GUNSTOCK FINISHING: THE REAL TRUTH

Part 2

by J. Bivins

In the last issue, we had a good look at the sort of materials early gunstockers used for finishing, and discussed some of the properties of those materials. As I mentioned, one of my goals has been to achieve the *appearance* of those finishes in my own work. Now, in doing some traditional form of hand work, we like to be able to take advantage of what we know of both ancient and modern technology. Despite all the advances in metallurgy and other such sciences, though, we can't always be sure that "modern" materials are always better than old ones. The same is true of stock finishes. We can't assume that because we buy a can of Smythe's Patent Best London Quality Gunstock Balm off the shelf that Smythe—or the corporate conglomerate that has bought his name—has really done some homework on what *really* is a finish that will resist moisture and abrasion. The fact is that some of the stuff being sold as gunstock finish is pretty mediocre. I'm not too interested in a finish that will look nice for a few years; I want something that's archival, as museum types are wont to say. I want to finish a rifle in such a way that it will still look good a hundred years from now, even after repeated soakings during deer-season rainstorms. While some of the old finishes we discussed are good, none of them can really stand that sort of treatment over time. Urban gunmakers expected to renew them from time to time, along with other even more fragile finishes such as color casehardening and fire blue, so stalwart and well-heeled hunters who haunted the salt marshes of Britain were encouraged to return their pieces for a facelift from time to time. Over here, of course, guns were just left in their used... and not infrequently abused . . . condition. Well, we don't want to have to do periodic refinishings now, but even so there is nothing short of an epoxy finish that will stand five seasons in Alaska. Even in this high-tech age, there is no miracle potion for gunstocks, but there *are* finishes available to us that will do yeoman service, even under trying conditions, and provide us with enough flexibility in use that we can make them take on whatever appearance we want. Let's have a look.

No matter what they're called, most of the commercial stock finishes on the market today are one form of varnish or another. With the exception of G-B Linspeed Oil, which is a modified form of linseed with special driers added, most of the off-the-shelf gunstock preparations are compounded with an alkyd resin, and are cut considerably with volatile spirits to allow deep penetration. Alkyd varnishes have been around since the tail end of the last century. They provide a relatively soft surface film that is easily rubbed out, but they are not especially impervious, at least by modern standards. Alkyd resin is inexpensive to synthesize, and in the commercial end of the finishing business, has largely been used in sealers and varnishes intended for interior use, such as furniture and panelling. A far harder and more moisture-resistant varnish has long been made from phenolic resin, though phenolic varnishes have a tendency to darken — much like the hard copal varnishes of the last century. Nevertheless, until the field of organic finishes expanded rapidly after World War II, phenolic varnishes were considered the best available. Today, when you can still find them on the shelf, they are usually labelled as "marine spar varnish" or something similar, rightly implying that they are suitable for exterior use, where the alkyds are not. That should tell us a little something about commercial stock finishes. Virtually all of them are cheaply made to be sold in small quantities at high prices, and made of materials not well suited to extremes of climatic conditions. The fact of the matter is that if you want to buy a high-quality varnish sealer off the shelf, you generally won't be looking for a product labelled as stock finish. Any of the phenolic varnishes can be used if they're thinned with mineral spirits, but most are slow to harden and there's little need to use them, with the exception of one product I'll discuss in a moment. I used to use an alkyd sealer produced by Sherwin-Williams Company, and found it easy to use. The product has been changed a couple of times, and is now listed as A66 V91 "Oil Base Varnish." It has to be thinned for gunstock use, and according to centerfire stockmaker Dave Simpson of Texas, gives as good a finish as the old A66 V3 that I used for years. From what I have learned from paint chemists, though, I no longer consider any alkyd varnish or varnish sealer (such as Tru-Oil) to be entirely adequate over a long period of time and under every conceivable weather condition. I'm sure it's fine for guns not subjected to such rigors, however.

Though I haven't tried it, a relatively new DuPont product labelled "Clear Penetrating Varnish," and having the code designation 704C, appears to

have better application for gunstocks. It's phenolic-resin varnish sealer with tung oil instead of linseed as a vehicle, which is definitely an advantage regarding imperviousness. Like the Sherwin-Williams finish, it hardens in a matter of six hours, and evidently may be rubbed out easily. Like the thinned Sherwin-Williams, 704C should be good for either a low-gloss or a built-up finish, and I see nothing in its specs that would prevent me from using it. Be aware, however, that tung oil is irritating to some people, which is certainly a consideration since finish is on your hands a good deal either while wet-sanding or rubbing on thin top coats.

Aside from the alkyd and phenolic resins, the latest kid on the block is polyurethane. Without going into a discussion of the process of producing this material, which I know little about in any event, suffice it to say that the urethanes are rather more akin to the plastics family than the other synthetic resins. They are quite brittle, and require the presence of at least a small quantity of one of the drying oils in order to make them usable. Urethanes, however, can be exceptionally impervious and resistant to abrasion, though they have one chemical property which makes them somewhat less useful than other synthetic varnishes. In hardening, the skin becomes densely cross-linked chemically, which generally means that after about three days' curing time, subsequent coats will not bond any too well with the last coat added. Of course, the same is true of the other synthetics, but over a much longer span of time. However, I have rubbed on later coats of urethane as much as two years after the first applications were made, and haven't experienced any trouble. What will happen twenty years down the road, though, may be another matter.

A series of urethane varnishes and varnish sealers that have been on the market for quite a number of years now are the products marketed by the Flecto Company. Flecto "Plastic Oil and Sealer" has been favored by a number of stockmakers, and seems to have given reasonable service so far. However, it has a very slow curing time, and it contains enough toluene to be rather poisonous if you keep your hands wet with it for any time. I've talked with two centerfire stockmakers who became ill from "Plastic Oil," but only after a considerable amount of exposure.

The finish that I use, and I must admit is the *only* finish that I use, was developed over a number of years by Rick Schreiber of Michigan, who is a fellow well acquainted with the properties of finishes. He markets the product under his "Laurel Mountain Forge" label, and shortly after he brought it out I arranged to market it as well under my own label. Lack of time to keep up with orders caused me to turn my end of things over to Lowell Manley, also of Michigan, and Lowell continues to market the finish as "Express Oil Sealer" and "Express Oil Filler." While the labels still bear my "IB" touchmark, I have had no financial connection with the product for a number of years. You can believe, though, that my mark wouldn't still be on every can if I didn't believe that this finish is the best on the market today. As a matter of fact, it's the *only* finish on the market especially compounded as a stock finish, designed to withstand almost any conceivable rigor Ma Nature can dish up. Like Flecto, it's an oil-modified urethane system, though made in very small batches for special care in quality control. It contains no toluene, and has a fast drying time, which I consider essential.

So there you have several possibilities in finishes. Notice that I *haven't* mentioned linseed except as an additive to varnish sealers. I don't use it, even in restoration work. I also have not discussed lacquers. Some of the modern versions are indeed exceedingly durable, having been compounded for use on table and counter tops, but most of them are best suited to spray-gun application, and can do their job only as a built-up finish, which severly limits their flexibility to the gunmaker.

Let's proceed with the process of finishing, or at least the process that I use. . . and a good number of other fellows as well, some of them fussier than I. The entire thing must begin with the raw wood, and that means grain-raising or "whiskering." Many of the early gunstockers omitted that step, and you can too if you don't mind a section of your gunstock eventually having all the sensuous feel of a Brillo pad after those nasty fibres decide to rear their spiky heads. I'm sure most of you know the process: dampen the wood with a pretty wet rag, then dry the stock rapidly with a propane torch. A heat gun is better if your tool budget is flush. The resulting "whiskers," actually wood fibres flattened during the process of shaping the stock, are lightly sanded off with a sharp, new piece of garnet paper; I use 220 grit. This process is repeated until the surface is *dead*. No, I do not raise the grain on relief carving. Instead, after grounding all the carving on the stock, I whisker the entire surface thoroughly *before* I model the carving. Since all of the finish cuts in carving are done with shearing cuts by sharp edge tools, there is not much tendency for grain to raise in carving unless you've used soft wood. . . which you shouldn't have done in the first place.

Stains and dyes are an entire story in themselves, and one which I won't discuss much here. Water-based dyes such as the aniline family are supposedly the most durable, and I won't contest that. I don't find them useful for the finishing process I use, but that isn't to say they aren't good. They are, and a far better choice than nitric or chromic acid. Rather, I use stains that are known in the finish trade as "NGR" stains. That is, dye materials run in a vehicle of toluene or a combination of toluene and methanol, thereby providing a "spirit" stain that has little tendency to raise the grain of wood. That attribute is of great consequence if you don't care for fuzzy-looking relief carving, but the most important thing here, as we'll see, is the ability of such stains to penetrate a certain amount of finish in the wood, especially if they have a healthy component of toluene. In any event, Sherwin-Williams used to offer an entire family of NGR stain concentrates labelled "Sherwood 500," but it's my understanding these have been discontinued. But take heart; several smaller firms still produce NGR stains, one of these being Wampler Chemical Company in Virginia, which markets both a walnut and a red mahogany spirit stain suitable for our purposes. I'll list addresses at the end of the article.

As I mentioned in the last installment, many early gunmakers preferred to tint their finish with dyestuffs such as alkanet root to provide a reddish tint to the finished sotck. I am fond of that appearance as well, but prefer to put all the color in the wood instead. For

hard curly maple, I use a basic brown NGR stain with a good bit of yellow added, which yields a color not unlike a rubbed-down acid stain. I add to this a fair dollop of red concentrate. If you use the Wampler stains, a bit of mahogany can simply be added to the walnut stain to achieve the effect. Color, however, is a matter of personal preference. If you like punk hair styling, you'll probably want a purple gunstock. In any event, I like to stain pretty dark, either using a concentrated stain or numerous coats of one not so concentrated. The color is going to lighten considerably in the work that follows. Incidentally, when I speak of staining, I am primarily referring to maple, for I do not like to add color to walnut, particularly light-colored walnuts such as buff-colored California-grown "English" walnut. It's a bit too difficult to maintain an even color in that wood after repeated wet-sandings, but maple offers few such pitfalls. If you want rich color in a walnut stock, buy a blank that Dame Nature made that way in the first place.

Before actually beginning to add finish, it's important to allow all the solvents and diluents present in stains to evaporate from the stock, or you take the risk of your finish not hardening properly later. I use a drying cabinet made of plywood, with 60-watt lightbulbs inside that will maintain an air temperature of no more than 80-85 degrees; more than that can cause shrinkage problems, and I am ever so fond of being able to get a rifle barrel back into its inlet after finishing the stock. Anyway, I put a stained stock in the box for two or three hours before beginning to finish.

Another little item to be aware of is that many finishes are sensitive to the presence of non-drying oils, and that means natural oils from hands and cheek if an in-the-white stock has been shouldered and sighted a number of times—and who can resist doing that when a stock is all shaped out? Those skin oils, however, soak into the wood, and even in small quantities may retard proper hardening of finish, especially the polyurethanes. It's a good idea to wash the stock down a bit with lacquer thinner or acetone before starting the application of finish. That may well prevent a nuisance later.

There's a lot of romantic nonsense about "feeding" wood with wonderful and exotic oils. . . i.e. Smythe's Best. . . but stock wood is *dead*. You can't feed it; the roots and leaves used to do that, but a decent gunstock should no longer have such appendages. Capillary action is certainly present, though, and any fibrous material will absorb a certain amount of liquids. It's a mistake to imagine that either stain or finish really penetrates a stock blank very deeply, though, except to end-grain areas which really do suck up stuff for some distance. That's why they turn so black when stain flows over them, or even finish, for that matter. In any event, when your first coat of finish hardens, a good deal of the wicking capability of a stock is effectively stopped. That, of course, helps to prevent the absorption of water as well. What's needed, then, is a heavy-handed, sloppy concentration of thin sealer for the first go, liberally laid-on in every crevice and each inletting cut, even under the buttplate (*especially* under the buttplate) until finish is pooling up without significant further absorption. At that point, I set the mess aside for twenty minutes or so, then wipe off all the excess with a rag. And throw that rag in the trash *outside*, please. The stock then goes into the box for a full day's dry "sauna."

I seal all of my inletting cuts twice. More than that may cause problems in returning tight-fitting metal to the inletting. After the first sealing, I like to use uncut varnish or the "Express Oil Filler," which is the heavier viscosity version, applying several successive coats to the end-grain underneath the buttplate and at the breech end of the barrel. These areas are difficult to completely seal unless a heavier-bodied finish is painted on, but don't let it build up.

Depending upon the wood the gunstock is made of, we now have to consider the fourth important step in finishing a stock, after final sanding and whiskering, staining, and sealing, and that is filling. Filling is a matter of little moment with a stock made of hard and dense maple, which is the *only* sort of maple worth considering as far as I'm concerned. Other more porous woods such as the walnuts and cherry are another matter, for they have longish, open pores that must be filled. The best method is to fill with the finish, but in working with a relief-carved stock, I'd rather be whipped through the fleet than try to fill an open-pored stock around carving ground, using only the finish. For a plain stock, by all means use the successive coats of finish to fill until sealer in the pores is level with the stock surface. For a carved walnut stock, however, I still resort to the old-time pigmented fillers, which really are little more than putty suspended in a vehicle of mineral spirits. These "paste" fillers seem to be going out of fashion these days for some unknown reason, and are hard to find, but many larger paint stores still carry them. Often, only a neutral shade is available rather than the large range of colors formerly offered, but that is easily remedied by the purchase of tubes of universal tinting colors in lampblack and burnt umber. Color the stuff until you have a creamy paste that is a deep reddish-brown. Paste fillers are applied to a stock *after* sealing, so that none of the muddy appearance of the filler is left in the wood after the first wet sanding. Paint the goo on, but avoid carving cuts, brushing it on with the grain. After a half hour or less, use a piece of T-shirt or the like to rub it off the stock *across* the grain. If some of it has gotten down in carving cuts, use a stiff toothbrush to get it out. Let the stock sit up for a full twenty-four hours after this, and even more than that is better, for paste fillers harden very slowly indeed. They will not totally fill all the pores, but the finish will complete the job.

I now brush on a second coat of varnish sealer, though not as exuberantly. This serves to leave more finish on the surface, and at the same time bonds the filler into the pores. From this point on, I do not allow any finish to pool in carving cuts. Rather, I want those cuts to be rather dark and dull, thereby providing highlights to higher areas of the carving that develop a bit of gloss. Shiny finish on the ground just next to carving, and in the flutes of the design will look as garish as a 1957 Caddy grille. So, when wet finish gets into the carving, brush it out.

After the second coat of sealer has hardened—six hours for Express Oil—you can start in with wet-sanding, and that's the part of the process which is guaranteed to build a fine, deep, and level finish like nothing else can. I use 3M Tri-M-Ite wet-or-dry paper, readily available at auto supply stores, but prefer their aluminum oxide wet-or-dry paper when I can get it. I whack a

three-inch square off a sheet with an old pair of scissors, fold it over, and dip it right in the finish, and start sanding the stock. Keeping the paper continuously wet, I sand right back to the wood, assiduously avoiding sanding over any carving at all. Now, I'm not going to fool you into thinking that wet-sanding is anything but a tedious chore, especially with a urethane finish which is quite hard. Sealers made from other resins, as I mentioned, can be wet-sanded much easier. But it's worth it, in either case. After wet sanding, the stock will look a little sick, for you'll have sanded some of the color right out of it since even the best stains or dyes don't penetrate that far into hard wood. That's where the toluene-based NGR stains come in; you can restain the rifle right through that thin finish in the wood. The stain won't "take" as it did on dry wood, but it will do quite nicely for our purposes. Just swab on a coat, and then wipe off the excess, and allow the stock to sit for a bit.

If you see that there is still a good bit of filling to be accomplished, you can switch to a heavier viscosity of finish at this point such as Express Oil Sealer, or the DuPont or Sherwin-Williams varnishes left uncut. *Don't,* however, be tempted to switch to a finish using a different resin at this point. In any event, a more viscous material will fill faster, but you pay for it somewhat by having more work to do. It's harder to sand off. I prefer to use sealer throughout the process. In either case, brush on another coat, again avoiding carving cuts. I use a 3/4" sable brush for this, though the doggone things are expensive. After six hours' hardening again, the stock may then be wet-sanded right back to the wood again using 400-grit paper, restained again, and the entire process repeated. The final wet-sanding is done with 600 grit. Three wet-sandings usually is quite adequate for maple, though porous walnut can take four to six. After the final go, the maple stock is again lightly restained. For a semi-gloss final finish, which is what I prefer, I then dot little blobs of finish around in a fairly small area and rub it in hard until it almost feels dry, proceeding all over the stock in that manner. Three such coatings will give a fine semi-gloss surface film that is quite thin. If you want a dull finish at this point, rub the thing down hard with auto-body rubbing compound or even pumice, the latter used dry on a felt pad. A dull finish, at least to my thinking, is better suited to fine classic centerfires than to muzzleloaders, though. For a linseed-oil looking finish, don't rub on more than one coat of sealer after the final wet-sanding and restaining, and don't compound it out.

I don't care for heavily built-up finishes, but as we've discussed, the old boys like them quite well. They are certainly appropriate for pieces such as schuetzens with highly figured crotch walnut stocks which won't be dragged about in the deer woods. For such a finish, straight varnish is simply brushed on the stock after the last wet sanding mentioned above. Three coats are usually needed, and after the third the whole thing will look pretty lumpy and disgusting, and may have dust in it if you weren't careful where you did the varnishing. When the third coat is thoroughly hard, start wet-sanding with 400 grit paper. This time, you are not trying to sand back to the wood by any means. The business at hand is to level the finish. Proceed from 400 to 600, wiping the work area dry frequently and peering across the surface to see that imperfections are disappearing. When the finish is perfectly level all over, give it a good shine with a hard rubbing down with plain auto wax that has a bit of abrasive in it. Rottenstone used with a little oil will do the same job. This is assuredly *not* a finish that can be easily used on a carved stock.

I find that a good wet-sanded finish using one of the varnish sealers I've discussed takes just about a week, though I've done it faster. The result is a lustrous, highly durable finish that has considerable depth of tone thanks to the restaining carried out between applications. If you stained fairly dark to begin with, the finish will also have a bit of mellowness to it in that areas of carving ground and fluted moldings will be just a bit darker.

If you want a really funky, patinated stock, that's really not at all difficult. A really fine sham patina comes in a paint can. Now, the ancient patination that is a product of decrepitated finish skin, soot, heat, general filth and so on is never really black, but is more a very deep brown or even a greenish brown. Buy a can a flat black enamel, and a can of bright red, and dribble just enough red into the black so that when viewed in strong light it looks like a brownish-black. When the stock has received its' final wet-sanding, you can now use the "canned patina" for judicious "aging" of the stock. The cove behind a cheekpiece, under the cheekpiece, deep carving cuts, moldings, below the lock mortise, and any other place where natural wear would not occur can be grunged up by lightly feathering in a paint job, rubbing out along the edges of the "patination" with the fingers to blend it in. If you really want things crummy, powdered lampblack can be dobbed into the wet paint, providing a thicker, ropy appearance, but if you want to go that far you'll likely have to beat up the stock as well. All this ersatz aging will need to setup for a day, and then light coats of sealer can be rubbed over the entire mess for startlingly realistic results. I personally don't use such techniques except for restoration work,

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(GUNSTOCK FINISHING)

since I like nice rifles to have a clean look, but I don't fuss overly long with those who like funk. The One and True Master of such tricks is Herschel House, whose fine "aged" guns have fooled even advanced collectors.

Now, as to sources of supply. Both the Sherwin-Williams A66 V91 and the DuPont 704C may be bought at the store; both require thinning with mineral spirits in order to be used as a sealer. The Express Oil Sealer and Express Oil Filler are available from Lowell Manley, 3684 Pine St., Deckerville, Michigan 48427; the sealer is $5.55 a pint, the filler $6.75, and Lowell has a finish tinter called "Rose Pink" that provides the same hue to the finish that alkanet or Brazilwood might; it's $6.00. Allow about $3 for shipping.

Both red mahogany and a good yellowish walnut NGR stain are available from Wampler Chemical Company, 1730 Dealton Avenue, Harrisonburg, Va. 22801. Gallon quantities are the minimum order, but I don't have current prices; I'd expect something around $14 a gallon.

One last tip. When a finish has "skinned" over in the can, throw it out, for the skinning indicates a chemical change. To avoid that happening, it's best to decant cans of finish into smaller-quantity vessels unless you finish a lot of gunstocks. Express Oil will last well over a year in a can that is frequently opened, but much longer than that if you keep it in smaller containers.

You say you still like linseed oil? Well, I do admit I like to rub a gunstock, just like I like to pet dogs and rumple kids' hair. And I like the smell of oil. Even so, I don't use it, but if you must, at least put it on *over* a good varnish sealer base that *will* at least keep most moisture out of your stock wood. That's a bit of a compromise over using finish materials that really do have good properties, but it's a compromise your stock can live with.

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