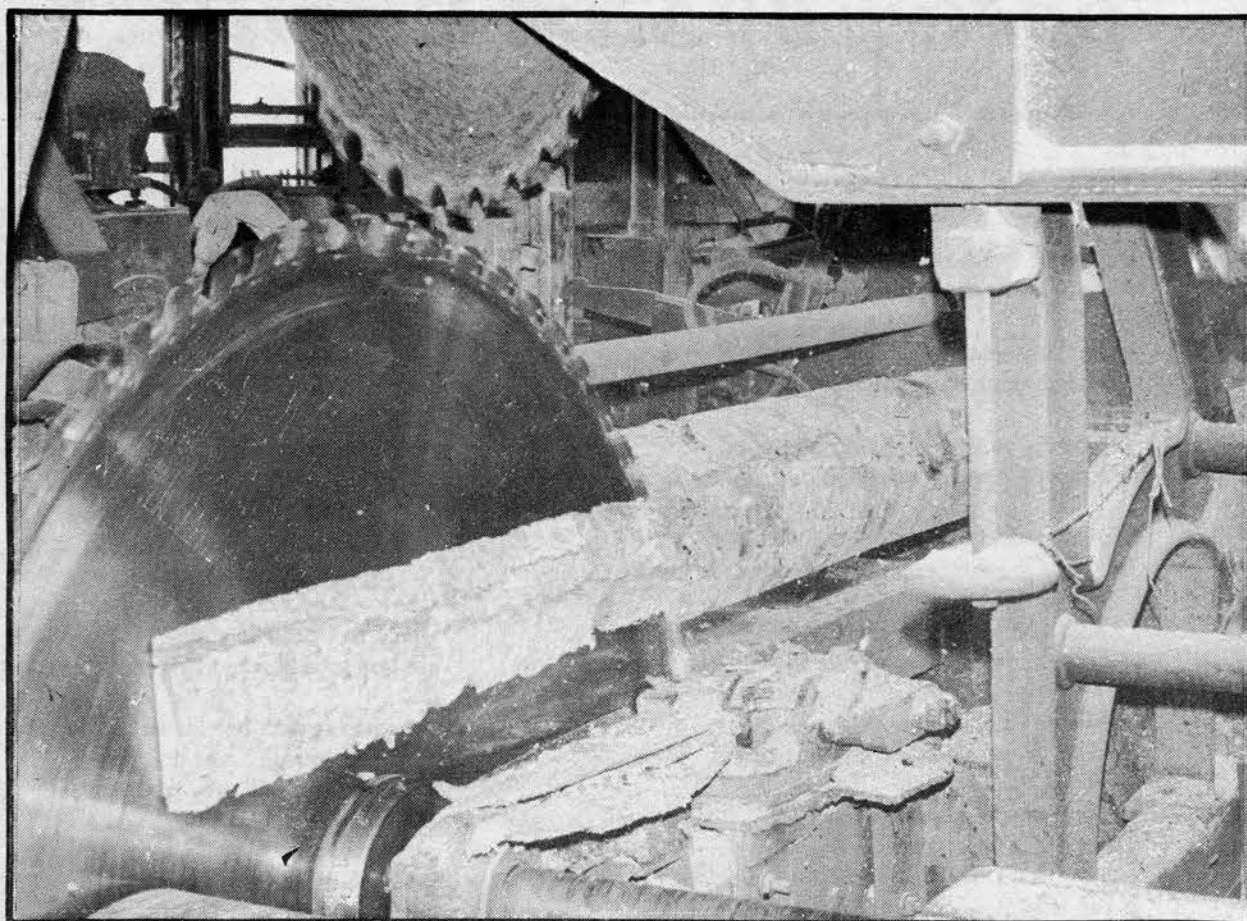




Sawing through to another world

by George Sibley

When I went to work in Luce Pipher's sawmill on Crystal Creek, in western Colorado, I couldn't help but remember the advice that was as much a part of my Pennsylvania mill-town adolescence as the five o'clock whistles at the factories down by the river: "Work hard in school and get a good education, or you'll end up in the mill." Sawmill, steel mill, paper mill -- what kind of mill didn't matter. Every town had one or two, and each served the secondary function of winnowing out young people convinced that they didn't want to "end up" in them. Common wisdom was that it was all too easy to surprise death with an atrophied mind, with nothing to show for a life of work but a mountain of logs or milled paper.

I did work hard in school, and I got a college education -- and recently, in what has been a very varied career, I found myself working in a sawmill. At the time, I had been living in or near the Colorado mountain forests for 15 years, and I had always been tangibly involved with trees: fighting fires, building furniture and houses, filling up hundreds of pounds of paper with various excretions of mind and body. My life was surrounded by trees as trees, and inextricably bound up with trees changed into a thousand other things. So when I learned that the new husband of an old friend had a small sawmill and was looking for a sawyer, it seemed like the most obvious thing in the world to go there, to spend a little time in the changing-phase, as it were, between the tree and the tree product.

As sawmills go, it was a small one, designed to cut between a quarter million and half a million board feet of lumber a year. I have since visited sawmills that cut and planed that much lumber in a single shift. For Pipher, the rough-cut owner, lumber production wasn't even top priority; he was first and foremost a cattle rancher, and all he wanted out of the mill was a little dependable income to help even out the fiscal vagaries of the cattle business. I was looking for a job, and he was looking for a sawyer. I wasn't a sawyer, but then he didn't want to pay what a real sawyer was

worth. I was willing to work at a trainee's salary, and a deal was struck.

My lack of experience bothered me more than it did him. The first day, Pipher told me he had just enough time to show me how to grease the machinery, start it up, stop it, and run a few logs through. Then he had to go move some cows. "You'll do okay as long as you don't do anything too fast," he assured me.

We started by clambering over the machinery, him naming the moving parts and pointing out grease fittings while I tried to take notes and figure out what the hell he was talking about. To one raised in the cosmetic technology of 1950s America, the mill was not impressive at first scrutiny, either from a distance or close up. Like most mills of its genre, it had been assembled out of spare parts -- old scrap iron, barnyard relics, antique tractor transmissions, army surplus, baling wire, and other oddments usually classified as "junk."

"Junk," I came to learn, was a touchy word around Pipher. A former employee of the mill told me that the rancher had once fired a man, on the spot, for muttering something about "junk" while repairing a breakdown. But Pipher himself used the term a few months later, when I made a comment about the venerable antiquity and possible ancestry of an old Hough front-loader we were trying to resurrect for use in the logyard. "The trouble with you damn hippies," he said, a hippie referring to anyone younger than he from outside of the valley, "you just don't understand junk."

Over the two years I worked at that sawmill, I think I did gain at least a journeyman's appreciation of junk, which I now know to be perhaps the last remaining valuable resource to be found in abundance in America -- specially on a working farm. "If you want a piece of wire," the rancher said on another occasion (kicking off a piece that had just tangled itself around his boot), "just take ten steps in any direction."

For a natural mechanic -- and they are, I think, the real artists of a technical age -- the combination of great wealth and scanty imagination that has marked the American industrial mainstream since World War II has

turned the nation into a veritable junk heaven; and that sawmill had been assembled by a friend of Pipher's who was one of the best of natural mechanics. Give him a cutting torch, welder, grinder, some hand tools and a box of nuts and bolts, and the natural resources piled behind any barn in America, and he could come up with a usable version of anything you needed, from a tractor set to a satellite dish. Had Jesus Christ told him in person that you can't make a silk purse out of a sow's ear, he would have taken it as a challenge. "Depends on how big an ear you start with, and how big a purse you want."

But I knew none of this that first day -- didn't know that good machinery needs to mature like good wine, and might take as long to break in as it takes bad machinery to break down. To me, that day, it all looked merely old and a little precarious. And nothing looked older or more precarious than the focal point of that sawmill, the saw itself.

It was a circular saw, not large as such things go: four feet in diameter. But it did not look flat and hard, like the little blade in my skillsaw; instead, it looked a little warped, dished -- alarmingly floppy, in fact, and relaxed. I mentioned this to Pipher.

"That's right," he said. He went over to the saw, grabbed it between a couple of its chisel-like teeth, and shook it: the saw flexed, *bawong*, *bawong*, like a big heavy-duty pizza pan. "It doesn't stand up till it's revving at speed -- 720 rpm."

Doesn't "stand up?" My experience with steel had left me with the impression of something solid, hard, and rigid; but I learned -- and was to learn more thoroughly in the weeks ahead -- that a piece of steel four feet in diameter, spinning at 720 rpm, acts more like a big piece of rubber. Under that much centrifugal force, its outer molecules tend to spread apart a little. So in order for a saw to be run flat and true at its operating speed, it has to be hammered into a slightly cupped shape at rest.

He showed me: we fired up the diesel generator, then threw the "head-rig" switch; the generator groaned, lugged down as the big old electric motor began to turn the saw. For about 15 uneasy seconds the saw picked up speed with a sound that can best be described as

"beating against the air." Then, all at once, it "stood up," visibly straightened out, and the sound of beating against the air changed to a smooth hissing whirr.

I spent quite a bit of time over the next few months just learning how to keep that flexible structure, that collective convocation of molecules, hissing smoothly. Mostly this was a matter of learning how, and how often, to sharpen the saw's teeth. Unlike the teeth on a skillsaw blade, a mill saw has replaceable teeth that are a little thicker than the saw itself, and which operate like little chisels, striking the wood at about 100 miles per hour. When the teeth are ground sharp with a straight edge, the saw makes a sharp *sna-a-acking* sound going into the wood, and, everything else being more or less in tune, the cut is smooth, straight, and seemingly effortless.

But when the teeth are dull, or chipped by a rock in the bark (big mills have debarkers for this reason), or crookedly sharpened, all sorts of increasingly ugly things begin to happen. The saw lugs down in the wood; you can hear everything working harder. But worse, as one side of those chisel-edged teeth grows duller than the other, that big flexible plane of whirling steel begins to "run in" or "run out" on the cut, wandering maybe one half to three fourths of an inch off its true course. This makes the boards come off the log with strange and varying dimensions, and it causes one side or the other of the saw to rub against the log, creating friction and heat.

Most saws -- ours included, when the pipes weren't frozen -- have a thin jet of water playing on them to help keep them cool, but twelve square feet of steel rubbing all the way along the length of a sixteen-foot-long log can generate a powerful lot of frictional heat. And when part of the saw gets hot, that part wants to expand, throwing the delicate molecular balance of carefully calculated centrifugal expansion all out of whack, warping the metal. An overheated saw lets you know with a low threatening mutter as it begins to beat against the air. If that early mutter is ignored and the log is run into the saw again without giving the metal time to cool, then a most frightening kind of hell is certain to break loose about halfway through the cut, as the saw begins to warp seriously.

Words hardly describe the banging horror of 100-plus pounds of hot steel oscillating chaotically at 720 rpm, but it should not be difficult to imagine the reluctance with which one approaches this raucous demon for the first time -- or fortieth -- with a can of water or handful of snow to cool it down. Amazingly, after only a few moments' application of something cold and wet to suck the heat out, the warp begins to disappear, the noise abates, and the saw grows rational again as order is restored to its ranks of molecules.

So I learned quickly enough that even though sharpening is a tedious job, the quality of both the lumber and the cutting depended on it absolutely. Hit a rock at, say, eleven o'clock and try to saw on through lunchtime before shutting everything down to sharpen, and it would be one long, lousy hour. If you ever look at rough-cut lumber that varies more than three eighths of an inch in its dimensions from one end to the other, you are probably buying lumber cut during an hour like that -- lumber that was quite literally born in an atmosphere of very palpable "bad vibes." Don't build it into your walls.

For the first few months I was pretty well occupied learning the basics, but eventually I was able to relax a little -- stand back, metaphorically speaking, and figure out what was really going on here.

From the beginning I had been totally fascinated by the visual magic of making the first cut on a log: there was the log on the carriage and there was the saw; I moved the log into the saw's space... and lo and behold, except for the sudden increase of noise, it seemed as if the log and the saw were occupying the same space without affecting each other, holographic images just passing through each other -- until I completed the cut and the slab fell away from the log, exposing the illusion and showing the log forever changed.

They didn't even seem to be of the same world, the log and the saw. The lines and surfaces of the log were all shaggy, textured, rounded, and

weathered -- the lines of least resistance and long accommodation to internal and external forces like wind, storm, the tree's own growth, gravity. But the saw -- like the saw's cut so strikingly emblazoned on the log -- was all hard lines, smooth surfaces, and sharp edges. And most distinctive of all was its motion: the saw didn't really become a saw until it stood up hissing at 720 rpm.

In the middle of one of those slabbing cuts one day, my mind flashed back some twenty years to a high-school geometry class, and some pictures in the text: line drawings of Euclid's plane, passing like a pane of glass through cones and cylinders to illustrate the "conic sections." In the book, the pictures seemed quite abstract, inherently fun but devoid of reality. Watching the saw snack its way through the log, its centrifugal stability not altered or deterred by knots or bends, I realized that the saw was geometry incarnate, the powerful evocation of an abstraction found nowhere in nature but in the mind of man.



Luce Pipher

The intersection of the saw and the log, however, was not an intersection of abstract shapes like the conic-section pictures in the textbook. The saw could adequately be described in terms of abstract ideas and designs made real -- but the log? The log came from a tree, the stem of a tree, which one *could* visualize as a greatly elongated cone, although there was no way to put together abstract conceptions and designs and come up with a tree.

So the saw truly was a juncture of two worlds. On my side of the saw were the logs: rough barked elements of a naturally evolved world whose shapes and textures were all derived from ages of ad hoc cooperation, competition, accommodation, and small instances of genetic inspiration. But on the other side, beyond the saw, were the logs changed into boards: all lines and planes and hard edges for assembly into the shapes and textures and objects found nowhere in the world before man came along. Euclid's Gate between worlds -- that's what the saw was, and I was the keeper of the gate.

Watching the lumber as it dried in the yard, however, I realized that Euclid would not have been entirely pleased with the transformation at the gate. Too much of the tree came through. Knots that violated the smooth grain of the plane, or even dried and fell out, splits working in from the end, four or five different kinds of warping... that world of lines and planes which is assembled so seamlessly and effortlessly in our minds demands uniform, predictable, regular, and interchangeable parts to become manifest around, and trees have some serious limitations in that regard. Especially trees that grow on mountainsides, where snowcreep, rock shift, erosion, and gnawing and trampling of teeth and hooves and feet interfere with their determination to grow straight up into the eye of gravity. Those

trees exposed to persistent winds grow more trunkwood and branches on the lee side. Part of being a good sawyer is learning to read each log for its own unique problems and possibilities, and recognizing that every tree is individual. Once, when I was cutting butt logs from the base of a gnarled old Douglas fir, the tree squeezed down on the saw so powerfully that the generator started to stall and I was forced to make a fast and noisy retreat from the cut. There was just too much inner tension in an otherwise "normal" tree. In general, no matter how well one saws, some of a tree's history in the natural world will eventually surface as a carpenter's problem in the man-made world. Not everything will pass smoothly through Euclid's Gate.

There was a period of nine months or a year when I enjoyed the work at the sawmill tremendously. Once I had learned all the separate little tasks that went into the larger task of getting logs through the gate between worlds, I found myself starting to blend the different tasks together, at first unconsciously but then deliberately. I wanted to try to integrate all the jobs involved in sawing up a log into a single smooth operation, from deciding how to fix the log on the carriage for the first cut to sawing apart the last two boards of the "cant." I found myself able to receive and process information simultaneously through eyes, ears, and fingertips, and answer the information immediately with appropriate action. On some days, it all worked toward such a sense of oneness with the machinery that it became quite exhilarating, more play than work -- a harmonious, efficient movement that was like dancing with the wood.

After a time, however, that sense of oneness began to deteriorate with increasing frequency. I found myself losing patience with logs that had the temerity to be crooked, knotty, or stressed with the environmental influences that I knew would lead to warped boards no matter how well I sawed them. I remember a day when we were cutting up a load of little aspen trees into mine props -- I got so irate that I started to slam the carriage back and forth, forcing the logs into the saw faster than was sensible or safe, until finally some kind of internal safety circuit closed in the part of the machine that was me, and I shut down the saw. I left the sawshed for a minute, and looked across the creekbottom pastures to a slope not a quarter mile distant that was covered with living aspen, admiring the subtle adroitness with which their limp-stemmed leaves manipulated light to set whole hillsides to shimmering, and wondered what the hell *they* thought they lived for, since it so clearly didn't fit into a Euclidean destiny.

I left the sawmill after two years, happy to have been there for what there was to learn, but also glad that I wasn't ending up there. Statistics indicate that most mill accidents happen not to newcomers but to people who have been too long in the mill. They start to put themselves through the gates, as it were: fingers, feet, and hands -- and all the knotty warped slices that come off the soul when one hangs around too long after starting to feel like just another piece of machinery.

Still, I think that at some point probably every person has to go through one of those gates, balanced between natural random clutter and some mind-designed conception of a more proper and fitting order for everything. I loved geometry in school, I liked rediscovering it at the mill, but I am worried that too much time in a Euclidean environment -- all the rough evolved textures and shapes of accommodative nature sliced down to smooth planes and predictable angles -- might eventually reduce me, as much as it reduces a tree, to a contoured two-by-four.

So what now? Which gate to look at next? I think of the Buddha, who sat down under a tree and found the portals to a personal peace on earth that millions have embraced. Or Newton, who sat down under a tree and discovered the gateway to the Industrial Revolution. The example seems clear: I think I will go sit down under a tree for a while.

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