

Preserving Your Antique Arms Collection

By

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Note this article is very much a work in progress and later versions will be posted on the SPAR web site at this address -www.nps.gov/spar then look under news for the title of the pamphlet] to make sure they are seeing the most recent version

The following are very conservative *guidelines* to help you care for a collection that is to be preserved for as long as possible and will never be fired. It represents the *safest* advice I can give without thoroughly examining your specific firearm. It may *not* be the most efficient. There are many more treatment options available to me which I cannot responsibly share in this forum. What may work beautifully in one situation can be a disaster in another. I treat every gun as a unique object and the treatments I perform can vary considerably from what follows. This advice cannot cover every possible situation. It is based on my training and experiences as a conservator, and my experience working (so far) mainly with military firearms in National Park Service collections. I continue to learn more every year. This is very much a work-in-progress and I am interested in any comments or questions you may have. Feel free to contact me with your concerns. By doing so you may be contributing to the improvement of these guidelines. Dave Arnold

1. Environment

- Avoid dramatic swings in relative humidity. Try to keep stable between 40 and 50%.
- Consistency is more important than precise maintenance of a particular reading.
- Important because of an unusual physical property of wood called *anisotropy*. Wood cells expand or contract very differently in response to changes in relative humidity -- *depending on their specific grain orientation* (axial, transverse, or radial) in the log from which they came.
- Changes in temperature make little difference to either metal or wood – better to concentrate on controlling relative humidity.

2. Handling

- Wear gloves when handling your collection. No protective coating – appropriate for conserving an artifact -- (see below) can stand up for long against repeated bare-handed handling. Best thing is to *always* wear gloves.
- Nitrile examination gloves¹ are recommended when cleaning and coating your collection.
- Once an item has been coated, wear plain cotton gloves.

3. Housekeeping

- Keep dust-free. Dust can trap moisture increasing the likelihood of corrosion occurring.
- Do not use commercial dust cloths. They often leave an oil film behind. Oil films trap dust. Dust traps and collects water vapor in the air.
- When dusting, use a soft cotton cloth very lightly dampened with water
- Without moisture, dust merely gets shoved around and will not be picked up.
- Do not use alcohol of any kind when dusting or cleaning a stock. It can skin or strip an historic finish.
- Dry immediately with a clean cloth.
- Never use liquid or spray dusting products. Most leave mineral oil behind, which traps dust. Dust traps and collects moisture. Starting to see a pattern?

4. Cleaning Wood Stocks

- Separate wooden and metal parts. They are cleaned and coated differently.
- Unless absolutely necessary, leave unfinished interior wooden surfaces alone.

- Clean **exterior** of stock as follows:
 - a. Use a few *drops* of a mild detergentⁱⁱ in a gallon of warm, distilled water, applied with a slightly damp soft cloth, and rinsed with clean cloths dampened with distilled water.
 - b. Dry with soft cloths immediately after rinsing.
 - c. Clean again with mineral spirits, using a soft cloth to apply. Work in fresh air or a well-ventilated area.
- Avoid using “oil soaps” as their pH can be in the caustic range and may damage an historic oiled surface. They sure do a nice job on floors though!

5. Cleaning Barrels And Other Metal Parts

Please note: *It is essential to practice any new technique on a sacrificial piece first, before applying it to something irreplaceable.*

- Use nylon or animal-bristle bore brushesⁱⁱⁱ. Wherever possible, avoid using brass or steel brushes. Such hard materials can scratch, but also might (under certain conditions) cause galvanic (bi-metallic) corrosion (specifically when using a copper-alloy brush on ferrous metals) by leaving a slight metallic smear behind.
- Use mineral spirits to soften accretions. Work in fresh air or well-ventilated area. Are there other solvents that are “stronger”? Yes, but they are difficult to work with *safely*.
- Swab clean with a cloth patch.
- Use only extremely fine abrasives such as oil-free 0000 steel wool^{iv}. Use only if absolutely necessary to remove stubborn rust deposits or other accretions. Work slowly and be alert to any changes in the surface. There is always an element of risk in such work. If you are at all uncertain, hire a conservator *before* causing irreversible damage.
- When cleaning brass parts *never* use metal cleaning products that contain ammonia. Ammonia can damage old copper alloy materials. In addition, such products often include abrasives which may prove too harsh. Elbow grease and mineral spirits should be tried first. If something slightly stronger is needed, try applying small amounts of wet tooth powder with a cotton swab and rinse with water.
- A general comment about commercial rust removers. To date, I have not found a rust-removal product which is entirely safe to use on historic metal surfaces. Some seem to come close. Some require close attention and precision – too much for most of us. In short, there are no magic solutions which are risk-free and I advise against their use on anything you value.
- Most surface rust can be removed by first lubricating the area with a light penetrating oil^v and *cleaving* it off with a sharp scalpel held at a very low angle to the metal. It requires close attention, a steady hand, and some patience, but if you are careful, you will probably get most – if not all – of the surface rust off without leaving so much as a scratch. When done, remove any remaining oil with mineral spirits.

6. Coating Stocks

- Wood is neither thirsty nor hungry. It is usually covered by a finish which may have become corrupted in some way, making it look “dry.” The wood beneath the finish does not need to be “fed”, (despite what wood-care product commercials may claim).
- Never put oil of any kind on an historic finish. There may well be unintended but permanently damaging consequences to ignoring this advice.
- A word about linseed oil. While it may be the only appropriate material to use to finish a modern historic replica, consider the following:
 - a) Linseed oil takes forever to dry and will trap dust. (It will not stop water penetration either).
 - b) When linseed oil oxidizes, its molecules cross-link with one another, making it increasingly more difficult to remove as time passes.
 - c) Oxidized linseed oil (linoleic acid) eventually becomes linolein, better-known commercially as Linoleum! Repeated, or seasonal, applications eventually develop into a surface that can look like very dark brown alligator skin, and can become almost impossible to remove.

- Applying a modern finish over an equivalent historic finish can forever confuse the finish “history” of a stock by making it difficult, if not impossible, to tell what (if anything) is original, and what is a restoration material – even with an analytical microscope. Therefore, you would not want to touch up, say, a shellac finish with shellac.
- Use paste waxes only. I prefer carnauba-based furniture waxes such as Kiwi Bois, Mohawk or Behlen, or Black Bison on wood stocks.^{vi} I also recommend using *pigmented* paste waxes. “Clear” waxes can collect in pores and appear as white specks against a dark wood background.
- Avoid wax mixtures which include a high percentage of bee’s wax. They are not especially harmful, but are relatively soft (fingerprint easily) and can be slightly acidic.

7. **Coating Metals** (this advice is strictly for guns which have been “retired” from use and will never be fired.)

- Avoid using oils. They are not the best material for long-term protection of collection pieces as they trap dust and dirt, eventually break down and have to be periodically replaced. A high-quality light oil is fine for maintaining a gun you still shoot, though.
- Use a microcrystalline wax, such as Renaissance Wax^{vii} as a protective coating. They are practically inert, remaining stable for a very long time. Apply and buff out with a soft cloth or brush.
- Brass parts can also be coated with wax. I prefer to use Inctalac^{viii} acrylic spray lacquer because it is easily removed with solvents but bonds especially well to copper-alloy metals, and will withstand more abuse and last longer than wax can.

8. **Minor Stock Repairs** If a split or detached piece of a stock must be repaired, use an adhesive that is both strong but reversible (i.e. can be safely removed at any time in the future). There is only one: traditional “hide” glue.^{ix}

- Do not proceed if there is evidence that the damaged site has been previously repaired. In this case, consult a conservator.
- Unless you work with hide glue every day – make it up fresh in small amounts as needed. It doesn’t take long and it will do a better job.
- Apply “hide” glue with a fine brush and clamp. Hot hide glue is preferable to liquid hide glue as it is less affected by humidity. An appropriate clamp can be as simple as a few pieces of masking tape, rubber bands or bicycle tire strips, small padded weights. Use the least force needed to do the job.
- Clamps can usually be removed in a few hours, but it takes at least 24 hours for the repair to fully harden..
- Excess glue can be removed with a lint-free cloth dampened with hot water. The best time to do this is usually right after removing clamps.

9. **Storage / Display**

- Narrow hooks or loops of wire should not be used to support collection pieces either in storage or on display. The weight of most long arms on such devices is sufficient to result in indentations in their stock at the points of contact.
- Use broad, padded supports. We use thin sheets of a closed-cell Polyolefin foam material^x to pad our display fixtures.
- To avoid mold and mildew during long-term storage -- avoid at least two of the three conditions known to promote bloom outbreaks: elevated temperature, still air, and elevated humidity.

10. **If you still need help**

- See a professional conservator.
- Contact me or the American Institute for Conservation of Historic & Artistic Works (AIC)^{xi} for a referral.
- There are few, if any, conservators who treat nothing but firearms. Look for an “Objects” Conservator with experience working with metal *and* the other materials (wood, celluloid, leather, etc.) that are part of your artifact.

ⁱ Nitrile examination gloves come in different sizes and can be purchased from most medical supply stores and some pharmacies.

ⁱⁱ **Kodak Photo-Flo** is a very good non-ionic detergent available at photographic darkroom supply stores in a variety of sizes from 4 oz. and up.

ⁱⁱⁱ **KleenBore** makes a stiff Nylon bore brush which I like alot. They even make a series of “blackpowder” brushes with bristles that extend to the tip. Contact Kleen-Bore, Inc. 16 Industrial Parkway, Easthampton, MA 01027, (800) 445-0301, or at www.kleen-bore.com.

^{iv} Liberon/Star Finish Supply offers a very good 0000 grade of steel wool. They can be reached by mail at P.O. Box 86, Mendocino, CA 95460, (800) 245-5611, or on the web at www.liberon.com. Another source is Conservation Support Systems in Santa Barbara, CA. They can be reached at (800) 482-6299 or on the web at www.silcom.com/~css.

^v Choice of oil for this purpose is not critical. I happen to use CRC 3-36, but WD-40 or any similar product will work fine as a scalpel lubricant.

^{vi} **Kiwi Bois** can be ordered from Hummer Capital, Inc., 1018 Stuyvesant Ave., Union, NJ 07083, (800) 55209952, or www.hummercapp.com. Kiwi Bois comes in seven different wood tones. I frequently use “walnut.”

As far as I can tell, **Mohawk** and **Behlen** are the same product with different packaging. Mohawk’s Blue Label brown wax can be ordered directly from Mohawk Finishing Products, 4715 State HWY 30, Amsterdam, NY 12010-9921, (800) 545-0047, or at www.mohawk-finishing.com. Behlen Blue Label brown wax can be ordered from Olde Mill Cabinet Shoppe, 1660 Camp Betty Washington Road, York, PA 17402, (717) 755-8884, or at www.oldemill.com.

Black Bison waxes are available through Liberon/Star (see iii above).

^{vii} **Renaissance Wax** can be ordered from Woodcraft (formerly Woodcraft Supply), 560 Airport Industrial Park, PO Box 1686, Parkersburg, WV 26102-1686, (800) 225-1153, or at www.woodcraft.com.

^{viii} **Incralac** acrylic lacquer is offered in 12 oz. spray cans by Custom Aerosol Packaging, P.O. Box 1411, Piqua, OH 45356, (937) 773-1824.

^{ix} Hide glue is actually made up of tendons and other connective tissues. It is easy use and should be prepared in small batches whenever needed and used hot. It is available from Woodcraft, Olde Mill, Liberon (see above), and many other fine woodworking suppliers. It is the only type of adhesive I use and recommend.

^x **Voltek** produces sheets of **Volara** in a range of thicknesses, color, and hardness which have proven to be very stable, conservation-grade materials used in many museums for padding storage shelves and exhibit fixtures. For your nearest supplier, contact VOLTEK, Division of Sekisui America Corporation, 100 Shepard Street, Lawrence, MA 01843 (800) 225-0668, or at www.voltek.com.

^{xi} AIC. 1717 K Street N.W., Suite 301, Washington, D.C. 20006. (202) 452-9545, fax (202) 452-9328.

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