FURNITURE DESIGN MARQUETRY VENEERING CARVING MILLWORK

# WOOD FORUM

Newsletter of the Sonoma County Woodworkers Association

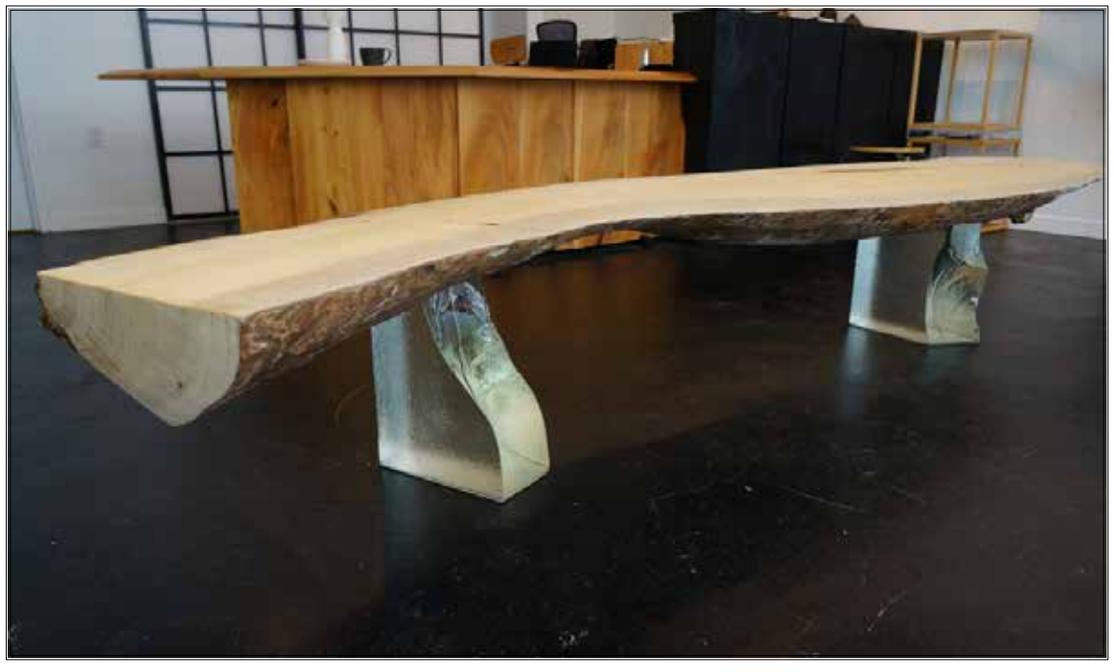
Volume 35, Issue 7 July 2015

# Japonisme 2015

by Art Hofmann

This month's membership meeting will feature a presentation by Chris Weiss and Monica Reskala, a husband-and-wife team with a business in Oakland, MRCW, which designs and builds furniture and environments based on a modernist interpretation of the Japanese style. The look is spare and lean, and combines elements of modern architecture and the Japanese aesthetic. They use wood, metal and concrete in their work, which aims at building beautiful, timeless structures. Their work is well-crafted to last for generations to come, functional, resourceful and sustainable and supportive of the local economy. Established in 2002, MRCW operates a 3200 sq. ft woodshop with extensive inventory of locally and sustainably harvested lumbers, as well as their Uptown Oakland design atelier and furniture showroom, Turtle & Hare.

Weiss and Reskala will discuss their work on the basis of photos presented in slide format.



Monica Reskala was born in Mexico City and studied Graphic Design and art. She operated her own design studio for ten years before forming MRCW. Chris Weiss studied architecture at U.C. Berkeley, London, Stockholm and Berlin, and then did a five year apprenticeship in Japanese joinery, building both traditional and contemporary timber frame homes. He worked as lead carpenter and project manager for the construction of Larry Ellison's residential compound in Woodside, CA.

When: Tuesday, July 7 at 7 PM

**Where: Cotati Cottages**

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**Directions**

Cotati Cottages is a townhouse development located west of the H'wy 101 and H'wy 116 interchange. Take Highway 101 to Gravenstein Highway (116 West) exit. Head west in the direction of Sebastopol about ¼ mile to Alder Avenue. Turn right on Alder and then turn right on the first street, which is Ford Lane (Cotati Cottages sign). Proceed to the end of Ford Lane and park in the gravel parking spaces. The Clubhouse is the small building on the northeast corner of Ford Lane and Starr Court. If the gravel parking area is full, please park on the east side of Alder Avenue. The address is 8050 Starr Court, should you be navigating by GPS.

# "Don't let Perfect get in the Way of Better"

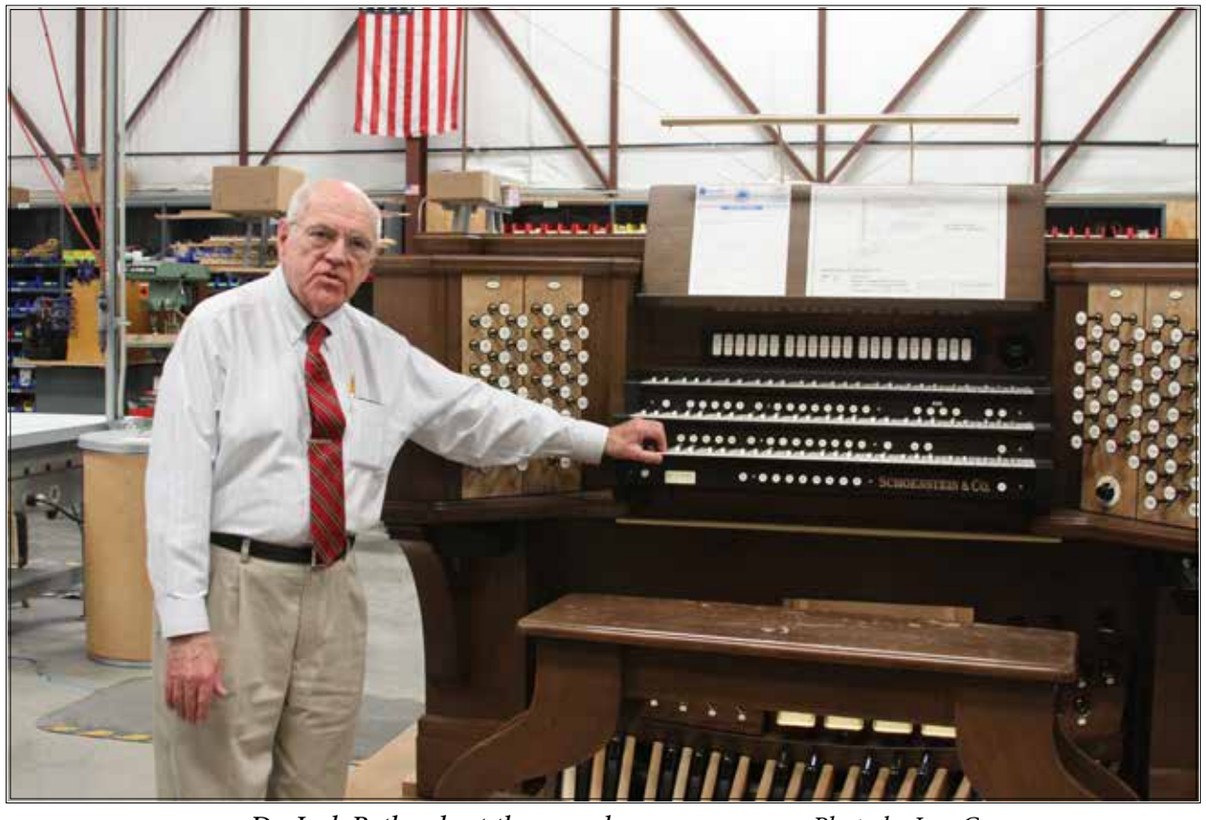
## SCWA Monthly Meeting June 6, 2015

by Walt Doll and Art Hofmann

A thirty-two member group from SCWA turned up at Schoenstein Pipe Organ Company in Benicia on June 6. Our members and guests assembled on a beautiful breezy day in Benicia, overlooking the mothball fleet. We were taken on a tour of the factory by Jack Bethards, the owner, who is passionate about pipe organs. Our contingent seemed to fire up Mr. Bethards, who fed on the members' perceptive questions, and since he has been involved with these instruments a long time, and there is seemingly no aspect of them that he has not investigated, the meeting turned out to be a long one, going from 10:15 AM to 2:30 PM with a half hour break for pizza.

Art Hofmann introduced Jack Bethards, who then began his long disquisition. Schoenstein Pipe Organs was founded in Germany in 1851. The founder started by making wooden pipes for cuckoo clocks, then pipes for orchestrions, similar to a player piano of the day. After selling the orchestrions all over the world, two of the brothers ended up in San Francisco to avoid being drafted into the Franco-German war raging in the 1870's. One brother started this company in 1877. Bethards bought the company in 1977. It was located on 20th Street in San Francisco's Mission District. This is now the largest organ company in the West, second oldest in the US. As an aside, Joe Scannell pointed out that guitarist Pat Metheny is involved in a revival of the orchestrion and has an album released in 2013 called the Orchestrion Project.

The Schoenstein Organ Company is composed of three parts. They make new organs, they restore old organs, and they do service work, tuning and maintaining all makes of organs. However, the main business is making and restoring organs. New ones are all custom made for the customer. Typically they have a five-year waiting list, but after the recession of 2008 the lead-time is now only one to one and half years. Most of their customers are churches. Some of the big name customers are Juilliard School of Music, Mormon Tabernacle Choir, and some are even designed for homes.



*Dr. Jack Bethards at the console* *Photo by Jose Cuervo*

They build the entire organ in the Benicia shop, after evaluating the acoustical characteristics at the future organ's home, then dismantle and pack the pieces and reassemble at the job site.

This was undoubtedly the cleanest, most organized shop of its size that we will ever see. Bethards sets aside time at the end of each workday and at the end of the week for cleanup, and it shows. Schoenstein Organs has only twelve employees, all amazingly qualified. Four of them work in the office only. It takes about nine months to make an organ if they were working on nothing else but that organ. Your typical organ sells for three or four million dollars. They go up from there. A pipe organ will last fifty to sixty years before needing an overhaul to replace the leather bellows and control valves that also have leather diaphragms.

Mr. Bethards caught the organ bug as a young boy when he attended a local Santa Rosa church called The Church of the Incarnation and they had a pipe organ there that needed repairs. He watched the mechanic from Schoenstein bring it back to life and he was forever hooked on pipe organs. Eleven-year-old Bethards pestered the owner of California Theater (next to the Roxy in Santa Rosa) until the owner gave him a key and he went in every Saturday to work on the organ and play it. It all started as a hobby.

We moved to Schoenstein's receiving bay, where they can unload a pallet of lumber with a forklift and drive right in the doors, unlike the 20th St. location where everything had to be carried piece by piece from the street and up stairwells. Poplar is the lumber that predominates in Schoenstein organs.. Everything structural is made of this. Of course, the casework front and the console are made of the species desired by the customer. The most popular species for this now is quarter and rift sawn white oak.

Bethards took us next to the 25 horsepower beam-saw, which was inherited from the owners of the cabinet shop that was their predecessor in the building. Initially it wasn't appreciated, but now Bethards can't do

without it for processing plywood and MDF panels. The MDF is over an inch thick, a special thickness made for them that closes off the sound box vibrations and mutes the organ. Each orchestral voice in an organ is called a stop. There are violin stops and flute stops, for example. Of course the entire horn section and woodwinds are represented. Then, the number of stops within it classifies the organ. And the stops are fitted piston-like in the pipe. Hence, the expression, "pulling out all the stops" - all the pipes are sounding because all the stops have been withdrawn.

*Photo by Walt Doll*

The entire shop is outfitted with machinery that Bethards has found and then rehabilitated, mostly old American cast iron that is no longer in production. The good old names, like Moke and Wadkin, abound here. Bethards is not a woodworker per se, but he is a machinery addict who has revived dozens of classic cast iron woodworking tools for his business. He did a lot of research to determine the best machinery maker for a particular machine, and then he was lucky that the entire woodworking industry was switching over to CNC and old tools could be purchased at bargain prices.

Bethards told an interesting story. Standing in the machine room, he told us that every machine manufacturer represented there was now out of business, save one. Northfield Machinery is still in business. Northfield canceled their insurance coverage so that the lawyers no longer sued them for workplace injuries. Without insurance, it was no longer a target!

Bethards moved on to discuss theories of machinery placement. He believes in wide spacing to give room to stack materials close by. It is difficult to make changes down the road because of electrical circuitry and dust ductwork, so he hired a consultant from Germany who talked to his crew and devised a great setup for his woodworking shop that has never been changed. He also initiated a maintenance tag system that ensures that each machine gets its required lubrication and adjustment. He hasn't had a breakdown in years. Although Bethards doesn't care for computerized CNC machines, he does like using digital readouts (DRO) and has equipped many of the machines with them where appropriate. Instead of hand measuring and making test cuts, the DRO saves time and guarantees accuracy. The brand he likes are made in Oregon and go by the brand name of TigerStop. They go on old cast iron machines like their old Oliver 260D table-saw with dual 16" blades, sliding table, and two 5hp motors.

Bethards talked a bit about scaling, which is the tuning of the pipes. A lot of research from their experience

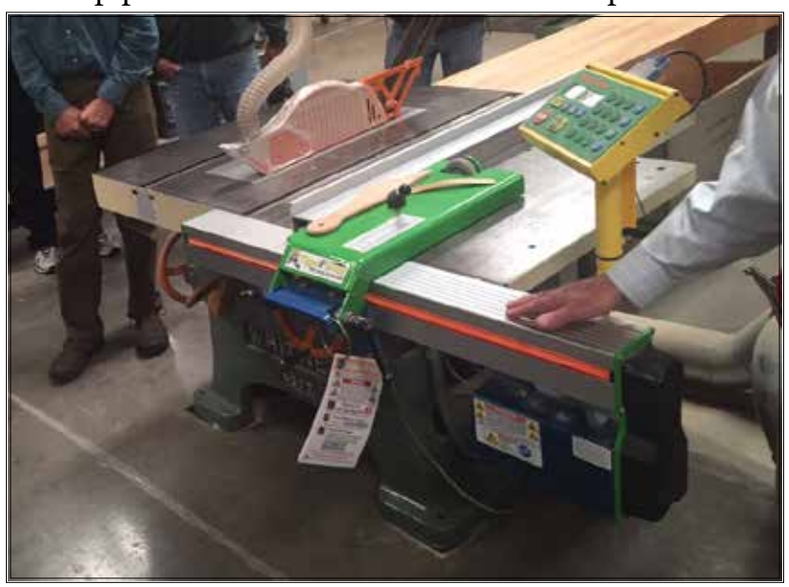
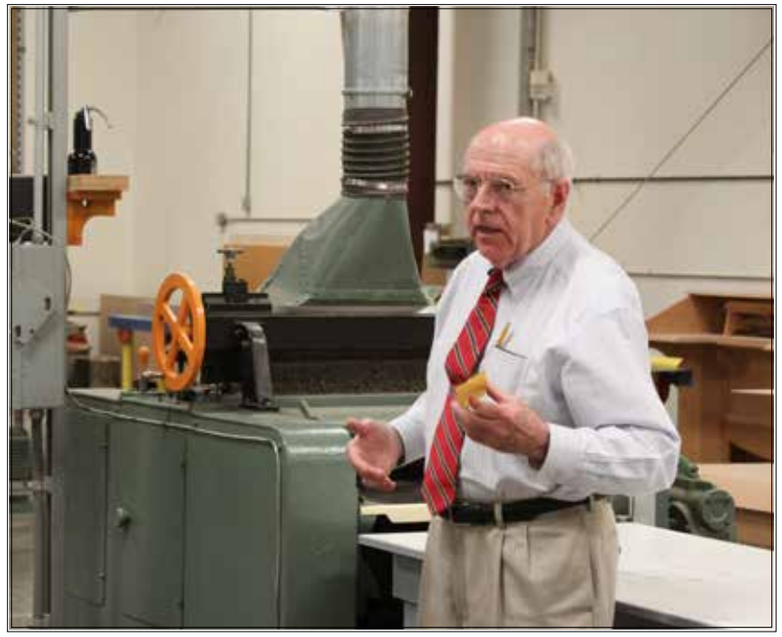


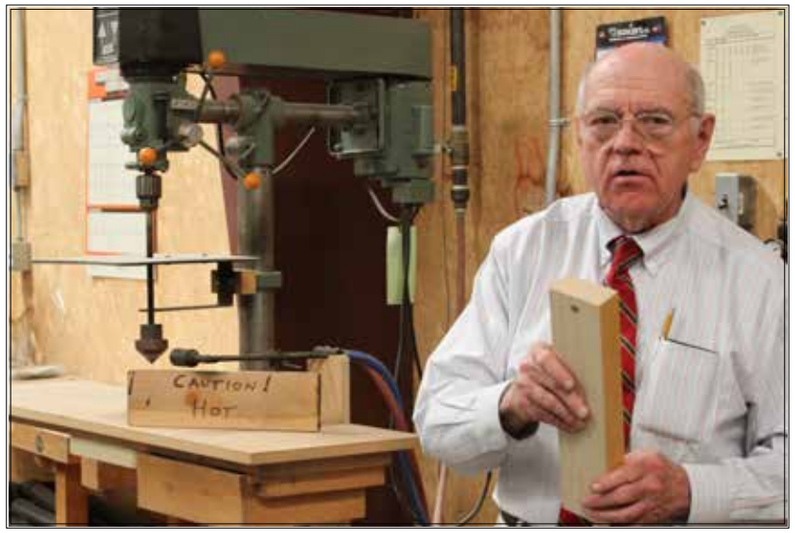
*Photo by Walt Doll*



with other organs in Europe and Britain feeds into this scaling, which is a blending of pipe diameter and opening size and placement. Designing an organ and selecting these variables ends up being a matter of personal taste and probably defines Schoenstein Organs as much as their craftsmanship. One technique that is rather unusual is how Schoenstein adapted a drill press with a roofer's torch that heats up a steel countersink and scorches the wood dimple to keep the lead organ pipe from rusting and creating "sugar crystals," preventing the pipe from sealing properly. Once the charred wood is sealed it no longer transfers moisture to the pipe and this problem is solved (photos on page 4). Due to its malleability, lead is used extensively in pipe organs for sealing off air pressure to the pipes.

Gathering around the console, Jack Bethards fielded more questions about pipe organs. The organ, he said, is a machine, not an expressive instrument, like the violin, the clarinet, the flute, or even the piano. It consists of valves that are either on or off. Loudness or softness is also controlled in a mechanical manner by an expression pedal, which opens or closes cumulative ranks. An organist really has to be a genius, and his art consists of perfect timing to obtain the fluidity and

tones that lead one to sense the beauty of the music. Schoenstein's job, then, is to produce an organ that is instantly responsive to the organist's touch. If the organ is sluggish, even the best player can not make it



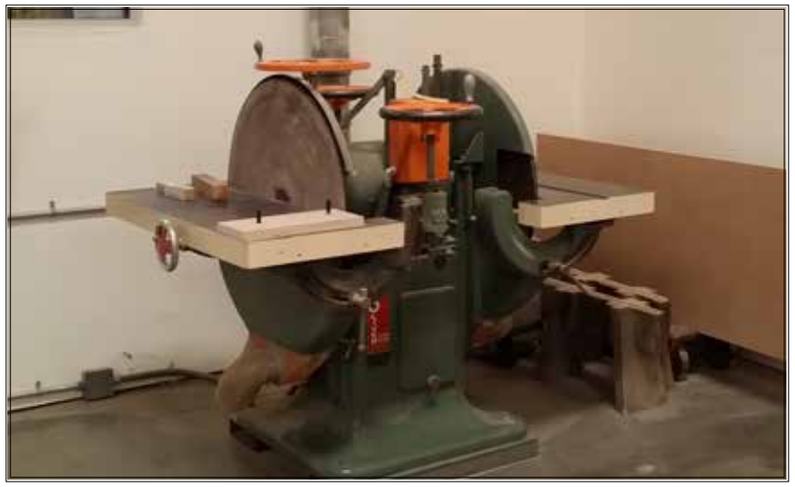

sound good. Played well, however, this one instrument can do what a whole symphony orchestra can do, and that makes it, in Bethard's opinion, the greatest of all instruments.

Keyboards are made for the company in England. Ivory is of course no longer in use, so the white keys are made of cow shin bone, which is better than ivory, since the bone has some 'grip' to it. Black keys are made

of ebony. Keyboard arrangements for an organ vary from one keyboard to five keyboards, each comprised of 61 keys, compared to the 88 of a piano keyboard. The reason for multiple keyboards is that each may be programmed for a different sound. The keyboard before us had three sets of keys on tiers, the vertical surfaces replete with buttons which function as pre-sets. The organist can configure them to pull out stops, and they can pull out any number of them, depending on what the music calls for. The organist has to be very coordinated, using his/her feet, and knees as well as fingers. The lesser number of keys does not mean that there is less range than a piano; there is more, because differing ranks of pipes can be invoked of either higher or lower pitch. None of the low notes are below hearing range, but some people cannot hear the highest notes.

The 'works' are digitally controlled through three computers in the back of the console. The signals from keys are collected and then distributed to the organ by the computers. The system is very much like a telephone switching system, reflecting its invention by a telephone engineer in England in the 1880's. In the 'old days' there were 61 switches with contacts. Bethards is generally skeptical of computers, but here, he uses them. When they work, everything is fine, but when they go awry, it can not easily be fixed with a soldering iron as in the old days, instead requiring replacement. The new technology has wonderful features, such as memory, and the ability to record and playback, where what plays back may be the entire performance, live on the organ. This is the only instrument capable of recorded playback. Bethard's guess is that the computers in the organs being built nowadays will fail at about the same time as the leather on the valves gives out. The computer components are, of course, made for Schoenstein. Previously they made their own diode matrix systems, and Bethards maintains these were wonderful, very rarely needing a new transistor. But they did not have the features that the current computer-based models offer.

Responding to questions, Bethards said that organs range in price from a quarter of a million dollars to about six million, with an average price of one million dollars. When an installation is done of a new or newly refurbished instrument, four of his men go to the site and stay for three weeks erecting the organ, then they are replaced by two men, who stay for another three weeks, doing the final work.



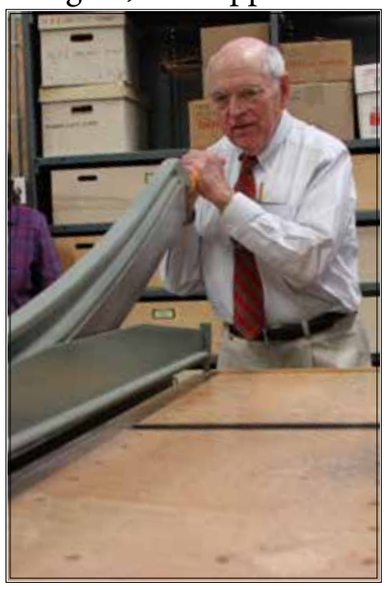
*Oliver disk sander* *Photo by Steve Greenberg*

After lunch we moved to an assembly area on the far side of the console. Various parts of the organ are assembled here. The boxes we saw made in the woodshop for instance, are here fitted with mechanisms from the leather shop. Other boxes from the woodshop formed the windchests. There is a chain hoist that serves this area, and its products are sub-assemblies of the final organ. In response to the question, "Why leather?" Bethards answer was simply

that the industry never found anything as responsive as leather and they always returned to this material. Sheep and sometimes goat leather is used for the numerous sensitive valves while horse and cow hide supply some

of the coarser leather for other parts. Gesturing toward a wall covered with colored plastic bins, Bethards pointed to the thousands of parts that the company kept in stock that are needed precisely at this assembly stage. He is a fan, by the way, of Robertson square drive screws. Bethards referred to electrical equipment, wires of various kinds for both high and low voltage circuitry.

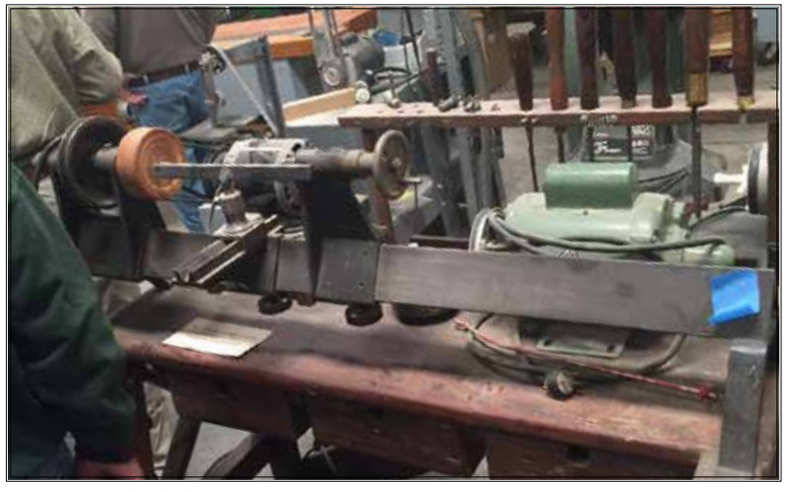
Moving on, a few yards away was a table with one tool that was impressive: a giant paper cutter with a blade that must have been five feet long, a book binder's shear, used here for cutting leather and felt. Moving on again, we stopped at a two ton punch press, where the thin leather was cut perfectly for the little pneumatic valves that make the pipes play. Such valves are needed by the thousands, and making them must occupy a good part of someone's workload. Moving on yet again, we followed Bethards to the machine shop area, where he paused only momentarily at several machines, the first a Bridgeport milling machine, doctored up with a DRO, the second, and one of Bethard's favorites, a Monarch 1050 machinist's lathe, that was completely rebuilt and had variable speeds. They use this to make all the little metal parts that they need for the console, say, and the mechanisms they need for the bench that makes it adjustable for height. An old lathe that belonged to the Felix Schoenstein, dating from 1878 was next. This lathe is still used on occasion. It was originally treadle operated until one of his sons equipped it many years ago with a motor. Next up was a little wood shop that supplemented the main shop by making little things that might be necessary in the final assembly of the organ. This area had an older Delta Unisaw and a Castle pocket hole machine, made in Petaluma. Bethards halted next at a rack containing pre-milled lumber that Schoenstein then finishes. It is called 'stay-stop' and is about three-quarters by four inches and is either medium or dark brown depending on where it is used in the organ. It is very useful in making braces and such, which often have to be made at the last minute.



*Not a SawStop!*

*Monarch metal lathe* *Photo by Steve Wigfield*

*Wooden pipes with stops in place* *Photo by Bob Roudman*



*Founder's lathe* *Photo by Walt Doll*

Next, Bethards ushered us into an area that Schoenstein added to the original building. Gesturing to the far end of the extensive space, he told us that it was intended to be a pipe shop, an area devoted to making pipes. All the equipment was there, he said, including a casting table. They have never made the really large pipes, and have to supply them from outside. They had an excellent setup in San Francisco for making pipes, but lost both the pipe maker and the capacity to make them in their move to Benicia. Another initiative in the works is that Bethards has been collecting old tools and patterns, and now he is taking them out of storage from this portion of the building and making displays out of them that will be distributed about the building. He aims to have that completed by the time of an organ builders convention that he will be hosting in October. He stopped at a completed display, an electrical testing device, which had a safety manual consisting of a one sentence admonition: Use common sense!

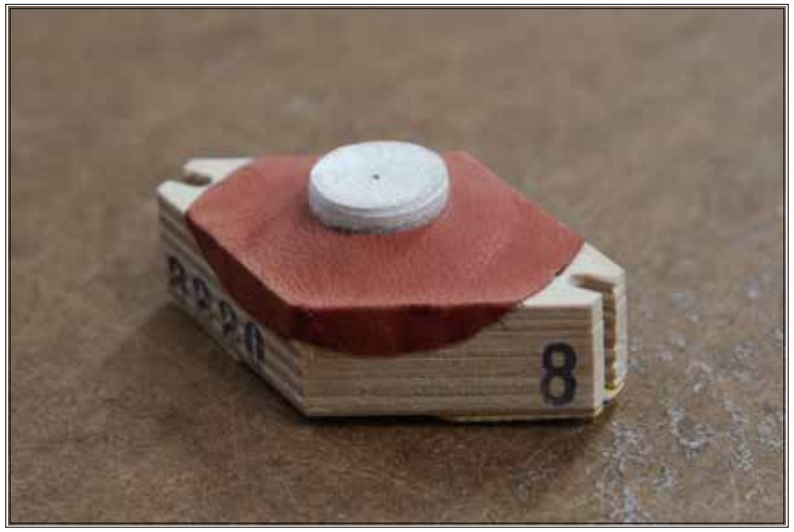
We then moved on to two rooms that had to be temperature controlled, the first being the leather room, where hide glue is used, the second, the voicing room. We went into the voicing room first, where, we learned, a neutral environment is important because the pitch will be lower in a cold space and higher in a hot one.

*Note the lead tips on these pipes - these are inserted into the countersunk holes seen on page 4.* *Photo by Mike Wallace*

Part of what makes this room neutral is the steady 70° temperature, where A is a constant 440. At 68° we can already discern a difference in pitch. If the client's building is normally kept at 73°, then they would keep the voicing room at that temperature. Salt Lake City and Denver, because of their altitude, demand different temperature settings to compensate for the thinner density of air in the pipes. All pipes have a rather blah sound at first and have to be tuned, have to be made to sound good, a task that is accomplished with files and other tools that push and pull and nick, to accomplish once and for all what a flute player might in adjusting his/her embouchure at any given moment. Setting one pipe is easy, but setting a thousand is difficult, and takes some real artistry on the part of the tuner. Reed pipes are even more difficult to voice, and Bethards went into some detail here on their technique, namely bending a curved metal reed either more or less radically. Schoenstein has one full-time voicer and three other workers who are capable at this work. Voicing a set of pipes and completing the tuning, which is yet another process, takes three or four days. It is done almost entirely by ear.

The leather room is also temperature controlled, due to the needs of the hide glue, still the best glue for the job because it is reversibility. Here the leather, goat and sheep skin, is skived with a knife; skiving is a tapering process that produces a surface that permits gluing all the layers of the leather. Small pieces then are glued to a wooden block, and with the addition of an electromagnet they become an organ valve that opens and closes pipes. There are various testing devices, a micrometer gauge among them, for testing the thickness of the leather at this stage.

In response to a question concerning humidity and leather, Bethards said that most churches are kept at a fairly constant temperature, but that they did install




*A leather valve* *Photo by Jose Cuervo*

humidifiers in some organs, especially in the South, to mitigate the effect of the wet summer and drier winters, where wooden elements shrink and expand and finally crack over time.

In response to a question by Michael Wallace, Bethards told us that recordings by Ken Cowan and Thomas Murray were very good, some of the best available.

Next we were ushered to the historical archive, a room devoted to all the transactions of the company, from its inception in San Francisco, and many of the file records from the Germany firm. Pictures of Felix Schoenstein, the founder, framed certificates and many artifacts abound here. The work on the archive is progressing for the upcoming organ convention. The room also contains a library which is devoted to books on organs, one of the best such collections around, Bethards told us. Drawings are kept in special files, and there is a complete set of them for all the organs that Schoenstein has made or refurbished. Tools that are no longer in use will be displayed here, as well as different era windchests by the company. Bethards called our attention to a scheduling device that was in use until ten years ago, when it was replaced by a computer. Not as good, he added. A curtain valve used in maintaining constant air pressure was shown to us by Bethards, technology that is a hundred and fifty years old, where a rubberized canvas screen moves subtly up and down. Old patterns and jigs that are to become part of future displays were kept here, too.

The final area that we saw was the erecting room, the big bump-up that is visible on the building from the outside. Bethards had this portion added to the existing building, creating an area that is 43 feet tall, enough to contain most organs, though some go higher. An organ was being assembled here, and we could see how the parts were to be arranged. The portion on the

*Parts of an early orchestrion* *Photo by Bob Roudman*

right is the section that will be to the right of the choir; the left hand portion on the left. The large pipes that play the bass notes are hidden, actually laying on their sides. On display is the cantilevered case work, and the

'golden' pipes, the bass portion of some of the ranks. Bethards explained that voices are achieved at times for certain notes by the use of additional ranks, since it sometimes takes two pipes to attain those notes. Thus there are often more ranks than voices.

The type of materials used for pipes depends on their tonal qualities and function. Smaller pipes are made of tin, while larger ones, where more strength is needed, are of zinc and tin. Large inert pipes call for lead, other large pipes sound best when made of wood. The receiver is also housed here, the other end of the electronic package where signals originating at the console are sent by the transmitter and end up here. An expansion cell filters the air flow of vortexes and permits smooth air flow to the pipes, allowing the pipes to 'speak' nicely. Bethards then went into an explanation of chest 'magnets' as they are called in the business, which is a valve at the center of the whole action. A minute electric current opens a very small valve within the unit, equalizing air pressures, which then opens the main valve, passing air to the pipe and producing sound. These magnets do emit a micro-click, but this is mitigated in various ways and goes unheard. This is the core of this electro-magnetic system, which is so fast that it can not be 'outplayed' by any organist. Another part of the organ, which Bethards first mentioned here, is in the back. This is the 'echo' organ, a part that emits little echo sounds, and chimes, and other sounds that embellish the music. Together with the parts of the right and left, and the large pipes 'under the window,' this is the fourth part of this four division organ. We moved into the interior of the organ, where Bethards showed us the 'shades' and how they operate to increase or decrease loudness in the church. This current organ belongs to a church forty feet wide and ninety feet in length. Drawings are important to the process of building or re-building. About fifteen major drawings are involved and numerous shop drawings of lesser sections accompany each job. Hand drawings, Bethards finds, are easier to read, but the computer drawings of nowadays are getting better and better. CNC machines do certain parts, and are supplied by a large company back East, who supplies all the organ builders. The thinking in relation to CNC

*Photo by Steve Greenberg*

is 'farm it out' wherever possible; Schoenstein gets the parts it needs cheaply, and doesn't have the headache of machine ownership.

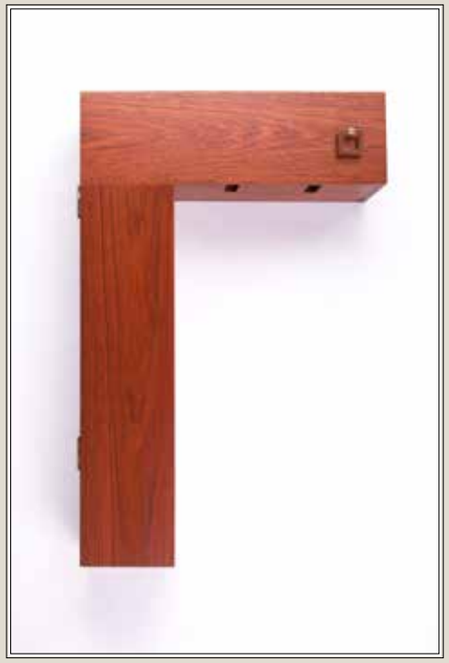
Karl Shumaker asked about dust control. Bethards said that the customer is responsible for building a blower room and installing a filter that they specify. In response to another question, the answer was, yes, air flow may cause wear after many years that affects sound, but this is controversial at best among scientists who study these matters. Sweet sounds attributable to age come from certain old organs.

When Bethards evaluates an organ, which he does as a matter of course in his business, he goes through the organ systematically, recording its sound, then playing each note from the console and taking notes. He finds a lot of abused organs out there. In studying European organs they have found sounds they like, and have experimented with pipes, trying to copy them until, by trial and error, they achieve a sound they like. Bethards believes in adding any pipe to his arrays that sounds good. Schoenstein has also produced original sounds, a set of pipes for instance that reproduces the lower register of the flute. This has become one of their most famous stops. Tropical areas produce problems that Schoenstein has encountered, but not frequently. Teak is used here, and the organ is protected by screens, but such issues are often for a local HVAC specialist to solve. Pipes do not normally suffer in transit. They are voiced to about eighty percent capacity and then 'brought up' to full sound when finally installed at the venue. It is easier to make a pipe sound louder than weaker. Finished and installed organs are usually allowed to sit for a while before a major recital can be scheduled, in order to work out any issues.

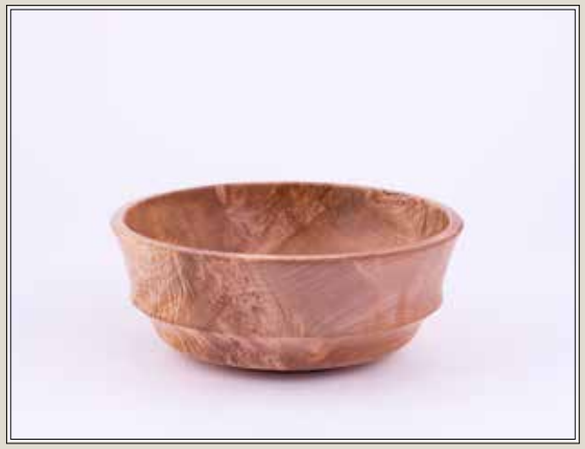
Bethards himself is not an organist, but a trumpet player. Good, he says, because he has flexibility in embracing various types of organs, which an organ player schooled in certain organ styles might not have. Schoenstein has two or three people who can play the organ, though most testing is done by playing scales.

In answering final questions, Bethards said that there is a succession plan, and that the company will be left in the hands of his employees. There is one woman employee in the factory currently, and she is very good at her job doing the leather work.

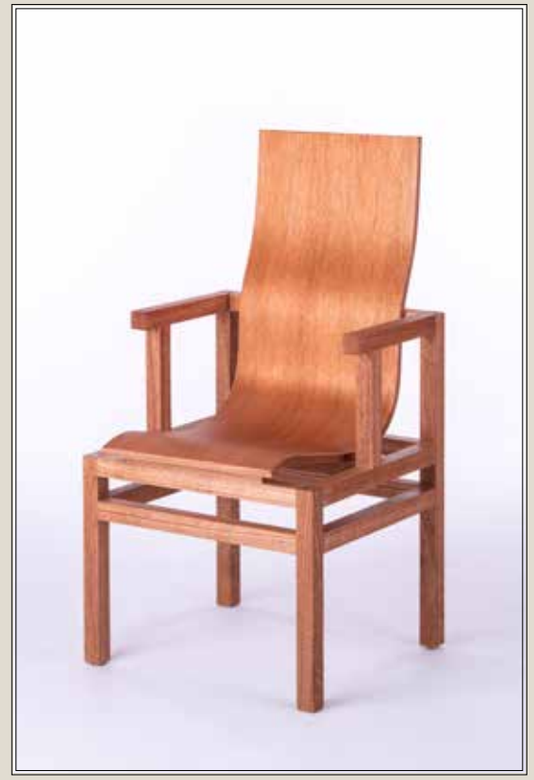
The tour ended with a big hand of applause for Bethards' sterling effort, a man whom seems to exemplify the best that the American business ethic can bring forth, a true entrepreneur. He said that the tour was longer than usual because of the intelligent questions coming from our members. In leaving, and afterward, many members remarked on how much they had enjoyed the day.



*Red* by John Sheridan & Chen Li

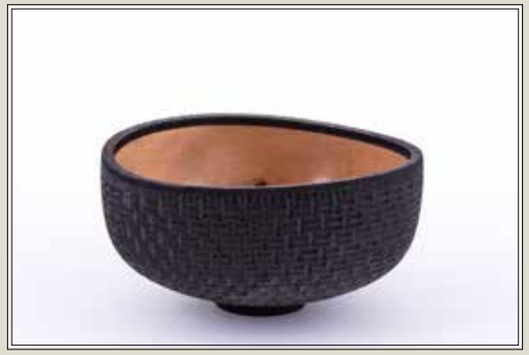


*Local Native Maple Bowl* by Chuck Quibell

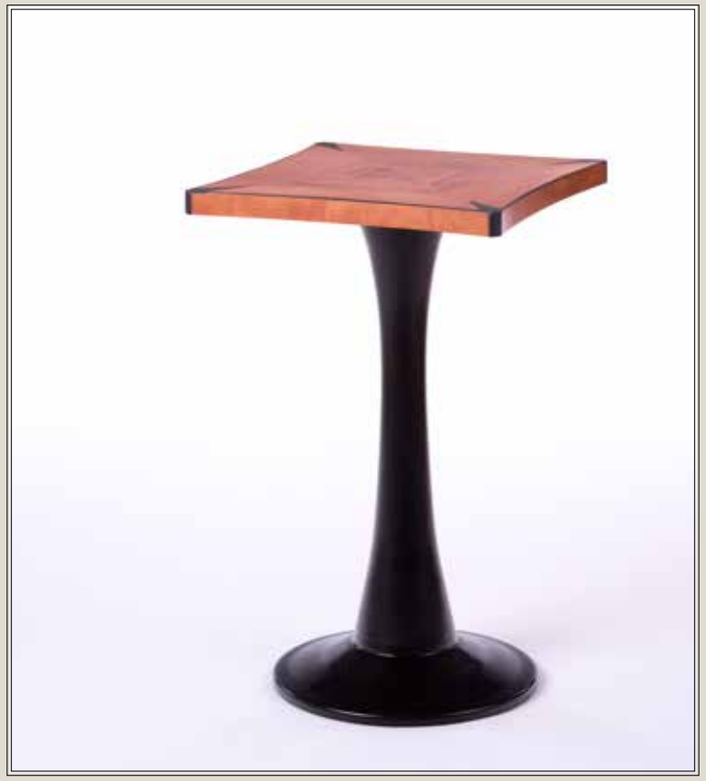


*P-14 Dining Chair* by John Sheridan & Chen Li

*Photos by Tyler Chartier*



*Basket Textured Bowl* by Scott Clark



*Cortadito* by Les Cizek

## Officers of the Association

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|---|---|---|---|
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*Wood Forum* is the monthly newsletter of the Sonoma County Woodworkers Association. Please feel free to submit articles and photographs for inclusion in the publication. You can send your submissions to the Wood Forum Editor at SCWAEditor@gmail.com. Advertisements are also accepted with a per-entry cost of $5 per column inch.

## Membership Application

I would like to join the SCWA to meet other people interested in the craft, the art and the business of fine woodworking. Enclosed is my check in the amount of $35 for the annual dues. I understand that this fee entitles me to attend monthly meetings and to receive the Wood Forum newsletter by email or via the SCWA's website.

Name _____ Email _____

Address _____

City, Zip _____ Home Phone _____

Cell Phone _____ Work Phone _____

Please send check and completed application to:

Sonoma County Woodworkers Association, PO Box 4176, Santa Rosa, CA 95402