aides new at furniture refinishing.
4. a refresher for those who have refinished furniture in the past.
5. a provider of some new and innovative ways of doing a sometimes dreaded task.

#### Statement of the Problem

The purpose of this project was to develop and prepare a teaching tool to assist Extension Agents in providing knowledge and skills training in refinishing furniture.

This included a complete teaching packet with a furniture refinishing slide set accompanied by a cassette taped script. It also included a lesson plan, posters, hand-outs and a set of samples showing various finishes on different kinds of woods.

#### General Questions Answered

Listed below are a series of questions which are answered in the teaching packet:

1. What is involved in the preparation for refinishing furniture?
2. How does one determine if a piece should be refinished or the existing finish restored?

3. How does one remove the old finish?
4. How does one restore the existing finish?
5. How does one remove stains?
6. How does one replace or repair broken parts?
7. How is veneer repaired?
8. How are dents raised?
9. How does one fill cracks in the wood?
10. What is the procedure for sanding?
11. How does one determine the type of finish that should be used?
12. How does one apply the finish?

#### General Procedures

The research was conducted in a non-experimental framework. Personal class participation and review of literature were the central methods of data collection in this project.

There was no statistical hypothesis or necessary analysis of data in this project. It basically consisted of gathering information and ideas to provide a means for establishing a set of guidelines to follow in refinishing furniture, and to prepare hand-outs and posters to be used at workshops.

The actual refinishing of several pieces of furniture and photography were also involved, as the author produced a slide series showing the steps in refinishing furniture and included it in the packet. A set of samples showing various finishes were also produced.

To achieve the goals of the research study, a procedural plan was followed. The major phases were:

1. Read materials and attend and participate in a class on refinishing furniture and applying finishes.
2. Read materials and attend and participate in a class on slide set production.
3. Survey fourteen Extension Agents, having classes on furniture refinishing, with a comprehensive questionnaire on what they would like to have covered in a teaching packet and what they would like the program to do for them.
4. Prepare a general outline and teaching plan for the teaching packet.
5. Establish a format for the series of slides in the teaching packet.
6. Do a furniture refinishing project and film it for the slide series to be used in the teaching packet.
7. Compile and edit a draft of the slide series and script to be used in the teaching packet.
8. Conduct a pretest of the teaching packet with several Extension agents.
9. Obtain an evaluation of the teaching packet by these Extension Agents.

10. Prepare the final draft and present it for use by the Cooperative Extension Service.
11. Obtain evaluation of the teaching packet by the author's graduate committee through a presentation of the packet by the author.

#### Limitations

The only limitation to the completion of the project was obtaining articles to be refinished that contained the numerous problems to be covered in the slide series.

#### Delimitations

The research will cover basic furniture refinishing only.

#### Definition of Terms

Base coat - the first coat of the final finish, or the basic color coat used under a glaze.

Bleeding - stains or dyes dissolving in solvents and spreading into adjacent finish layers.

Crazing - a fine net-like pattern of fine cracks found on aged finishes.

Cut - the number of pounds of shellac resin dissolved in a gallon of solvent. Thus 4 pounds of dry shellac in one gallon of alcohol is a four pound cut.



Denatured alcohol - Grain alcohol made repulsive for human consumption by addition of poisonous materials.

Flat - a finish texture which produces absolutely no reflections.

Glossy - the condition of a silky, smooth surface with a highly reflective but not mirror-like finish.

Grain - the pattern produced in a wood surface by the fiber structure of the wood.

Hardwood - a term designating wood from non-coniferous (non-cone bearing) trees. Not a literal term since many so-called hardwoods are actually physically softer than those called softwoods.

Matte - a finish texture similar in reflectivity to drawing or blotting paper.

Methyl alcohol - an extremely poisonous alcohol produced by distillation of wood, hence its trade name of wood alcohol.

Mineral spirits - less expensive and less odorous thinner than turpentine, used for some paints and varnishes.

Pigment - color in finely powdered form which is used to provide hue and opacity to finishes.

Opaque - impervious to light, or, in finishing terms, any finish that blocks a view of the wood surface.

Poylurethane - an air hardening, oil-modified urethane resin used in varnish, enamel, and paint manufacture.

Pores - small voids or pits in wood surfaces which are actually

the open ends of the tree's sap vessels.

Pumice - a volcanic rock which is used as a fine abrasive in powder form for reducing the gloss of finishes.

Rottenstone - a finely ground silica containing limestone used for very fine polishing.

Satin - a finish texture having a soft sheen like that of satin or silk material.

Sealer - a liquid finish material designed to selectively seal or shield the surface from excessive penetration by finishing materials.

Solvent - a liquid that will dissolve a particular material.

Stick shellac - dry shellac resin in stick form with selected color additives to approximate standard wood and stain colors for use as a hot melt surface patching material.

Tack rag - a tacky, varnish-impregnated piece of cheese-cloth, or other lint-free material, used to wipe surfaces free of dust and debris.

Tacky - that point at which a sticky surface grabs or pulls at anything touching it, but is not readily removed from the original surface.

Thinner - any volatile liquid compatible with, and used to reduce the consistency of, a liquid finishing material.

Top coat - that coat of finish which covers another. Usually applied to the final coat.

Undercoat - any finishing material coat used under a final or top

coat of finish. Also the process of applying an undercoat.

Vehicle - the liquid or carrying portion of glazes, paints, stains, or fillers.

Veneer - a thin surface layer of wood or other material used to add durability or beauty to an otherwise unsuitable surface.

Wash coat - a very thin sealing or shielding coat of any finishing material.

Wood filler - any material useful in filling open pores of wood. Silex based paste fillers are preferred.

Wood dough - any material used in filling cracks or holes in wood. Wood dough will not accept stains.

### Summary

For centuries the finishing of furniture and other wooden objects has been an honored craft. In more recent years the art of refinishing furniture is being taken up by people everywhere as a hobby, a means of self-satisfaction, and/or an economical factor.

Many of these people are requesting training on how to refinish furniture.

The purpose of this project was to produce a useful teaching tool to be used in this training.

The research was conducted in a non-experimental framework. Class participation, review of literature and photography were the main methods of gathering information, ideas and materials included in the

teaching packet.

The research focused upon the basic refinishing process only.

## Chapter 2

### REVIEW OF LITERATURE

The specific purpose of this section will be to present the reader with an overview of literature concerning finishing and refinishing furniture and the process of developing a teaching packet on refinishing furniture.

It is the author's plan that this will enable the reader to better understand the need for and the process involved in preparing a teaching tool of this type.

#### History and Evolution of Furniture Finishing

Information on this subject is of limited supply. Few sources tell much more than the discovery of pieces of furniture with a finish on them. In chapter 1, the author noted that the pitch applied to the ark was the earliest recording of a type of wood finish. The first historical mention of a paint material is in the book of "Jeremiah", Chapter 22, Verse 14, of the Bible. Jeremiah writes concerning a house "...cieled with cedar, and painted with vermilion." "Ezekiel", Chapter 23, Verse 14, the Bible, also mentions "... the images of the Chaldeans pourtrayed with vermilion." According to Webster, this vermilion was a bright red pigment consisting of mercuric sulfide.

Painted furniture was found in the tomb of King Tutankhamen of Egypt who reined from 1352 to 1343 B.C. (Pattou and Vaughn, 1970, p.121) This furniture was considered "routine" and "ostentatiously embellished

but by no means achieving a summit of Egyptian art." (Cheney, 1961, p. 65) Christiane Desroches-Noblecourt, in this book on the life and death of a pharaoh, Tutankhamen, notes numerous times the use of a colored glass-paste on the articles taken from the tomb. Glazed terracotta, white paint and colored stains are also mentioned a number of times. A stuccoed wood chest painted with scenes of "intense vitality", that was to have inspired the great mural compositions of the XIX th Dynasty, was also found in Tutankhamen's tomb. (Desroches-Noblecourt, 1963, p.297)

From these accounts, it is evident that paint has been used for centuries to embellish articles of furniture and other wooden objects.

Early wood finishes, besides the one's previously mentioned, were often white lead, mineral and earth colors (for paint pigments), organic dyes, and lamp black. (Pattou and Vaughn, 1970, p. 121)

According to Pattou and Vaughn (P. 122) "Waxes were first used as vehicles for colored paints which were later mixed with animal fats and oils to lower the melting point of the wax." They further stated that, "For interiors, fish glue, vegetable gum and white of egg were the earliest mediums used for mixing with colors."

Drying oil, used as a paint vehicle, was first mentioned by Actius, a Greek Physician of the Sixth Century. It apparently was linseed oil he spoke of.

Information on how to make a transparent varnish, from amber gum

and linseed oil, is found in a manuscript in the library of Lucca, Italy. It is noted that the fundamental operations in making varnish haven't changed a great deal since then. (Pattou and Vaughn, 1970, p.122)

China wood oil or tung oil was used in China centuries ago.. They used it in all kinds of lacquering. More recently tung oil was introduced into spar or water proof varnishes about thirty years ago and is now used as a finish by itself. (Pattou and Vaughn, 1970, p.122)

Turpentine, an oleoresin derived from various coniferous trees, was discovered by early settlers in South America about 300 years ago. The essential oil (oil of turpentine or spirits of turpentine) used today is obtained from the various turpentines by distillation. Another product important in the paint and varnish industry was also discovered over 200 years ago. Kauri gum, a gum very important in the manufacture of high grade varnishes, was brought to England from New Zealand in 1767. The early eighteen hundreds saw a number of paint pigments and vehicles discovered but the development of the paint industry was in general slow until the revival of industry after the civil war.

Even after nine centuries of improvement in the paint and varnish industry, the furniture finishing industry is still far behind other industries. Not long ago the finishes were put on with a trowel while still hot. Previous to that the finishes were applied by hand with what is known as a sponge or rubber. It took several weeks to finish a

large piece of furniture. As a result, kings and noblemen were all that could afford to have fine furniture. After the advent of brushes, the application of varnish and paint was speeded up and, in the last few years, sprays and airguns have been in the vogue for applying paints and varnishes. (Pattou and Vaughn, 1970, p.123)

In studying the history of furniture finishing and the recent advancements in materials, it would seem that the ideal furniture finish is yet to be discovered, that one day soon a finish will be found that will not scratch or mark or be affected in any way by ordinary chemicals. When this is a reality, refinishing furniture may be a thing of the past along with many other outmoded and unneeded methods and techniques of doing things.

#### Purpose of a Teaching Tool for Refinishing Furniture

Antiques are in vogue, the nostalgia craze is here. People everywhere are fascinated by the beautiful relics of the past. The craftsmanship, beauty, charm, and sentimentality, as well as the historical and commercial value of antiques, gives them great appeal. Yet they still have a drawback -- they are basically second-hand and have, in the majority of the cases, suffered from use, misuse, or storage, as Ratcliffe states in her book Refurbishing Antiques.

Antique dealers have increased in number but the number of professional restorers have dwindled. The results are long waiting lists and exorbitant costs. The public has hence become frustrated.



Their interest in antiques is there and the antiques themselves are also available, whether from the attic, an antique store or an auction sale, but what to do with them once they have them in their possession is the big question. Since professional restorers are few in number the problem lies in learning how to restore or refinish those precious items themselves. (Ratcliff, 1971)

Home refinishing of furniture requires little more than time, patience, energy, an ability to follow directions, and a desire to restore the beauty of the wood. (Ratcliff, 1971)

A piece doesn't have to be an antique to give pleasure and have value. If the wood is naturally beautiful, the design attractive and if the piece fits well into the home, it may well be worth restoring.

Whatever the reason for wanting to refinish furniture, be it a hobby, for self-satisfaction, or for economic reasons, the interest and desire to learn is there as evidenced by the growing number of articles in magazines, books written on the subject, and the interest indicated in conversations and requests to educators.

#### Planning and Producing a Teaching Tool for Refinishing Furniture

When determining the best method for teaching furniture refinishing, one needs to look at what is to be taught, where it is to be taught, who will be teaching and how it will be taught.

First let us look at what is to be taught. Furniture refinishing

is a craft that is accomplished in visible steps. Therefore it could be illustrated in a step by step sequence in the teaching packet.

Where will it be taught? In most cases, in a workshop, garage, or empty building. Highly technical and advanced equipment, such as a video tape player, would not be readily available. Electricity would be available and a slide projector would be the most readily available media equipment.

Who will be teaching the class? In most cases Extension Agents, aides, or project leaders will be teaching. Some are very proficient in furniture refinishing, others will be beginners themselves. Detailed instructions and illustrations will be needed.

How will it be taught? In most cases it will be taught in a workshop setting with each student working on a different piece and each at a different pace. There may be some instances when individuals would need to review a step in the process of repairing or refinishing their article of furniture. It would be expedient if they could review the step in the illustrations themselves.

With these conditions or requirements in mind, one turns to the vast media field to find the ideal medium for the teaching tool. Slides meet all of these requirements and are an excellent medium for improving communication. Good slide presentations that have been carefully and properly designed, according to Eastman-Kodak, help the instructor to gain and hold audience attention, create and build interest,

and convey messages. Slides can also be used with other visual media for drawing attention to specific areas. Some other media that might be incorporated into the teaching package would be: posters to remind people of methods and safety measures, printed publications and fliers to be distributed for further detailed instructions, and samples of finishes on various woods for comparison and decision making.

Eastman-Kodak Company, in their publication Planning and Producing Slide Programs, stated four basic approaches to assembling slide presentations. They are as follows:

1. use existing slides, assemble into a short, simple and inexpensive show.
2. produce full coverage of an event or situation, photographing all phases and then edit the slides after the film has been processed and mounted.
3. follow a written script or preplanned storyboard where specific pictures will be required.
4. combination of all three approaches above, including titles, artwork, and other flat copy.

In the case of a furniture refinishing teaching tool, it would appear that the third method best suits the situation.

The degree of success of a slide program, as with anything, depends upon how thoroughly the planning was done. Eastman-Kodak again stresses the need for a complete and detailed plan to be designed in advance,

the need for clearly defined objectives, an analysis of the audience it will be used with, and a determination of what special circumstances must be considered in the production of the program.

There are a few items of equipment which will be most useful in planning and producing lessons and slide sets, scripts or presentation outlines, and in generating, collecting, and organizing ideas and visuals. These include a planning board, planning cards, a slide-sequence illuminator or slide sorter, and write-on slides.

Eastman-Kodak gives directions, in their manual Planning and Producing Slide Programs, on how to construct a planning board. (pp. 3-4) It consists of a piece of quarter inch plywood with plastic strips stapled across it to form grooves for holding 3x5 or 4x6 inch index cards. For planning a lengthy presentation, several boards may be needed. 3x5 or 4x6 inch index cards are used for the planning cards. Individual ideas, or points to be made, are written on the cards and they are placed in the grooves on the planning board. This makes it possible to rearrange the sequence of the cards into the order that is most desirable. Ideas may be added or subtracted, as one goes along, to reach the ideal. When the planner is satisfied with the presentation, as it appears on the planning board, then the cards can be numbered to help in keeping them in sequence.

The next step is to go into more detail using another set of planning cards. Visualize each anticipated shot and sketch it in the

upper left hand corner of the planning card. Any production notes, such as the camera angle needed for the shot, background, or whatever, can be jotted in the right hand corner. The commentary that goes with the slide can be written across the bottom of the card.

Plan for the show to run anywhere from thirty minutes to one hour but no longer. It is far better for the audience to be wanting more when the show is over than to be stifling yawns at the end of the show. (Feininger, 1969, p. 390)

Once the plan is complete, the narration or script can be written. Begin the narration with the notes written on the bottom of the planning cards. Read through the notes and get the feel of the script. If it sounds satisfactory, then plans can be made for taking the shots. If a special location for shooting the slide series is in the plans, this is the time for scouting and preparing them. Written releases should also be obtained in advance from each person who will be recognizable in the slide scenes. (Eastman-Kodak, 1975, p.6)

When taking the shots, shoot at least three exposures of every scene -- one according to the meter reading, another at one stop above that reading, and one at a stop below the meter reading. If the picture is especially important, take five exposures; four of these can be in half-stops, two above and two below the meter reading. (Sussman, 1965, p. 329)

Once the shots have been taken and the film developed and mounted,

then using the slide-sequence illuminator, sort and place them in sequence with the planning cards. (3M Company, 1975, p.15) Slide-sequence illuminators are practically indispensable for previewing, editing, and organizing slide programs. (Eastman-Kodak, 1975, p. 5)

In preparing the audio portion of the program, don't do the narration before the visuals are completed. 3M Company, in their guide on How to Prepare a Multimedia Storyboard, stresses that "it should be a joint effort of sight and sound with visuals being primary and the audio made to fit the visuals." (1975, p.14)

A professional writer isn't needed to prepare the script or narration and neither is a professional announcer needed to provide the audio. Usually it is more effective for the author-instructor to talk informally about the subject rather than use a script. However, when the author and instructor are not one and the same, then it is desirable to have a tape recorded script to accompany the slides. (Eastman-Kodak, 1975, p.61)

Begin the narration by talking through the slides, getting the pace and feel of the intended program. Record this and play it back. Read your notes as you play it back and make corrections on it. You may decide you need more slides in one spot to clarify a point and fewer in another. The same goes for the narration. You may delete some words and add some new ones elsewhere. (Eastman-Kodak, 1975, p.61)

When planning the sound track a point to keep in mind is, if you don't

have to say it, don't say it! Rely on the visuals to tell the message. The audio is to support the visuals. (3M Company, 1975, p. 14) The narration ties the whole presentation together, emphasizes certain parts and rounds out the story. It should not call attention to itself but be simple, brief and to the point. Continue to read through the slides and edit as necessary until the words and pictures flow smoothly together and then write a working script. It should contain the slide number, a brief description of the slide, the narration for each slide, cue marks for slide changes and cue marks for background music and sound effects. (Eastman-Kodak, 1975, p. 61)

Plan to show the slide only long enough for the information to register -- no longer. A variety in the timing of the slides adds interest and keeps the audience's attention. (Eastman-Kodak, 1975, p.62)

If the narration includes more than one person, use more than one voice when recording. This adds variation and interest. Someone can impersonate an announcer, teacher, salesman, policeman or whatever. Be sure to pick the voice to fit the situation. (3M Company, 1975, p. 14)

Background music and sound effects can also be added on the tape, but Eastman-Kodak cautions that "only materials that have been cleared by publishers" can be used. (1975, p. 61)

A good sound track is just as important as having good visuals. Use tape recording equipment that produces a good quality sound. (3M Company, 1975, p. 14) The music and sound effects create the pace and



the mood of the program. Choose them carefully. Background music should support the pictures and should not attract attention to itself. Match the music to the pictures and have it set the mood.

It is helpful if someone will assist in the final recording of the script and music. They can control the music and leave the rest to the narrator. The music and sound effects should originate at a distance from the mike so as not to drown out the narration. If there are exterior sounds, that could affect the recording, a box lined with sound-absorbing material and big enough to hold the mike can be used to squelch these sounds. One side must be left open to speak into. This system can be used only if the narration is the only thing being recorded on the microphone. If music and voice are to be recorded on the same microphone, this system will not work. (Eastman-Kodak, 1975, p. 62)

If a stereo tape recorder is available for use, all of these taping procedures can be, at first, produced on it with the narration on one track and the background on the other. This allows changes to be made on one track without having to retape the other track. If a combination of the two tracks, is desired later, the output of both channels can be fed into a single channel on a second recorder. (Eastman-Kodak, 1975, p. 62)

Once the audio is on tape, the next step is the synchronization of sound and slides. One method is for the projectionist to change



slides by following cues on the script while listening to the tape. Another method is to use audible cues recorded on the tape. This is distracting, so the least distracting sound available should be used, such as the gentle tap of a pencil. There is also a machine available that will put audible cues on the tape, as well as inaudible ones. The inaudible cues will work only if a tape-recorder-projector synchronizer is available to trigger the advance mechanism on the slide projector in response to cue signals on the tape. Only projectors with remote-control outlets can be used with the synchronizer. If an automatically synchronized slide-tape program is produced, one must remember that the needed equipment, to present the program, may not be available to all potential users. Always include a cue-marked script indicating the slide changes so that it may be used with any projector. It is a good idea also to have the script taped on both cassette and reel to reel tapes for the same reason. (Eastman-Kodak, 1975, p. 63)

The production of a slide-tape presentation is a real experience. It is a challenge to effectively combine the pictures, narration, music, and sound effects to tell a meaningful story. As a final point, one should keep in mind that even with an outstanding slide-tape package program, the projection, viewing and sound conditions of the room, where the program is presented, need to be satisfactory if the presentation is to be a success! (Eastman-Kodak, 1975, p. 64)

### Restoring and Refinishing Furniture

Whatever the desired result of the final finish -- to bring out the grain or the color of the wood or to protect the surface -- the correct and patient preparation is critical. (Day, 1973, p. 407)

As the project is begun, a careful inspection of the furniture is important to determine if it is worth refinishing or restoring. The following lists some questions to answer when examining the piece for its worthiness:

1. Will it be useful?
2. Is it attractively designed?
3. Is it made of one or several woods?
4. Does the wood have a rich color? (Moisten slightly with finger to determine richness of color.)
5. Are parts missing? If so, would they be expensive to replace?  
Can they be easily replaced at home with available tools and materials?
6. Is it sturdily constructed?
7. Will it be less expensive to restore than to purchase a new piece of furniture? (If not, and the piece is not a valuable antique, it may be wiser to buy a new piece.)
8. Will it blend in with other furnishings when restored?  
(Styles do not have to match but should go well together and not clash or draw undue attention to themselves.)

9. Does the piece just need a thorough cleaning?

If it passes these tests, the article may well be considered worthwhile to restore or refinish. (Thames, 1974, p. 4)

Once it has been determined that the piece is worth the time and effort involved, the first step, in restoring or refinishing it, is deciding the extent of refinishing actually necessary.

If the finish is removed entirely, much, if not all, of the mellow patina of age is also removed by the remover. Once gone, it is very hard to simulate the patina. (Daniels, 1969, p. 36)

Don't attempt to make the piece look new as over-restoration can turn a fine old article into a piece of junk. (Kinney, 1950, p. 1)

Leave some indications of age such as the marks of the cabinet maker or some signs of wear. These are proof that it is an antique. (Thames, 1974, p. 4)

Determine the type of finish that was originally used. Antiques from the 1700's -- the so called Golden Century of furniture design -- were all made of wood and nearly all covered with the same finish -- shellac. Stains were rarely used because the woods were so beautiful. Among the woods used in that era were the Honduras mahogany, French and English walnuts and the wood of various old fruit trees. Stains do have to be used on the replacement pieces, however, to match the darkness these woods have achieved through aging. (Grotz, 1976, pp. 63-64)

Although shellac was used on nearly all the fine furniture between

1700 and 1900, it is not a very good finish by modern standards. Alcohol will wash it right off, drops of water will quickly turn it white, and direct sunlight will craze it. If left in a damp, cool room, it will turn foggy. (Grotz, 1976, p. 65)

To test for shellac, use a cloth that has been saturated with shellac-solvent alcohol (not anti-freeze types) and rub an inconspicuous area on the back or underside. Shellac will soften and liquify immediately. If it does not soften, it is another finish -- either lacquer or varnish most likely. (Daniels, 1969, p. 38)

To test for lacquer, moisten the spot with lacquer thinner. If the finish softens, it is lacquer. If, after trying both tests, neither spot is affected, the finish is varnish. (Savage, 1975)

If the piece still has its smooth -- not checked -- original finish, do not remove the finish but rather use a furniture cleanser-conditioner (such as the one listed on page five of the Pacific Northwest Cooperative Extension Bulletin, number 145, Furniture Restoration) to clean the wood and restore the natural grain and color, disguise scratches and retard checking, remove dullness and cloudiness, and "winterize" the furniture to withstand dryness and heat. Use this cleanser-conditioner sparingly, if the finish is shellac, as water, alcohol, and heat damage shellac finishes. When through cleaning the old furniture, use 4/0 steel wool to apply a greaseless furniture cream containing beeswax or apply a paste wax. These replenish moisture and

natural oils. A furniture polish may be used, if the furniture hasn't dried out or lost its luster. (Thames, 1974, p. 5)

If the finish is shellac, it can be restored by the following method:

1. Clean old finish with a wet cloth and wipe dry.
2. Follow with a cloth dipped in mineral spirits and wipe dry.
3. Pour one cup of denatured alcohol and about 1 ounce of lacquer thinner into a bowl. Using a new brush (don't use a brush that has been used on anything else, even if cleaned thoroughly), brush this mixture on the surface lightly (the surface to be treated must be horizontal). The shellac will dissolve in only a few seconds. Brush this dissolved shellac just as if it were a new coat. Tip off the same way as a fresh coat and stop. Allow to dry over night in a dry room.
4. The next day polish the piece smooth with steel wool and wax it with a paste wax. (Grotz, 1976, pp. 65-66)

If the finish is beyond restoring, then refinishing the article is the answer. Set up a work area where the furniture will be undisturbed until completed. Keep this area clean and free of sanding dust, especially when the final steps of applying the stain and finish are to be completed. Moderate temperatures are needed and good ventilation. The article should be kept out of direct sunlight as it can affect the performance of the chemicals used in the process. If working inside where

ventilation is poor, an exhaust fan in the window will help. A dust and mist respirator may be worn to protect one's lungs. Wear old or protective clothing and cover the floor with newspapers to protect it from the harsh chemicals. (Montana Extension Service, 1970, p. 4)

Before the finish removal process is begun, the removable hardware should be taken off. If it cannot be removed, it should be protected against bleaches and stains with petroleum jelly. (Day, 1973, p. 409)

The equipment, that will be needed for the removal of the old finish, is: a scraper, toothbrush or orange stick, old brush, fine steel wool, sandpaper, protective gloves, paint remover, alcohol, turpentine, wax paper, aluminum foil, empty cans or jars, old rags and burlap, if available, newspapers, and paper towels. Additional supplies, needed for making repairs, or for applying the finish, will be listed later.

A good quality varnish or paint remover is needed to remove the finish. If the finish is shellac, plain denatured alcohol and lacquer thinner mixed half and half can be used to remove it. If a commercial remover is needed, purchase a non-flammable type for safety's sake. Don't use any remover near an open flame, however. (Montana Extension Service, 1970, p. 4)

Apply the remover with an old brush or cloth and let it work. If the air is especially dry or if removing several layers of old finish, cover the area with aluminum foil to keep the moisture in and to allow the remover to work for a longer time. When the finish is thoroughly

blistered, scrape it off with a putty knife, scraper or steel wool. One point of caution, if the piece is an old veneered one, work on a small area to keep from loosening the veneer. Use extreme care when working around carved or grooved areas, also. If the article is an antique, it is best not to use anything rigid or sharp to remove the sludge. It can be removed with a smooth wooden paddle, coarse wool or burlap. A toothbrush or orange stick may be used to get into hard to get at areas. To get the final bit of old finish off, apply some remover to a piece of rough cloth, such as burlap, and rub over the entire area. (Johnson Wax, p. 6)

After the old finish is removed, follow directions on the remover container and neutralize the remover as recommended. Wash the entire area with turpentine to assure that no wax or silicon is left on the piece. Follow with an alcohol wash to neutralize. (Johnstone, 1974, p. 15)

Allow a full day to dry before proceeding. If there are dark stains to be removed, use a common household bleach and apply to the spot. When the spot is nearly gone, apply bleach to the rest of the area to even out the bleaching. Wash the entire area with plain water and quickly dry with paper towel to retard swelling of the grain of the wood caused by water standing on it. Allow to thoroughly dry. This means at least twelve hours drying time before starting another process. (Savage, 1975)



Another method of removing stains is using a solution of one ounce powdered or two ounces crystals of oxalic acid in one pint of hot water. Brush this solution onto the spot and allow to stand. After the stain has been removed, apply the solution to the entire area and let stand another three to five minutes. Next wash with a weak solution of ammonia water (two tablespoons ammonia to one quart of water). DO NOT MIX THE TWO METHODS. DANGEROUS FUMES CAN BE FORMED, EVEN IN A WELL VENTILATED ROOM. (Montana Extension Service, 1970, p. 4)

When stubborn base stains are found, apply several coats of remover and rub off quickly with coarse steel wool. If the stain persists, use commercial wood bleach to remove the stain. Follow by sponging with warm water and quickly dry. If this does not remove the stain, sanding may be the only remedy. (Johnson Wax, p. 7)

If the article of furniture is missing some parts, or has parts that are too broken up for repair, replace them with parts made of the same kind of wood or, if aged wood can be found, use it, as it will have a similar patina and will blend in better. To replace the parts, measure the old piece carefully and make a pattern, if necessary. Use this pattern to cut the new piece. Apply glue to the new piece and the area it fits into. Work the glue in well and clamp in place immediately. If the part is a rung and the rest of the article of furniture is glued solidly, replacement will be a problem. However, if the replacement is cut a fraction of an inch too long, then a diagonal cut can be



made through the piece with a thin saw blade, where the grain will hide the cut or scarf joint. Insert the piece in place, glue, and clamp until dry. (Johnstone, 1974, p. 19) If the rung is thick enough, or in a situation where a piece is broken in two, the pieces can often be held together with dowels and glue. Bore a hole in the two cut or broken ends, apply glue, insert a short dowel, fit the two ends together and clamp. The dowel should always go at right angles to the line of breakage. (Ratcliff, 1971, pp. 22-23)

If the end of a rung fits loosely, glue a strip of cloth around the rung end, or insert a wedge in the end of the rung to increase its size, or glue a piece of tight fitting dowel into the hole, let set and drill a new hole of the correct size. (Montana Extension Service, 1970, p. 3)

Pressure is spread throughout a chair when it is sat on. A broken arm or loose joints can easily throw the whole chair out of alignment and could cause it to break someplace. If the joints are loose, take the article apart, using a soft faced mallet to knock them apart. Next scrape or wash the old glue off, reglue and clamp the item. A reglued piece is much stronger and sturdier. Inner tubes cut into strips make good clamps. (Ratcliff, 1971, p. 18)

Decorative carvings or veneers that have come loose, can be reglued using a hypodermic-like glue injector or a syringe with a large needle available at a drug store. Insert the needle end under the veneer or

carving and inject the glue. Apply pressure to the carving or veneer and wipe off excess glue with a damp cloth. Cover with wax paper and then a magazine for protection and clamp over night. If the item can be laid down, a heavy object may be used for the clamp.

Veneers that are chipped or burned can also be repaired. Using a template for a pattern, cut a small irregular area out around the damaged area and scrape it out carefully. Use the same template to cut a new piece of veneer to fit. Use a veneer that matches the kind, color, and grain of the wood as near as possible. Glue the new piece in place matching grain of wood, apply pressure and wipe off excess glue with a damp cloth, cover with wax paper and lay the template on top, matching edge for edge, apply a heavy weight and let set. (The template laid on top assures that the weight will bear down on the patch.) Let dry over night and sand smooth. Be sure to sand with the grain of the wood. (Daniels, 1969, p. 44)

Veneers that have blistered can be repaired by splitting the blister down the middle with a sharp knife or razor, cutting with the grain. Inject glue underneath the blistered area, press down, cover with wax paper and a heavy weight. Allow it to dry a day or more. Scrape away any paper or glue that is sticking to the surface and sand with fine sand paper. Raised edges are repaired in much the same way except cutting is not necessary as the underside is accessible. (Grotz, 1976, p. 9)

Liquid animal glues, casein glues, plastic and resin glues, fake animal glues, and catalyst-type cements are all good for woodworking. However, the casein, plastic and resin glues, and catalyst-type cements set up much faster than the others; the latter sets up in only one hour. (Montana Extension Service, 1970, p. 3)

A small dent in the wood can be raised with steam. A blotter, piece of felt, or heavy fabric, iron or putty knife and water are needed for the job. Dampen the blotter or fabric in water and place over the dent. Apply heat with a common household flat iron. Do not permit the blotter or fabric to become dry, nor the iron too hot, or the wood may be burned. The steam will soften and raise the grain of the wood to its previous level. (Montana Extension Service, 1970, p. 5)

Small holes or cracks may be filled with stick shellac or wood dough. Both come in various wood colors. The stick shellac is melted into the hole and is hard to do well, the wood dough is applied with a putty knife. When the material has dried thoroughly, sand the area smooth with fine sandpaper. Another method for filling cracks and holes is to use a 50/50 mixture of fine sawdust, from the wood being finished, and ordinary powdered or liquid white glue. Mix well and apply with a putty knife. When thoroughly dry, sand smooth with fine sandpaper. (Montana Extension Service, 1970, p. 5)

When all the problems have been remedied, it is time to sand the furniture and prepare it for the final finish. The final appearance of

the project depends on how well and how carefully the sanding was done. This is especially important if staining is to be done, since rough spots will show up darker than the smooth surface.

There is one point to be made about sanding, however. If the piece of furniture you are working on has any value due to age, it should never be touched with abrasive paper because it will ruin the patina. If there is a rough spot, very fine 4/0 steel wool can be used to smooth it. (Savage, 1975)

A belt sander is good for removing thick layers of old finish but be careful -- it gouges easily. Always sand with the grain. A reciprocal type or orbital type finishing sander is better as it doesn't cut as much away at a time. Do not use a disk type as it can easily produce deep circular digs in the surface. Keep the sander you use moving constantly and overlapping each pass along the grain about an inch with the next pass so no digs or levels are produced. (Daniels, 1969, p. 41)

Don't use an electric sander on any veneered surface as the veneer is too quickly sanded away.

Between sandings, brush and wipe the surface thoroughly to get all the particles of grit off so it won't be there to gouge in the next sanding step. Finish by block sanding by hand with a very fine grit cabinet paper. Use a pad between the block and the abrasive paper.

For fine polished finishes, many professionals use the same worn

abrasive paper long after most people throw it away. Worn papers produce a very homogeneously ground surface. When the sanding process seems to be doing nothing more than moving fuzz around, vacuum up all traces of dust and grit, sponge the surface with just enough warm, clean water to thoroughly dampen it. Don't leave a visible film as too much water can damage the surface. Allow the surface to dry thoroughly and sand again with the same size grit as last used before sponging. This sponging process raises both the grain and wood fibers so that they can be leveled off. It also swells out any pressure marks, made during handling. (Johnstone, 1974, pp. 23-24)

A word of caution concerning steel wool. Don't use it on bare, open grained wood as particles will be pushed into the pores of the wood and will later rust and show up as tiny red specks in the finish.

After the final sanding, vacuum again and wipe the surface with a tack rag. A tack rag may be made by dampening a lint-free cloth with water and ringing it out well, then further dampening it with a little turpentine, and finally add a few drops of varnish. Work the cloth to get the varnish all over it, making it tacky but not sticky.

(Johnstone, 1974, p. 40)

The process of selecting a finish can take place any time up to when it is applied. It is a good idea, however, to select the finish before the refinishing process is begun. There may be special steps to be taken according to the directions on the container.

According to Savage in her book Professional Furniture Refinishing for the Amateur every finish can be classified as either opaque or clear. Opaque finishes, better known as paints, cover the grain of the wood entirely. They should be used only to hide something or to create special effects. Clear finishes are protective coatings that allow the wood grain to show through. These are classified into three categories -- soft, hard, or oil. Sealer and the so-called "wax" finishes are soft. Varnish, shellac, and lacquer finishes are hard.

The sealer finish is relatively fragile and not recommended for furniture that will receive more than a minimum of use.

Varnish is the hardest finish and is alcohol and water proof. It is preferred by quality cabinet makers and refinishers. Grotz, in The Antique Restorer's Handbook, cautions not to use "spar" varnishes on furniture, as they never dry all the way through and things left lying on them will make impressions in about 30 seconds or so. Use a varnish that **dries** to a dull or satin finish.

Lacquer is the most fragile of the hard finishes. It is very hard for a home refinisher to apply with a brush. It is best suited for production line work with a spray gun. Most modern factory made furniture is finished with lacquer because of its ease of application with a spray unit and its quick drying quality.

Shellac is of medium hardness between varnish and lacquer. As was mentioned earlier in this chapter, it is not a good finish by modern

standards. Its main disadvantage is that it is easily affected by water and alcohol. One advantage that shellac has is that it can be applied to a surface that is not completely wax-free. Often it is applied on such a surface and then followed (after it is dry) with a coat of varnish to provide the toughness needed for the outer finish.

Oil finishes produce a velvety smooth finish of medium hardness. It is often used on fine antiques that will not be subjected to hard use. Savage added that, "The appearance of an oil finish can be approached, but not equalled, by a judicious combination of shellac, varnish and dressing (wax)."

Ratcliff states, in Refurbishing Antiques, "Wood finish -- stain and polish -- has two purposes: to put a protective layer between the open pores and the outside elements and to bring out the patterns and textures which are the essence of wood's appeal."

Once the desired finish has been determined, the blemishes removed, damages repaired, and the wood finely polished with an extremely fine abrasive, it is time to apply the finish. This process can take from one to any number of steps depending on the wood and type of finish desired.

For a good final surface use a wash coat of three pound cut shellac thinned one part shellac to five parts alcohol. Use only a single coat. Let dry for about four hours, then sand with fine cabinet paper. This stiffens the minute hair-like wood fibers so the final sanding will re-



move them. It also is absorbed by the most porous areas of the wood and prevents it from excess absorption of the stain later. It results in an automatic overall evening out of tone when a stain is applied. This is especially important on soft pine and pine plywood, which are very soft and absorbing. (Daniels, 1969, p. 41)

How does one determine if a sealer, filler or stain is desired or needed? The following gives a brief description of the purpose of each product and the refinisher can determine from this guide which fits the type of wood and finish they are working toward.

Sealers keep the stain, filler or finish from penetrating deeper. A stain brings out the grain of the wood and a filler fills the pores of an open grained wood. These products may be used in some combinations as well as individually. Often stains and sealers are mixed together and also fillers and stains are often mixed together when used. This cuts down on one step by doing two jobs at once.

If a stain is being used, try it out in a hidden area to make sure it produces the desired effect. A walnut stain is best for use on antiques as it gives the old look to wood. (Grotz, 1976, p. 68) Wipe or brush on the stain and let it remain until the tone is as deep as desired, then wipe off. It can also be rubbed in with a cloth -- wear rubber gloves to avoid stained hands. An even tone is achieved by applying more to areas that are lighter. This method doesn't allow the stain to "soak" into the wood. Let dry over night before applying the



first coat of finish. (Daniels, 1969, p. 41)

When using a filler, whether alone or with a stain, apply across grain, rubbing in well, let set until it loses its gloss and then quickly rub excess off, again rubbing across grain. If it isn't coming off easily, use a turpentine dampened cloth to remoisten and then continue to rub across grain removing the excess. Then very lightly, wipe with the grain to avoid streaking. Let dry overnight.

For the final finish, a soft luster is best. Don't aim for a high gloss finish, as it emphasizes every flaw in the finish and also dust shows up so much more on a high gloss finish. A satin finish is much more desirable. Rottenstone or pumice can be used to soften the luster as desired. To save time, apply finish to the hard to get at or bottom portion of the furniture first, leaving "handling" areas free of finish, then turn over and apply the finish to the top areas. (Daniels, 1969, p. 43)

When applying varnish, add two ounces of mineral spirits to each cup of varnish in a clean bowl. Use a new brush or one that has been suspended in mineral spirits (one that has been allowed to dry out after cleaning causes dust specks in varnish). Apply varnish (always thinned) by brushing it right into the wood in every direction, then tipping it off by going with the grain lightly and then stop! Faint brush marks will smooth out by themselves if left alone now. In 24 hours the surface can be buffed with fine steel wool and waxed with

a paste wax. One coat of varnish is adequate. (Grotz, 1976, pp. 72-73)

If an oil finish is being applied, rub lots of it into the wood and let it soak in. After wiping excess off, let dry over night and apply another coat of oil liberally. Wipe excess off after a few minutes. Repeat this process for five days and then once a month for a year. When the finish needs to be renewed, just repeat an application or two of the oil and again let it dry. (Johnson Wax, p. 14)

A traditional wax finish is one of the oldest and easiest to apply. Using a soft cloth, rub a fine grade of paste wax over the sealer. Polish with a soft cloth immediately. Continue applying wax and polishing after each coat until the desired finish is obtained. The more coats applied, the harder and more lustrous the finish will be. Periodically renew the finish by applying another coat of paste wax and polishing with a soft, dry cloth. (Johnson Wax, p. 14) Simomiz car wax or wax shoe polish can also be used on furniture. (Ratcliff, 1971, p. 11)

A French finish dates back at least three centuries and is the finest and probably the most beautiful finish known. It would be considered a fragile finish since it is primarily shellac. The process is tedious and painstaking. It requires patience, skill and time. The finish must be applied to an extremely smooth wood and if a stain is used, it must be a water stain.

Shellac is thinned to the consistency of alcohol with alcohol and

applied with an old silk stocking made into a ball, squeezing out a little of the mixture at a time. The pad is dipped into the solution and applied in straight strokes. As soon as it is dry, apply another coat and another. Continue to apply coats until a sheen or gloss is achieved. If cracks appear on the surface, sprinkle a little pumice stone on it and apply more coats of the shellac, until the cracks are filled. Allow time for the surface to dry completely. Next put a few drops of raw linseed oil on the pad and rub in a circular motion over the entire area, adding a few drops of oil as needed. When a high polish is seen, add no more oil, but continue to rub until the surface is thoroughly dry. Allow to stand over night and repeat the rubbing with the oil. This hard and rugged process will produce a high polish that cannot be produced with the so-called "French Polish". (Kinney, 1950, p. 156)

On chairs or other furniture where the finish will be subjected to a lot of contact pressure, allow more than enough time for drying or else someone will leave a fabric imprint on the furniture and some of the finish may come off onto their clothing. This drying period is especially crucial in humid weather, as it will take much longer to dry in these conditions. For hurried jobs, use a hard, fast drying floor finish. (Daniels, 1969, p. 43)

When through with the finishing project, it is a must that all rags, with removal and finishing products on them, be disposed of.

Don't leave them in a building, as they can cause fires.

The restoration or refinishing process is tedious and time consuming but well worth it when one sees the beautiful finished product.

### Summary

Paint materials have been used, however crude their form, since near the beginning of time. Even so, the furniture finishing industry has been slow in development. Only recently have the new and faster methods of finishing and refinishing furniture been made available to the general public.

Another recent happening has been the boom in the antique business. Antiques have become the "in" thing. Many people are collecting them and, since professional restorers are few in number, they are having to learn to restore or refinish the antiques themselves. Others are wanting to refinish furniture as a hobby, for self-satisfaction or as an economic factor.

Whatever the reason for wanting to refinish furniture, the interest and desire to learn is there, as evidenced by the growing number of articles on the subject and the requests for training that Extension Agents are receiving.

To answer the requests, a teaching tool was needed for refinishing furniture. It was determined that a slide-tape program would meet this need.

The steps in preparing this slide-tape program consisted of:

1. defining objectives,
2. making a detailed plan using a planning board and planning cards, complete with a sketch of each shot, production notes and commentary,
3. taking the shots,
4. preparing the narration,
5. taping the audio including the musical background and sound effects,
6. synchronizing the sound and slides.

The production of a slide-tape presentation is a challenging experience. Even when completed, the projection, viewing and sound conditions of the "show room" determine the success of the presentation.

In the refinishing or restoring of furniture process, it is important to carefully prepare the project. First determine if the article is worth refinishing or restoring. If it is considered worthwhile, don't over restore it. This is especially important if the furniture is antique. It is best to attempt to restore the article and keep the patina in the wood, rather than stripping it right down to the bare wood and sanding all that rich patina away. If it appears to be beyond restoring the existing finish, then the refinishing process is required. The steps in refinishing a piece of furniture are: remove old finish, remove stains, replace and repair broken and missing parts, repair the veneer, raise dents, fill cracks, sand or polish the bare wood, select

and apply the finish. Allow plenty of time for the article to dry before subjecting it to a lot of contact pressure. When through with the project, clean everything up and throw away any rags that have the finishing and removal products on them.

Enjoy the results of the tedious and time consuming project! It really is worth every minute spent!

## Chapter 3

### PROCEDURES

The purpose of this project was to develop and prepare a teaching tool to assist Extension Agents in providing knowledge and skills training in refinishing furniture.

The investigation primarily involved gathering information and ideas on refinishing furniture and the production of a slide program.

When writing this chapter, the author included the plan for conducting a needs assessment and the methods utilized in developing and producing the teaching packet.

Due to the nature of the information collected and the project in general, there was no statistical hypothesis.

#### Needs Assessment

Extension Home Economists in fourteen Montana counties were sent a questionnaire inquiring into their background in furniture refinishing, what they felt they needed more help in, how they would use a slide program and how detailed they would want the teaching packet to be.

#### Categories of Investigation

The research was conducted in a non-experimental framework. To achieve the goals of the project, the following categories were considered:

1. Preparation for refinishing furniture.
2. Removal of old finish.
3. Restoration of existing finish.
4. Removal of stains.
5. Repair of veneer.
6. Raising dents.
7. Filling cracks.
8. Replacement and repair of broken parts.
9. Sanding.
10. Application of new finish.
11. Production of slide programs.

#### Investigation Design

The investigator did an intense review of literature, participated in classes, and visited with professionals in the fields of refinishing furniture and slide program production.

#### Method of Organizing Data

The information and materials, on refinishing furniture collected, were organized into the sequence of action for refinishing furniture and a slide program layout was designed.

Slides were then taken of these steps during the process of refinishing some furniture. The slides were then screened and set up into a slide program. The script, complete with musical accompaniment



was taped onto a cassette tape.

Additional parts to the program, such as the teaching plan, posters and handouts were also written from the information collected.

### Summary

The purpose of this project was to develop and prepare a teaching tool to assist Extension Agents in providing knowledge and skills training in refinishing furniture.

The investigation primarily involved gathering information and ideas on refinishing furniture and the production of slide programs.

The research was conducted in a non-experimental framework.

To achieve the goals of the project, the following categories were researched: Preparation for refinishing furniture, removal of old finish, restoration of existing finish, removal of stains, repair of veneer, raising dents, filling cracks, replacement and repair of broken parts, sanding, application of new finish, and production of slide programs.

The data was collected through review of literature, class participation and interviews with professionals in the two fields.

The data was organized into a slide presentation on refinishing furniture. A complete teaching packet was produced.

Due to the nature of the project, there was no hypothesis.

## Chapter 4

### SCRIPT FOR SLIDE PRESENTATION ON REFINISHING FURNITURE

| Slide | Subject                                                                          | Narration                                                                                                                                               |
|-------|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.    | (title slide)<br><br>Furniture Refinishing                                       |                                                                                                                                                         |
| 2.    | (credits slide)<br><br>Produced and Photo-<br>graphed by Jane C.<br><br>Svalstad |                                                                                                                                                         |
| 3.    | Two old chairs                                                                   | During the course of this presentation,<br><br>you will note that several pieces of furn-<br><br>iture have been used to illustrate a<br><br>technique. |
| 4.    | Old chair                                                                        | Do you have a chair that is on its last<br><br>leg?                                                                                                     |
| 5.    | Old chair                                                                        | Or a piece of furniture that has seen<br><br>better days?                                                                                               |
| 6.    | Antique chair                                                                    | A precious antique?                                                                                                                                     |
| 7.    | Child's chair                                                                    | Or a garage sale bargain?                                                                                                                               |
| 8.    | Replacing rung                                                                   | How about replacing a mismatched or lost<br><br>rung and...                                                                                             |
| 9.    | Refinished chair                                                                 | ...refinishing that special piece into a<br><br>nearly new one?                                                                                         |

10. Refinished and decorated child's chair      The savings in refinishing as compared to buying a new piece is phenomenal!
11. Refinished chair      And the rewards in personal satisfaction far outweigh the time and energy it takes.
12. Refinished chair      Being a success at furniture refinishing does not require a professional knowledge of the subject.
13. Refinished chair      With the right materials, enough time so your project is not rushed, ...
14. Refinished chair      ...and a little imagination,...
15. Refinished dufold      ...you can surprise yourself, your family and friends with "new" additions to your home.
16. (title slide)  
Inspect
17. Chair      As you start your project, you'll want to inspect the piece of furniture carefully to determine if it is worth refinishing.
18. Work area      Set up a work area where the furniture will be undisturbed until completed. Keep the area clean and free of sanding dust.
19. Protective clothing      Wear old or protective clothing and put several layers of paper underneath the

piece of furniture to be refinished. Be sure you have adequate ventilation and moderate temperatures. You may also want to wear a dust and mist respirator to protect your lungs.

20. (title slide)

Removal of Old  
Finish

21. Removing drawer pull

Before removing the old finish on a piece that has drawer pulls and other hardware, remove these items.

22. Equipment needed

This is the equipment you will need for removing the old finish: scraper, toothbrush or orange stick, old brush, fine steel wool, sandpaper, protective gloves, paint remover, aluminum foil, alcohol, turpentine, empty cans or jars, old rags and burlap, if available, newspapers, and paper towels.

23. Cans of remover

To remove old varnish or paint, use a good quality paint and varnish remover. There are a number of good ones on the market. Be sure it is non-flammable for safety.

24. Reading directions      Read and carefully follow directions on the paint and varnish remover.
25. Holding can with opening directed away      Hold the opening of the can away from you when removing the lid because of possible inside pressure.
26. Pouring into pan      Pour the remover into a small throw-away pan or can for easy access. Note the can is held with the pouring hole at the top for easy pouring, better control, and fewer messy spills.
27. Applying remover with brush      Apply the remover with a clean, old brush, or an inexpensive one, or ...
28. Applying remover with cloth      ...you can use a cloth to apply the remover.
29. Brushing it on      Brush it on in one direction only. Don't go back and forth over the same area with the brush. This destroys the full effect of the remover's ingredients.
30. Area covered with aluminum foil      To keep the remover from drying out before it has worked down through all the old finish, apply the remover and then cover with aluminum foil. Let stand until the remover has penetrated all layers of old

finish,

31. Blistered finish

The finish should now be thoroughly blistered. If the finish doesn't loosen with one coat, apply another. The number of coats and length of time to stand varies with the kind of remover and the amount and age of the finish to be removed.

32. Removing the foil

If you are using the aluminum foil covering, pull it off.

33. Old veneered piece

Caution: If the piece of furniture is an old veneered piece, work on a small area at a time in taking off the old finish to avoid the moisture penetrating and loosening the veneer.

34. Scraping with putty  
knife

Scrape off the old finish with a putty knife or scraper. Always scrape off the old finish going with the grain of the wood.

35. Wiping on burlap

Use old burlap, or ...

36. Wiping on paper

... paper to wipe off the remover after scraping with the scraper.

37. Carved area

Use extreme care when working around a carved or...

38. Groved area                      ...groved area.
39. Using steel wool                Steel wool can also be used to remove the blistered finish.
40. Using steel wool on curved leg                On curved surfaces, use fine steel wool to keep from scratching the wood.
41. Carved surface                      To get into cracks, carved or groved areas, to remove the old finish, ...
42. Using toothbrush                      ...use a toothbrush or orange stick.
43. Rubbing with burlap                To get the final bit of old finish off, apply some remover to a piece of rough cloth, such as burlap, and rub over the entire area.
44. Applying neutralizer                After the old finish is removed, follow directions on the remover container and neutralize the remover as recommended.
45. Pouring turpentine                Wash the entire area with turpentine to assure that no wax or silicon is left on the piece.
46. Pouring alcohol                      Follow with an alcohol wash to neutralize.
47. Water in pan                        Water may be used to neutralize but it takes longer to dry and may raise the grain of the wood.
48. Inspecting finish                      Allow a full day for the wood to dry, then

inspect for any finish not removed and remove this.

49. (title slide)

Removal of Stains.

- |                      |                                                                                                                                       |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| 50. Dark stain       | Dark stains can usually be removed with one of several methods.                                                                       |
| 51. Pouring bleach   | Household chlorine bleach may be applied with a cloth and allowed to stand until the stain is gone.                                   |
| 52. Applying bleach  | After the stain has been removed, apply the bleach to the whole area (such as the whole seat). Let this stand 3 to 5 minutes.         |
| 53. Washing area     | Wash the entire area with plain water and ...                                                                                         |
| 54. Drying area      | ... quickly dry with paper towel to retard swelling of the grain of the wood caused by water standing on it. Allow to thoroughly dry. |
| 55. (title slide)    |                                                                                                                                       |
| Replace Broken Parts |                                                                                                                                       |
| 56. Broken part      | Broken parts may be replaced with new parts made of the same kind of wood.                                                            |



57. Measuring First measure the broken part carefully and make a pattern if necessary.
58. New piece Cut new piece from the same type of wood.
59. Applying glue Apply a good wood glue to the new end piece...
60. Applying glue ...and the hole the piece fits into.
61. Working glue in Work the glue into holes with a toothpick.
62. Applying glue Apply glue to the other joints affected...
63. Clamping ... and clamp in place immediately; some glues set very quickly.
64. Showing broken part Or if the dowel end of a rung is broken off, but the rest is still okay, ...
65. Sawing ... cut off the ragged, broken end, ...
66. Showing dowel ...measure the diameter of the broken dowel end and obtain the same size doweling.
67. Drilling hole Using a drill bit the same size as the dowel, drill into the end of the rung at the same angle as the broken dowel; being careful not to drill out through the side of the rung. Be sure the rung is secured in a vice for safety's sake and for easier drilling.

68. Drilling hole      You may also have to drill out the hole in the leg where the end of the rung fits into.
69. Sawing dowel      Cut small 2 inch lengths of doweling ...
70. Applying glue      ... apply glue,...
71. Inserting dowel      ...insert doweling, ...
72. Innertube clamp      ...assemble and clamp over night until dry.  
Inner tubes cut into 1½inch wide strips, stout cord or strong strips of fabric make good clamps.
73. Wiping off glue      Wipe off excess glue immediately with a damp cloth.
74. Chipping off glue      Or you may let the glue dry and chip off the excess glue with a chisel. The stain will not penetrate glue.
75. Drying      Let dry until set. Note directions with the glue. Clamps may be removed but let the newly glued area dry overnight.
76. Separating joint      If any joints are loose, separate the joint, scrape old glue off and reglue.
77. Clamping      Clamp in place and let dry until set.
78. Replacing screws      Replace screws that may be missing or that were removed to facilitate repair.

79. Reglued cahir Furniture that has been reglued is much more solid and stable.
80. Decorative carving Decorative carvings or veneers that have come loose can be reglued using a syringe with a large needle or a glue injector. The syringe would be available from the drug store and the glue injector from a craft store.
81. Filling syringe Take the plunger out and fill syringe with wood glue. Replace the plunger.
82. Injecting glue Insert needle into crevice and inject the glue.
83. Wiping glue off Apply pressure to the carving or veneer and wipe off excess glue with a damp cloth.
84. Clamping Cover with wax paper and then a magazine for protection and clamp overnight.
85. Heavy weight If the item can be laid down, a heavy weight may be used for the clamp.
86. Reglued carving The piece is now securely glued.
87. (title slide)  
Repair of Veneer
88. Chipped veneer Veneers that are chipped or burned can also be repaired.

89. Using chisel                      Using a small sharp chisel and hammer, ...
90. Tapping with hammer            ...tap lightly to cut through the veneer  
only around the chipped area. Make an  
irregular cut for better blending of the  
mend.
91. Scraping area                    Scrape out the chipped area and make sure  
it is a clean cut.
92. Making pattern                  Place a piece of paper over the area and,  
with a pencil, rub over the edge of the  
cut.
93. Showing pattern                The rubbing will result in a pattern.
94. Tracing pattern                Lay the pattern over a matching piece of  
veneer with carbon paper between. Be sure  
it is laying with the grain of the veneer  
going in the right direction. With a  
pencil, trace the line of the pattern.
95. Checking grain                Check the newly drawn piece to make sure  
the direction of the grain is the same as  
the hole to be filled.
96. Fitting new piece              With a slightly beveled cut, cut the new  
veneer piece to fit. The beveled cut  
allows the veneer to fit in closer making  
a near invisible patch. This beveling can

- be done with sandpaper.
97. Applying glue      Apply glue to the area to be patched...
98. Applying glue      ...and the new piece.
99. Patch in place      Put the patch in place...
100. Tapping with hammer      ...and tap lightly with a rubber hammer to set in place without damaging the wood.  
Be sure to wipe off any excess glue now!
101. Placing paper and block      Cover the patched area with wax paper and place a smooth block of wood over the patched area as a protector to keep the furniture from becoming scratched or marred when being clamped.
102. Applying clamp      Apply a clamp and secure, then let set for 20 minutes or over night.
103. Clamping patch      Always use clamps to hold freshly glued pieces until the glue sets. Laying heavy objects on the glued area can also be used as a clamp.
104. Inspecting patch      After the glue has set, remove the clamp and inspect.
105. Sanding patch      Let dry overnight and sand smooth. Be sure to sand with the grain of the wood and never across grain as it can easily

scratch the wood.

106. Repaired veneer

Your piece of furniture is ready for the next step.

107. (title slide)

Raising Dents

108. Dent in leg

A small dent in the wood can be raised with steam.

109. Tools needed

A blotter, piece of felt, or heavy fabric, iron or putty knife or soldering iron, and water are needed for the job.

110. Dampened cloth

Dampen the blotter or fabric in water and place over the dent.

111. Applying heat

Apply heat. For large dents, use an iron. A common household iron is fine. Do not permit the blotter or fabric to become dry, nor the iron too hot, or the wood may be burned.

112. Raised dent

The steam will soften and raise the grain of the wood to its previous level.

113. (title slide)

Filling Cracks

114. Crack in chair

Small holes and cracks can be filled.

115. Sawdust mixture

Mix a 50/50 mixture of fine sawdust from

the wood being finished and ordinary powdered glue to form a dough. Liquid white glue can also be used.

- 116. Applying dough      With a putty knife, apply the dough-like mixture to the crack.
- 117. Scraping off excess      Scrape off the excess.
- 118. Wiping area      Then with a damp cloth, wipe off the dough from the surrounding surface, as it is difficult to remove once it is dried.
- 119. Sanding area      When dry, sand smooth.
- 120. Completed mend      Allow to dry over night and the chair is now ready for general sanding. Do not sand patina off of an antique.
- 121. (title slide)  
Sanding
- 122. Sandpaper      There are many types and grades of sandpaper. Sand first with a coarse grade, then follow with medium, fine and very fine grades.
- 123. Protector over nose      It is a good idea to wear a protector over your nose to keep dust out of your lungs.
- 124. Sanding with grain      Sand only with the grain of the wood to avoid scratching the surface.

125. Electric sander      An electric sander may be used on flat surfaces but use extreme caution. Do not use on veneer. An electric belt sander can do a lot of damage in a matter of seconds. An electric finishing sander, as shown, is some better.
126. Brush furniture      Brush the furniture well with a soft brush to get all the dust off.
127. Wiping with rag      You may want to wipe it with a tack rag.
128. Dampening tack rag      A tack rag is made by dampening a cloth with water and ringing it out well...  
with water
129. Dampening with      ...then further dampen the cloth with a  
turpentine      little turpentine...
130. Adding varnish      ...and finally add a few drops of varnish.  
Work the cloth to get the varnish all over it, making it tacky but not sticky.
131. Sanded chair      You are now ready for applying a filler, sealer, or stain, depending upon what your project calls for.
132. (title slide)  
Applying New Finish
133. Wearing gloves      You may wear gloves or coat your hands with liquid detergent and ...



134. Scraping soap bar ...scrape a bar of soap with your fingernails. When through with the staining, etc., most of the stain will wash right off.
135. Materials for staining and filling If you have an open grained wood, and are planning on filling the grain and also staining the piece, you will need a paste wood filler, your desired stain, and a small pan or can.
136. Cans of wood dough and wood filler Don't get wood dough instead of the paste wood filler. Wood dough is for filling cracks or small holes and will not take a stain.
137. Mixing stain and filler You may want to mix the paste wood filler and the stain together to apply all at once.
138. Mixing Mix well ...
139. Applying mixture ...and apply with a cloth or burlap, rubbing the mixture in well. Rub across grain to get the filler worked into the open grain.
140. wiping excess off When you complete the application, the first part will be ready to wipe off. When it loses its gloss, it is ready.

141. Pouring turpentine on cloth      If it isn't coming off readily, you may use turpentine on a cloth to get the excess filler off.
142. Wiping off excess      When rubbing off the excess, continue to rub across the grain. Then lightly wipe with the grain to avoid streaking. Be sure to wipe very lightly or you will rub the filler right out again.
143. Chair drying      Let it set over night to dry.
144. Applying finish      Next apply your finish. Here you see a dark Danish Oil finish being applied.
145. Applying oil finish with out stain      This is a clear Danish Oil, rub lots of it into the wood and let it soak in.
146. Applying oil finish      If you are using Danish Oil, rub lots of it into the wood and let it soak in.
147. Chair drying      After wiping excess off, let dry over night.
148. Applying second coat      Apply another coat of Danish Oil liberally  
...
149. Wipping off excess      ...and wipe off excess after a few minutes.
150. Finished chair      Let dry and your furniture is ready for use!
151. Buffing finish      You may want to use a paste wax finish over a stain or clear linseed oil finish

- and then rub and buff well.
152. Applying varnish      Or, if you would rather, you may use plain varnish, lacquer, or shellac on your piece of furniture. Apply several coats, allowing to dry and then buffing with very, very fine steel wool between coats. If you use shellac, make sure it has not outlived its shelf life and is too old or it will never dry!
153. Brushing with grain      Be careful to brush with the grain when applying varnish, lacquer or shellac.
154. Rags and papers      Clean up and destroy used rags and papers as they are a fire hazard. This includes those used for the finish removal process.
155. Finished chair      And now, enjoy your near new piece of furniture for years to come.
156. Finished Chair      Yes, it does take time, energy, and some expense...
157. Finished chair      ...but it is well worth it...
158. Finished chair      ...and you did it all yourself...
159. Decorated chair      ...and it can be fun!
160. (title slide)

The END!

## Chapter 5

### SUMMARY

Paint materials, however crude, have been used since near the beginning of time. For centuries the finishing of furniture and other wooden objects has been an honored craft. Even so, the furniture finishing industry has been slow in development. Only recently have the newer and faster methods of finishing and refinishing furniture been made available to the general public.

Antiques are in vogue, the nostalgia craze is here. Many people are collecting antiques since they are available from various sources. However, professional restorers are decreasing in numbers. The resulting situation is that, if people are going to have their antiques restored or refinished, they will have to do it themselves. In more recent years, furniture refinishing is being taken up as a hobby, a means of self-satisfaction, and/or an economical factor. More and more of these people are requesting training from Extension Agents on how to refinish furniture. The problem was to develop and prepare a teaching tool to assist Extension Agents in providing knowledge and skills training in refinishing furniture. It was determined that a slide-tape program would fill the need.

The steps in preparing this teaching tool consisted of:

1. attending and participating in classes on refinishing furniture and preparing slide presentations.

2. doing a thorough review of literature in both subjects.
3. defining objectives.
4. making a detailed plan using a planning board and planning cards complete with a notation of what each shot would consist of (a sketch could also have been used), production notes and commentary.
5. refinishing several pieces of furniture and taking shots of the various steps according to the plan.
6. preparing the narration.
7. taping the audio including the musical background.
8. synchronizing the sound and slides.

The following categories were covered in the teaching packet:

preparation for refinishing furniture, removal of old finish, restoration of existing finish, removal of stains, repair of veneer, raising dents, filling cracks, replacement and repair of broken parts, sanding, and application of new finish.

The teaching packet includes a slide-tape presentation, lesson plan, posters, handouts and samples of various finishes on several kinds of wood.

The production of a slide tape presentation is a challenging experience. Even when the finished product is presented, the projection, viewing and sound conditions of the room it is shown in determined the success of the individual program.

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#### REFERENCES

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## APPENDIXES

## APPENDIX A

### Lesson Plan For Refinishing Furniture Workshop

## LESSON PLAN FOR REFINISHING FURNITURE WORKSHOP

I. OBJECTIVE - To assist individuals in achieving knowledge and skills in refinishing furniture by the following steps:

- A. Inspecting the article
- B. Removing the old finish
- C. Removing stains
- D. Replacing and repairing broken parts
- E. Repairing veneers
- F. Raising dents
- G. Filling cracks
- H. Sanding
- I. Applying the new finish.

II. Training Materials and Aids Included

- A. Slide set and script
- B. Script on cassette tape
- C. Samples of various finishes
- D. Know Your Wood
- E. Furniture Restoration bulletin
- F. Listing of materials needed for refinishing
- G. Do's and Don'ts posters
- H. References sheet
- I. Evaluation sheet

## III. INSTRUCTION

- A. Introduction
- B. Presentation of the slide program
- C. Hand out List of Materials Needed, Furniture Restoration bulletins, and Know Your Wood.
- D. Have samples of various finishes for the people to look at.
- E. Conduct question and answer session and evaluation of slides.
- F. Follow with a furniture refinishing workshop covering the following steps:
  - 1) Inspecting the article
  - 2) Removing the old finish
  - 3) Removing stains
  - 4) Replacing broken parts
  - 5) Repairing veneers
  - 6) Raising dents
  - 7) Filling cracks
  - 8) Sanding
  - 9) Applying the new finish.
- G. Have the Do's and Don'ts posters up around the room for reminders.
- H. Hold an "Open House" and display refinished articles!

## APPENDIX B

### Materials Needed For Refinishing Furniture

## MATERIALS NEEDED FOR REFINISHING FURNITURE

Good quality commercial paint and varnish remover (non-flammable)

Scraper (such as a dull putty knife)

Toothbrush or orange stick

Old paint brush for applying remover

Fine steel wool and abrasive paper (Coarse, medium, fine and extra fine)

Turpentine or paint thinner

Empty cans or glass jar (preferably with a cover)

Old rags and burlap if available

Newspapers to cover area under furniture

Wax paper

Paper towels

Aluminum foil

Household bleach for removing spots

Alcohol

Wood glue (white glue is okay)

Protective gloves and clothing

Dust and mist respirator if desired to protect nose and lungs

Clamps (heavy objects and 2 inch wide strips of inner tube are fine)

Filler, sealer, stain, varnish, oil finish or whatever you project  
requires for the finish desired

Good paint or varnish brush or soft cloth for applying finish (depends  
upon the type of finish used)

## APPENDIX C

### Know Your Wood

## KNOW YOUR WOOD!

A basic knowledge of the different kinds of woods used in furniture will help you in determining the finish you want to use. Here are some of the more common types of woods and their characteristics:

- A. Oak, an "open-grain" wood either white or red in color.
- B. Walnut, an attractive light brown wood with distinctive dark patterns.
- C. Mahogany, red-brown in color with distinctive markings.
- D. Satinwood, warm yellow color with a close grain.
- E. Maple, yellow-brown with small markings.
- F. Pine, cream to light reddish brown with visible resin canals and gradual color changes across subdued growth rings.

These woods are more rare but were used in making many furniture pieces of the past which today are priceless antiques:

- A. Cedar, a very hard wood, reddish in color.
- B. Ebony, black wood with close grain and very heavy.
- C. Elm, similar to oak.
- D. Harewood, gray with rippled markings.
- E. Lignum Vitae, dark brown with black markings.
- F. Rosewood, blackish lines on a brown ground with a close grain.
- G. Yew, medium brown, not plentiful, therefore quite expensive.



**APPENDIX D**

**Evaluation Sheet**

EVALUATION OF THE FURNITURE REFINISHING SLIDE SERIES

Rate it on a scale from 1 to 7, 1 being the lowest and 7 the highest,

Low      High

1 2 3 4 5 6 7      1. How much does it motivate you to want to refinish  
furniture?

1 2 3 4 5 6 7      2. How clear are the directions?

1 2 3 4 5 6 7      3. How self-explanatory is it?

1 2 3 4 5 6 7      4. Rate its length. 4 is just right, 7 is too long,  
and 1 is too short.

1 2 3 4 5 6 7      5. Rate its content. 4 is just right, 7 is too hard,  
and 1 is too simple.

1 2 3 4 5 6 7      6. Rate its helpfulness to you. 1 is no help at all,  
4 is helpful and 7 is very helpful.

7. What did you learn that you did not know before? \_\_\_\_\_

8. What did you like best about this program? \_\_\_\_\_

9. What did you like least? \_\_\_\_\_

10. Are there any areas not covered that should have been? \_\_\_\_\_

11. Are there any areas that are unclear? \_\_\_\_\_ If so, which ones? \_\_\_\_\_