

Wood News

Published by Highland Hardware, Inc.

Serving Woodworkers

Number 15, Spring 1985

George Frank, Tage Frid and Michael Dunbar at Highland this Spring

George Frank led off Highland Hardware's spring series of woodworking seminars by authors February 22-24 with his demonstration of what stains, dyes and finishes are, and when, why and how to use them. His article "Sex and the Woodworker" appears on page 6 of this issue of *Wood News*.

Tage Frid will be in Atlanta March 22-24 for a seminar on wood, design, hand and machine joinery, bending, veneering, turning and finishing. As this issue goes to press, the weekend seminar is already sold out but there is limited space left in the introductory slide lecture on woodworking design Friday evening at 7:30pm. The cost is \$5, and you must register in advance. *Friday evening's location has been changed to the Habersham Room at Colony Square Hotel, 14th at Peachtree.*

Michael Dunbar appears in Atlanta for the first time on April 19-21 for a seminar on Windsor chairmaking. As this is written, limited seating remains available in both weekend seminar (\$90) and introductory slide lecture (\$5) Friday evening at 7:30pm. You should register at Highland Hardware as soon as possible.

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At his evening slide lecture April 19, Michael Dunbar will explore the question "What is a Windsor Chair?"

Season for Savings

Special purchases from a number of our suppliers have enabled us to offer outstanding prices on some of our top products. On pages 2-3, we describe specials on the Inca model 330 bandsaw, and on Makita's 2030 planer-jointer, 2040 15" thickness planer, new 2020 8" jointer, and new model 2708 8" carpenter's tablesaw.

On page 13 we announce new lower pricing on the Lamello plate joinery tool, plus a new line of Lamello accessories, hardware and companion tools.

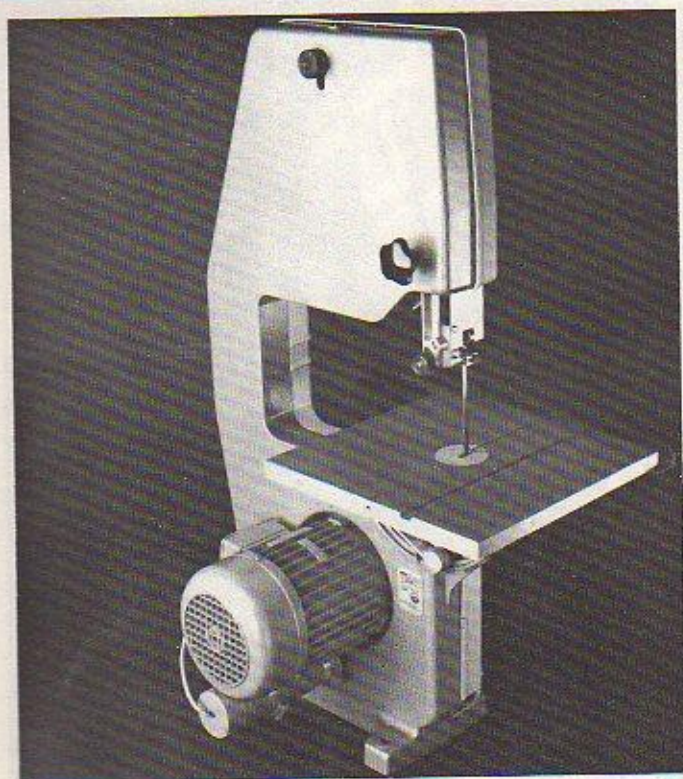
And on page 15 we make a special offer on the Nibex model 202 precision mitre saw and the Makita 3/4 hp router. We invite you to take advantage of these good opportunities to save.

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Editor Chris Bagby
 Assistant Editor Zach Etheridge

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Wood News solicits manuscripts contributed by readers. We pay \$40.00 (in tools) per page for material selected for use in Wood News. Enclose b/w or color photos. Submit material to Wood News Editor, c/o Highland Hardware. Deadline for next issue is June 1, 1985.



Inca Bandsaw - \$495

A special purchase of Inca's motorized model 330 10-1/2" bandsaw has enabled us to lower the price on this popular machine from \$565 to \$495, only while current supply lasts. The 330 provides excellent precision resawing on boards up to 6" wide, and its direct-drive .6 hp motor enables convenient portability for on-the-job use. Optionally available is a guide kit which enables extremely tight scrolling with 1/8" diameter blades. (The set of special guides with two 1/8" blades costs \$46.50). A stand (\$99.50) and mitre guide (\$34.50) are also optional. A rip fence is included as standard equipment.

See the Inca 330 bandsaw demonstrated along with most of our other stationary power tools at our free demonstration at Highland Hardware Saturday, April 27 from 9am-4pm. Special offers on a number of the tools shown will be made only for those attending the demo. Register in advance in order to reserve yourself a space.

To get the \$495 special on the 330 bandsaw, you should order now, as we have only 20 available at this price. Delivery of Inca tools not picked up at Highland Hardware is via truck freight collect from Atlanta.

Sharpening News

Diamond and silicon-carbide sharpening and grinding materials are fast acquiring a following here at the store. We now offer a variety of affordable diamond-coated sharpening and lapping tools, two new silicon carbide Green stones (one being the Green wheel for the Makita 9820 sharpener, as seen in our 85 catalog), and an expanded range of grit sizes in silicon carbide powder.

Diamond paddles (3/4" x 2" surface on 6" paddle) are perfect for touch-up honing of carbide router bits, shaper cutters, and other cutting tools. (Fine, \$4.95; Medium, \$7.95; Coarse, \$9.95, plus shipping).

Mounted flat stones (1" x 3" on walnut base) are remarkably efficient with chisels and carving tools, and will excel at hand-held lapping of plane soles and other tools. (Fine, \$7.20; Medium, \$9.90; Coarse, \$17.30).

The **unmounted flat diamond stone** (1" x 3") will economically do a fine job of maintaining jointer and planer knives between sharpening. (Fine, \$6.25; Medium, \$8.95; Coarse, \$16.30).

Following the enthusiastic reception of the 120-grit Green wheel we're offering for the Makita 9820-2 sharpener (offered in ad below), we've brought in another Green stone for the kind of tools the sharpener can't handle. It's a 180-grit Green slipstone for fast re-shaping by hand of combination plane irons and other small cutters. (\$4.95 plus shipping).

Loose silicon carbide powder, used mostly in flat grinding and lapping the backs of plane irons and chisels, is now available in 46, 90, 180, 280, 400 and 600 grits. 2 oz. of one grit costs \$1.95, or get 2 oz. each of the 6 grits for \$8.95 (plus shipping). Order on page 23.

JAPANESE WATERSTONES

America's best selling new sharpening stones. Rapid cutting action produces razor sharp edges in minutes by hand.

SET OF THREE WATERSTONES \$39.50 POSTPAID

Set includes a 1200 grit medium stone for establishing a sharp bevel, a 6000 grit finish stone for honing and polishing the edge, and an 8000 grit Gold finishing stone for producing a final edge of unsurpassed quality. Medium stone is 2 1/2" x 8" x 1-3/8". Finish stones are 2 1/2" x 7 1/4" x 1/2".

GREEN COARSE STONE \$19.50 POSTPAID

This 200 grit silicon carbide waterstone pictured above features an extremely fast cutting action suitable for grinding out nicks in blades and reshaping bevels, yet is hard enough to resist rapid hollowing common to most manmade coarse stones. Complements the set of waterstones above. 3" x 8 1/4" x 2".



MAKITA BLADE SHARPENER

\$195.00 POSTPAID Model 9820-2

Sharpens jointer & planer knives up to 16" long with great speed and accuracy. Medium grit Japanese waterstone rotates in gravity-fed water bath for safe work on your edge tools.

OPTIONAL ACCESSORY JIG (shown in use at left) for chisels & plane irons... \$12.50 Postpaid.

NEW GREEN WHEEL

for 9820-2 \$35.00 POSTPAID

120 grit silicon carbide wheel rapidly re-shapes bevels and grinds out nicks in HSS or carbon steel blades. Also sharpens carbide planer knives.

MC/Visa users outside Georgia

ORDER TOLL FREE

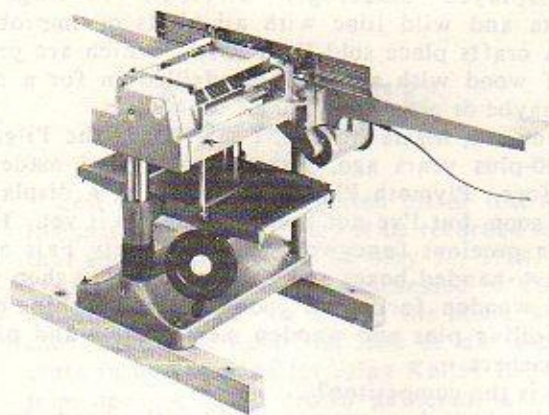
(800) 241-6748

(Orders Only)

Or send check, money order, or MC/Visa info to Highland Hardware. Prices are Postpaid in U.S. Send \$1.00 for our tool catalog (free with order).

highland hardware

1045 N. Highland Ave., NE Dept. WN
 Atlanta, GA 30306 (404) 872-4466



2030 Planer-Jointer - \$1295

Long a favorite because of its capacious compactness, this machine is now available at a tremendous savings. Offered for \$1499 in our 85 catalog, the 2030 is available from us for \$1295 POSTPAID while our special supply lasts. We have used a 2030 under rugged conditions in our hardwood shop for the last 5 years with total reliability and minimum maintenance. Its autofeed planer handles stock up to 12" wide by 7-1/4" thick. The 6-1/8" wide jointer has a total bed length of 59" for serious edging duty. Arrives fully assembled with high performance 2 hp 110 volt Makita motor. Weighs 276 lbs. Shipped free to the 48 adjacent states via truck freight.



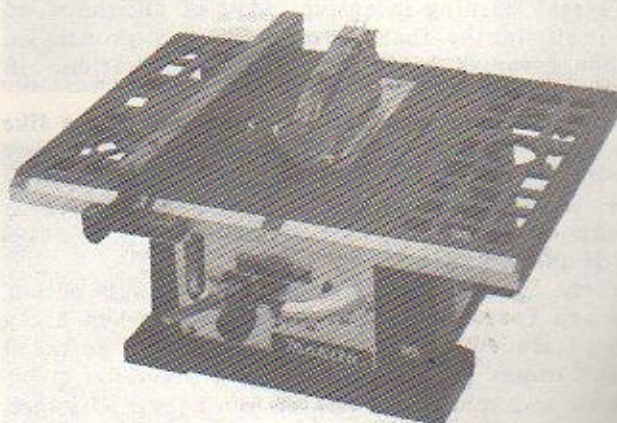
2020 8" Jointer - \$1095

New on the market and quite innovative in its design, the Makita 2020 8" jointer was brought to market by popular demand. Its unique rack and pinion arrangement for raising and lowering the tables eliminates the inevitable wear inherent with sliding ways common to conventional competitive jointers. Powerful 2 hp 110v Makita motor. Net weight is 198 lbs. Bed length is 59-1/2". Shipped freight prepaid within the 48 adjacent United States. \$1095 is our introductory price for the Makita 2020 jointer.

2708 8" Tablesaw - \$249

This powerful new lightweight saw is attracting a lot of attention here at the store, as much among basement woodworkers as among the construction-trades professionals for whom the saw was designed. The 2708 has several important features going for it: it's a saw that's very affordable without being just plain cheap; light and portable (37-1/2 lbs.) without being rickety; and quite compact without being a toy. A new 12-amp, 4500 rpm motor designed for the saw has an unusually long armature and heavy windings to provide a solid 2hp output and great ability to take heavy loading without overheating. Max depth of cut is 2-1/2" at 90°, 1-5/8" at 45°. Table size is 26" wide by 18" deep; saw without stand is 14-3/4" high. Full length rip fence and mitre guide are standard equipment. (Note: rip fence can be set up to 10-1/2" from blade; methods for extending the maximum ripping capacity to 24" are being considered by Makita but are not yet available.)

The optional steel stand for the 2708 is, like the saw,



light (13 lbs.) but surprisingly sturdy. It is particularly recommended for those who plan to take advantage of the saw's portability. Another option is a set of three extension bars which can be mounted to the saw table, providing 11-1/2" extra lateral support (each side) and 11" of outfeed support.

Model 2708 tablesaw is \$249.00 Postpaid. Stand is \$48.00. Extension bar set is \$28.00.

And They Call Me an Artist

©1985 by Wallace Macfarlane

TREEN: Made of 'tree'; wooden. Of or belonging to a tree or trees; in quot. 1670, obtained or made from trees.

Oxford English Dictionary

When I began to make treen for fun and profit, I worried about the competition. How about all those woodturners who laminate exotic woods at an angle and turn bowls translucently thin? Precise craftsmen with micrometers in one pocket and scale drawings in another? How about those hand-rubbers who finish wood smoother than a baby's cheek?

What I have is a Shopsmith made in San Francisco, serial number 1200-something. I got it from a friend for \$100, and he threw in a kerosene heater, a desk lamp and some chisels made in the USA. "How does the lathe work?" I asked. He sawed off a broom handle, chucked it and gave me 15 minutes worth of formal instruction. All this happened a long time ago. I used the Shopsmith to rip batts for the barn, to cut up kindling, and to make shelves for my wife.

So a few years back, when I wanted a mortar and pestle, I naturally went to buy one. What I found were a few dusty samples from Sweden. They were made of birch. The turning lines were still there. They were ugly and cost an unreasonable amount of money. "Hand work," said the salesman.

Maybe so, but I had a mental picture of a tree trunk being shoved into the machinery, with rolling pins and mortars and finally toothpicks coming out the other end of the factory.

I went home, cut a dead branch off a French prune tree and made a mortar. It had a deep-enough hole at one end. The walls were half an inch thick to withstand the pressures I imagined when I would grind herbs with the six-inch pestle I made. I oiled it with Wesson oil and what do you know? It worked. It still works.

And I was hooked on woodturning.

There's a mystique about spinning a piece of wood on a lathe. The exercise preempts your attention. You'd better not think of other things or you'll hurt yourself. This is a real learning incentive. Most of all, the wood reveals itself in the shapes you spin. Any proper job makes hours vanish in interest and concentration. If this is not so, look for another line of work.

I kept on turning wood and finding out things like wearing goggles and how to use polyurethane and what to do with all that sawdust. I read *Fine Woodworking* when it began and found it mostly concerned with fancywork or flat wood. I still don't want to make cupboards unless I have to.

When my friends and relations had enough potato mashers and foot rollers and champignons, when every gardening friend was equipped with a dibble, I persisted in making things on the lathe. It was plain too much fun to quit, so I sold things at a church bazaar. I joined the Art Guild and sold more things at shows.

This was when I began to look for the competition. Writers read books; painters look at pictures; architects deplore other buildings; cooks eat out; everybody learns new ideas from other people. I looked for treen.

Some fancy food stores had teak bowls from southeast Asia - you push in a tree at one end... you know. A specialty shop sold myrtle wood bowls finished in oil or glass, all to the same sixteenth of an inch. An artistic

store displayed amazingly difficult turnings of manzanita and wild lilac with all kinds of improbable voids. A crafts place sold "bud vases", which are pretty pieces of wood with a bitsy hole drilled in for a dried flower maybe or a weed.

In Plymouth, Massachusetts, I saw bowls the Pilgrims made 300-plus years ago, just the same as I made the week before. Plymouth Plantation promised a display of turnings soon, but I've not been back to see it yet. There was some precious fancywork at the County Fair along with heavy-handed boxes and bowls. In a gift shop were racks of wooden forks and spoons, with machine-made French rolling pins and wooden meat beaters and pitiful potato mashers.

Where is the competition?

Who else is doing mortars and pestles, and darning eggs, Lazy Susans and stools, cutting boards and spinning tops, yo-yos and rolling pins and freestanding towel holders? And boxes and finials and all the other shapes that strike my fancy.

I've made friends with a wonderfully accomplished technical woodturner. He makes cups that ring when you tap them with a fingernail. He turns bowls patterned so intricately it boggles the mind. He and I exchange views on wood and dogs, and curing methods and limericks, and oil and wax and polyurethane. While he does splendid work, he does not make useful articles of wood.

The ancient Egyptians made treen. So did the Greeks and Romans and everybody else. Right today, at least once a month, somebody will come up to me and breathe heavily. "I'm in love with wood," they say, and press money into my hand. Sometimes they look into my eyes and call me an artist. This makes me scuff my toe, but they do buy the merchandise.

How come nobody else is making treen?

Wallace Macfarlane lives in Santa Ysabel, California.



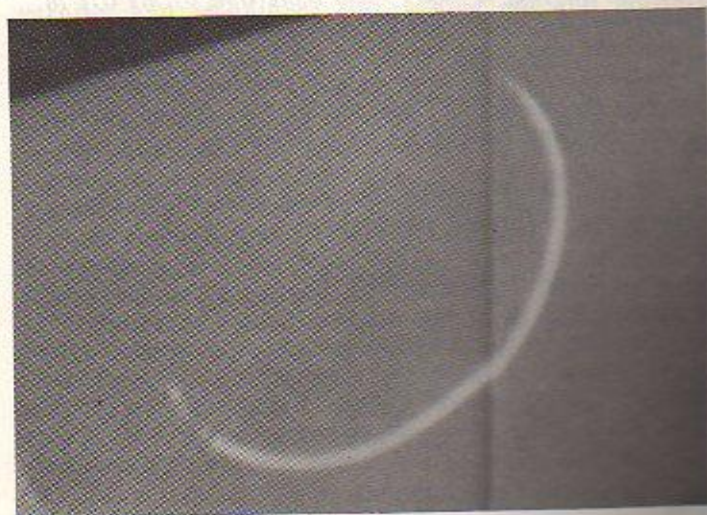
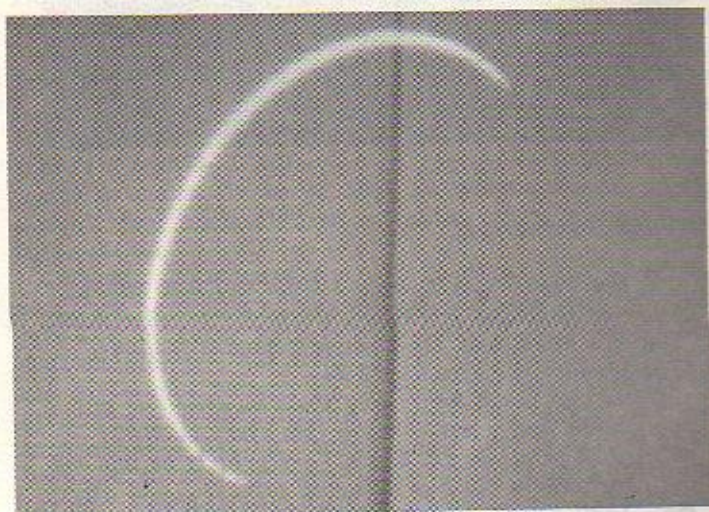
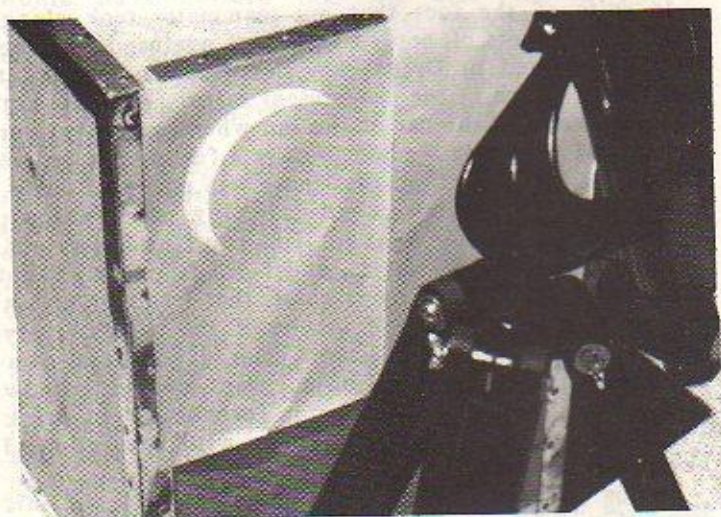
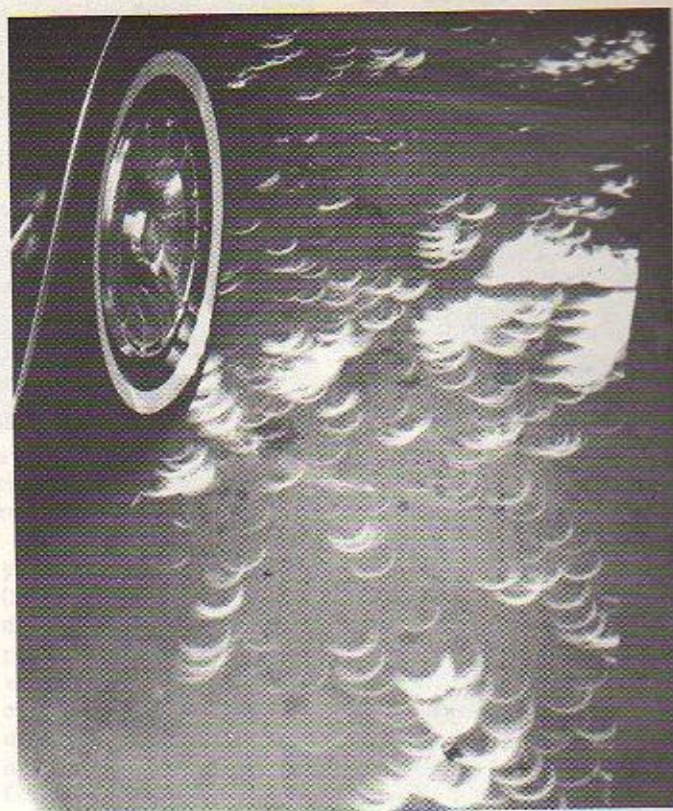
*Editor's note: Though he doesn't think to call it treen, Bruce Boulter in his book **Woodturning in Pictures** devotes thirteen chapters to methods of chucking blanks in the lathe to turn a variety of small turned objects, from eggs and egg cups to goblets, bowls and scoops, and from nutcrackers and corn cob holders to vases, lamps and sand-glasses. Essentially the book consists of extensive photos and captions giving detailed directions for using the English 6-in-1 chuck, which we offer on page 7 of our 1985 catalog. We stock models of the chuck to fit Rockwell, Sears, Myford, Hegner and Shopsmith lathes. Outboard chucks are available for Rockwell and Myford lathes. Chucks for other models may be available by special order if you tell us your lathe's make, model, and spindle diameter and thread. Cost is \$89.95 plus \$4.20 shipping (Specify your lathe when ordering the 6-in-1 chuck). The book **Woodturning in Pictures** can be ordered from us for \$12.95 plus \$2.50 shipping.*

ECLIPSE

Lest it become a forgotten bit of lost and insignificant history, may it be recorded here that shortly after noon on May 30, 1984, we at Highland Hardware witnessed a total annular eclipse of the Sun by the Moon, with the image cast upon the side of an import crate in our parking lot using Kelley Bagby's telescope. A small crowd gathered, a hush fell, the sky grew dim, and we exclaimed. Crescents of light danced on the pavement beneath a tree we were fortunate to be near.

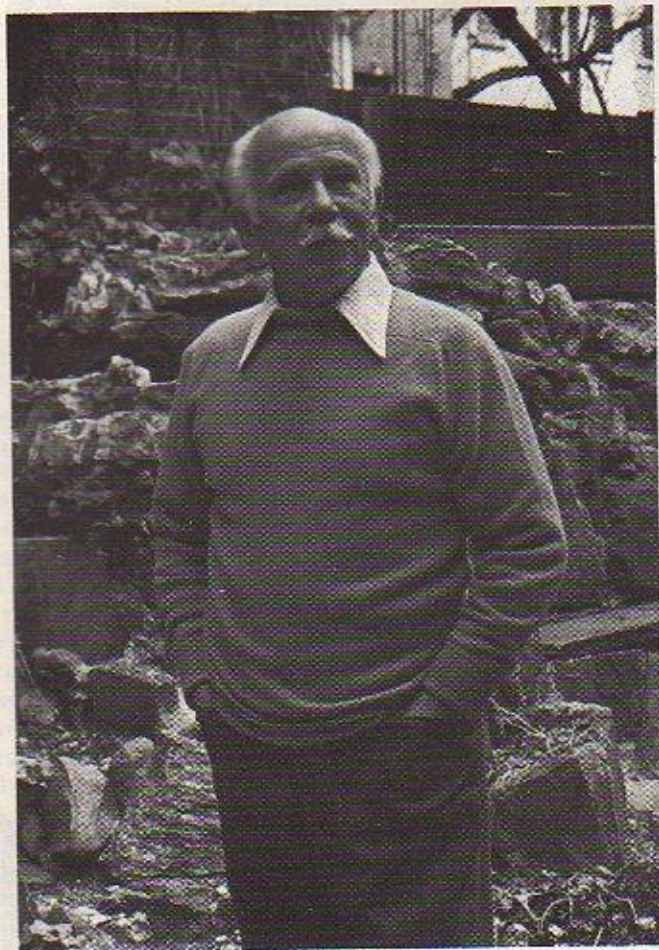
Praise God none of us burned our eyes, thanks in part to stargazer eye protection provided by Wendy's hamburgers and passed around among us till all grew tired of watching the crescent growing round again through the dark lens.

Afterwards, we returned to the bustle and routine. The day on which Sun and Moon crossed paths at Highland Hardware receded into the past. The memory lingers on.



Sex and the Woodworker

c1985 by George Frank



Fellow Woodworkers,

A few weeks back I wrote a letter to Chris Bagby, owner of Highland Hardware, starting with these words: "You just hired yourself a two left handed lecturer." (The seminar is February 22-24).

Chris also asked me to contribute an article to this publication, and I sent him one that every publisher refused to print. So did Chris. Very politely he told me the paper would blush if he would print it ... and asked me: "Shall I send it back to you, George?"

Now, the fact is that I spent more time of my life in woodworking shops than Chris Bagby and his staff combined, and I can vouch for the fact that among woodworkers the #1 topic of talk concerns woodworking, mainly the project at hand, but topic #2 is--you guessed right--sex, and believe me, there is nothing wrong with it.

So, if Chris is printing this story, don't blame him, blame me. . . I asked him to do so.

Au revoir et a bientot,

George Frank

Dreux is a busy little town in Normandie, about 75 miles west of Paris. It is so busy in fact that the Banque de France decided to open a branch office there in 1926.

I was working then for Papa Fernan, who had the contract to finish the woodwork of these banks. I was pleasantly surprised when on a September payday, while handing me my envelope the boss motioned for me to wait. Four more men received the same signal and when all the others departed we learned that the five of us had been selected to go to Dreux and finish up the bank. I was twenty-three at the time, Fernan's youngest employee.

These assignments were coveted among Fernan's thirty-to-forty workers, since they involved generous extra pay, easier working conditions and far greater freedom than we had in the home-shop in Paris. No wonder, shortly after learning about our good fortune we went to celebrate it in the nearest bistro, each of us offering "Une tournée" to the group.

The weekend over, early Monday morning we met at the railway station, the Gare de l'Ouest and noticed that we had forty minutes to kill until the train's departure. Obviously the station's barroom was the place to do so.

In spite of the fact that my teammates took along generous amounts of bottled insurance against it, by the time we arrived in Dreux they developed a new thirst and found solace in the everpresent bistro. A repeat act was performed at the bar of the inn where we rented our rooms, and evidently we had to have a few drinks before lunch. By then I realised that there was no way I could keep pace with my hard-drinking companions; furthermore I did not want to. I had to find a way out, without offending my mates, and I did find one. Right after lunch I told Carlos, our chief, that I had to have a private talk with him, and in one of the bank's empty offices I spoke to him: "Listen Carlos, I hope that you can keep a secret, because I do not want anyone to know that I have the clap. The doctor forbade me to drink any alcohol, and if I try to keep up with you fellows I never will be cured."

Carlos assured me of his understanding, of his sympathy, of his eagerness to help and of his discretion. He kept his word and never uttered a single word about my ailment, never. But when he ordered drinks for our group he emphatically specified milk for me, commenting? "The kid had an accident and for a while milk is better for him." Of course, no one guessed the kind of "accident" I had, and everybody was much too discreet to inquire further.

This arrangement suited me quite well. I love milk and Normandie has the reputation of producing the best of it. The five or six big glasses of this rich beverage that I consumed daily did a lot of good to me and soon I realized that my young and healthy body had other needs besides food and drinks. It was no miracle that I noticed that the innkeeper had an 18 year old daughter, Andrea, and that she was quite easy to look at. She filled up attractively every inch of her dress. She had rosy cheeks and an always ready smile, mainly when she spoke to me. She gracefully accepted my invitation to the cinema, enthusiastically so, since Jean Gabin was the star in the film.

Next morning the innkeeper invited me to his kitchen and made a little speech that went something like this: "Young man, I do know the reason why you drink milk. I was young too, and I had the clap not one, but three times, and I drank milk, same as you do. I know that you took my daughter to the movies last night and noticed that you two, you get along quite well, and I understand that. But there is something I want YOU to understand, and with these words he picked up a sharp ten inch long knife. I want you to understand that Andrea is a clean, decent girl and that this knife will go all the way up in your belly if she catches the clap from you. Am I making myself clear?"

I assured him he did, and that I had not the slightest intention to transfer my infection to such a charming creature as his daughter. "I am greatly attracted to her, but my intentions are clean and honorable. I approve your concern, Monsieur, in fact so much so that I am asking you a favor. Please let me have that knife and let ME have the privilege to stick it into the belly of the thug who harms this pure child or who despoils her."

Either I was an accomplished liar, or the innkeeper was much too gullible. He smiled at me, shook my hand and we both went to our daily chores.

Andrea and I kept company as frequently as we could and it was not too long before I told her about my fictitious ailment to her great amusement.

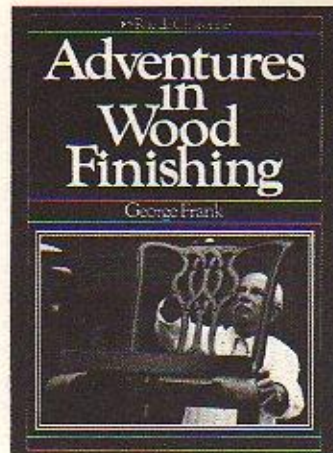
Alas, about three weeks later our job at the bank was terminated and to our great sorrow we had to say "Adieu" to all our friends in Dreux. A keen observer would have noticed that the kiss Andrea and I exchanged was not the superficial, innocent type, wasted on the two cheeks. It was the kind practiced by lovers whose lips meet tenderly and part reluctantly. But there were no keen observers; all the others were busy with their drinks.

Back in Paris, I sorted out my sweet memories of the time I spent with Andrea, and was about to write her a love letter "Poste-restante" as we agreed, but somehow I was disturbed by an itchy feeling around my lower section. I postponed the letterwriting and concentrated on scratching.

A few days later there was no longer any doubt about it; the clean and decent girl did not catch the clap from me, since I did not have it, but she gave me the gift of a large and prolific family of crab louse, and it took the best part of three weeks and three jars of poisonous ointment to get rid of them.

Furthermore, it was not easy to justify to my Paris girlfriend my abstinence.

Andrea is still waiting for my letter.



By George Frank. The first time you read *Adventures in Wood Finishing*, your most distinct memories might well be of anecdotes rather than finishing formulas. George Frank was clearly born to be a story-teller, and has managed to make a living as a wood finisher only because the trade is such a good source of tall tales. The editors at Taunton Press have seen to it that none of the stories goes quite so far afield

as the one published in this issue of *Wood News*, but there are numerous more topical events equally well recounted.

In the chapter titled "Elegant Fakes", for instance, you'll learn how to bury wood in a pile of horse manure (first quality only, of course) to produce just the proper degree of artificial aging. Then there's the tale of putting the torch to a baron's bedroom suite and watching the whole thing disintegrate before the owner's eyes - now that's a finishing technique! And there's the mystery of the finisher and the perfect crime, which has nothing to do with finishing except that it nearly finished the author...

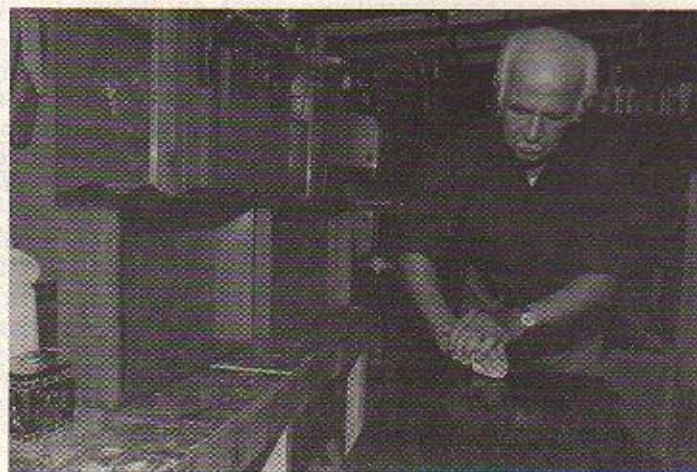
Not all the book is funny stories, of course, for they alone would not have earned such descriptions as "the wood finisher's bible". If your first reading is as much entertainment as education, your second will be more like serious study of the surprisingly large amount of detailed information about both classical and home-grown finishing techniques. As Frank says in his preface, there's a standard collection of facts and formulas that seems to appear in every book on wood finishing, so he doesn't feel compelled to reiterate every bit of basic information.

Instead, you'll learn what to do with logwood if you ever run across any, how to get the most out of those jars full of rusty nails, and the secret of a brown dye that doubles as a hot drink on cold days. You'll examine the difference between stains and dyes, and consider the effects of various mordants on particular woods and how they enhance dyeing. You'll learn how to gas an entire building to get just the right color on the furnishings inside. You'll study sanding; filling (including colored fillers); finishing with wax, oil, shellac, lacquer and varnish; and techniques for rubbing out and polishing the finish once it's on. You'll find out what Frank has discovered in sixty years of experimenting with bleaching, burning, blasting, and burnishing (such as with chain mail). And if you've got any questions left you'll probably find the answers in one of several sections Frank devotes to queries from readers of *Fine Woodworking*, for which he serves as contributing editor.

Once you've gotten through your second reading, you'll be ready to put the book to use, for it will make an indispensable handbook in the shop. With so much information at your disposal it would be difficult to say which item is the most important thing in the book, but regardless of the specific information which proves useful to you, you'll surely find yourself greatly encouraged to approach finishing with a fresh eye and a considerably lightened heart.

Reviewed by LJE

The book is available from Highland Hardware for \$9.95 plus \$2.50 shipping.



Thoughts on a Working System

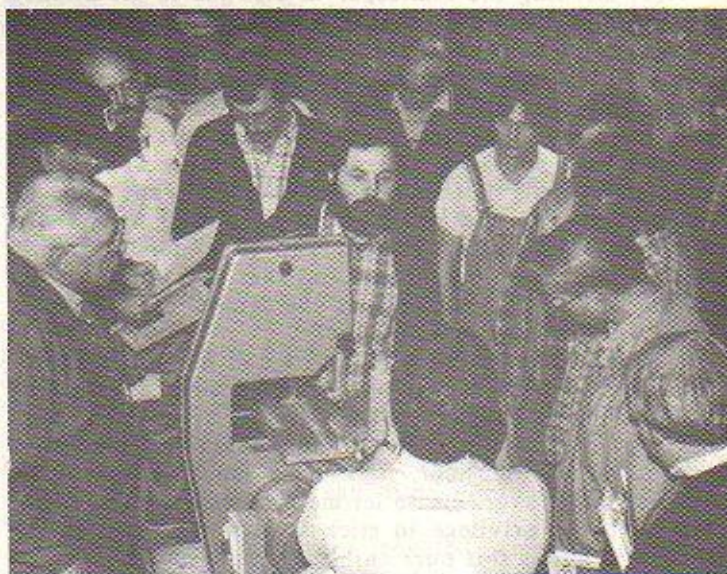
c1985 by Mark Duginske

Woodworking is an ancient craft in the middle of a revival. A small number of modern woodworkers are doing work on par with the best in history. We now have access to the best tools and techniques ever available - our work ought to be good. Even with all of the modern advantages, however, many contemporary woodworkers are not happy with their work. Their progress is painfully slow. The modern woodworker is missing something; his approach is incomplete. This is particularly true of the novice who is self-taught. The rare successful woodworker of today shares something with the woodworker of the past. We will attempt to explore why both function well and how the developing woodworker can improve.

Woodworking is a lot of fun, and on one level it is quite simple. You measure a board and then cut it. No problem, just pay attention. The harder part of woodworking is understanding, and hopefully dealing with, the minor details. Woodworking is a series of steps. The proper sequencing of each step is critical. Each step depends on the accuracy of the previous steps. An error, poor judgement or sloppiness at an early stage will haunt you later on. We all know that horror story.

Fundamentals are incredibly important. Once you can make a nice square box you can build nearly any piece of carcass furniture. Making the first square box is the hard part. The beginner re-invents the wheel with each project. The first time you try something, it takes a long time. The second time takes less time and less mental energy. The first cabinet or chair is actually a prototype and should be accepted as an experiment. It is normal to feel that you would change something if you did it again. You may want to change the design or technique, or both. The third attempt would be even more evolved. By the tenth time you will have developed an efficient system.

At each step of the building process there is a jungle of options. There are few concrete right answers. Two experienced cabinetmakers will use different tools and techniques, yet arrive at similar results. Each step is a move in a chess game. You must consider all of the different pieces and how they relate to each other. It requires that you balance many factors: your skill (or lack of it), wood technology, your tools, design, aesthetics and technique. The list goes on and on. It becomes rather complex because everything is inter-related. Picking the most important element is similar to picking the most important noodle in a plate of spaghetti. How does one begin to deal with all of these equally important considerations? An answer may be found if we look at the woodworkers of the past and try to understand their approach. Throughout history each culture developed a system to deal with the complicated problems of design and construction. Each system balanced the cultural needs with the locally available materials. The Japanese system is quite different from the various European systems. The European systems are different from each other. Each system works well in its



particular region. Through trial and error the systems evolved over generations.

Historically, woodworkers worked in small groups. Family members often composed the group. In contrast, most woodworkers today work in isolation. Few function together well as a group.

The group not only supplied physical help, but also provided emotional and financial support. The approach to design and construction used by each group was the accepted system of their area. Each group would vary its techniques slightly but the general system remained intact. The slight variations contributed to each group's particular style.

A style is the result of a working system. The Shaker "style" is the natural outcome of their system of design and construction. The Shakers didn't hire a "designer" and ask for a line of simple furniture with exposed joints. Real style comes from within the piece; it isn't clothing worn on the outside. Our modern preoccupation with "style" often results in the superficial work we see today. Old handmade furniture often has real style. You don't get the feeling that the person who made it was trying too hard, a frequent feeling with modern work. Pre-industrial objects reflect an evolved refinement which is rare today. The refinement is the result of a system which blended design and technique in a compatible way. The system evolves over years. The early Shaker furniture is clumsy in comparison to the more evolved later pieces.

The traditional woodworking system was also an educational environment. The apprentice was an integral element in the system. The apprentice started by doing basic tasks. He then gradually learned to function at a higher and higher skill level. He was not responsible for design; that was the master's area. The apprentice enjoyed the advantage that today's beginner has when he uses a plan. The complex problems of design have already been solved. The apprentice did the basic preparation work requiring more muscle than skill. It was a good use of adolescent energy. Apprentice work was very repetitive. After enough repetition a process becomes a habit. At the habit stage the process is automatic; little energy is wasted. Modern woodworkers rarely evolve to the habit stage unless they are experienced professionals.

The successful woodworker of today mimics the cultural system. Both have developed a system through trial and error. Their systems suit their needs and contribute to their individual styles. Real woodworkers are often poor teachers because their systems are so fluid, hard for them to analyze and bottle into words. A woodworking system is a soup, a mixture of ingredients which work well together.

It is worthwhile to look closely at a "system" to see how and why it works. A system is a group of solutions to specific problems. It is a framework, a set of shelves, which helps separate and organize each step or process. A complete system must include the material, design, technique and skill; it must somehow make sense out of the mixture. A system provides the ounce of prevention; it anticipates and arranges each step. Anticipation of what can possibly go wrong helps avoid frustration. A system lubricates the woodworking process, maximizing energy and avoiding waste.

A mature system is past the experimental stage; it provides certainty. After you become efficient at a particular technique it becomes part of your system. If you think about it, we have systems that we use every day. We have a system for brushing our teeth, putting on our shoes, etc. A system helps to organize activity without a great deal of mental effort. It is particularly handy for activity requiring multiple steps such as cabinetmaking. Little things add up. Keeping a router in a box with everything for its function adds to your system. It saves the time and frustration of looking for wrenches and screwdrivers. Anything that saves time and decreases frustration adds to a system.

How does one go about developing a system? First, you must decide what your goals are, the type of work you want to do. Are you doing it for satisfaction or for money? If you are doing it for a living you must gear your system and your mentality for survival. In the last fifteen years, too many idealistic people tried to do woodworking for a living. Many failed because they were inefficient. They hadn't developed a system of their own. It is very hard to simultaneously earn money and develop a system.

After you decide on the kind of work you want to do, you can concentrate on developing your own system. If you have been doing woodworking for a while you have developed your system partway. You have solved some of the problems. You have a repertoire of techniques that work well for you and are now part of your system. You are also aware of things that you haven't worked through. A technique is two-fold. Part is conceptual while the other part involves skill. Thinking or reading about something (conceptualizing) and actually being able to do it (having the skill) are two completely different things. A technique becomes part of your system only when you can do it.

Ideas and concepts are seeds. With the informational explosion of the last few years we have access now to a multitude of ideas and approaches. Books and magazines are raw information, a garden. You must pick, clean, and process the individual components to make your own soup. When you read someone's book you are reading about their system. It is a temptation to copy someone else's system. There are some problems with that approach. Copying someone gives a false sense of development. What works for them may not work for you, and vice versa. Do you really want your furniture to look like someone else designed it? Probably not. However, we can learn from someone else. We should be

receptive and experimental. Borrowing an idea or technique is productive; slavishly copying someone isn't.

A note of caution is appropriate when discussing written information. It is useful up to a point, but only up to a point. Woodworking is best learned in a real environment. A magazine picture may be worth a thousand words, but it doesn't give off the smell of freshly cut wood. It is not real. Magazines and books are good entertainment. They provide relief from the isolation of working alone. They often have more emotional than technical value. Don't take written information too seriously. "Experts" often give contradictory advice. This leads to confusion. Some woodworkers are intimidated when an article gets too wordy or cosmic. Others are intimidated by the dogmatic expert and lose confidence in their own ability. Many woodworkers feel that something is wrong with them when an article doesn't make sense. It may be that the article was grossly over-edited and didn't make sense to a lot of other people. Written information is a useful tool, but every tool has limits. The best way to use written information is to try out the ideas that are applicable to you and your shop. Only after experimentation will a process become your own, part of your system.

You should be conscious of your experimentation, but don't get too compulsive about it. You will do better if you play than if you act like it is a scientific exercise. When you get a new tool you should play with it. See what it does or doesn't do. Get to know it. Develop a habit of using it. Most woodworkers are too goal-oriented. They get a new tool to do a particular job and expect immediate results. If they don't get the expected result, they get frustrated. That starts a destructive cycle. It is healthier to be a relaxed observer.

A great part of your system is your physical environment, your shop and your tools. Getting your shop together is closely related to getting your system together. It takes time and energy. Your shop should help you be efficient and comfortable. It should become one of your favorite places, a private place devoted to exercising your creativity.

Making storage cabinets, jigs, and tools greatly adds to your system and is very rewarding. No one can develop your system for you. It is something you have to do for yourself.

Mark Duginske is co-author of a new book, The Inca Woodworking Machinery Handbook. The book is subtitled Useful Tips and Jigs for Everyone. Mark's co-author is Karl Eichhorn of Switzerland.

Although written in explanation of Inca woodworking machines, many of the concepts described apply to tools by other makers and will be of interest to anyone owning power equipment, especially those interested in making their own jigs and fixtures. The sections on the tablesaw and bandsaw are especially good in this regard. Other sections cover the shaper and the jointer-planer along with fundamentals of wood structure and behavior. There are over 300 clear illustrations and 155 pages.

With a list price of \$12.95, the book is currently available from Highland Hardware for the special introductory price of \$9.95 plus \$2.50 shipping.

Pictured here on the opposite page is Mark Duginske demonstrating the Inca bandsaw during his November, 1984 dovetail seminar which was held at Highland Hardware.

Woodworkers Guild of Georgia, Inc.

Submitted by Chuck Boelkins

The art and craft of fine woodworking is alive and well in Georgia, and is flourishing particularly well in the metropolitan Atlanta area. The concept of a woodworkers' organization arose back in 1980, when a group of acquaintances began holding informal get-togethers on a more-or-less regular basis, sharing their affection for the work, the tools, the tricks and trials of the trade. As these casual meetings began to attract more participants, it became clear that many, if not most, woodworkers felt like basement exiles most of the time, working in solitary secrecy and nearly total ignorance of what others were up to. *(The picture below was taken at one of the Guild's first meetings, held in December, 1980.)*



Early on it was suggested that a more formal, organized sort of organization be formed, and after a couple of years of struggle the Guild was born. News of early meetings was spread by word of mouth whenever members met at Highland Hardware, Carlton's, or other local watering holes; before long there were scheduled meetings, planned topics, officers, directors, and public showings of members' work. Membership in the Guild has grown slowly but steadily during the past three years, and the service provided has likewise grown in quality and variety.

At present we have about ninety members, representing all sorts of backgrounds and professions. About twenty are full-time professional woodworkers, many of whom have been at the heart of the Guild from the beginning. Some of our members are just getting started in woodworking; others are craftsmen as fine and talented as you'll find anywhere. We all share a great deal of respect for and love of fine woodworking, be it expressed in custom furniture, turnings, sculpture, carving or architectural millwork. Our primary goal is to encourage the highest level of individual excellence, and our monthly meetings, demonstrations, formal and informal shows are all conducted with that goal in mind.

Through the efforts of attorney Robert Tuttle, a Volunteer Lawyer for the Arts, The Woodworkers' Guild of Georgia has become an officially registered non-profit corporation in the State of Georgia. This is an important step forward in our long-range plans - we hope

to solicit financial support from local corporations for the organization of major regional shows of fine woodworking. It also means, by the way, that your dues are tax deductible! The various activities of the Guild are planned and managed by a nine-member Board of Directors which is elected annually by the membership.

A brief list of Guild meeting topics from the last year or so includes: demonstration of carving techniques and tools; tool sharpening; informal "theme" shows of turned objects, small containers, tables, "sittables", and children's toys; bowl-turning demonstration by Ed Moulthrop; a visit to Kirby Studios; visits to four "hand-made" houses; and demonstration of chainsaw carving.

Meetings planned for 1985 include: Forum on Finishing (part 2); Toxic Hazards in the shop; Origins and Controls; Open Show & Tell on Finishes; Legal Implications of being a woodworker; 2nd Annual Family Picnic and show & tell on "floatables". Most Guild meetings are held on the second Wednesday of each month, usually in the seminar room at Highland Hardware.

Membership in the Woodworkers' Guild of Georgia, Inc., is open to anyone who wishes to join. No special qualifications are required or imposed. Any member may stand for election to the Board of Directors or to executive office. Annual dues are \$15. If you would like to join the Guild, send your dues (payable to The Woodworkers' Guild of Georgia, Inc.) to Mark Palmquist, Treasurer, 5033 Arbor Lane, Lilburn, GA 30247. For a detailed schedule of coming events, send a stamped, self-addressed envelope to Chuck Boelkins, Secretary, P.O. Box 1113, Conyers, GA 30207. We invite you to attend a meeting or two to get acquainted with the Guild - we'd be happy for you to join our growing community.

We hope it's apparent that the Guild intends to be more than a woodbutchers' club or a mutual admiration society for nit-picking knot-knockers. By pooling the knowledge and experience of each member, the entire membership gains access to an extraordinary educational resource and a wealth of moral support. Works by Guild members have been shown at the High Museum in Atlanta, the Atlanta Arts Festival, the Fall Furniture Market at High Point, NC, and at many local galleries and invitational shows. Articles about and pictures of members' work have been featured in *Fine Woodworking*, *Atlanta Magazine*, *Southern Living*, and *Southern Homes*. We have members who make museum-quality reproductions and others who do restoration for the High Museum. We also have members who are just discovering the joy of filling their basements with sawdust, and members who do woodworking because it's such a wonderful excuse to acquire fine tools. Whether you're an established professional cabinetmaker or a part-time home carpenter with grand ambitions, we offer you the opportunity to become a better craftsman through membership in the Guild.

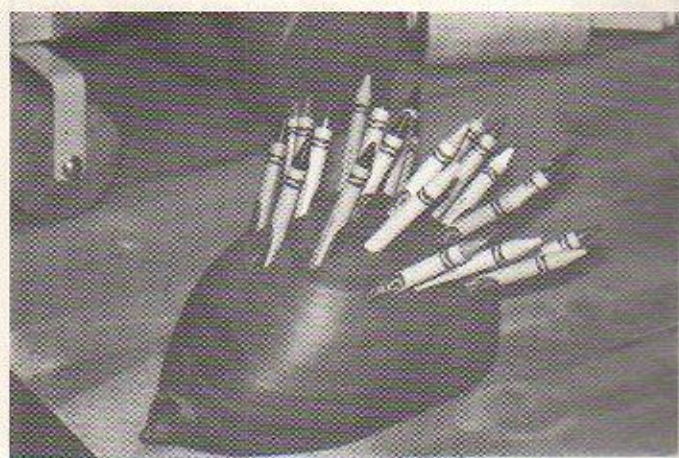
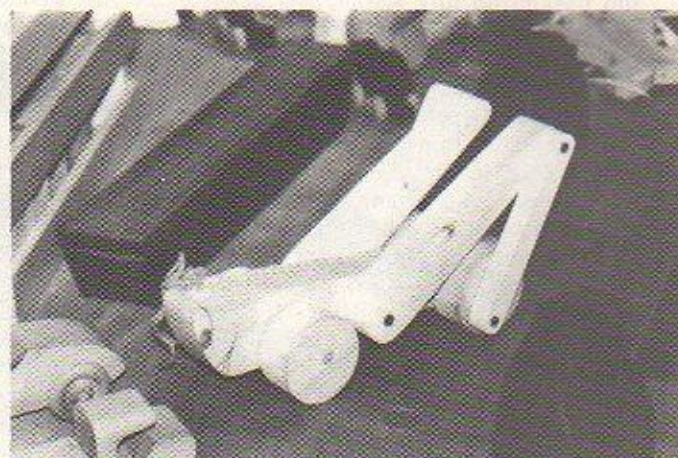
The Guild is deeply grateful to Chris Bagby of Highland Hardware for making this space in *Wood News* available to us, and for his long-standing support of our efforts to promote fine woodworking in the southeast.

Editor's note: If you belong to another southeast area woodworking organization, mail us some details and photos of your members' activities. We will be glad to give you free exposure in future issues of Wood News.

Guild Toy Project

The December meeting of the Woodworkers Guild consisted of a Christmas party for members, for which the price of admission was at least one handmade wooden toy. The more than one hundred toys collected from members were donated to Atlanta's Egleston Childrens Hospital as Christmas presents for seriously ill kids. Later, the hospital staff reported that the Guild had made Christmas morning especially bright for the several dozen kids who could not go home for Christmas.

These photos were taken at the December meeting.



Simple Jig for Routing Wide and Deep Mortises

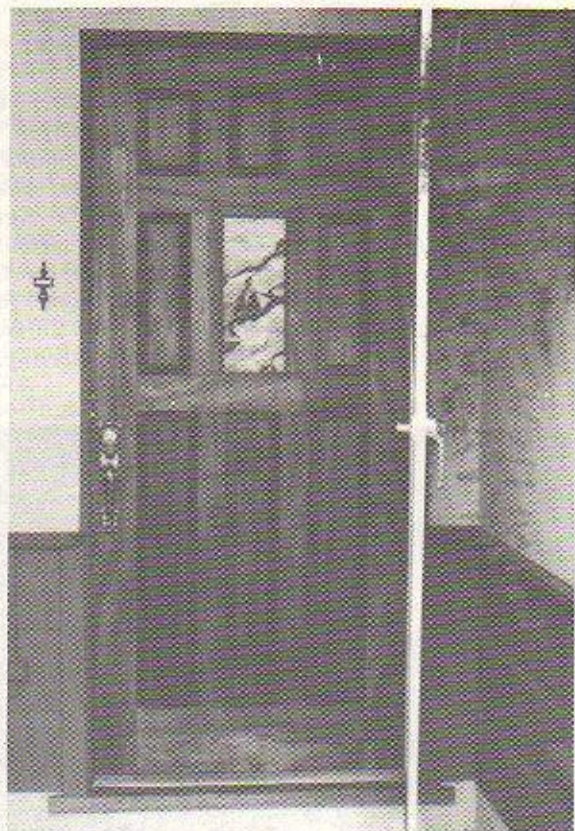
by Robert Pieser

Faced with the problem of cutting 3/4" mortises in the stiles of the koa door I recently made, I found it best to clamp these heavy pieces to the bench and straddle with this simply-made guide on the Makita 3600B router. (Editor's note: Makita has discontinued the 3600B, and replaced it with the 3612BR, which also works with this jig design.)

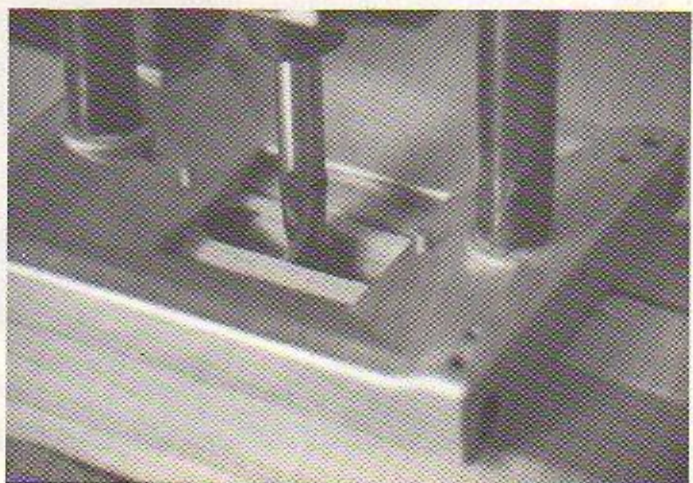
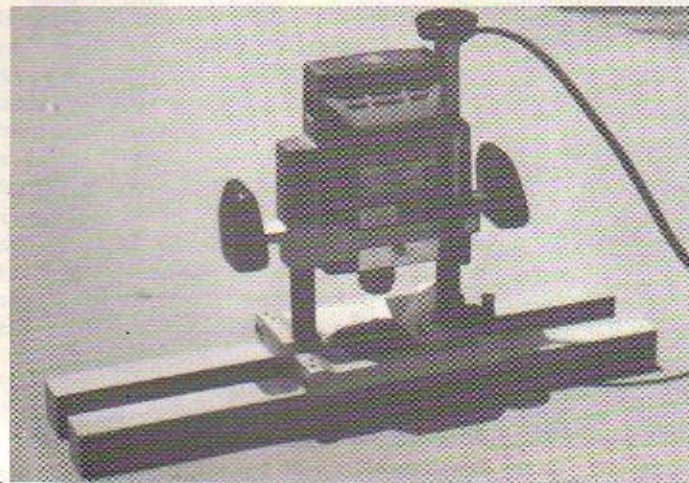
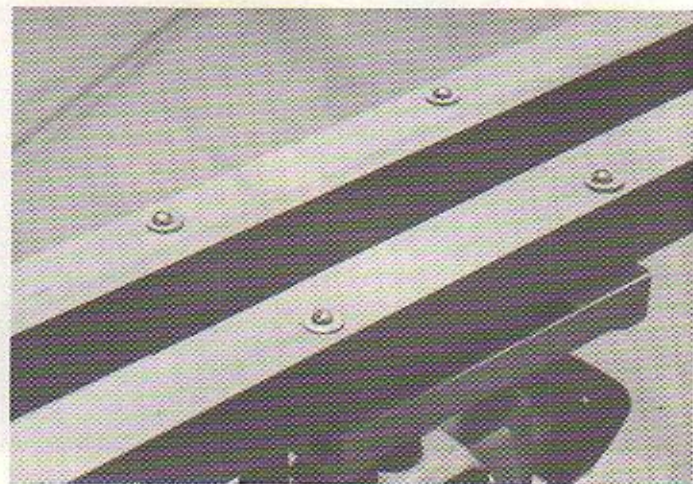
The guide is constructed of a pair of 2x2's about 14" long and drilled with a pair of oversized holes corresponding to the holes in the base of the router. As is obvious, the oversize holes permit adjusting to a sliding fit over the workpiece. Note the off-center location of the holes; by flipping top to bottom, a larger range of workpiece sizes may be accommodated.

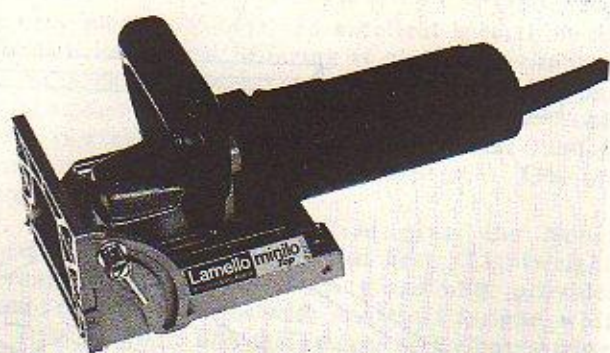
Excellent results are obtained by using 3/8 or 1/2 inch shank end mill cutters as pictured. They make a rounded end mortise and it is a simple matter to round the ends of the matching tenons. A woodcarver's rasp is a good tool for that purpose. Follow all safety precautions and limit the depth of cut on each pass to 1/8 or 3/16 inch.

Here is a little tip to help in cutting the mortise in the exact center of the stiles. After every two or three passes with your router and guide, merely rotate the tool 180° and make a pass. I found it convenient to re-tap the four holes in the base of the router to 3/16 x 24 tpi, making it easier to find bolts of various lengths at the local hardware store.



Robert Pieser is a woodworker from Ventura, CA.





Lamello Lowers its Price

Effective March 1, price of the Lamello Minilo Top has been reduced from \$580 down to \$525. This will come as good news for those who have been considering adding plate joinery to their furniture and cabinet making techniques but have not yet done so. The Lamello, with its patented design and Swiss precision, offers the fastest and most accurate setup of any plate joinery tool on the market. Its reliability is unmatched by any competitive machine.

Highland Hardware has been a leader among Lamello dealers nationwide, and much of the reason has been the word-of-mouth advertising of the tool among our many customers who have taken the plunge and purchased one. The Lamello has essentially changed the way in which material is assembled in the shops which now employ them. Speed of production is dramatically increased and the plate joinery approach enables cabinet and furniture projects to be completed with extremely clean lines uncluttered by evidence of the methods of attachment. Although the tool is not an inexpensive one, we have yet to hear an owner say that the machine did not pay for itself almost immediately in reduced production costs.

In addition to the savings on the purchase of the tool itself, users of the Lamello will also save now on the joinery plates themselves. Formerly costing \$30 to \$32 per thousand depending on size, they now cost \$25 per thousand for each of the three sizes. The plates consist of carefully seasoned beechwood compressed under great pressure so they fit easily and loosely into the groove created by the Lamello tool. The dampness of the glue then causes them to swell, guaranteeing a tight joint with maximum strength. The ability to often gang several plates in near proximity further enables superb strength characteristics.

Lamello has also recently introduced in the U.S. the Lamello System, a line of Lamello accessories which also includes items of hardware that can be installed using the Lamello. Two of the hinges available are pictured here. The hinges are offered in bright, brass or black finishes.

Attachments in the Lamello System include devices to flush trim edge banding or edging strips up to 9/16" thick, and a system for repair patching of defects in wood. Also available is a kit for installing knock down fittings as well as a separate tool for door and window removal during renovation.

ROUTER SPECIALS



**New Makita 3612BR
2HP Plunge Router
\$199.95 Postpaid**

New model features 14 amp motor, improved 1/2" collet, & 3 adjustable depth stops. Handles 1/4", 3/8" & 1/2" bits. Optional guide holder, straight guide, and roller guide. \$24.50 Postpaid.

**Set of 4 Spiral End Mill
Router Bits \$36.00 ppd.**

Excellent for mortising with a plunge router, these HSS bits can be plunged vertically like a drill bit and then moved laterally as a router bit. Clean-cutting. Set of 4 includes 1/4", 5/16", 3/8" & 1/2", 1/8" shanks.



**Ogee Fillet Raised Panel
Router Bit \$99.95 ppd.**

This unique carbide router bit is excellent for all panel raising. Bit diameter is 2 1/4", 1/2" shank.

Router Handbook
\$9.95 plus \$2.50 shipping.

by Patrick Spielman.

A comprehensive guide written to help you get the most out of your router. 224 pages. 510 photos.

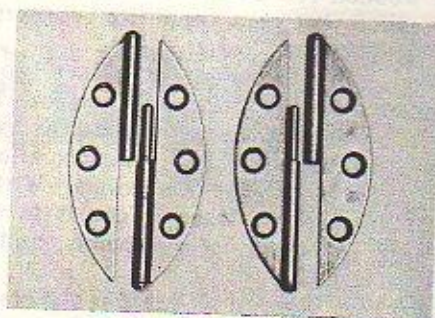
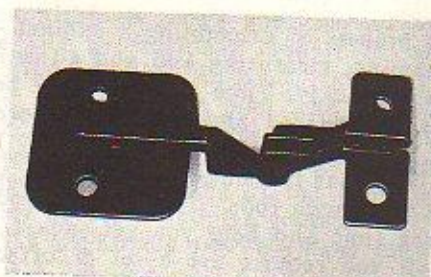


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(Orders Only)

Or send check, money order, or MC/Visa info to Highland Hardware. Prices are Postpaid in U.S. Send \$1.00 for our tool catalog (free with order).



A brochure and pricelist on the new Lamello items are available on request. The Lamello machine itself can be ordered from Highland Hardware for \$525 plus \$5.00 shipping.

Trammel Rod for Squaring Cabinets

©1985 by Gene Liberty

When you glue up a cabinet, the best way to check for squareness is to compare the two diagonal distances between opposite inside corners. If the diagonals are equal in length, the cabinet is square. If the diagonals are unequal, the cabinet is twisted, and you must adjust the clamp to bring the cabinet into squareness.

Of course, squareness is not just a matter of correct clamping. Joints must mate closely, and all parts have to be cut accurately. To some degree, you can compensate for a poor joint or an inaccurate dimension by skillful use of clamps - but your best chance of achieving squareness is to be intolerant of inexact tolerances.

The squaring, or pinch, rods shown in Figure 1 are the traditional tool for checking squareness by measuring the diagonal distances in a cabinet. Mark the diagonal distance in pencil at the end of one rod onto the other rod. Then check the diagonal distance between the other set of corners in the same way.

How much difference between the diagonal distances is acceptable? The answer depends on such factors as potential movement of the wood and the style and fit of drawers and doors. Thus the following figures are intended only as a rough guide.

If the diagonals are about 6 feet or longer, a difference of 3/16 inch is acceptable. Therefore, for gluing purposes, the cabinet may be regarded as square. Smaller cabinets call for smaller differences. For example, if the diagonals are between 3 and 6 feet, the difference between them should not exceed 1/8 inch. And if the diagonals are between 2 and 3 feet, a difference of 1/16 to 1/8 inch should not cause any problems.

The whole process of assembling a cabinet - applying the glue, clamping, measuring and adjusting - must be carried out quickly. Time is the enemy because the cabinet must be squared and clamped before the glue begins to set.

You may find that the single trammel rod is easier to use than the two pinch rods. The trammel rod will save you measuring time and help you get square before the glue sets. All you require are a set of offset trammel points and a wooden rod an inch or two longer than the diagonal distance between opposite corners of the cabinet.

The trammel points have to be offset (not perpendicular) to reach into the corners. There are additional advantages to working with offset trammels like Highland's no. 06.19.13. These trammels allow you to substitute a pencil for one of the points. With a pencil in place, you can also use these trammels to draw large circles and arcs, to repeat measurements, and to scribe hard-to-measure profiles.

The wooden rod should be reasonably straight and wide and thick enough to ensure good clamping with your particular trammels. To measure the first diagonal, clamp the trammels to the rod and suspend the rod over opposite corners of the cabinet. Then position the points

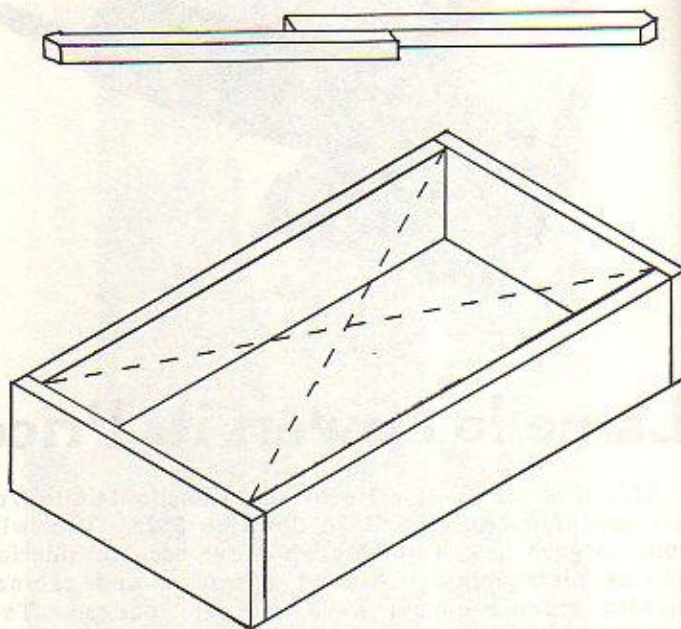


FIGURE 1. When the diagonal distances (shown by the dotted lines) are equal, the cabinet or frame is square. The ends of the squaring rods are pointed to fit into the corners.

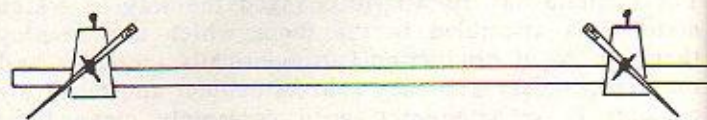


FIGURE 2. Only one rod is required in this fast and precise method of measuring diagonals. In use, the rod rests on opposite ends of the cabinet, and the offset points into the corners.

so that they lightly touch the opposite inside corners.

Designate one trammel as fixed and the other as movable. Make a fine pencil mark alongside the movable trammel. Now place the rod over the other set of opposite corners. Measure this diagonal by sliding the movable trammel. Make a second pencil mark alongside the new position of the movable trammel.

The distance between the pencil marks will show you how much your cabinet is out of square - and whether or not you have to reposition your clamps. Keep in mind that the trammel rod is not limited to squaring cabinets. It is a precise and versatile tool that will also help you square drawers, boxes, cases, racks and frames of all types.

Our # 06.19.13 deluxe trammel points are available for \$32.50 plus \$3.30 shipping.

Gene Liberty is a writer and woodworker from Bronx, New York.

highland hardware

Mitre Saw Sale

We're very pleased to offer an excellent special on this fine Swedish mitre box. Mitring is almost inevitably a pain in the neck unless you've got expensive, professional quality equipment on hand to do the job, but the Nobex 202 gives you the opportunity to acquire that kind of equipment at a remarkably painless price - 33% off regular cost.

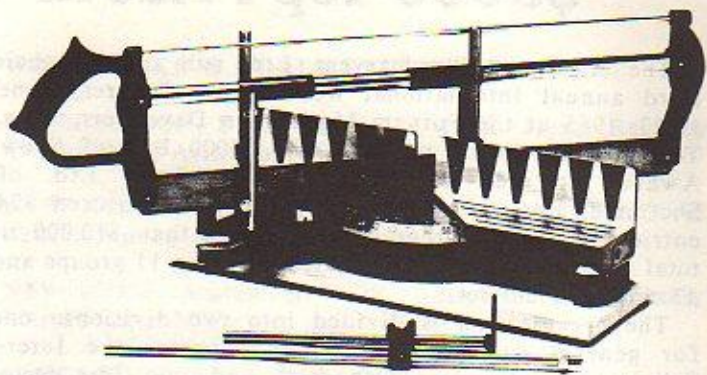
Light, tight, precise construction gives the Nobex performance specs that are hard to beat. Lightweight, high strength bowsaw-style cutting assembly provides maximum feel for the work with minimum fatigue, while the 11" stroke length allows fast and efficient sawing. Positive stops at 90, 22-1/2, 30, 36 and 45° left and right allow instantly accurate set-up of all the most common polygon angles. The 18tpi blade supplied with the saw cuts satin smooth in most stock; 12 tpi blades are available for extra heavy work. The 202 will cut materials up to 4-1/2" thick at any angle. Max width is 6-1/2" at 90°, 4-1/2" at 45°. The saw table measures 3" wide by 17-1/2" long; an adjustable stop sets up repeat cuts up to 24" from either side of the blade.

In sum, this is a top-of-the-line manual mitre box, now available from Highland Hardware for a limited time at \$99.95, plus \$5.00 shipping.



3/4 HP Router Special

The 3608B provides Makita quality for beginners and full-time professionals alike. At 5 lbs., it's ideal for extended hand-held use; its 4.8 amp, 23,000 rpm motor supplies plenty of power for any light to medium shaping or joinery work. As your first router, the 3608B gives you a durable and economical introduction to this extremely versatile tool; for professionals, it's the perfect choice for full-time rounding-over or other trim work while your bigger machines handle the heavy stuff and table work. Many inexpensive routers commit you to a real gamble on quality, but the Makita 3608B is a sure bet. We bought a bunch of these routers when Makita had them on sale, and we'll pass along the savings while supplies last. *Only \$79.00 Postpaid from Highland Hardware. (Last year's price was \$99.00).*



New Cordless Drill

Here's a new 3/8" cordless screwdriver/drill that's perfect for the general around-the-house user who wants a tool worth paying for even if it doesn't cost too much. Though the 6010SDW is smaller, lighter, and about half the price of Makita's professional cordless drills, it is nonetheless a powerful, versatile and durable tool such as we've come to expect from this manufacturer.

Power is supplied by a built-in 7.2v NiCad battery; recharging time is three hours with the standard 110v AC recharging unit. A full charge will drive three hundred #8 x 3/4" screws into wood, or drill twenty 1/4" holes through 1/4" steel plate. The 6010SDW operates at 600 rpm in forward or reverse; the switch also includes an "off" position. The built-in overload protector features manual reset so you can get back to work (a little more gently) promptly even if you've tried to overdo it. At 2.1 lbs. and 7" long by 7-1/2" high, the drill is astonishingly small and easy to handle, but is built like the professional models to withstand the toughest kind of use. In fact, the only significant difference between this and the bigger models is three-hour recharge time versus continuous operation (with spare battery). If you've been coveting a good cordless drill but shrinking at the price, the 6010SDW offers a fine excuse to indulge yourself and get the best.

Cost is \$59.95 Postpaid from Highland Hardware.

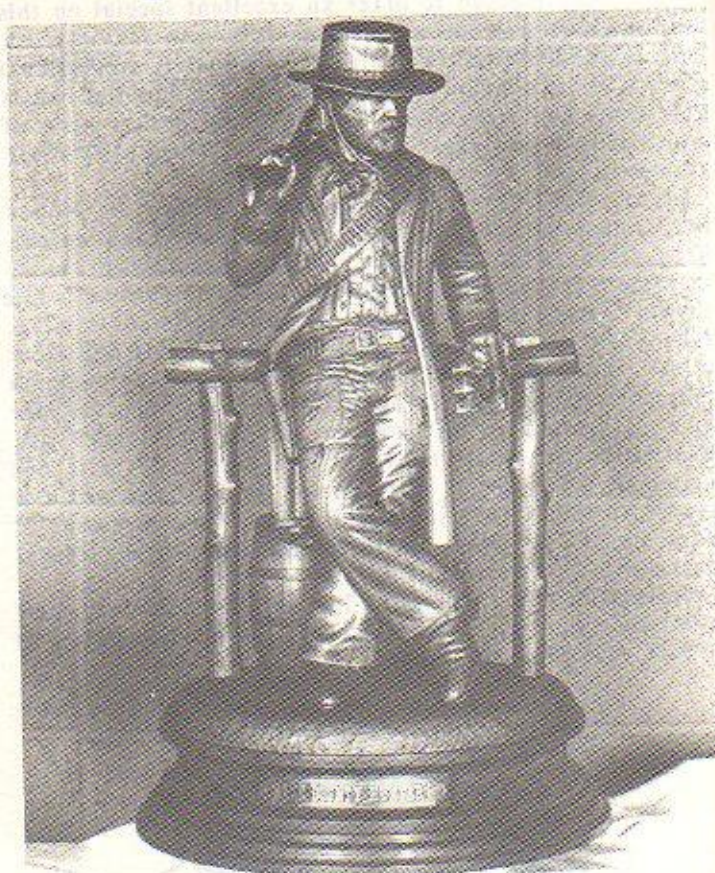


\$5000 Top Prize in Carving Competition

The Affiliated Woodcarvers, Ltd. will sponsor their third annual International Woodcarvers Congress June 19-23, 1985 at the Putnam Museum in Davenport, Iowa. Topping the list of prizes is the \$5000 Best of Show Award provided by Henry Taylor Tools Ltd. of Sheffield, England. Last year's Congress featured 524 entries by 154 different carvers. More than \$10,000 in total prize money was distributed covering 11 groups and 47 classes of entries.

The organization is divided into two divisions: one for general woodcarving (which sponsors the International Woodcarvers Congress) and one for decoy carving (which sponsors the International Decoy Contest August 9-11, 1985, also held in Davenport). The organization has its roots in the Mississippi Valley Fair, where the first National Decoy Contest was held in 1965. In 1967 the general carving competition was added at the fair. When austerity forced the fair to withdraw sponsorship of the competition in 1982, a group of carvers stepped forward and formed Affiliated Woodcarvers, Ltd., an Iowa non-profit organization. Membership has grown to around 600, including carvers from 38 states and four foreign countries.

Carvers wishing to enter this year's show can receive a copy of the official show brochure (which provides rules for entering and a detailed listing of the groups and classes) by sending \$5.00 to the organization's secretary, whose address is given below. If you should choose to become a member of the Affiliated Woodcarvers (annual dues are \$10.00), the show brochure will be sent for no extra charge. For your convenience, a membership application is reproduced here.



1984 Best of Show winner: "The Bounty Hunter" carved by Wayne Holsopple of Bedford, Ohio.

Membership Application Affiliated Woodcarvers, Ltd. (An Iowa Non-Profit Corporation) (9/23/82)

International Decoy Contest
Originated at Mississippi Valley Fair,
Davenport, August 1965

TWO DIVISIONS

International Woodcarvers Congress
Originated at Mississippi Valley Fair,
Davenport, August 1967

Memberships are in Affiliated Woodcarvers, Ltd., with identification as to division of interest. A member can transfer from either division to the other once in any calendar year without charge. Dues are \$10.00 and run for a full year from date of payment. There are **two classes** of membership - identical for each division: (1) **Active** - carvers should join here - has voting power, carvers in control of their own destiny. (2) **Sustaining** - no voting power - receive all mailings as goes to "Active" members - a patron of the arts.

PURPOSE

Concern as to the well being of the carver and the acceptance of his/her art. The format for both annual competitions is geared to refining skills, widening the scope of personal influence and acceptance as a carver in his/her field of interest. Questions and suggestions are welcome at any time.

If member intends to participate in **both** divisions, then membership is \$20.00. Allocations for expense items are based on percentages of membership fees from each division. There is no charge for any particular report from a division - but if the carver wants reports from both divisions, then a second membership fee is mandatory.

Kindly accept my check enclosed for membership in:

☐ International Decoy Contest

☐ International Woodcarvers Congress

Place X in square over division of your interest.

☐ Active ☐ Sustaining

☐ Active ☐ Sustaining

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1985 Calendar

LECTURES AND SEMINARS at Highland Hardware

Tage Frid on Woodworking and Design.
Lecture, March 22, 7:30-9:30pm. \$5.00.

Michael Dunbar on Windsor Chairmaking.
Lecture, April 19, 7:30-9:30 pm, \$5.00.
Seminar, April 20-21. \$90.00.

Stationary Tools with Zach Etheridge.
Saturday, April 27, 9am-4pm. **FREE.** Register on p. 23.

ARROWMONT WORKSHOPS in Gatlinburg, Tennessee

Wood Laminate Construction with Ron De Kok.
March 11-15.

Creative Woodturning with Rude Osolnik.
March 25-29.

Cost of workshops is \$250.00 each including room and board. Write Arrowmont School of Arts and Crafts, P. O. Box 567, Gatlinburg, TN 37738. (615) 436-5860.

WOODWORKING WORLD EXHIBITIONS

WASHINGTON, D.C. March 1-3, 1985. Hyatt Regency Crystal City, Arlington, VA. \$5.00

NEW ENGLAND. April 12-14, 1985. Springfield Civic Center, Springfield, Massachusetts. \$5.00

NEW YORK. September 27-29. Westchester Co. Center, White Plains, NY.

CHICAGO. October 25-27. O'Hare Expo Center, Hall E, Rosemont, Illinois.

For more information, contact Woodworking Assn. of North America, 35 Main St., Suite 6, Plymouth, NH 03264 or call (603) 536-3876. Show hours are Friday, 5pm-9pm; Saturday, 10am-6pm, and Sunday 10am-5pm.

Editor's note. Send news of woodworking events to:
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We will print items in future issues as space permits.

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SUPPLEMENTARY SET OF 12 \$119.95 Postpaid

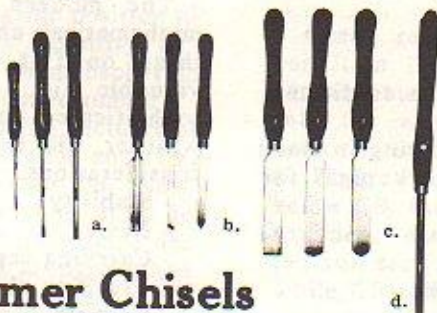


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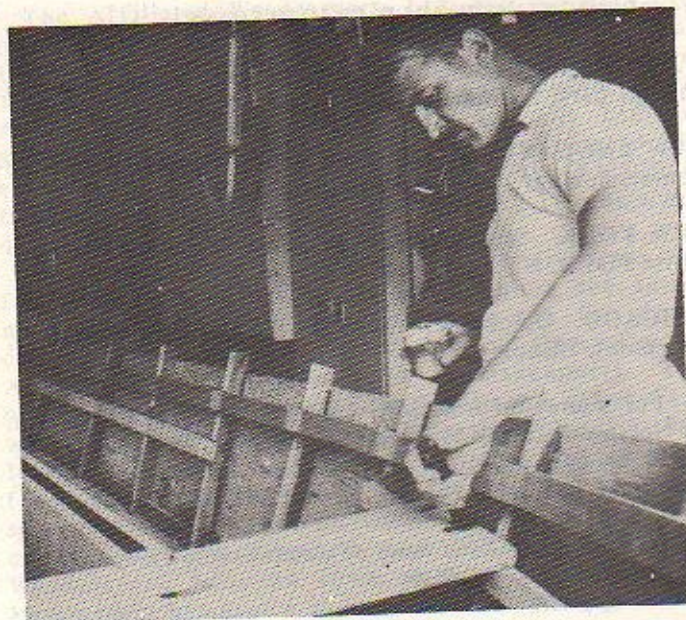
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BOATBUILDING

with John Wermescher



©1985 by John Wermescher

A reader from Goldsboro, North Carolina has written asking about a book with plans for a flat-bottom, one seat, pond fishing boat. There are many good designs for such boats, and it is an excellent starting point in one's boatbuilding. I'd like to answer the question in some detail, as it is good information for all.

The major publisher of marine books of all kinds is:

International Marine Publishing Co.
21 Elm Street
Camden, Maine 04843

Send for their catalog of books and plans, etc. It is a newspaper listing hundreds of titles, with descriptive information about each. Once you're on their mailing list, they'll send you updated catalogs regularly.

Publishers of boat plans include:

Woodenboat Magazine
PO Box 78
Brooklin, Maine 04616

They also publish books and other materials. Get a copy at Highland Hardware.

Mystic Seaport Museum
Mystic, Connecticut 06355

Lengthy catalog of plans, most of them traditional boats, of every size and kind.

A few of the excellent designers specializing in small boats, and who carry an inventory of stock plans for sale, are:

John Atkin
PO Box 3005
Noroton, CT 06820

Steve Redmond
127 College Street
Burlington, VT 05401

McKie W. Roth
PO Box 50
Bath, ME 04530

Joel White
Brooklin Boat Yard
Brooklin, ME 04616

Two specific books which contain such plans, and are mightily instructive in other ways:

Boatbuilding In Your Own Backyard by Sam Rabl.
This is a classic text on boatbuilding.
Instant Boats by Dynamite Payson. A new approach to boatbuilding.

This issue we'll consider various types of boat hulls and why they are what they are. In other words, the subject of *design*. With this discussion, we'll pretty well wind up the background and theory material, hoping that it has given you some good ideas about how to choose your boat to own or build. If you have further curiosity about boat design, do write me, c/o Highland Hardware, and I will try either to answer your question or point you in the right direction.

It is often I hear some soul say, "I'm reworking a design by so-and-so." Or, "I'm working on my own design for a new boat." If you're a small craft designer, fine. The naval architect, or yacht designer, or small craft designer has received years of education, training and experience to bring him to the point where he can consider all the details, large and small, that impinge upon the successful design of a boat which fulfills its intended purpose. The idea of second guessing such a professional strikes me as about as sensible as going home from surgery, taking a paring knife, and reworking what the surgeon has done. So if you're not already an experienced boat designer, leave that work to them. They do it quite well. Take their plans and do it their way. For building boats, this seems to be what works.

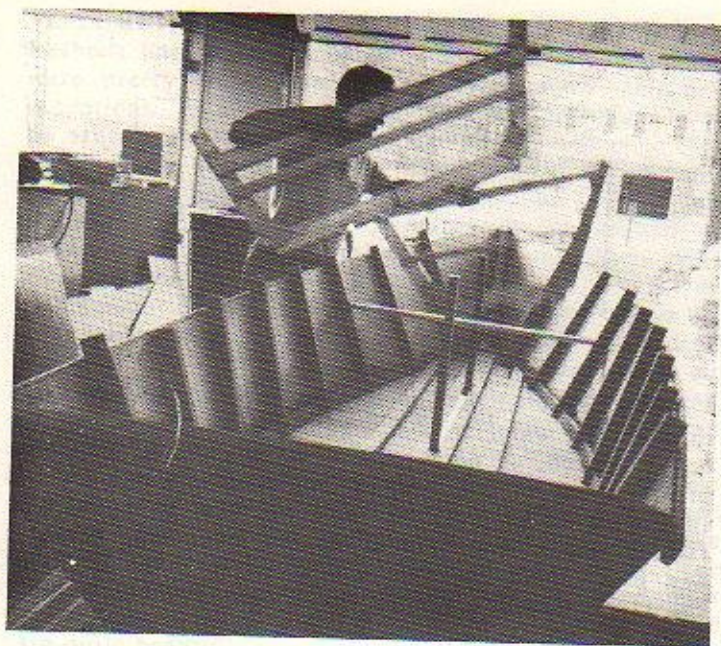
There are a lot of things these designers have to consider, many calculations, trial and error stuff, experimentation, sketches, new calculations, and so on. In times past, the designer of a boat was often the builder, too, of one particular kind of boat. He had grown up with those boats and knew them from every angle. When he wanted to improvise, which is what design pretty much was back then, he got some boards of soft pine, stacked them up into a block of wood a couple feet long and started to whittle out a *half model*. The result was a smooth, carefully formed and finished model of half the boat, as if cut down the middle from stem to sternpost.

This was then fastened to a board and used to take off measurements which would be scaled up to full size. During whittling and smoothing, the designer's educated eye and hand knew from long years of experience what would probably result from shaving a bit here, filling a bit there, decreasing this aspect, increasing that. He would whittle, shave and smooth, do a whole lot of looking, holding the model up in various lights, turning it this way and that until he was satisfied that he had created the model of a boat which would "do better".

The modern boat designer has at his disposal mathematical and geometric tools for doing the same thing on flat paper. The computer has become a valuable aid. But today's designer, with whatever sophisticated means he has, as well as yesterday's whittler, did their work in terms of certain important considerations:

- Stability
- Draft
- Carrying capacity
- Tracking ability
- Dryness
- Sturdiness (vs. lightness)
- Speed, involving
 - a. Fluid dynamics
 - b. Power to be used

The best way to get a handle on each of these parameters is to talk about boats which exemplify each, boats that don't, and how some of the other factors on the list are affected, beginning with a basic definition something we can hang onto, for each item.



STABILITY: staying upright. There are two kinds of boat stability - static stability, or initial stiffness, or the resistance to being tipped at all, and dynamic stability, which is resistance to further heeling, once heeling has begun. Some boats have great initial stability, but flip once they get beyond a certain point. Others might heel easily, but the more they heel the more they resist going further.

Stability in a boat is a tremendously important factor, often, literally, a matter of life and death. To understand it, look at two forces acting to keep a boat upright or roll it over. First is the Center of Gravity (CG), the theoretical point in a boat's hull where all the mass of that boat is concentrated (including passengers, cargo, etc.). It remains fixed, as long as the passengers, cargo, etc. remain fixed. In the figures it is represented by a dot. It always acts directly downward. The other theoretical point is the Center of Bouyancy (CB) and it is the center of all the forces of the water pushing up to keep the boat afloat. It is represented by a circle.

When these two force points, gravity and bouyancy, are centered over each other, they oppose each other equally, in the same place, and nothing happens. They are said to be in equilibrium. The boat is at rest, stable, upright. Any boat's resistance to changing the position of these centers is the boat's *initial stability* (stability, or stiffness). Any boat's tendency to bring them back into alignment once they are shifted is her *dynamic stability*.

This is easier to understand by considering pictures of specific boats. Figure 1 is a section of a canoe and (1,a) shows the canoe at rest. CG is centered over CB. Now, if you've ever hopped into a canoe you know it is not very stable. Due to the roundness of the hull shape and the fact that with your weight in it, CG is higher than CB, rolling to one side comes easy and CG moves out away from CB. Or, CB moves away from CG, whichever way you want to look at it. Anyway, over you go, pretty fast.

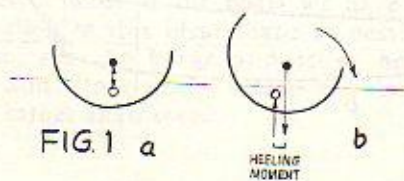


FIG.1 a

HEELING
MOMENT

b

That distance separating the downward force of CG and the upward force of CB is called a *moment arm*, and the whole system a *moment*. New words. Since in (1,b), the system is acting to heel the boat over, it is called a *heeling moment*. A canoe is not very stable. Now we see clearly why. Canoes and boats with similar hull shapes are for calmer waters and/or where paddlers/sailors are ready to use their own balance for stability.

In Figure 2 we have another boat entirely, a flat bottom skiff such as catboats, sharpies, punts and the like. Again, at (2,a) CG is over CB, but see what happens when she heels just a bit. CG remains in the same place, but this time CB moves outboard of CG, since that triangle of hull is what is immersed, or bouyant. Now we have an opposite force system from the canoe, a *righting moment*.

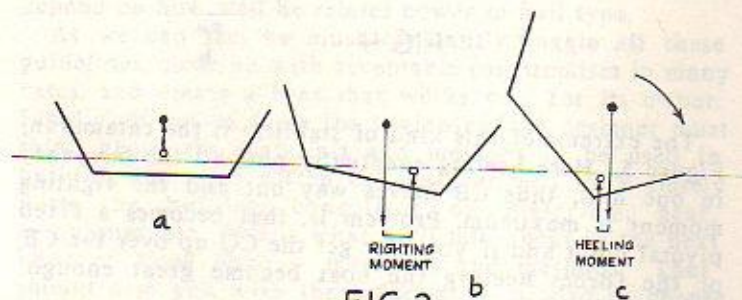


FIG.2

b

c

If you keep going, leaning over to net that fish that stays just out of arm's reach, CG can pass CB as in (2,c) and now, with a heeling moment, over you go. Boats such as this are fine for general use and all kinds of power, and they are pretty stiff initially, but you don't push them past a certain point. Ever sail a Sunfish?

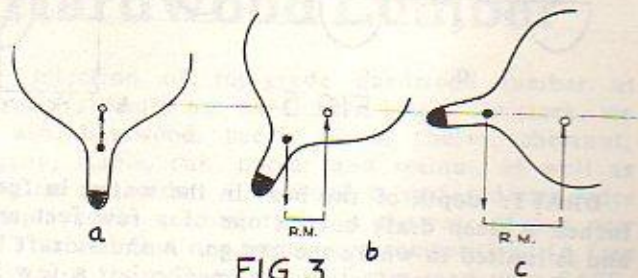


FIG.3

b

c

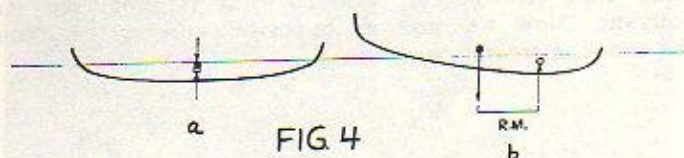
Ocean racers have to go out to blue water in any condition the sea may throw up. They have to have ultimate stability. Thus, the keel is designed to go deep into the water and have a great deal of weight, or *ballast*, attached to its very bottom (the shaded portions in Figure 3). Initial stability is high due to CG being below CB, though she may rock a bit if the hull is very rounded. As she heels, CG, as always, remains fixed in the hull section, moving out to one side in that deep keel, while CB scoots off in the other direction. The righting moment is great. You can see that even in a complete knock down (3,c), the righting moment is even greater and the boat will right again quickly. These boats are designed to do just this, as knock downs are not unheard of and the yachts must be self righting.

Any boat, ocean racer or other, that has deep keel sections and weight kept low, has this self righting ability to some extent. These are the boats you want if you are doing blue water boating.

(continued on next page)

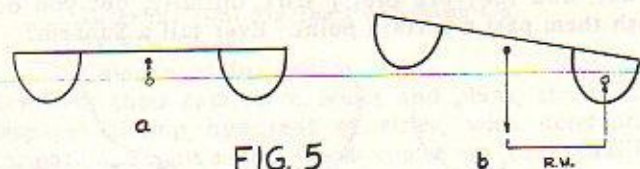
Boatbuilding (contd.)

The term scow encompasses a number of hulls from municipal garbage hauler (of bygone days, I hope) to sizzling lake racer. The hull sections are similar to the drawings in Figure 4 and stability acts somewhat like a flat bottom boat, only more so. Very stable up to a point, as you can see from the great righting moment generated by heeling.



The extreme of this kind of stability is the catamaran, Figure 5. Here heeling eventually puts all the buoyancy in one hull, thus CB moves way out and the righting moment is maximum. Problem is, that becomes a fixed pivotal point and if you ever get the CG up over the CB, or the forces heeling the boat become great enough, watch out! Ever sail a Hobie?

Both hull types are great for sport where you, the sailor, are willing to provide stability control with a good bit of *hiking*, leaning out on the high side and thus actually moving the CG outboard, away from CB. Flattens the tummy, too.



DRAFT: depth of the boat in the water, in feet and inches. A deep draft boat is one of a few feet or more and is limited in where she can go. A shoal draft boat is one of a couple of feet or less, maybe just a few inches, which can almost float on the dew. I once had an airboat which did just that, a fact which I recognized a few feet from the front porch.

The flat bottom skiff and the scow are very shoal draft, while the ocean boat is the deepest type. Consider the effect of draft on stability.

CARRYING CAPACITY: the ability to carry loads normal to the type, from windsurfer to ocean liner. Obviously, the deeper and/or wider boats have larger carrying capacity, size being equal, than narrower or shallower boats. The barge shown in Figure 6 has the largest carrying capacity, being used to haul tons of cargo over the water, or should we say, "through the water"? Stability is great due to the low CG and extreme beam (width). Draft depends much on loading but, for its size, the barge is very much like the scow (for all practical purposes, the same hull type) - very shoal draft. Figure 6 shows a simplified profile, section and plan view.

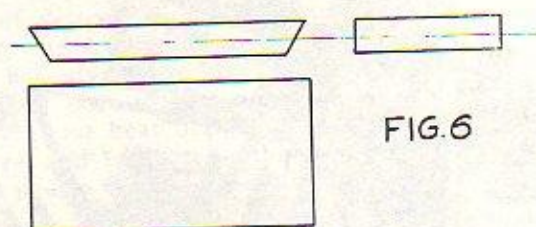
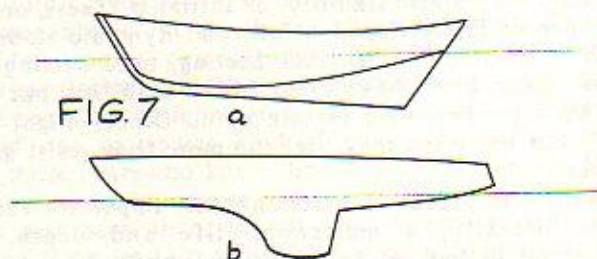


FIG. 6

TRACKING ABILITY: the tendency of the hull to go through the water in a straight line without constantly being tended, or corrected. This is a function of the profile shape of the hull, as seen from the two profiles in Figure 7. At (7,a) we have the hull of a Bahama fishing smack whose owner has to make long passages and make them pay. He cannot waste a lot of effort constantly tending the helm, so the boat has a long, straight, deep keel to keep her on a straight course.



The skipper of the modern ocean racer, (7,b), is more interested in maneuverability. Someone is paying close attention to the helm all the time anyway, so she has that deep fin keel and shallow sections fore and aft of it. She will not track well unless the designer does some clever things with the rudder or other appendages.

DRYNESS: the hull configuration which allows passage through rough or choppy water without a lot of splash and spray being thrown aboard. Shape of hull sections forward has a lot to do with throwing spray back to where it came from. Also *freeboard*, or the amount of hull from the water line up. Some boats, like the rowing shell hull shown in (8,a) are meant to travel on smooth water or get very wet. But the offshore cruiser in (8,b) has great flare (angle outward) and flared (curve outward) to deflect spray and choppy seas. Runabouts, some sail craft and many houseboats are also designed this way.

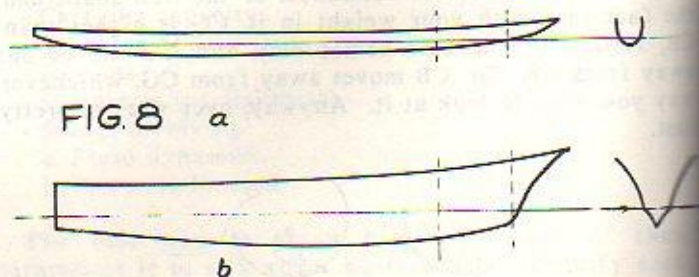


FIG. 8 a

STURDINESS vs. LIGHTNESS: Until modern methods and materials came into use, these two terms were pretty much mutually exclusive, with some few exceptions. In most cases, they still are. If a boat is to be sturdy enough to cruise the North Atlantic, that means fairly heavy *scantlings* (dimensions of the various parts). If the boat is to be feather light, she had best not be caught out in a bad blow, because the sea can kick up some rather ugly combinations. Heavy scantlings mean more weight or, in the designer's words, *displacement*. The amount of water that the boat displaces, or takes up, is equal in weight to the total weight of the boat and all her gear. A fellow named Archimedes found this out playing around in the bathtub with the king's headgear, or so the story goes. Anyway, displacement is an important aspect of design and refers to heaviness.

The canoe and rowing shell are built for lightness, both for the same reasons: limited power and the need for one person often to carry the boat on land. They are handled gently because they cannot be very sturdy. The Bahama smack, the power cruiser, the barge and most deep water boats of all kinds are built for sturdiness and are quite heavy.

However, cored hull construction, plastics, and cold molding techniques (don't worry, we'll get to it all) have made the ULDB (ultra light displacement boat) possible. Ocean racers with unheard of scantlings and extremely light displacement are being successfully created today and are quite sturdy due to these new methods. So the old rule that a deep water boat to be sturdy must be heavily built, is not necessarily true anymore.

You can also build your scow, skiff, catamaran, day sailer, or whatever in a traditionally heavy way, or a more modern light way.

SPEED and PERFORMANCE, as related to . . .
FLUID DYNAMICS: how the water parts, passes by, and closes back in again as the boat hull moves through it. Figure 9 shows the familiar airfoil shape and how a fluid travels around it with minimal turbulence. This shape offers the least resistance to fluid flow (water or air). Note the shape of birds, fish and marine mammals, to say nothing of torpedos, submarines, and Ursula Andress.



FIG. 9

The designer tries to make his underwater shapes (the *waterlines*) as near to this airfoil as practical. But he is faced with a problem: how does this shape change when the boat is heeled, as she will be most of the time in the case of a sailboat. As with most other design considerations, there are always compromises. The waterlines of most of the boats we have considered will come as close to this ideal shape as possible. Exceptions, of course, are the barge and scow, houseboats, river cruisers and other craft whose aim is large carrying capacity rather than speed.

All of the above is out the window when considering planing hulls. They do not go through the water; they go over it. The airboat is a very scowlike hull, but driven by a 65hp aircraft engine, it gets up out of the water and almost flies. Very little of the hull touches water and the shape of what little does is not important.

Next time you're near water, observe a large power cruiser that is not up to planing speed, but dragging that huge transom through the water, making a great hole aft of the boat into which the stern settles. The boat looks as if it is continually trying to climb out of that hole. Bad shape. Also, bad news for the guy in the canoe near shore.

...and **POWER TO BE USED:** Kind of power - engine, sail or oar. Amount of power - hp, sail area and sail combinations, length and number of oars. The designer is planning on certain stipulations here from the beginning. The boat's shape, stability, dryness... all the other factors depend on how well he relates power to hull type.

As we can see, he must constantly juggle all these guidelines, come up with acceptable compromises in many cases, and create a boat that works well for its owner. Finally, of course from the beginning, the designer must think about the materials and methods to be used in building the boat. Often the designer will work closely with the builder, consulting on materials, gear, techniques, etc. This is what we'll talk about in the next issue of *Wood News* -- materials and methods. That should arm you with the information needed to choose the kind of boat you want to build.

John Wermescher is an Atlanta commercial artist and part-time boatbuilder.

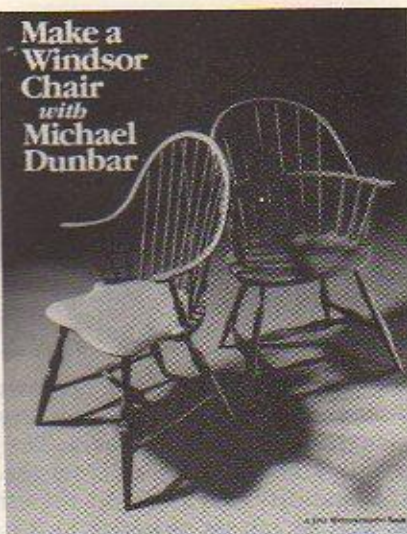
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Make a Windsor Chair with Michael Dunbar



Make a Windsor Chair with Michael Dunbar is a new prescription available this year for woodworkers suffering from the type 2 blues. Some users report it is as effective as aspirin. If you find yourself a victim of any of the symptoms described below, a shot of chair-making may be just what you need.

Have you ever felt that some of the adventure has gone out of your woodworking? That those wonderfully rewarding moments of inspiration and success just don't come around much any more? That your work may be getting better, but it somehow isn't as much fun? Well, you may have caught a dose of the woodworkers blues type 2 - but don't panic, there's a cure.

The most common kind of woodworkerly blues are of the "OhmyGodIblewit" variety, and as we all know sometimes the only cure is a hot fire for the work and a cold beer or two for the patient. The type 2 blues, however, are not so simple a matter. To begin with, the symptoms are not always very clear; you may think you're becoming unaccountably just a little bored, or you might find yourself thinking any jerk could do this stuff, or you could even catch yourself thinking of going back to the drawing board because at least there's something challenging there. Well, if that's the way you feel you're in pretty bad shape, but modern science is on the way with help.

Paradoxically, the cure for type 2 blues is easy as pie, and this is where chairmaking, particularly Michael Dunbar's Windsor chairmaking, comes in. Recent research indicates that a major cause of the type 2 blues may have to do with the reduction of woodworking to a connect-the-dots kind of science. When you know everything there is to know about wood technology, you've mastered every kind of tool you've ever been able to afford, and you've spent forever at the drawing board working out every detail of a piece of work, by the time you get around to doing the work itself it can feel as though there's really not a lot left to do; you've turned yourself into the shop monkey who does all the grunt work. If you frequently find yourself faced with this frightening fantasy, it's time to rush out and find a good five-foot long green log at least twelve inches in diameter and free of any conceivable kind of blemish or defect. Drag it over to your shop, round up a few old hand tools, and get ready for a different kind of woodworking.

Windsor chairs, says Dunbar, are possessed of a variety of charms: they've got tradition (the last new type was introduced around 1830); they've got class (middle class -

everybody likes 'em); they're beautiful to look at, comfortable to sit in, surprisingly durable; but best of all (for medical purposes) they're fun to build.

They can't really be built from measured drawings, he says. Each chair will be a little different from every other, and will insist on telling you about itself as you go along. Since you can't have any idea what some parts will look like until you've made and assembled other parts, you can't isolate design from construction. It's almost like going back to those earliest days of your woodworking career - remember when you did most of your drawing with a saw? - when design and construction were all balled up into one heady and epiphanous process, when it felt almost as though a piece were growing rather than being built.

Actually, Dunbar doesn't talk much about this kind of stuff in his book, but he does enjoy building chairs and he does seem to know that they're a great opportunity to do some extremely rewarding and even rather simple woodworking. His book is well organized, clearly presented in text and photographs, and will almost surely guide the motivated reader successfully through the making process from start to finish. If he occasionally succumbs to the impulse to wax didactic, he's to be forgiven; there's a lot of information to impart, and besides, anybody who recommends drilling compound-angle mortises by eye can't be all bad.

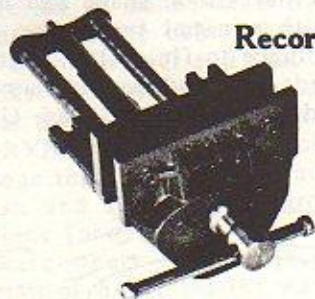
Michael Dunbar's lecture and seminar comes to Highland Hardware April 22-24, presenting a firsthand look at what his new book is about. Dunbar will be available for autographing copies of the book at his lecture Friday evening, April 22. Reviewed by ZJE

The book is available from Highland Hardware for \$13.95 plus \$2.50 shipping.

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Catalog Corrections

Our 1985 catalog contains some errors regarding our Hegner scroll saws and the new "through or half-blind" Leigh dovetail jigs. Corrections are offered here.

On page 8 we indicated that the C-frame of the new Multimax 1 saw was die-cast aluminum. Our importer tells us that this is not certain; they refer to it as a special fatigue-resistant alloy. Also where we give warranty periods for the saws, we erred in saying they apply to the motors. All electricals on Hegner machines have a *one-year* warranty. In addition, cast iron is the material used in the base and frame of the Multimax 3 and Polymax 3 saws.

Our description of the model C and D Leigh dovetail jigs on page 35 was incomplete regarding dovetail angles. When cutting *through* dovetails with these two models, the dovetail bit must have an 8° angle, rather than 14° as we implied. However, when cutting *half-blind* dovetails with these two jigs, a dovetail bit of any angle (8°, 14°, or 15°) can be used, depending on the thickness of your material.

For through dovetailing on models C and D, we now offer the following new 8° Dovetail Bits:

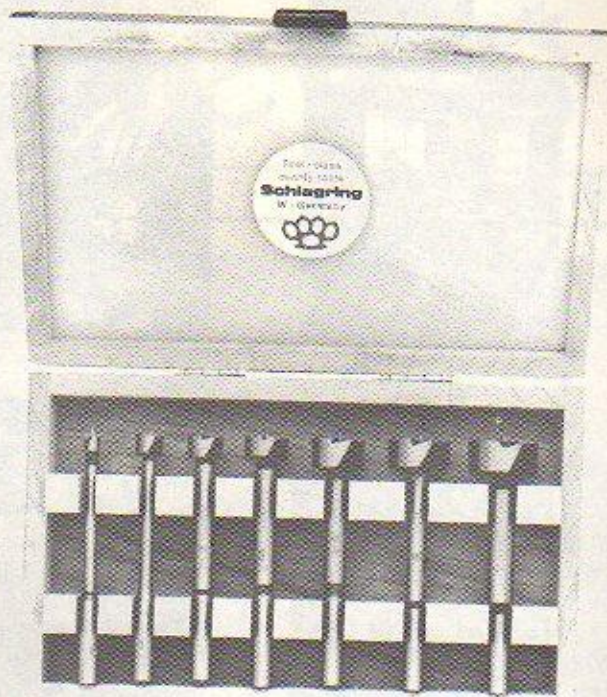
Order No.	Dia.	Max. Depth	Shank Dia.	Cost
10.53.11	3/8"	1/4"	1/4"	\$29.50
10.53.12*	1/2"	13/16"	1/4"	\$29.50
10.53.13	11/16"	1"	1/2"	\$39.50
10.53.14	13/16"	1-1/4"	1/2"	\$49.50

* Included as standard equipment with models C and D.

1985 Catalog

Don't have a copy of our 1985 catalog? It contains a comprehensive selection of essential hand and power woodworking tools which we promptly ship to all parts of the U.S. We have taken care to select top quality tools which you will be proud to own for a lifetime of caring use.

To receive a copy, send \$1.00 to Highland Hardware with your name and address, and we will also continue to send *Wood News* to you for one year. Or if you order from one of the ads in *Wood News* and indicate that you don't yet have a catalog, we will include one free with your order and also begin a newsletter subscription for you.



Boxed Sets of Forstner Bits

Schlagering has recently begun offering their fine quality Forstner bits packed in wooden cases. Two assortments are available. The set of seven includes 1/4", 3/8", 1/2", 5/8", 3/4", 7/8", and 1" sizes.

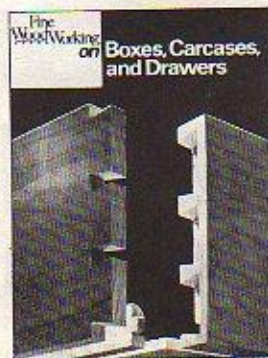
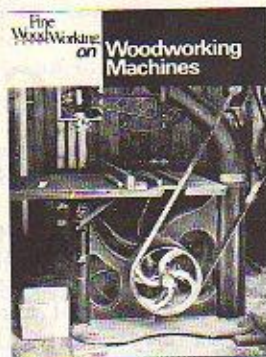
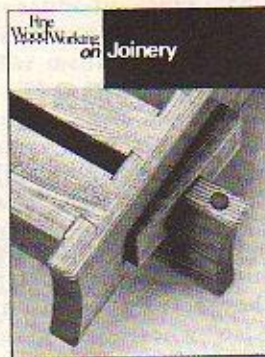
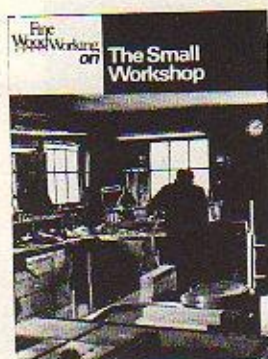
The set of fifteen includes the above seven sizes plus 1-1/8", 1-1/4", 1-3/8", 1-1/2", 1-5/8", 1-3/4", 1-7/8", and 2". Shank sizes in both sets are 3/8" or less.

In our experience, Schlagering has been a quality leader among European makers of Forstner pattern bits. Their bits are carefully engineered and precisely machined, and can be depended upon to cleanly drill flat-bottomed holes in all woods, whether in difficult grain, delicate veneer, or densest heartwood. The inside beveled circular rim guides the bit for consistent cutting action, permitting overlapping holes for mortising or grooving.

We are pleased to offer these premium bits at the attractive price of \$49.95 postpaid for the boxed set of seven, and \$179.95 postpaid for the boxed set of fifteen.

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Fine Woodworking On... Series

Edited by John Kelsey. How many times have you been in the middle of a project and had a problem crop up? You remember reading an article that could help in an old issue of *Fine Woodworking*. Now you have two problems: the original problem plus which back issue the article was in. So it's off to the bookshelf to start the search. After an hour of searching and being distracted by all the other fine articles you see, you find the article and the solution. Now you ask yourself why couldn't *Fine Woodworking* group articles together by subject and offer them as separate books. It would certainly save time in looking up information. Well, your wish has reached fruition.

The editors of *Fine Woodworking* have come to your rescue by publishing a series of softcover books entitled "Fine Woodworking On..." The "On" series covers:

The Small Workshop; Planes and Chisels; Joinery; Woodworking Machines; Boxes, Carcases, and Drawers; Making Period Furniture; Bending Wood; and (edited by Jim Ritchie) Proven Shop Tips.

Each volume is a compendium of 30 to 40 articles published in the magazine during the last nine years.

A while back I built the workbench in my shop from the plans in Tage Frid's article "Workbench" which originally appeared in *Fine Woodworking's* first issue. On comparing the original magazine article with the piece as it now appears in the book *On the Small Workshop*, I was pleasantly surprised to find that it had been revised for correction and appended to offer the reader a cut list. While it was enjoyable to read Tage Frid's article again, I was dismayed to find some of the other articles had not been revised to reflect reader comments on technical errors and personal prejudices of the authors. This was the only shortcoming I found in this series.

Even if you have all the issues of *Fine Woodworking*, the "On" series will be a welcome addition to your woodworking library, and it certainly won't break the bank. Each book in the series retails for \$6.95 each.

Reviewed by Phil Colson

The books can be ordered from Highland Hardware by calling (800) 241-6748 (MC/Visa only).



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