

Thank you, Josh Baker
By Siegfried Engelmann

I've been enormously lucky to have worked with people who taught me how to think straight and solve difficult problems. The person who may have influenced me the most was Joshua Baker.

I met Josh on my first day on the job at the Ingersoll Steel Company on the far south side of Chicago. I was 15 and looking for a summer job that would get me in shape for athletic pursuits. I had heard that Ingersoll was a good place to go because it had an abundance of physically demanding jobs.

I had to talk the employment office into hiring me. There was a posted sign that said, "No Hiring." I told the man at the counter, " In a factory this big, there has to be some job that nobody else wants to do. I'll do the job and do it well." I believed what I said, but I had no idea of how challenging those jobs are. He looked me in the eye, and I looked him in the eye. Then he said, "Are you sure you want that kind of job?"

"Yes."

"Okay, you got it. Fill out this form."

I did. I lied about my age. I wrote 16 because that was the minimum age for employment.

The next day, after a brief physical exam and receiving a pair of gloves and safety glasses, I returned to the man who hired me. He gave me my identification card, and showed me the time clock I would use to punch in and out. Then he called somebody to escort me to my work station. When we walked through the hallway into the factory the noise level rose to the point that I could hardly hear my escort, who shouted and cupped his hand around his mouth to focus his voice. We walked

about a city block through a maze of aisles flanked by huge presses and a three-high rolling mill that converted blocks of white-hot steel into 1/8 inch sheets that were about four feet wide and more than 20 feet long.

Finally we came to the annealing furnaces on the south side of the plant. The annealing furnaces provided the final finish on plow discs and other type of blades. The discs were first shaped by starting out as little blocks of white hot steel and then being flattened, trimmed, and shaped by a series of presses. Then the discs were hung on hooks that transported them through the acid tub, and finally they went onto conveyor belts through the annealing furnaces, which hardened their surfaces.

The worker who stacked the discs after they finished their tour had the most demanding job on the line. The discs dropped unceremoniously but continuously in stacks of five from the conveyor onto an apron grid where they spread out. The worker picked them up and put them in a stack that would grow to more than four feet high before a fork lift would take them away and provide a new skid for the next stack.

The worker didn't touch the discs, but used long tongs. These look like pliers with jaws not much bigger than those on large pliers but with handles that were more than 2 feet long. The worker held the tongs with two hands and used it to shuffle and organize three or more blades at a time, pick them up, and with one looping motion, transport them to the stack that was growing on a wooden skid. As the stack become higher, the procedure required more effort to swing the blades up so they would land neatly on top of the stack.

The worker who operated a press just behind the end of the annealing line showed me how to use the tongs, and which oversized buttons to press to stop and start the conveyor. He also told me that a relief man would give me a five-minute break every hour. Then he turned

on the conveyor, watched me for a few minutes, and went back to his press. I was on my own. As the discs kept dropping on the apron faster than I could gather them up, I felt a surge of panic; I also realized how hot it was. My station was right next to a huge overhead door that was open. Outside was a fan with blades as big as a small airplane propeller, blowing cooler air on me. The temperature was well over 110 degrees, but I didn't sweat. I just slowly became coated with salt.

I could not keep up with the discs as they relentlessly dropped from the conveyor. I was working as fast as I could but the pile of discs on the apron grew so large that discs were sliding off the apron onto the floor. The man operating the press behind me noticed I was in trouble, turned off my conveyor, took my tongs, and cleaned off the apron. Then he said, "Don't kill yourself, but remember everybody on your line is on piece work. When the line goes slow, nobody on the line earns more than the minimum."

Following those encouraging words, he started the conveyor and I tried like hell to keep up, but I couldn't. I had to stop again. This time I cleaned the discs off the apron and pressed the start button. The same thing was happening again. My arms hurt; my back hurt; I think I was crying but I didn't have tears, just salt. When I was ready to press the button again, a black man trotted over to the furnace, took my tongs and said, "Go outside and sit on your ass. I'm your relief man."

I told him. "I can't do this job. I quit. I quit. I try but I just can't do it."

He said, "No, no. You're not quitting. You'll catch on. Go sit down for a while. I'll show you how to do it"

I sat outside and watched him. He was in his mid 30s, about six feet tall and lean. As he worked, I could see that his arms were muscular. He didn't stop the conveyor. He just stacked and organized discs about four

times as fast as I could do it, occasionally picking up discs from the floor. As he worked he pointed things out. "You want to stand like this, so the stack is more to your side. Then you take one step, pull the discs off the apron fast and make a sweet swing. Like this..." It probably took him less than two minutes to clear all the discs off the apron. Then, as the conveyor continued to discharge discs, he sat down across from me and told me, "I didn't know you were going to be here today, or I'd have been here earlier. I'll give you more than 5 minutes an hour, because its important for you to learn to make the right moves. If you don't learn them, you'll make the job hard because you'll swing the wrong way, take too many steps, and use too much energy. If you learn it right, the job isn't hard because you're sitting on your ass half the time. In fact the job is fun."

I thought: Like hell it's fun.

After he all but cleared the apron , he called me over, asked if I was ready to try again, and handed me the tongs.

He watched me, as I did my fumbling best, and pointed out little details, like holding my right hand closer to the jaws of the tongs. "Gives you more leverage," he said.

After possibly a couple of minutes, he said, "I have 10 other guys I have to relieve, so I'll get back as soon as I can."

He came back about 20 minutes later and told me I was in luck because the other line he relieved for was down. He worked with me on a couple of details, then told me to go sit on my ass again.

I made it through that first day but my forearms were throbbing; my back was screaming; my butt and legs were sore. The most prominent problem was my self confidence; it was on the rocks.

I took a bus home. People stared at me. I didn't know why until I got home. My mother looked at me and said, "Oh my god, what happened to you?"

I looked in the mirror. The image reflected how I felt. My face was black around my nose and mouth with grey patches of dried sweat and soot covering the rest of my face."

I told my mother how work went and she said, "Well, you're not going back to that terrible place again!"

I went back. I was so sore that I didn't think I'd be able to hold onto the tongs. Also, I had discovered, when I showered the night before, that I had left three coins in my back pocket (although somebody had mentioned not to wear metal objects) and my butt had three burn marks to show where the coins had been.

Josh relieved me about 15 minutes every hour over the next week. Also, he arranged it so the line was running about half the number of discs it ran on my first day.

My third day was a little better. My form definitely improved and I didn't fumble around as much trying to maneuver my tongs to pick up discs. I was still sore, very sore, but I could deal with it. One of the things that kept me going was thinking about the next day. It was Saturday and I would have two days to recover.

I improved steadily. During my breaks I would talk with Josh. I was fascinated with him. One day, he took his gloves off when we were talking, and I noticed that his left hand had only two fingers and a thumb. He explained that he was working a press that did something out of sequence and went down before he could get his hand out. He cautioned, "If you work on presses in this place, know your machine and know it well. They will sometimes screw up although management denies it. It's always

operator error, never machine error. But don't ever forget that this a dangerous place to work."

From our conversations I learned that Josh had gone through two years at the University of Chicago. He quit because, "There aren't a hell of a lot of jobs for guys of my color, and I could see that I was on a dead-end road. So you just move on and do the best you can."

Our talks during breaks confirmed that he was a very smart guy. One time he told about helping a friend put a roof on his house. He explained how his friend was bungling the job and said, "If you build anything you have to understand basic rules of geometry or you do stupid things." He explained measuring tricks to make sure that corners were exactly 90 degrees and that the roof joists were parallel and configured so they formed identical isosceles triangles.

The way Josh influenced me most was through his attitude and philosophy about work. Once, after I complained about the hard work in the mill, he said, "Be careful about thinking that way. A job is just a job. It doesn't interpret itself and say, "Oh I am a good job," or "I am a horrible job." It just sits there and is what it is. You're the one who interprets. And with all the jobs I've ever known, if you interpret them as a challenge that you can meet, that's what the job becomes. And if you really put your mind to it and say 'This job is fun,' you can make it fun."

"How do you do that?"

"Well, you just tell yourself, 'There is no way this job can beat me. I'm going to beat this job. I'll keep score and prove it to the job every day--I own you.' The day goes by faster, you have some good thoughts, and it doesn't cost any more than believing you hate the job and can't wait for the day to end. If you're going to work eight hours a day in a place like this, you better enjoy doing what you're doing."

Another time he said, "The job is even more fun when you work on a piece-work line. If everybody on the line thinks of themselves as part of a team, they not only work better; they earn more."

He used our line as an example. He told me that they were running twice as many discs on the line as they should be running. He said, "Everybody on this line gets a piece-work bonus, and it's not much harder to do."

For me, it was a hell of a lot harder, but I took his advice and set goals for myself. My main goal or wish was to become as good as Josh, and I became pretty good, but I didn't even come close to Josh. He remained totally out of my league. Near the end of the summer I was able to keep the apron clean when it carried twice as much material, and I could even pause from time to time, but there was no way I could sit on my ass half the time, until the last couple of weeks of the summer.

The mill closed the annealing furnaces to rebuild them. The time required for rebuilding was not very long, but they couldn't begin work until the furnaces cooled enough for workers to get inside and tear out the floor bricks. The wait time was over a week. In the meantime, I was transferred to department 27, which was in a cold Mill that built things like large industrial sinks that were about six feet long.

That's the line I was on. I operated a press that was so big I could sit down in it sideways with both legs straight and arms stretched to the side. My whole body was inside the die area of the press.

I had the "toughest" press on the line because I had to perform more operations than the other press operators. The others just took the sink-in-work from the conveyor line that ran along the row of giant presses and put it in the press;. The procedure was simple When the sink was positioned properly, ,you activate the press by simultaneously hitting the red buttons on either side of the opening. That made the press close

and then reopen. Then you free the sink from the press the sink and put in on the conveyor.

I had to do several more steps. I couldn't simply lift the sink from the press after it was pressed, because the sink was stuck to the die. So I had to pull up the end of the sink that wasn't stuck and slam it down hard. Most of the time, this would free the sink. Sometimes it wouldn't. I used a long pry bar to wedge the sink free.

because I was at the end of the line, I couldn't return the finished sink to the conveyor. I had to carry it five feet to the side and stack it. I did all the things Josh taught me to do. I went through the steps slowly at first and thought about how I should position myself, how I could save time by saving steps. After only a few days, workers would stand around and watch me work. I was good. I had figured out how to position the sink in the die with one sweet swing. Then after I freed it, I didn't walk it over to stack it. I launched it so it landed softly on the stack. If you do it right, you don't dent the sink on top of the stack, because it comes down on a cushion of air. True, I got bawled out a couple times by inspectors for denting sinks, and I was told not to toss them, but I continued to toss them so there wasn't a dent in a carload. By my last week on the job, I could sit on my ass until the row of sinks on the conveyor was getting so long that the guy on the press behind me wouldn't have room to put his sink on the conveyor line. Then I would put on my show. It would take me maybe eight minutes to catch up. Then I would sit on a turned-over sink for about three minutes.

Two days before my "summer vacation" was over, I had an experience in which I could have lost my life if I hadn't heeded the advice Josh gave me. That advice was: Know your machine." I knew mine, the loud "Pchoo" sound it made when you pressed the red buttons, how long it took for the press to close, how long it took to open.

On the life-threatening occasion, a sink in my press was so stuck that I couldn't release it with the pry bar. So I climbed inside the press with the bar to see if I could pry it out from the other side. Suddenly, I heard that unique announcement that only my press made: "Pchoo." I dropped the pry bar and dove out of the press, just before the press came down on my pry bar and broke the die inside the press.

Because my press was disabled, the line was down, and engineers appeared within a couple of minutes. I told them what happened, but they didn't believe me. They said I left the pry bar inside the press. I showed them that it couldn't have happened that way because the damaged sink was already pressed. So the only way I could have created this outcome would have been to press the sink, then put my pry bar on top of the sink, and hit the buttons to press the sink again. "Why would I do something like that?"

I asked the other workers if they saw what happened. Nobody did. While they were waiting for the tool-and-dye folks to remove the broken die from the press, the guy who operated the press behind me activated my press three or four times then waited a few seconds before activating it again. Each trial resulted in a faithful "Pchoo" followed by the press closing and opening. He looked me and shrugged. I think that the other press operators believed me, but it was basically my word against the engineers'; however, after we stood there about ten minutes, my press announced, "pchoo" and came down without any coaxing from red buttons.

I said, "Did you see that? Did you see that?"

Yes, they all saw it or heard it. "Damn," one of them said, "You're one lucky son of a bitch."

I agreed. I was lucky to learn from the man who was obviously the best worker in the whole damn mill.

On my last day I walked over to the hot mill to say goodbye to Josh. We shook hands and I thanked him for all that he taught me. I told him I would never forget him.

He said, "This is not a good way to say goodbye. You come by at the end of the shift. We'll go across the street and I'll buy you a lemonade."

We went to the bar across the street. It was payday and the bar was crowded and happy. The owner was also happy to cash everybody's check.

Josh bought me a lemonade and made an announcement. " Let's have a toast to Ziggy. He's going back to high school as a man."

Everybody cheered. The guys sitting around me slapped me on the back. I smiled and nodded and felt very proud of myself. After I finished my lemonade, one of the workers handed me a beer and said, "If you're going to be a man, you should be able to drink like a man." I drank the beer with bravado, and before I left the bar, I drank another beer. I could really feel it, so I didn't go straight home because I knew that my mother would smell the alcohol in a second. I went to a buddy's house and called my mother to tell her I'd be late because it was my last day at work. I hung out for about two hours. During that time, I ate a whole box of sensens to mask the smell of alcohol.

When I got home I went to the kitchen. My mother came in and pointed out that dinner was now cold . She brought some food from the refrigerator, looked at me, and said, "What is that odor? Have you been drinking alcohol?"

not me.

That summer was not the last time I saw Josh. Two summers later, I thought I had a job as a lifeguard at the 75th street beach in Chicago. The job fell through and I went back to Ingersoll. Things had changed. The

base salaries for working on lines was lower, but the piece-work bonuses were higher. Apparently this change was designed to promote greater efficiency. Josh, who now had a few grey hairs, had adapted to the change. He was no longer a relief man. Instead he would work at different jobs. As he explained to me, all production lines have a bottleneck. If you remove the bottleneck, the line goes faster, and everybody on the line makes more money. So Josh analyzed different lines, identified the bottleneck in each, and then got together with the guys on the line. They discussed how Josh could take the keystone job, do it much faster than it ever had been done, and everybody on the line would earn big piece-work bonuses. Josh explained to me that this was a short-term strategy that worked for only a couple of weeks. Management would then "adjust" the piece-work rate on the job so the faster rate didn't earn any bonus. Time for Josh to find another line.

He told me that management was trying to find an excuse to close down the current line he was working on and said that if I wanted to see it I should drop by soon. He added, "It's pretty impressive."

The next day I dropped by for a couple-of-minute survey and ended up watching it for about 20 minutes. It would have been spectacular in a circus. The bottleneck in the line was the third or fourth press in shaping 30-inch curved plow discs. The process starts with a white-hot block of steel. Then a couple of presses start to shape it. These presses go slowly because the disc rotates and stops, as a heavy shoe pulls down on the side of the disc to taper it. After the disc is probably two feet in diameter, the bottleneck occurred. The hitch was that the operator removes the disc from the press but does not put it on a conveyor line because the next press is across the aisle, which is about 15 feet wide and accommodates workers, fork lifts, and small trucks that carry material and belch out fumes. The operator carrying the heavy disc has to wait

for a break in the traffic, then walk across the aisle and transfer the disc to the next operator, who puts it in his press.

That routine had changed a lot. Josh had his buddy operating the bottle-neck press. His buddy was big and very strong. When he took the disc out of the press, he didn't walk across the aisle with it. He held it with his tongs as he spun around in a full circle, then launched it, more than 15 in the air, right over the aisle. The disc turned white hot, as bright as the sun. And when it sailed through the air like a giant Frisbee, it lit up the mill.

Josh operated the press on the other side of the aisle. He stood there holding his tongs with one hand. The bottom handle of the tongs hung down. He tracked the disc as it came down, positioned the jaw of his tong under the lip of the disc. Then he grabbed the other handle of his tongs, closed the jaws, swung the disc so it circled down, then up, right above the die in his press. Josh released it as it turned a dull red. Plop. I couldn't help it. I clapped when I saw it. I knew how spectacular it was because I knew how hard it was to use those long tongs, and I knew how heavy those big discs are.

I wasn't the only one watching this show. At least five other workers on break were watching. I said to the guy next to me, "Have you ever seen anything like that in your life?"

He smiled and said, "Hell no!"

In addition to workers were two men from the front office, wearing clean short-sleeve shirts and holding clip boards. They were not there for entertainment. They were waiting for Josh to drop a disc, just one, so they would have an excuse to make the line go back to the original configuration. During the time I watched, he didn't drop any, of course.

I marveled over the strength of Josh's buddy, and the precision of his delivery. If the discs didn't stay pretty level as they went through the

air, Josh wouldn't be able to get his tongs under their lip. If the discs didn't go as high as they went, they wouldn't clear the trucks that have big loads. The delivery was flawless and very consistent.

As for Josh, he was a magician who could explain every detail of his performance

I briefly observed the performance again on the next day, the last day of the show. On the day that followed the line returned to its traditional configuration. Management couldn't use the excuse that Josh damaged material because during the days they observed, he didn't drop one. Their back-up excuse was "Safety issues," particularly scales from the radiant disc that could badly burn somebody on the aisle below. . Safety. Sure. During the three times I worked in the Mill, one guy was hung up on the hooks and dragged through the acid bath; another guy was cut in half by a sheet of steel that slid off the conveyor of three-high rolling mill, and a third guy was beheaded as he tried to clean the steel shavings out of his press.

Josh went back to a job he had earlier. It had an okay piece-work rate. Josh planned to stay there for a while as he found another bottleneck somewhere.

The good news was that during the 10 days Josh and his buddy put on their show, everybody on the line earned more than they could have earned in three weeks. So everybody was quite happy, including Josh.

The last time Josh and I talked, I commented on how technically sound every part of his show was. He said something like, "Yes, but I'm impressed with you because you can see the technical details of the job. You need to remember that. Think of the details of the job, any job. If you arrange details the right way, the job is well done, and fun."

In fact, I don't remember all the details of what Josh said or I said. So my account may be a little distorted in places, but I have very vivid

memories of Josh, what he did, and the messages he conveyed to me. Over the years, I've tried to think in the manner he taught me to think. I have tried to make work something I look forward to. And I have faithfully followed his maxim that big pictures are composed of details, and the only way to engineer the big picture is to become aware of all the details and configure them so they work harmoniously together. Thank you, Josh.