

The Cisco Kid

The Cisco Kid was another famous cowboy we were familiar with. But for some reason, he was never one that I wanted to be. Perhaps it was his Spanish name? There were few Mexican people in the valley so I didn't have first-hand knowledge of them. I don't think that my parents were prejudiced. Indeed, dad told funny stories of working with Hispanics in the Leamington area. He was not prejudiced. I think that the reason he wasn't one of our favorite cowboys is because he was from a region of the country that was different than our region. On that basis alone we would have gravitated to the Roy Rogers type of cowboy in the mountains, rather than the south-west desert type. In any event, he was there in our cowboy constellation, adding to the sense that there are important men out there who ride horses and shoot guns and chase bad men and rescue beautiful women.

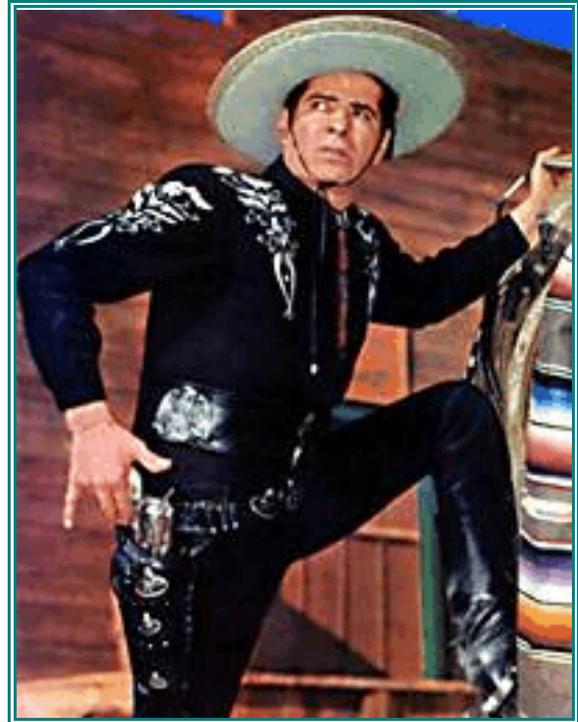


Figure 1 Cisco Kid
<http://www.fiftiesweb.com/western.htm>

Repairing the Well

I was afraid. Dad removed the thick dark linoleum and pulled up most of the flooring of the enclosed back porch. This exposed horizontal boards called 'floor joists' beneath which was a space too short for adults to stand up in that was dark and cobwebby, like a cave. The point of this destruction was to expose the water well because it needed some maintenance. That was our only source of water, a well that had been dug at the time the house was built and then concealed under the porch. Up to that time I had no idea what was under the porch or where our water came from. I'm not sure I ever thought about what might be under a house, and probably assumed the floor was on the ground. The missing floor boards meant that I would fall if I walked out the kitchen door or if I walked into the porch through the back door. We were given explicit orders: Don't you dare go through either of those doors as long as the flooring is torn up

and dad is working there.

After dad had enough of the flooring pulled up, he rigged a rope and pulley affair and hung it from joists over the center of the well. He secured a contraption to the tackle so he could sit and lower himself down into the well to do what needed to be done. This exercise was done in the evenings after he got home from work. It must have been summer because the weather was good. He used a light bulb to be able to see what he was doing down there.

He allowed us to get a look down the well one time. It was pretty sobering. A circular hole that was probably about six feet in diameter, straight down into the ground. With dark water down there, just waiting for someone to fall in and drown. I'd never seen inside a well under a house and the experience made me nervous ever after when I walked over that porch floor. What if the flooring let loose? I'd fall straight down that hole into the water. And drown. I had a mortal fear of water. I don't know what he had to do but it was a necessity because he stopped working on some art project, the focus of his life, to tend to the well.

Impetigo and Ring Worm

Farm aren't the cleanest places to live especially when compared to city dwellings. That's not to say that country people didn't care about being clean or that they were dirty, because they did care and they were not dirty. But in those days out in the country, roads and driveways were not paved, there were no sidewalks, and yards were not covered with neat tidy grass, rather were dusty crabgrass places. Plus cows, horses, chickens and hogs were present doing their thing, which resulted in a multitude of organisms that city folk didn't have to deal with. These creations always made deposits wherever they went. When people walked anywhere on a farm and then went into the house, they tracked in whatever they picked up on their boots out in the corral, yard or driveway. The wind blew "dust" from the roads and fields and corrals through the open doors and windows. Kids who played with anything that came to hand were exposed to a wide range of bacteria and fungi and whatever was in the soil.

Two different times I had impetigo, a painful, embarrassing skin disease.

It is caused by a staphylococcus organism and actually isn't limited to farms, but I lived on a farm when I got it there so the association with farm life is inevitable. It was embarrassing for two reasons. First, it was on my chin and grew into large brown scabs that told the world I was diseased. Second, the treatment was equally conspicuous - gentian violet.

This stuff came in a small bottle with a dauber. It is dark purplish-blue in color and was daubed liberally over the crusts and surrounding skin to ensure complete coverage. The treatment was even more conspicuous than the lesion.

These infections were painful like any bacterial infection. The original blistering spot crusted over and formed hard thick scabs. When they were bumped, they broke in half, tearing the skin a bit and bleeding a lot. Mom gave me orders to leave the scabs alone because that lengthened the amount of time needed for them to heal, but that was impossible. There is some fatal attraction to pick scabs from any source, impetigo or mosquito bites. The traitorous evidence spoke for itself when I got home from school, bright red weeping blemishes. I listened silently and impatiently while she gave another lecture and painted the things with gentian violet again.

Antibiotics would have solved the problem. They are probably the most commonly administered drugs today. Gentian violet was the most available chemical to treat the bacterial infection. The first anti-bacterial medicine that came into existence in the 1940's was the miracle drug sulfa. When that became available it was widely prescribed and we took it many times but for other reasons. Penicillin came along in the 1950's. The sulfa we took was in the form of what seemed like enormous large, blocky pills that we had a hard time swallowing. They had an odd sweetish taste that was offensive and they hurt when going down because they had square sides..

Little kids are not famous for being nice to each other. When you appear with large scabs on your chin you are ridiculed, and when they are covered with purple dye, you really stand out as a topic of conversation. You felt like a leper so when the Sunday school teacher talked about how lepers were shunned, you had a



Figure 2 Impetigo sore
<http://www.emedicine.com/DERM/topic195.htm>

real good idea of how it felt. That may have been a good thing.

Ring worm was another common malady of the scalp. It is caused by a fungus rather than a bacteria and usually showed up on the scalp. It was spread by sharing combs or skin to skin contact. It was another embarrassing thing to have because it appeared as circles of yellowish skin that lost the hair. Little kids would comment about it and since they were taught to avoid the infected person, were at liberty to demonstrate their aversion. I had this once or twice and don't recall that it hurt. There was just a funny looking spot in the hair, but no pain. The pain comes from the treatment that other kids give you. I don't remember what the treatment was.



Figure 3 Ring Worm
<http://www.nsc.gov.sg/commskin/Tinea/tinea.html>

Lifesavers

These were the neatest candy in the world. Little round wheels with holes in the center. Wrapped seductively in tubes of waxed paper like the kind mom used in the kitchen. The wrapper was printed with colored bands suggesting the contents. A

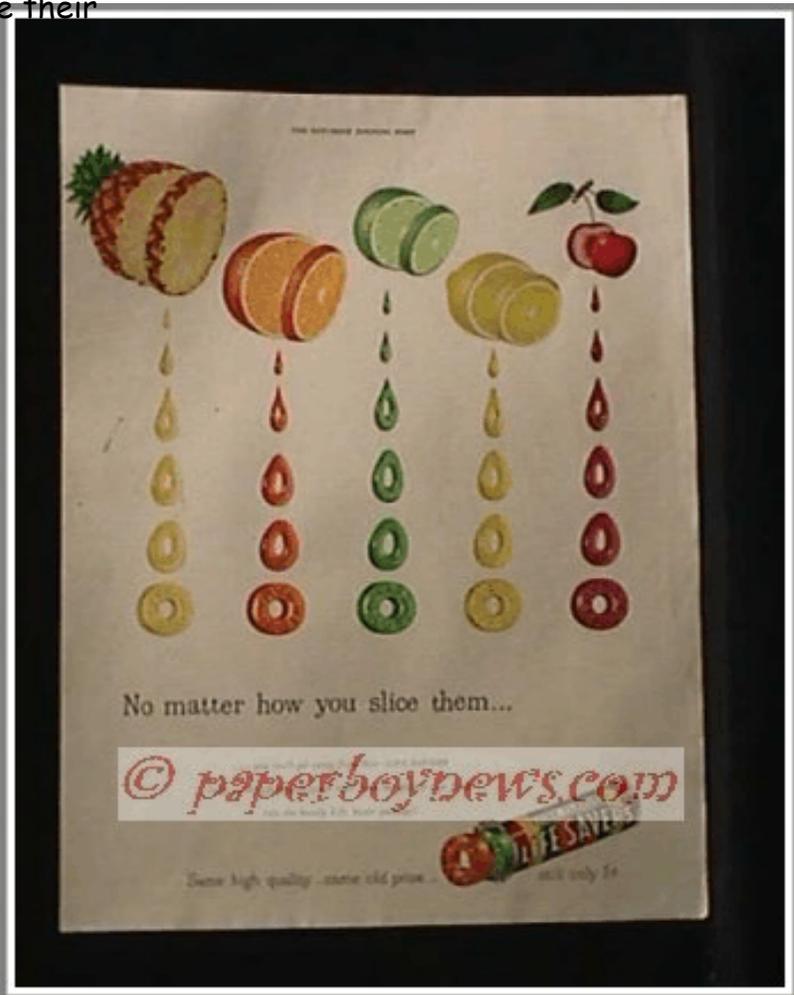


Figure 4 Lifesavers
<http://paperboynews.com/inventorydetail.asp?number=a3959>

heavy waxed string on one end provided access to the package when you pulled it hard to tear open the wax paper inner tube. The string was heavily waxed so flakes of wax broke off as you pulled it. After the end was open, you tore the paper in spirals as you ate further down into the tube. Such delicious colors and tastes. The colors were as enticing as the flavors for some reason. Colors have always been fascinating.

This image appeared for years and always fascinated me. Flavors, colors and circles dripping out of fruit. That ended up in these neat tightly wrapped tubes.

Joe O'Leary Visit

Joe O'Leary came to visit dad around 1950. I don't know where he was living at the time but regardless, he spent about a week with us. I can tell from Mom's words that he was not a welcome visitor. I will tell you more about this in the Afterword. This was the first time I met him and I was uncomfortable with him, as I was with any new adults. But he was a sort of quiet man who watched what was going on around him and didn't take pleasure in giving kids a hard time. He probably wasn't interested in kids at all, but at least he wasn't unkind. Note how that is one of the first things I comment on about adults - how they treated kids, i.e. how they treated me. Was it that way for you when you were a kid, i.e. did you note first and foremost whether a new adult was nice or mean?

Dad was working while Joe was in town so Joe was on his own during the days and kept himself busy. For various reasons that I learned later from mom, she did not like Joe. For good reason it seems, and not simply because he wished to have coffee in the house, a thing that she eschewed. Whatever that means. I don't know what he did when alone during the day while dad was at work, but in the evening he and dad spent a lot of time reminiscing and looking at stuff dad had brought home from Hawaii, the fish casts, the bottles filled with creatures, the Tahitian war club, spear gun and so on. Remember that dad only left Hawaii about 3 years earlier, so they still had a lot in common and recent experiences to rehash.

This is a Tongan, rather than Tahitian, war club but it gives you an idea of the ornate character of the club. The pattern is dense, carved skillfully by artists who had the tools and the experience to set the pattern into hard dense wood. Dad's club is more cylindrical and is still at 2821 N. His was carved out of a black wood like ebony that is highly polished. It was used to crack skulls.

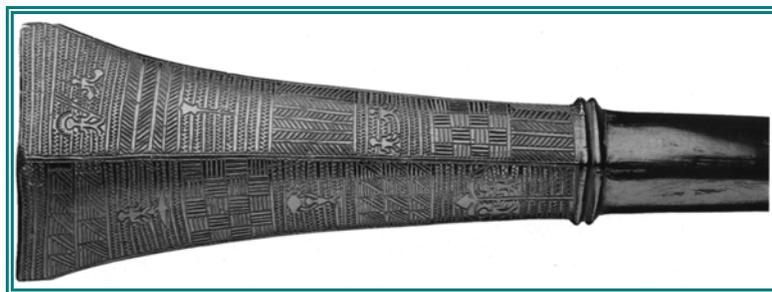


Figure 5 Tongan War Club

http://tongan_tattoo.tripod.com/TonganTattoo/Id6.html

The item they talked about that impressed me the most must have been something Joe brought with him because I don't remember that dad had one. It was a mammoth tooth. These things are about 10-12 inches long, 4-5 inches wide and must weigh 8 or 10 pounds. Its size is what impressed me the most, just having gotten to the age when teeth come out. My own were minuscule compared to this giant, which made it easy to understand that the creature that wore the tooth was also enormous.

Note the "bars" across the tooth. Those are stripes of dentin which is harder than the other portion of the tooth so don't wear down as fast when the animal is grinding its forage. This is the only kind of tooth the creature had. These bars were familiar because they are essentially the same as those that I saw on the teeth of horses and cows that I dug out of the pile of bones on the other side of our east fence. The other peculiar thing about these teeth is that unlike our own teeth, they grow throughout the life of the animal. That was essential because the animals ground a lot of dirt and debris with the plant materials which ground the teeth down.



Figure 6 Mammoth tooth

http://home.earthlink.net/~mccullough1/bear__mammoth.htm

The manner of replacement was to grow from the back end forward the front.

This allowed the thinner portion -the left end in the photo- to drop out one day. Ingenious way to deal with the gritty food and the need to refresh teeth.

Joe always had a great interest in Indian things, any kind of anthropological thing. So he and dad probably went out to the Ouray Reservation which is was the closest reservation to Vernal. That may have been when I went to the reservation. I have a vivid memory -that I verified with mom last week- of going out there one afternoon. At the time she and I talked, I didn't remember why we went but it must have been to take Joe because there was no other reason to go out there. The homes were not like mine. They were wooden structures that were rounded on the top. The doors were surprising because they were rawhide skins nailed on the lintel. You lifted the hide or pushed it to the side to go in.

Joe was an artist like dad so they talked about painting and drawing. Dad had been doing some work with linoleum block prints and so they looked at the blocks and the prints. His favorite topic was flowers. For most of his life. The last painting he did is a tiger lily, hanging in my kitchen. It took some talking to convince him to let me have it.

While I was scouring through the stuff I have around here a few months ago, I found an envelope that was filled with "designs" that I had clipped for dad. I cut those things out of scraps of paper while he was in Seward waiting for us to come up. Amongst that bunch of stuff was this proof he made of one of his blocks. I apparently found this in the trash so took the freedom of cutting the thing out, though I can't imagine why I chose to make this shape. To cut a "V" between the two top and the two bottom petals but not between the two left petals strikes me as odd, sort of inconsistent. But kids do what kids do.

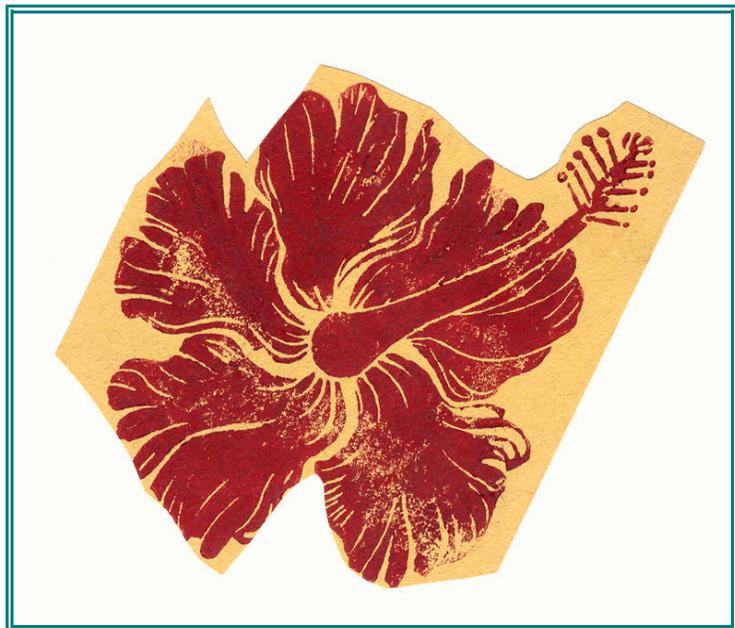


Figure 7 Hibiscus linoleum block proof

Here's the back side of the proof. The name "Ghana" stands out at the top, suggesting that dad had been reading a National Geographic recently. The name in the middle, "Randeaux", appears to be a test to see how my name looked in French spelling. The other names I don't know what they are. He was a dreamer.

Joe was a constant in dad's life. He was one of the few friends that dad had. Joe, Bud Hegessy and Art Schafermeyer are the only men I know who meant something to dad. He didn't have much contact with any of them, but there were part of his universe, part of the frame of reference within which he lived his feverish life. He

knew that anytime he wanted to get in touch with one of them, all he had to do was phone or write and they would be right there. They always were. Dad and Joe exchanged letters occasionally, i.e. every year or so, which surprised me because dad didn't keep in touch with even Bud. Joe's letters -and packages- usually had some specific anthropological or artistic thing to share. For example, Joe built a Plain's Indian peace pipe from scratch, using soap stone for the bowl, and just sent it as a gift to dad. I want it. Dad even went to the Florida Keys to visit Joe one summer at his home where he retired, a measure of their friendship. Dad got Joe got a job as a preparator at MCZ so we knew him in Boston. He invited us to his place for Sunday dinner. He had some interesting new items from Africa and when I asked him about the crusted grimy surface of one item, he shook his head and muttered that I didn't want to know about it because it had to do with human sacrifice. Of course, I was instantly fascinated by it but he would not talk about it. Stinker.

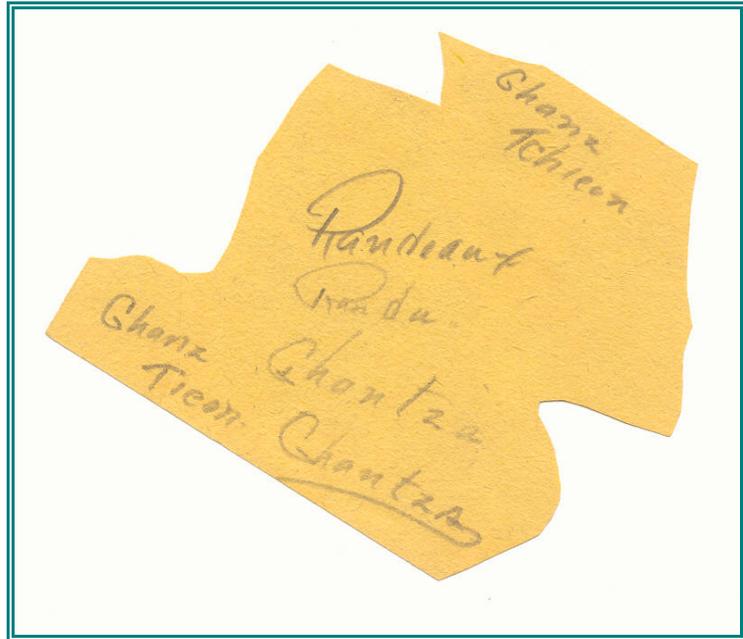


Figure 8 Obverse of Hibiscus proof

Science, Art and Manners

A farm on Vernal doesn't seem a likely place to learn much about science other than agriculture, nor much about art. But it was rich in both. Thanks to dad whose interests were supported by mom. I make this point, not simply to provide the facts, but to make a major point:

All of my avocations stem from these fertile rich years where dad was doing what he did naturally, exploring and experimenting, being generally busy all the time without trying. The stuff rubbing off on me like pollen.

There is nothing I have tried to do that he didn't presage. I see his footprints in every new room I enter.

Mom provided the manners. Manners were mandatory. If you forgot to say "please" or "thank you", there was a sharp reprimand with a frown. Then the dang thing you wanted was withheld, held up in the air until you said the magic words. And if you were surly about saying the 'please', guess what. You didn't get the thing at all. Every time. Every time, so whether or not you felt like saying either word, you knew you better make the effort, and 'nicely', because the consequence would cost you more. That was so frustrating. To be under such total control. It felt like humiliation was the point of the drill.

Manners extended to how you eat and what you eat with. I don't know how widespread on farms, if at all, mom's concern about manners extended. But manners were a big deal in that little house. By the time I was eight years old, I could set the table with a salad fork, a meat fork, a cocktail fork, a knife, a soup spoon, a desert spoon and a butter knife. With a butter plate, a main plate, a dessert plate and a cocktail goblet. On a farm. Mom and dad even bought some silver plate specifically to have the equipment necessary for this sort of dinner. And a set of cheap cut glass goblets, cocktail glasses and so on. I don't know today how much of it was just a need to "put on the dog" and how much was a genuine love of these things. But that love persisted in mom through the years. You've seen her closet filled with these sorts of things? Some of them stem - haha- from these years.

The only memory I have of mom and dad actually entertaining formally in Vernal centers on the large round dining room table. Covered with a starched ironed white table cloth. Us kids had to go to bed early to be out of the way so we

did not even see mom set the table with the things she did. Nor did we get to see the guests who obviously had a great time. We were locked into our bedroom and heard the loud laughing friends come because they walked right past our door to the front entrance, creaking on the porch flooring. We could tell that they had a great time the next morning.

We went into the dining room while mom and dad were still in bed and saw the table. Such a decadent rich-looking scene for our little farm house. The dinner party must have gone late because the table had not been cleared, unusual for mom. The dessert course was still on the table with left overs of cake and ice cream in the bowls, goblets and dishes. It was obvious that adults had even played with their food because things were mixed together that otherwise would not have been. Cloth napkins lay on the table or chairs or even in the dishes. Crumbs were everywhere and I was amazed that my folks would entertain this lavishly and that they would allow the bad behaviors that were manifested in the party debris. And I was jealous that I missed it.

Science was part of my life from as far back as I remember. The largest area of science was obviously paleontology and he had specimens around the house or stored in boxes in the grainery. We went out east of Vernal and collected gastroliths, small rocks ingested by certain dinosaurs to aid in digestion, much as chicken ingest pebbles that are used in the gullet to grind up food. Trips out into the desert to hunt rabbits or picnic were fairly regular and everywhere we went dad talked about the stratigraphy and rocks we found. It was sort of a competition to find the most interesting rock to show him because it focused his attention on us for a period of time. His love of plants and his year in Hawaii was abundantly present. In the form of information he had collected, such as a knowledge of plant taxonomy. In the form of pastels he painted of tropical flowers like hibiscus. Or linoleum blocks he made of orchids that he used to print dresses that mom sewed and sold.

One of the most intriguing things in his collections were dark amber colored bottles of specimens he had collected in Hawaii, crabs and insects. He didn't look at them often which probably heightened their fascination. He also had plaster casts he had made in the islands for a dozen or so fish. Which he had painted with the natural colors, extraordinary creatures for farm kids who only knew catfish, suckers and trout.

Art showed up in the ways just noted. Painting, sculpting, drawing,

Postum

The religious culture of the community didn't include coffee on its list of things that were acceptable to drink. But it was abundantly present. And interesting. I loved the smell of Nora's coffee pot, as it sat perking on her stove, water boiling up in spurts through a tube into a glass stopper in the lid, falling through a basket filled with the dark grounds. The acceptable substitute for coffee was Postum. Mom and dad drank it sometimes, though I don't remember it being a daily routine. Struck me as a bit odd to substitute something for another that was denied. If it isn't acceptable to drink the one, then why try to produce an imitation of the thing.

We obviously got to drink the stuff and it was generally too strong for us. One time I refused to finish a cup of Postum at breakfast. So guess what. I got to just sit at the table until I did finish drinking it. About gagged on it but that would have evoked an even worse punishment.

This ad impressed me. I wasn't quite sure what "coffee nerves" were but this creep sort of looked like a guy who could make problems for mom. We certainly weren't the cause of her 'nerves.' Drinking Postum didn't seem to solve the problem. These two kids look like Dick and me and the mom is doing what mom did. Even down to the striped shirts and short hair. There we were. And there she was. Yep. That about

Do you bear up—or flare up?

HEH, HEH, HEH!
I MAKE HER NERVOUS
AND CRANKY—BUT THE
KIDS GET THE BLAME!

**Don't let "Coffee Nerves" make you irritable!
SWITCH TO POSTUM . . . it's caffeine-free!**

Do you often feel so jumpy and nervous that every little thing upsets you? If you're tense and irritable, can't sleep nights—your trouble could be the caffeine in coffee and tea. While many folks can stand caffeine, it brings on the horrors of sleeplessness, nervousness, indigestion. So, switch to POSTUM, the caffeine-free drink that's brought blessed relief to millions! You'll like Postum! It saves you money, too—costs only about 1/2 as much as coffee, cup for cup! Postum is made instantly—right in the cup!

**NO CAFFEIN
—NO "COFFEE
NERVES"!**

A Product of General Foods

Figure 9
<http://www.old-time.com/commercials/postum.html>

says it all.

LT Payton's Machine Shop

As I've worked with this volume and tried to relive this history from the point of view of my inner child, as opposed to my adult mind, it has become evident to me that the time that dad worked in LT Payton's machine shop is the time when I formed my definitive image of "my dad", when I decided for my inner person what my dad was and who he was. Forever after. I can tell that I hit pay dirt in this section, that the man I loved the most is here. It turns out that he was a machinist and a welder. First and foremost. He was a machinist and welder and that is how I view him today, as odd as that may seem to you who only knew him as "Dinosaur Jim." True, he was an accomplished artist, and inventor and sculptor and so on, but to my inner child those are simply the things that he did, not what he was. It is as if a man who was truly a carpenter took up plumbing or teaching, while he remained at bottom, a carpenter. So it is for me and my dad. He was a machinist and welder. Above all else.

LT Payton's shop captures the whole man, so I am going to spend more time in this sub-chapter than most others in UBW. Because I want you to be able to experience some of the same feelings and thoughts and understandings I experienced. As a 6 year old. Remember that. I was 6 and I was 7 and I was 8, so my world view of James Alvin was as narrow as that of any other kid that age. But more importantly, the world view of James Alvin that formed while I was that age is the definitive experience for me of him. Period. Others will view him differently and they will be right -for them- but not for me. You know what it's like to be a six year old. Go back there.

The fact that James A was a stevedore does count for something. The fact that he became one of the most widely internationally known paleontologists of the century counts for something. The fact that he was an artist, sculpture, inventor, musician, singer, etc. all count for something.

But not much.

He was MY dad, first and foremost. And my dad was a machinist and welder, thank you very much. Now we'll go on. Leave it alone now. You have my view.

So we're going to go to Payton's machine shop now and wander around, seeing and experiencing and smelling what I saw, experienced and smelled. Please regress yourself to your own 6th year and go with me. Be 4 feet tall, looking up at large machines, hearing odd sounds, wondering and being frightened and impressed.

This is my dad's world, the one where he was most at home, most creative, burning with an intensity and focus that I thought was natural for any dad/man. Turns out it isn't.

Machine shops are unique amongst industrial establishments. At least in my experience. They are filled with a multitude of machines that are used to produce 'things' out of hard shiny metal, according to blueprints handed to the machinists, highly skilled men and women who invest a great deal of themselves in becoming qualified to deal with substances that are so hard and difficult to manipulate, all of whom exhibit a degree of intensity and creativity that few trades encompass.

LT Payton's shop sat on the east end of Vernal's main street and was probably typical of machine shops. It was a huge cavernous place without a ceiling, just a high curved roof, uninsulated, with large doors on either end. It looked like an airplane hanger. The front doors were large enough for trucks to get inside and the back doors were large enough to allow large stock in to be set up in lathes or the other devices for manipulating and shaping metal. In the process, smells are produced that can only be produced by the techniques employed in such shops.

The floor was of cement and had a coating of paint, smooth but not decorated with linoleum or tiles. The whole shop seemed to have a patina or dirty grease and oil which is not surprising under the circumstances. Nothing was shiny though the place was sufficiently clean to properly do its work. Except for the threads of a newly-machined tool or the sheen of a highly polished shaft. Those things were immaculate, but the setting in which they were produced was not. Indeed, one wonders how such brilliantly shining things were created in such a disheveled, dirty appearing setting.

"Waste", "sweeping compound" and "push brooms" were introduced to me in Payton's shop. "Waste" is difficult to describe. It is compounded of what looked like a mass of heavy threads and small balls of cotton and other colored clumps of fiber. It came in gunny sacks and was used to wipe up spills, to clean off finished products, and clean up the equipment like the lathes, drill presses, grinders, and arbor presses. You would just reach into the sack, grab a hank of the stuff and pull and tear it out of the mass. After it had been used to clean up whatever you were cleaning up, you threw it into the trash where it was eventually burned or taken to the city dump.

"Sweeping compound" was a novel idea: when you have a dirty floor dirty, throw some more stuff on it. Stuff that is absorbable. Then sweep the whole mess up. That's about all I really understood but I didn't speak my confusion too

much, just held it inside. What I was missing was the fact that this fine sawdust that came in cardboard containers was lightly impregnated with oil. That meant that when the sawdust was sprinkled onto a dusty floor, the dust would stick to the oily sawdust so that when the sawdust was swept up, so was the dust. I didn't get that part, just that the dirty floor was made more dirty on purpose. I wouldn't dare try that at home. Seemed to me that it was just making more work for the sweeper who in this setting was using a large heavy broom. Push brooms with wide heads and long stiff bristles were also pretty new to me though I had doubtless seen them in service stations and the local market. But I hadn't been able to play with the thing to see how it moved. If you pushed it, it moved smoothly across the floor, but if you pulled it back toward you, it skipped and jumped, another of those surprises that filled my life. Why would it go smoothly but balk at coming? The idea that the bristles were bent in one direction didn't occur to me which is too bad because that explains this phenomenon.

Payton's shop had various kinds of massive tools that were used to create out of metal whatever the customer ordered. Giant lathes set in the back, small bench grinders along the sides of the space, a large manifold for acetylene and oxygen was arrayed around the shop, surface grinders, drill presses and so on were bolted to the floor for the machinists like dad to use for whatever they needed to use them for.

Of all of the possession owned by my father during his life, I think that his dirty grease-stained oak tool box is my most prized. It captures the essence of this brilliant creative man. I own it, as noted elsewhere, and I am going to take you on a tour of some of the tools from that tool box -most of which I don't even know what they are for- and of some of the stationary tools he used in LT Payton's machine shop. Read this section about LT Payton's Machine Shop carefully, please, because you will get one of the best insights you will ever have into James A. Keep these images in your mind as you remember him and think of what he accomplished. This section explains a great deal about him.

In addition to the large stationary tools stationed in a machine shop, each machinist had to have his own tool box of small hand tools that were necessary to perform his job. You have never seen such an array of bizarre, arcane tools as are found in a machinist's tool box - unless you go into a chemist's lab.

I don't have room to show you all of the different kinds of tools in that tool box. There must be 400 so I am just giving you a sample of some of the kinds to give you an idea of how complicated it is to be a machinist. Compared to a

carpenter with his hammers, screwdrivers, squares, saws, chisels and so on, the



Figure 10 Six tools from dad's machinist tool box

tools of this trade are considerably more complicated in number and in subtlety. A thirty second of an inch may be an acceptable tolerance in cabinet making but in making a motor that tolerance is disastrous. These are the tools that I remember as part of my environment. They affected and shaped and sharpened me. The two top left instruments in that plate are ones I know. I played with them when I was a kid. They are called "micrometers" and they are designed to measure things

down a thousandth of an inch. That's less than a third the thickness of a hair. Ultra fine measuring is done with these devices. I mention elsewhere how devilishly difficult it is to actually do the measuring because what feels "right" to an untrained hand is "wrong" according to how things fit. Did you realize that for some things to "fit" together properly they have to be forced together with an arbor press?

This is a small arbor press which gives you an idea of how much force is used to "fit" some things together, e.g. the inner and outer races of a set ball bearings. Lots of force and this is only a tiny arbor press.

To use a micrometer, you place the thing to be measured inside of the "C" shape. Then you turn the wide barrel, i.e. handle, to move the stem up against the item so that it is captured between the stem and the anvil on the opposite side. As the thing is being snugged into place with the wide barrel pressure builds up as it gets tighter. Inside of the wide barrel is a carefully machined set of gears that are designed to pop loose at a preset pressure. That's how 'torque wrenches' work. At that point the large barrel just spins freely without tightening the thing. As that point, the measurement can be read off the barrel - if you know how to read the arcane numbers. In the larger micrometer, however, you still have another step to take. You take hold of the tiny knurled shaft that is sticking out the bottom end of the barrel and turn it until it clicks loose like the wide barrel did. At that point you read off the measurement from the barrel. Sounds easy, but it ain't.



Figure 11 Arbor Press
www.machinebootsjwk.com/dake.htm

The next device in the plate has a magnifying lense. I don't know what he placed it on to keep it in place while he inspected threads or whatever he inspected, but this lense gave his eyes the ability to ascertain whether there were defects that had to be seen in order that the finished product would meet the specifications on a blueprint.

I don't even know what the top right device is. It has a barrel like a micrometer so I suspect it is a specie of micrometer but one that is placed inside of a pipe to measure its width. Got a better idea? The odd comb-like tool is a gauge that was used to measure the outside diameter of things that needed to be measured. Notice the range of diameters. Even the teeth on the left have ultra-

small diameters for measuring small wire-like things.

In the next plate there are three tools. I don't even have a clue what they were used for. You can see his name engraved on the top right tool. It is in his usual fancy script, the way he wrote his name on pictures that he painted. He was judged the finest penman in his high school, a substantial accomplishment in those days when penmanship was practiced and admired.

In the next plate you see another device with varying sized holes and an embossed designation of the diameter of each hole. It is used to determine the size of a piece of wire or rod. The size was expressed in "gauge" as well as in thousandths of an inch. The upper rightmost tool is another that I don't even know what it is. The long narrow shaft swivels freely and the knob on the left is knurled, meaning that it was used to tighten or turn the tool in whatever setting it was used.

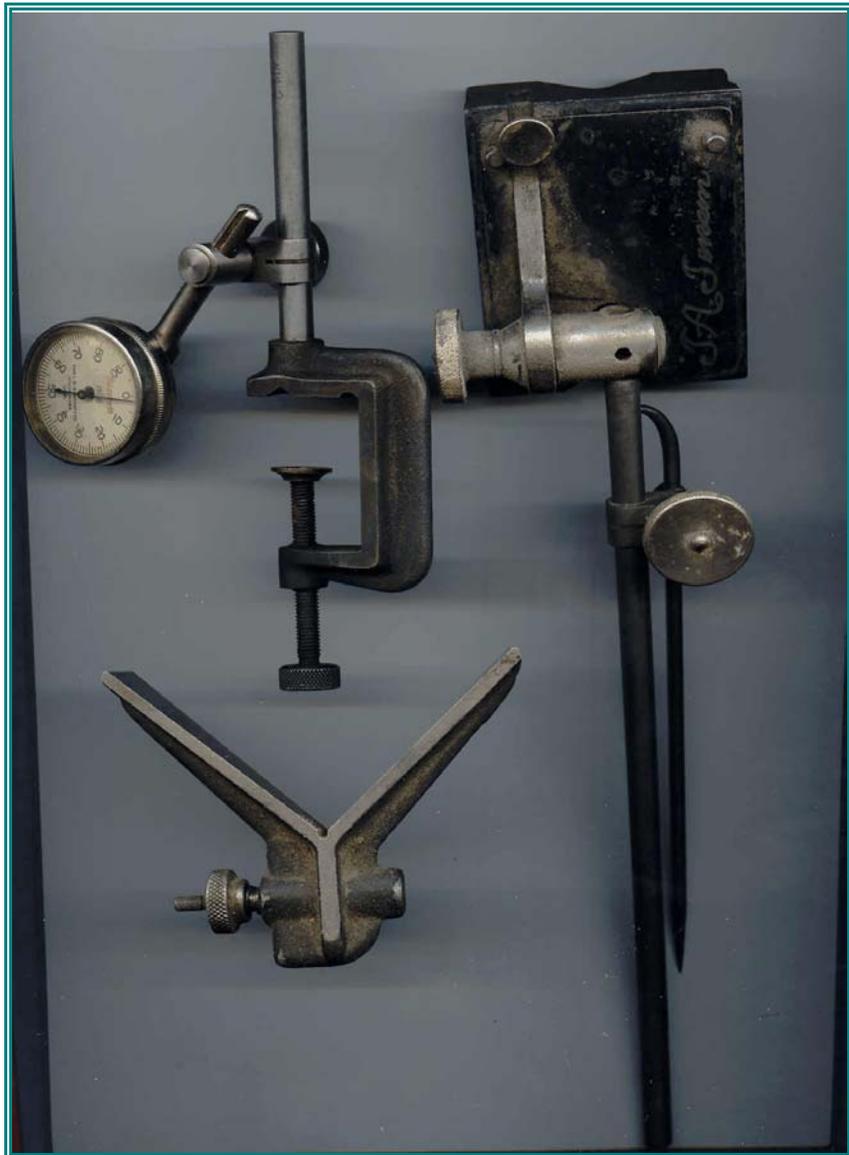


Figure 12 Machinist Tools - Plate #2



Figure 13 Machinist Tools - Plate #3

The other odd shaped devices in this plate are "bits", pretty innocuous looking things, but they were the heart of a lathe. They are the actual cutting tool that makes threads or removes metal from a chunk of metal locked into a lathe that is turning the metal against the point. For each job, dad was provided specifications that stated the width and depth of a thread -or the amount of metal

to remove, the shape he was to produce. Then he had to personally create a die for that job. He'd take a bit like one of these that was close in size and shape to his purposes. Then he had to grind it on a fine-grained grinding wheel to match the specifications of the blue print. The metal that these dies are made out of is extraordinarily hard, being formed of Carborundum, a mixture of metals and carbide, so that they were hard enough to cut other metals. After the bit was completed, it was clamped into a special device on the lathe after which the lathe was set up to turn at the rate specified and to advance as necessary to create threads or remove metal.

This curious piece of oil paper from his tool chest has a notation "Sudanese knife with Sheath. Port Sudan, Sudan" with the name "A. Loveridge 195" corrected to "1935". I have no idea where the knife is or even if he bought it, but the fact that the label is in the tool box suggests he did. The sort of thing he'd spend his money on. He was interested in knives as the collection of knives he personally machined proves.

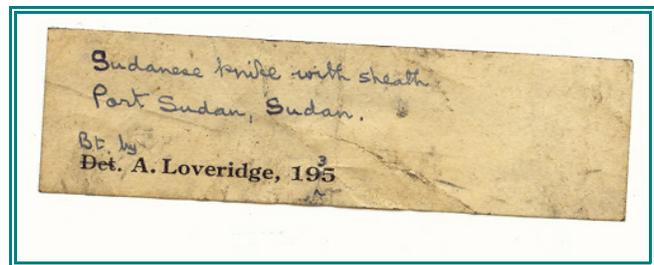


Figure 14 Label from tool box



Figure 15 Machinist tools - Plate #4

In this set of tools there is an identification plate that he made and left in his tool box for some reason. There is a straight razor but I don't know whether he used it in some metal-shaping process or whether it was just his personal barbering tool. The long white flat stick is soapstone. It is used like a pencil or chalk to mark metal because it is not affected as quickly by heat as chalk or crayons.

This last plate of tools are mostly unfamiliar to me as well. The odd square block at the top with perpendicular "troughs" is used as a base to hold a piece of round stock that needs to be cut or treated in some manner. The item to be worked is clamped into an appropriately wide trough on a bench which keeps it in a stable position, without marring the surface of the item. The other items are foreign, except for what looks like a dental explorer.



Figure 16 Machinist tools - Plate #5

Running a Lathe

Here's a photo that I put in with some reservation because it fails to give you a sense of the size of the lathe that dad used. It's pretty substantial compared to a lathe used to turn wood, but it's a baby compared to the real deal. You may think that my memory is flawed - and that would be right- but I can tell by size of the chuck, the dark round wheel on the right end of the light gray housing that this is a baby compared to what dad used. This probably wouldn't handle more than a 3-4 inch piece of stock while dad's lathe stood 6 feet high and handled much larger material. This does give you an idea of what the parts of a lathe look like. And what a machine shop is like. Messy and unpainted. What's missing is the smell. A rich mixture of things.

Ah ha, here's a photo that give you a better idea of what the lathe was like that dad worked on in Payton's shop. This is even the same vintage as the ones he used, being a 1942 Craven. With all sorts of gizmos, handles and things. The large "wheel" on the left is the one that has the chuck, i.e. the circular clamp, that secured the stock so that it could be machined. It

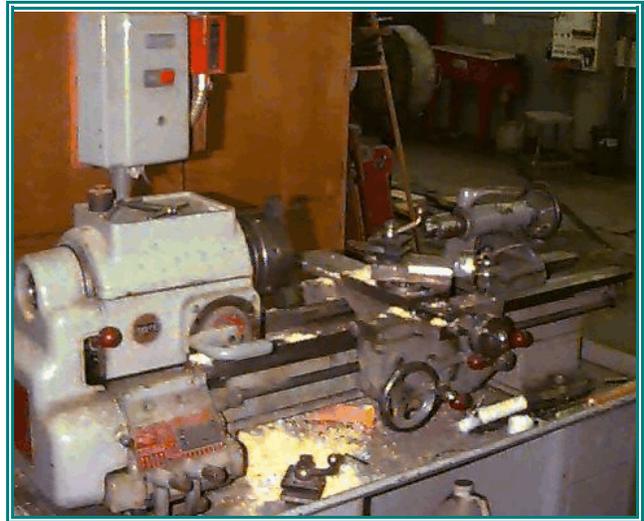


Figure 17 Small Metal Lathe

<http://www.hanoverhigh.org/departments/industrialtech/ml.html>

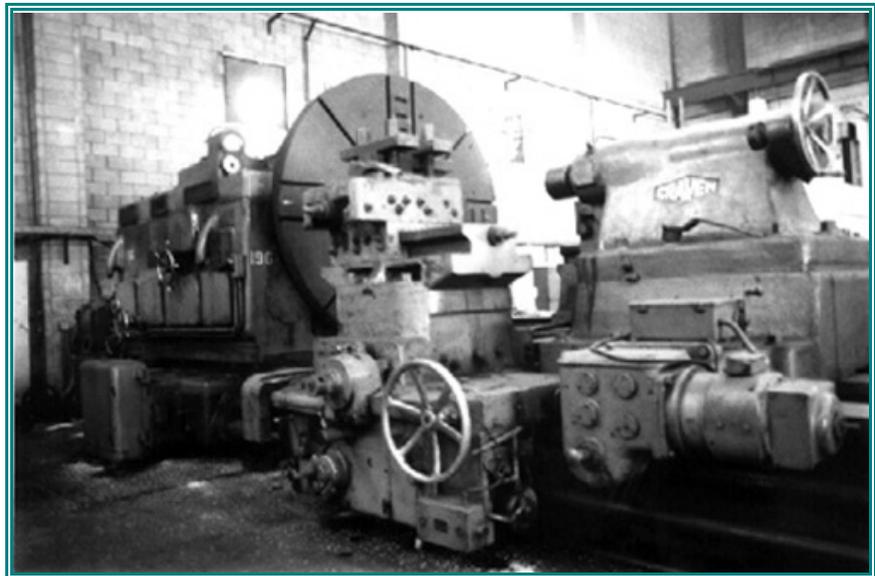


Figure 18 1942 Heavy-duty Craven Lathe

<http://www.mortonmachinery.com/machines/4900/26-50/4943.jpg>

determined what diameter stock could be machined, and since weight went up with size, the entire lathe had to be larger to handle the load. There is something in this photo in front of the center of the chuck so you can't see the actual chuck but you get the idea of how large it is, particularly when you compare it to the small gray chuck in the preceding image. This is where the big boys worked while the preceding one is for small work around an auto shop or a machine shop that did small jobs. This guy was ready to take on anything. The major difference in the layout of dad's shop and the one in this photo is that in this one there is a solid wall behind the lathe. That shows that most of the jobs were worked between the chuck and spindle on the right, jobs that required long lengths of metal to be turned. In dad's case, the oil drilling pipes were 20 feet long and he only worked on the ends, so there was a doorway behind the lathe that allowed him to pull the long pipes through the back end of the lathe up through the chuck where he'd set up and work on it.

The largest stock I remember dad working on came from the oil fields in Rangeley Colorado. I don't know which oil company was exploring the region but the closest machine shop to Rangeley was Payton's machine shop, so he had a steady stream of work in the years the oil exploration went on.. A drilling rig consists of a derrick, a tall framework that sits over the hole. This derrick is the structure within which the drilling machinery operates. It's sort of the exoskeleton of the beast.

Lengths of heavy steel pipe are fitted together with a special grinding bit on the bottom end to drill down into the earth for oil. As the bit digs deeper, the length of steel pipe has to be extended in order to push the bit even further. This length of pipe with a bit is called the "drill string" and it is the central part of the drilling rig.

Here's a shot of the drill bit on the end of the drill string that has been pulled up out of the hole and suspended in the derrick. Problems with the drill string meant that the oil company's investment was sitting still, i.e. being

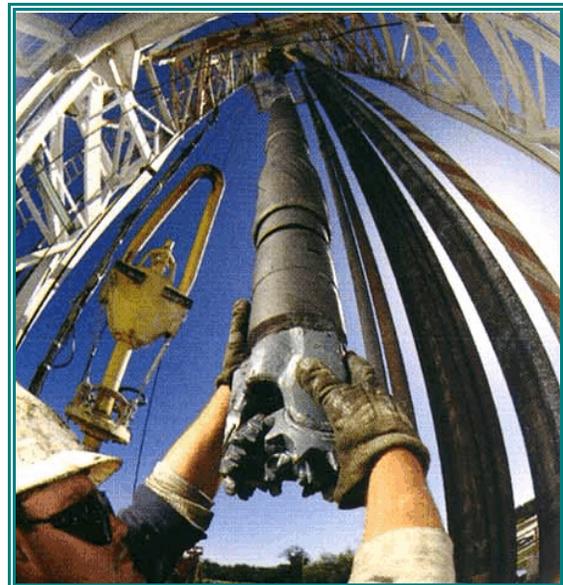


Figure 19 Drill bit on bottom of drill string
<http://www.brookes.ac.uk/geology/8361/1998/jeff/sch4.jpg>

wasted. So maintenance of the drill string was the number one priority at the oil field. Drill bits always wear out which means they have to be replaced which is a major project. The drill string has to be pulled completely up out of the ground so that the bit can be removed and replaced. Imagine the sequence. Imagine that the drill string is a mile long and consists of pipes that are 20 feet long. To get the string out of the ground so that you can get at the business end to change the worn bit, the whole string has to be pulled up out of the ground. The only way to do it is to elevate the string 20 feet, after which the top section of pipe is unscrewed and set aside, then the string is pulled up another 20 feet, that pipe removed and so on until the bit is exposed at which time it is removed, replaced and the string is let back down in the hole 20 feet at a time while pipes are reattached.

The men who do this work are termed "rough necks" and it is tough work. There is a great deal of pressure on them when they are removing the drill string to replace the bit. Bosses are irritable and anxious that this be done as quickly as possible because the hole is not being extended during the entire time it takes the pull up and reset the drill string. In addition to the pressure to get the job done quickly, there is a great deal of mud and debris that make the handling of the pipes difficult so some of the pipe threads are dinged up badly enough that they cannot be used. In that case those sections of pipe were sent to Payton's shop. Where my dad re-machined the threads so they could be sent back out to the field.

The pipes were hauled out to the south side of the machine shop where there were openings into the shop. The pipes were driven up close to the shop where an overhead crane was moved out and over them so that dad could hook on

to one of them at a time. This overhead crane was a chain hoist like the one being used by women machinists in WW II. See the chain hanging down from overhead, and the large hook between the women? The hook was how a thing was secured to the overhead hoist.

Then the chain was pulled to raise or lower whatever it was hooked to.

After getting the pipe elevated from the ground or truck, he would then pull the hoist laterally along the overhead way which obviously moved the pipe in that same direction. He moved the pipe closer and closer to his lathe and carefully inserted its end into the back end of his lathe. As he moved the pipe far enough with the overhead crane, it moved far enough into the lathe that he could then secure the pipe in the chuck and proceed to do the repair designated for that length of pipe.

He'd tighten the pipe in place by individually tightening three clamps that were spaced equidistant around the circumference of the chuck and do the same thing at the end stock to hold the piece securely when the lathe rotated it. He'd check the specifications he was to work to and pick the die, like those shown in the plates above, to cut new threads-or re-thread old threads. He examined the die to see if it was sharp enough and of the right shape and if not, then he'd take it over to a large grinding wheel bolted to a wooden bench.



Figure 20 Chain Hoist - WW II Women Machinists

<http://www.defenselink.mil/specials/womenshistory2001/images/build.jpg>

He'd throw a protective hood over his head, fire up the wheel which had a starting coil to get the thing turning, imparting a low growl until it disengaged and the motor sang at its high speed. When it was at speed, he carefully ground down and reshape the tool. This produced gorgeous rooster tails of hot sparks that flew a yard in the air, that burned if you stuck your hand into the spray. The grinding produced so much heat in the piece being ground that had to be dissipated lest the piece be deformed. This was done by dipping the tool frequently into a can of dust-covered water that was sitting by the grinding wheel for that purpose. There was a hissing boiling sound each time he did that. After he had the shape and size he wanted, he'd take a smooth stone like a whet stone to remove any burr that would affect the cutting ability of the tool.



Figure 21 Bench grinder
http://store3.yimg.com/l/builderscentral_1664_120815

When the die was correct, he'd set it into the lathe, and tighten it into place with a wrench. Then he'd turn a little handle that moved the bit up against the metal, and another handle to move it to the right or left. Then he'd adjust the rotation speed of the chuck and the depth of the cut, the rate of speed at which the tool advanced along the ways, and turn it on, concentrating hard. At this point us kids could get away with more exploring and foolishness than otherwise because his mind would be riveted to the joint where the bit was cutting the steel.

One of the things that fascinated me about turning metal stock was the drip of emulsion oil that he used. The emulsion was milky creamy colored and was slightly viscous. It smelled like oil but had the consistency of water which puzzled me. There was a narrow goose neck attached to the lathe that he would pull down over the bit when he was ready to start. It was connected to a reservoir of emulsion that served two purposes. First, it reduced the heat that was produced when a Carborundum bit cuts into metal stock. Second, it acted like a cutting oil to make the bit cut better, and since it, too, was protected from the heat, its edge lasted longer. To get these benefits, dad would turn a small valve to adjust the trickle of emulsion directly onto the bit and pipe. This oil flowed over the work piece and was collected in the bottom of the work area of the lathe and

drained off into a bucket. If the work was really hot, it would produce some steam and a smell that is found only in a machine shop.

At the same time, the die is removing a narrow strip of metal that comes off in a spiral, sort of like a spring, except that this spring is composed of a brittle metal that crystalized in the process. It is extremely hot right when it comes off so can't be handled for a while. We played with the coils that were lying on the floor under the lathe after they were cold. We usually cut our hands when we played with these springs that were different thicknesses and diameters, depending on the size of the stock in the lathe, the die being used and the speed of rotation.

Welding

In addition to being a machinist, dad was a skilled welder. It was a natural thing for him to express his artistic creative side through metal. The world of welding is actually more complicated than understood by most people. The man in the street thinks, "Welding. Oh yes, that's just sort of joining two pieces of metal together with heat." While that definition isn't wrong, it is inadequate because welding processes can be divided into two large groups, one of which is left out of the definition. The groupings might be named "joining processes" and "dividing processes." Welding can be also sub-divided into the type of technology used, electrical or gasses. Then gasses are divided into oxy-acetylene, heliox, etc., the names of the gas combinations used to weld. The different mixtures are used in different situations, depending on the metals being welded. For example, aluminum metal can only be successfully joined with heliox mixture -or spot welded with electricity- because oxy-acetylene torches burn too hot and simply melt the device into a pool of molten metal.

Dad did two kinds of welding. He was an arc welder and he used oxy-acetylene torches. Arc welding is used to join pieces with electricity while oxy-acetylene torches with intense flames can be used to either join pieces through the process of "brazing" or to cut metal apart.

Arc welding is the welding you observe when a steel framework for an office building is being erected. You've seen an intense bluish-white flame created by a man leaning closely to the metal girders, wearing an odd hood over his head. Saying that brings tears to my eyes. That is what my dad did and I admired him doing it, Vulcan himself couldn't have impressed me more. I was jointly frightened

and impressed at the danger and power of arc welding. My dad did it. He wore his hood and bent over the diabolical stuff without fear rendered a new rigid metal thing.

The basic process of arc welding is simple. First, you get the two pieces of metal that you want to join, and you carefully line them up where you want them to be in relationship to each other. Then you clamp them together with C-clamps or whatever kind of clamp is needed to hold the pieces steady so they don't pull apart before they can be welded. Then you hang a steel hook on the end of a heavy cable to one of the pieces of metal. This cable comes out of the welder and is called the "ground". Then you take the other cable that is also connected to the welder and hold it to the pieces to be welded to be sure you have enough cable.

When the welder is turned on, an electrical current flows through the handpiece and jumps across the tiny space into the metal that has the ground attached to it. As the current flows across this short space, it creates that brilliant flame that can literally destroy your retinas in an instant if you look at it without any protection over your eyes. The cardinal rule for anyone around arc welders is "Never look into the arc without protection"

That tiny flame created by the flow of current across a narrow space is called an "arc", hence the name "arc welding". But something else is needed for the open joint between the metal pieces to be filled in. The way this is done is simple. A long skinny rod of metal - called an electrode- that is 12-14 inches long is clamped into the handpiece so it is an extension of the handpiece. When the tip of this rod is held down to the grounded metal pieces, the arc created by electricity flowing across the space melts the of the rod. The rod melts and the molten metal flows into the open joint between the metals and is immediately cooled off and hardens in place. The welder simply moves the rod of metal slowly along the open joint filling it up. That is welding.

But some more details. The "electrodes" obviously are not just any kind of



Figure 22 Welding handpiece
<http://www.metasafeindia.com/weld1.jpg>



Figure 23 Box of electrodes
<http://www.easternwin.com/WeldElect.jpg>

metal. They have to be the right kind of metal for the metals being welded, and the right diameter which depends on the heat of the arc, that is controlled in the arc welding unit, based on the thickness and kind of metals being joined.

When the electrode melts and joins the two pieces there must be a chemical involved in the process to keep the joint "clean", otherwise there will be impurities and/or bubbles that will weaken the weld causing it to eventually fail. This chemical is called "flux" and applied as a coating around the electrode. If you have seen welding electrodes you have seen that they are sort of a grayish white color. That's the flux. If you take one in hand and look at the tips, you will see the thick metal rod with a thin layer of what looks like chalk.

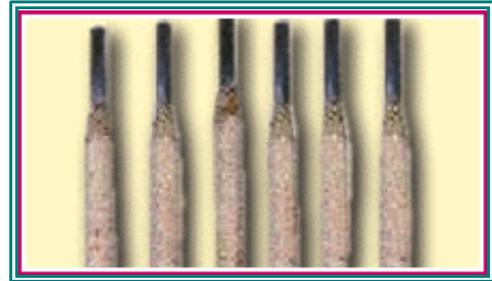


Figure 24 Flux coat on electrodes
http://www.giclibya.com/images/welded_elec.gif

I always awed to see dad weld. He'd caution us to not only close our eyes, but to turn around, just turn all the way around and do not dare turn back until he tells us we can turn around to see what he had done. Getting ready to arc weld was a lot of work. He took great pains to shape the pieces that were specified in the print, then aligned and then clamped. I watched what he was doing from the corner of my eye as I played and investigated things in the shop, usually cutting my fingers on the coils produced when he cut threads in pipes on his giant lathe. Finally, he was ready to weld. The time had come. He'd call to us to advise us that he was starting and ordered us to take steps to protect our vision. There was no sweetness or kindness in his order. He wasn't hostile either, but there was no doubt that to ignore his command was to choose to be blind. Do you remember when you discovered the concept of "blindness"? I can remember when I did, in the movie 'Sampson and Delilah', with orange-hot metal. It was a horrible terrible thing so I did what dad ordered me to do. When he said to turn around, to close my eyes and to stand still until he told me he was through, I did precisely what he said. I did not want to be blind.

After he had the pieces in place, he'd pull the welder over and check his ground to be sure it was securely attached to one of the pieces. It just hung in place but he made sure it was in fact in full contact. If there was a space between the ground and the piece there might be an arc there which would be a real problem. Then he'd make sure his hand-piece worked by opening and closing the clamp that worked like one of those clothespins that you squeeze to open.

He'd check the settings on the welder to be sure that he had the right heat for the work he was doing. Then he'd get the right electrodes, half a dozen of them, fitting one into the handpiece and lay it down by the piece that was to be welded. This was a slow methodical process, done a step at a time to ensure the success of his work, an excellent model of how one should do things. He didn't preach or lecture or teach. He simply did what he did, and by itself constituted the most effective form of teaching there is - by example, without preaching.

About this time, he'd put on leather gloves that extended part-way up his arms or he'd put on a full body coverall. Finally he crowned himself by putting on a welding shield. I was in awe. He was covered entirely in black, except for his face at that moment. The shield made of a light metal had a glass window that he looked through to see his work. Its shape and size was designed to protect the skin of his head and neck from the intense radiation that would burn him otherwise. More than once he came home with what looked like sunburns over the front of his neck when he welded a small joint without protection. But he always wore this shield. It was constructed on an adjustable head band that had joints on each side that allowed the welder to raise and lower it by twitching his head forward or backward.



Figure 25 Welding Shield
<http://www.metasafeindia.com/weld6.jpg>

After Dad was protected and shielded, he'd grasp the work piece with his left hand, pick up the handpiece and electrode in his right hand, and after checking the electrode to be sure it was secure, he'd hold it down just about touching the



Figure 26 Welder welding

<http://www.fmametalfab.org/Conferences/Images/welder.jpg>

open joint. Then freezing himself in that position, he'd quickly bob his head forward with a sharp nod which made the shield fall down. Over his face. There he was, Vulcan. He'd experimentally touch the electrode to the joint to get a jolt of light to be sure he was in the right place because the view window is so dark that you can not really see anything unless there is an arc operating. Then he'd settle in to weld.

Head bent forward in the shield, hanging over the welding field, sparks roaring flashing and splashing, intently deliberately slowly moving the electrode across the joint to close it. It was so exciting and terrifying to stand there hearing the roar of the arc that could kill in an instant, or blind in less. The whole shop lighting up with the brilliant blue flickering lightening from this arc that he was controlling. All eyes averted from this tremendous act of creation. I feared the light would enter through the back of my head as I stood with my back turned to the fearsome arc.

As the tip of the electrode melted, it formed a puddle of liquid metal that filled the space that needed to be filled, the point of the process. As this melting occurred, the electrode became shorter so dad had to keep moving the hand holding the electrode down closer to the work at the same time he was moving it forward, being careful to not allow the electrode to actually touch the work. As he welded the electrode was consumed, he'd shake out the inch long butt, quickly lift his hood to see what he was doing, grab and insert a new electrode into the handpiece, position it over the work piece, flip his hood back down and proceed. On the floor a small collection of these stub ends would collect, something else to play with. After they had cooled.

If it touched the electrode to the piece, he had a little emergency. He had to get it free. To leave it in place with the handpiece and ground basically connected to each other was to risk a meltdown of the arc welder. That's why it was a little emergency. The instant that happened, all bets were off about the smooth bead. Just get the dang circuit broken. He'd suddenly jerk the handpiece back and forth to get it free, all the time the welder was making a loud ominous hum it normally didn't make. If he couldn't get it free -which was unusual- he'd just open the clamp on the handpiece leaving the electrode welded in place on the work piece. That would immediately break the circuit. Then which he'd hammer or chisel the electrode off the work piece and start again.

After the bead was finished, dad would lay down the handpiece, lift his shield and examine it. The bead that is. At this point, he could determine how

well the joint had been formed, whether there were irregularities, how much further treatment it needed. During the welding process, the intense heat interacts with the three melting metal pieces -the two being welded together and the electrode. This interaction which is both physical and chemical produces stuff called "slag". Slag is waste material that is composed of some oxidized metal and impurities of the metal - though the electrode should not have impurities in it. The flux that surrounds the electrode -though it can be applied as a paste with a brush- works its magic in that instant and causes the slag to float to the surface out of the weld. This maintains the integrity of the weld and simplifies the process of removing the slag that usually accumulates during the welding process.

The first step in removing slag was to use a chip hammer designed for the welder, the most distinctive feature being the wire-wrapped handle. You can figure that one out. One end was chisel shaped and the other was a flat hammer head. He kept this hammer by him while welding because he always used it after finishing his weld. He'd use it to chip off the bubbles of slag or excess drops of metal. That allowed him to inspect the bead thoroughly to see if it was sound.

After he'd cleaned off the slag, he would grab a grinder. I loved to watch grinding metal because the abrasive wheel produced a rooster tail of lovely orangish sparks of hot metal the scattered everywhere, turning into black gritty dust on the floor. If you put your hand into the rooster tail you could actually feel the mass of the material hit you. And how hot some of them were. This grinding was usually sufficient to smooth the bead though there were methods of actually polishing it if that was called for by the application or specifications. In this photo the guy is wearing eye covers and



Figure 27 Welder's chip hammer
<http://ourworld.cs.com/SNACHOR1/0e4c86f0.jpg>



Figure 28 Grinding welding bead
<http://www.barony.ac.uk/images/Grinding.jpg>

gloves.

The most offensive smell -actually, the only offensive smell- in the machine shop came from the acetylene generator. A machine shop generally smells like hydrocarbons - greases, oils, solvents and the like. They have a jillion uses when machining and shaping metal so they are used in abundance and provide the basic smell of a shop.

Acetylene, the gas that is mixed with oxygen in a welding hand piece to cut metal or to braze it together, has an unpleasant odor, sort of like decayed garlic. The welder used a handpiece that was connected to two hoses, one from a cylinder of oxygen -usually a green tank- and one from a cylinder of acetylene -usually black but not always. This image shows a standard moveable acetylene torch setup. On the top of each tank is a regulator to control the pressure of gas being sent through the lines to the handpiece. I'll tell you more about this type of welding now since it is the other type that dad did



Figure 29 Acetylene Welder
<http://www.hartfordpr.com/Images/GW-10oxy.jpg>

throughout his life. His extraordinary ability to mount dinosaurs in ways that no other paleontologist ever dreamed of doing stemmed to a large extent from his ability to do both types of welding. His technique which has become the world standard today was the ultimate for mounting skeletons: no visible supports. The ultimate mount was the camptosaurus he put up in the Eyring Science Center lobby. It was standing on one foot, leaping into the air, without any visible metal anywhere on it. No one will refine the technique beyond that.

Oxy-acetylene welding is done with an ultra-hot flame that is created by burning a blend of oxygen and acetylene. The mixing is done in a specially designed hand-piece that is connected by hoses to sources of each gas. This image shows the elements of the setup used by a welder. The two long pieces in the bottom front of the photo are two different types of hand pieces with different nozzles. Dad used both kinds of handpieces. The one on the top is for cutting metal apart. The one on the bottom is for brazing metal together as you can tell from the two knobs on the very right end of the handpiece. Each knob controls the amount of one gas that enters into the handpiece from one of the

tank.

The hoses are the upper-left items in the photo, and look like a coil of rope but which is in fact a coil of tubing that consists of two different hoses manufactured together. In front of that coil of hose is an item that has 2 round gauges with needle indicators which sit on top of a non-descript looking round part that has a tube sticking out the left of it. That non-descript part is the part that is inserted into the top of a tank of gas and secured in place with a large nut. There are actually two of these things, the other one being on the top-right of the picture. They are "pressure regulators" and the two



Figure 30 Welding torch accessories
<http://ourworld.cs.com/SNACHOR1/ld32.htm>

dials tell you two things - obviously. The dial that is closer to the tank indicates how much pressure is left in the tank, which infers how much gas you have left. The other dial shows how much pressure is being fed out of the regulator into the hose that goes to the handpiece, two very different numbers sometimes.

See the odd Tee-shape handle on the left side of the regulator? That handle is used to adjust the amount of pressure coming out of the regulator for which reason this kind of two-stage regulator is properly termed a "variable pressure, pressure reducing regulator". It is necessary to step the tank pressure down to a working pressure that the handpiece can handle. A full oxygen tank has 2,200 PSI of pressure which would just explode the handpiece and hose the gas were applied directly to the hose. After a regulator is fitted onto a tank, the wheel valve on the top is opened fully and pressure is adjusted by the regulator, not by this valve.

One end of each hose is connected to a regulator and the other end is hooked to the handpiece. When the welder is ready to fire up his torch, he makes sure both tank valves are wide open and adjusts the pressure coming out of each regulator to his handpiece. Then he uses the small valves on the handpiece to carefully allow some of

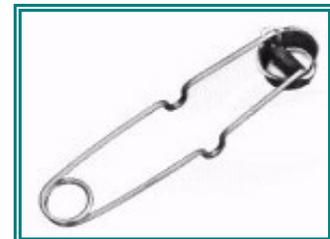


Figure 31 Welder's Match
ourworld.cs.com/SNACHOR1/ld31.htm

each gas to enter into the handpiece. At that point you hear a quiet hiss as the gasses flow out of the nozzle. The welder then uses his "welder's match" or lighter to ignite the gas mixture. It usually ignites with a sort of roar and the flame is always improper, smoky and yellow.

After the torch is lighted, the welder then fine-tunes the flow of gasses into the handpiece to adjust the flame. He does this with the small knobs on the handpiece while he looks at the flame and listens to it. The sound of a flame coming out of a torch is almost as diagnostic and the shape and color of the flame. There are two basic types of flames, oxydizing and carburizing and each has specific applications in welding. The two types of flames are distinctive and easy to identify. The welder knows which type of flame he wants so adjusts the controls to get that kind of flame in the handpiece.

If you have looked carefully at a candle flame you have observed the same segments that a welder watches while adjusting his flame. Next to the wick - nozzle- is a long dark oval, almost colorless. That is the coolest part of the flame and consists of unburned gasses. On top of the cool oval is the portion of the flame where the gasses are burning. In a candle the color of this part is orange-yellow because it is such a cold flame but in an acetylene flame this portion is a blue color. The center of this segment is the hottest part of the flame and is the one that the welder hold on the metal he is working with. The welder can increase the temperature of this portion by increasing the amount of oxygen introduced to burn with the acetylene and he can see the flame change shape and color as he adjusts the amount of oxygen flowing out the nozzle.

If the welder is going to be cutting metal, he will use the cutting torch that has a long handle on the top. As he adjusts the flame, he will press this handle down to see if enough additional oxygen flows through the nozzle. After he heats the metal to melting point, it will turn orange and soften. When he can tell the metal is ready, the welder presses that handle and holds it down at which point the high pressure flow of oxygen causes the molten metal to spray off in a rooster tail of ultra-hot globules of metal that will scorch your shoe leather in an instant if it lands on it. Worse, it will give you third degree burns in less than a second of contact, so in contrast the rooster tail produced on a grinder, you stay away from this rooster tail.

A machine shop like this one saved money by generating its own acetylene for use in the shop. The moveable set up shown above was also used on jobs off-site but it was considerably cheaper -after the initial capital outlay for the generator- to generate acetylene on the property. An acetylene gas system is a low pressure system operating at something like 8 PSI; for reasons I don't know, an H-tank for acetylene, in contrast to an H-tank of oxygen, is filled with a porous filler of some type that apparently does something to stabilize the gas.

The only chemicals required for the production of acetylene are calcium carbide and water. Nothing else, in about the simplest chemical process you can imagine: drop carbide chips into water and collect the acetylene gas. That is the basic process.

Obviously, there needed to be a sophisticated system to do this in safely and economically but the concept was that simple. The acetylene generator consists of a hopper for the carbide chips that is constructed over a sizeable, sealed vessel of water. The chips are dropped a few at a time into the water. As soon as the chips contact water they are chemically transformed and the major byproduct is acetylene gas.

The generator looked something like this, though Payton's wasn't this large. The two devices above the tank are the carbide hoppers. The sealed tank is outfitted with a piping system that collects and directs the gas into the shop. This piping system had regulators at various points around the shop that can be used by anyone who needs to do some acetylene welding. During the chemical process of producing acetylene from the carbide chips, they are converted into a gray sludge that accumulates on the bottom of the tank. Periodically, the sludge must be removed out of the round cover on the bottom right of this tank. The water is also changed at the time and a new supply of fresh chips provided. Obviously, it is critical that the hopper of carbide chips be sealed so that water vapor cannot rise into them.



Figure 32 Carbide chips
<http://www.chem.leeds.ac.uk/depts/photos/Acetylene/1.jpg>



Figure 33 Acetylene Generator
<http://www.rexarc.com/acetylenecomp.gif>

When welding pieces together, an oxy-acetylene uses an electrode similar to that used in arc welding, with the difference that they usually do not have the coating of flux and no electrical current flows through it. In this type of welding, the flux is usually painted onto the metal with a brush.

The heat for this welding obviously comes from the torch rather than an electrical arc. The hot metal and flame produce UV rays and infrared rays that give welder's head aches and can ruin their eyes so they wear goggles with



Figure 34 Acetylene welder
<http://www.amerentbc.com/images/Tour.ht1.jpg>

tinted lenses. electrode. But in contrast to the arc welding flame, this one represents far less risk of injury to the retina. Goggles are still worn however.

The process of welding metal pieces together is also called 'brazing' and is comparable to arc welding. To begin, the welder must prepare and set his pieces up as in arc welding with the differences that no ground is affixed to them, and he will apply flux out of a can or tube directly onto the work piece.

Then he collects his tools, welding rods -not electrodes since no current flows through them- and his torch setup. He gets his flame going, puts his goggles on and applies heat to the workpiece. When the metal changes to the proper color, he then sticks the end of the welding rod into the hottest part of the flame next to the work. As the rod melts, he directs the bead of molten metal onto the open joint to fill it, as in arc welding. After he has completed welding the pieces together, he checks the bead as in arc welding with a chip hammer and will grind it with a surface grinder as needed.

That, then, is a quick introduction into welding. Dad did that my entire life. He did it in Vernal, in Alaska, Boston and Provo. I think that he was stimulated by the notion that he could personally take the hard stuff of metal and bend and fold and shape it to his design. He seems to have experienced a heightened sense of creativity from welding and I do suspect it stemmed from the hardness of the substance. He also felt creative when he painted but I wonder if there wasn't a different feeling to him. He had a arc welder in his basement in Provo when he

died.

I think you might benefit from understanding more about what a machine shop is like because it should give you some more understanding into your grandfather J. Machining metal is totally different than carpentering or concrete working. The demands created by stubborn metal require the wide range of tools shown above in samples. The hardness insists on absolute perfection in technique when a shape is being made, a hole is being created, a joint is being filled and so on. My dad loved the challenge and rose to it. As I just noted, he achieved the ultimate artistry in mounting dinosaurs when he mounted the camptosorus standing on one foot on the edge of a ledge - without a single visible support for the skeleton internally or externally. No metal showed.

Crepe Paper Citric Acid Kool Aid

I don't know when Kool Aid was created but I remember early memories of the stuff so it has been around a while. The Kraft Food website offers this image and says it was designed in 1954 by the artist's son who drew his name on the pitcher of icy kool aid. We did not buy it because it was too expensive. But cousin Tommy's mom would buy it, probably because both parents were working and making more money than my folks were. Only a nickel for a package, that made 2 quarts but a nickel was a nickel and when you didn't have extra, then you didn't. Period. My folks were unswayed by Madison Avenue.

Tommy loved to show off when he invited us to his house to have some kool aid. He'd get permission from Mabel to make it himself, something that she probably didn't exactly approve of because there would usually be some spilled kool aid, or scattered sugar, or too much sugar used. But it was great fun to drink the commercial preparation.

We had our own special drink, however. Made with water, crepe paper, citric acid and sugar. The citric acid was a powder in a small cardboard box.

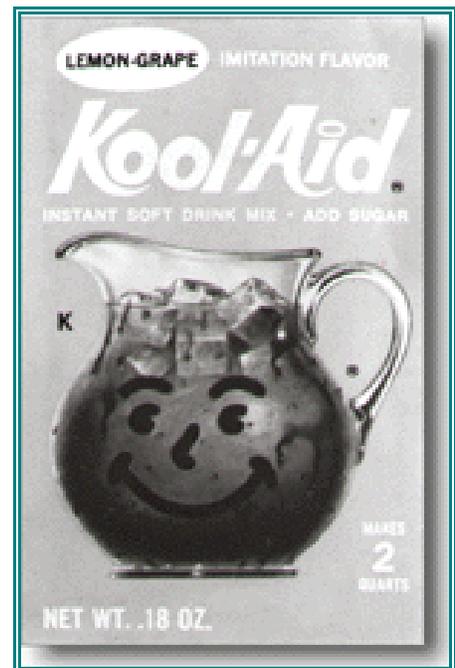


Figure 35 1954 Kool Aid package
www.kraftfoods.com/kool-aid/html/history/ka_pitcher.html

We'd taste a little bit of the stuff on our finger but it was so tart that it was too strong to enjoy. We'd put some in a quart jar filled with water and coax some sugar from mom in the kitchen. We'd mix the three together well, and to get some color we'd take a piece of any color of crepe paper and stick it in the water. That leached the water-soluble dye out of the paper and into the water so we then had a colored drink. It obviously didn't have a particular flavor, but it was fun to make, and was something farm kids could do at the time.

Grandpa Jensen, Rain Storm, Sago Lilies and Carbide Lamps

The rain was terrible. We huddled in a small cave created by an ledge of sandstone that hung over a small cave. In the cave. Avoiding the heavy rain. Waiting for the rain fall to tend. Out there on the massive desert between us an Vernal. A long way. What if we couldn't make it back in time for dinner? Would we die?

Grandpa sat in the dryness and talked quietly about the desert. He explained to me what he had explained to the preceding generation, i.e. my dad, that Sego Lilies had saved the lives of the pioneers who entered Utah territory in 1848. They had learned from the Indians that the bulbs, the tubers, of Sego Lilies were edible and nutritious. So the starved pioneers waiting for their first crop of wheat the nurture harvested Sego Lilies for their survival. The page that was the source of this image says, "Sego lilies saved many early Mormon pioneers from starvation. The most critical period was 1840-1851 when Utah was visited with a plague of crickets which devoured crops, forcing food rationing."

So when the rain stopped, Grandpa Jensen took me out onto the flats. He pointed to the myriad mariposa sitting out there and showed me how to pull the plant so that the bulbs, some of them walnut sized, could be harvested. He showed how to rub off the dirt, and remove the outer scaly layer. Then he ate the bulb and relished it. I tried it, and they were crunchy with a nutty flavor, no bitterness, just a mild sweetness and crunchiness. The pioneers' lives were preserved by eating this miraculous



Figure 36 Sego Lily

<http://www.geobop.com/World/NA/US/UT/Flower.htm>

plant that is as beautiful as it looks. The flower is subtle and gorgeous. The throat is a deeper color than the rest of the three petals, an arresting combination.

Out there on the desert dad took my grandfather into a cave, a place that he had relished for years and had looked forward to sharing with his father, triumphantly, revealing to the one who taught him something of priceless hidden beauty, a hidden thing that he had discovered himself. He took us with carbide lamps on our oversize helmets into a cave where there was something he savored and desired to reveal to his dad in a burst of glory. We walked and walked down steeply into this cave, deeper and deeper, going close to the core of the earth, so that dad could reveal this unspeakable glory to his dad. Finally we were there. The mystery was a column, a pillar, of ice, several feet in diameter that stretched from the floor of the cave to the ceiling. And it was cold, ice cold and I shook.

A carbide lamp produces acetylene gas, the gas used by welders, by dripping water stored in a reservoir in the top of the lamp into a hopper of dry chips of acetylene stored in the bottom of the lamp. Adjusting the rate of flow of drops of water adjusted the brightness of the lamp by varying the quantity of acetylene gas. The outflow of gas was ignited by a lighter like a welder's match.

The light from the lamps not really bright but in a dark space it was sufficient. It shimmered as the wind currents whisked the flame from side to side. Smell from the carbide like rotten eggs, hydrogen sulfide smell. I feared that the light would be extinguished by the winds blowing through the deep caves we descended into. I did not want to go. But turning around alone in the dark to find my way was a greater fear. So I held onto my companions and followed them with such fear that I look back and think I was a hero. I must have been a hundred feet tall to follow them, given the enormous fears I felt inside of me. I remember them. I was nearly paralyzed by the cold, the everlasting darkness, the rumbling rushing noise of the deep river and the fear that the earth would collapse on us and the fear that the feeble lamps would blow out. How did I do it? How do kids



Figure 37 Miner's Carbide lamp and helmet

<http://www.gfxgold.com/005x.htm>

do it ever?

It stretched from the floor of the cave to the ceiling, adjacent to an enormous hole in the floor of the cave. Through that hole came to roar of a subterranean river in the next chamber of the earth that rushed noisily onward to the aquifer that it fed. Such noise it made. It was terrifying. The sight of the gigantic icicle was impressive, but the terror created by the noise and the cold suggested that the river might tear the floor of this cave away and destroy us all. It was more than I could tolerate. I shivered from the cold, because it was cold and I wasn't properly coated, but the shivering was more from fear of the river swelling upward and drowning us than it was from the deep cold that made steam of our breaths. I even feared falling through that hole into the earthly-sunk river, but I felt like a coward when I felt that way, felt guilty and ashamed, because my giant dad stood on the edge of the hole, ready to fall in but showing no fear, while he shouted to his dad about what he could see down there in the hole gesticulating with obvious relish and sense of safety. I could only think about getting out of that cave before I lost my mind. It was absolutely terrifying to be there in the location experiencing what I was experiencing.

It is interesting to be an adult today writing this, recounting my childhood as I remember it. Admittedly it is biased and incorrect. But the interesting thing to me is the fact that these accounts are permeated by threads of fear and anxiety, about uncertainty, about insecurity, confusion, all of which filled my life, occupied these times I spent with my dad. What a time to live. Childhood. I have no way of knowing if that is the experience of all children, but I know it is mine. Childhood was a tough time, like I was just biding my time until I would be able to get out there on my own, doing what I wanted to do, not depending on my parents or adults for safety and direction and control, becoming able to do what it was that I wanted to do. I obviously had no idea about what that was, but I had an inkling, a sense, a longing, to be there to do "it". So that I didn't have to rely on, or obey, these adults who put me in positions that were so painful and confusing. Dad dragging me down into this terribly frightening cave near Oak Creek was on one hand, a generous thing. Yet on another, I cannot but harbor the suspicion that he knew it would scare me to death. And -here's the point- that he wanted to do that to me. I don't understand it. What did I do to deserve that sort of treatment? I was in no position to threaten or harm him, indeed, I was completely dependent on him, helpless and hopeless, yet he persisted over the years in doing things like this to humiliate me, to satisfy whatever the base desires of his were to do this

sort of thing to helpless human being. He might as well have tortured helpless puppies. After all is said and done, he was a mix of things.

Boxing Gloves and Bloody Noses

Dickie and I fought so much that mom and dad decided they would develop a formal method to resolve differences between us. Today as a parent I sympathize with their effort. It is difficult to find a method to keep siblings from fighting all the time, and as difficult to mediate their arguments so any method offers promise to control the insurrections is attractive. To the parent. But it wasn't to me, nor do I think it was to Dickie. It didn't work.

Mom and dad bought a set of boxing gloves, shiny red gloves, the most ridiculous things I ever see. Huge puffy red things that you put on your hands and were to wreak havoc on the other guy. I didn't know that Rocky Marciano wore those kinds of things when grandpa Merrell listened to the radio, screaming for him to "Knock him out!" Wouldn't bare hands be more effective? Dad was going to teach us how to box. That way, so the theory went, when we had a difference of opinion we could ask for a boxing match. We could decide who was right that way. I guess. I'm not really clear about how the whole thing was structured, but it strikes me as a dangerous thing to say that the one who beats the crap out of the other is somehow "right". Besides when things heat up between brothers, there isn't a whole lot of cool logic that would allow as how the time has come to retreat to our own corners, don the clumsy gloves and then as gentlemen engage in a spot of fisticuffs. Nope, beat the crap out of him and no. None of that silly business.

In any event, I remember several evenings when dad was home and these things were strapped onto our hands. They were big and silly, huge puffs of something sort of soft covered in a slick leather. Laces across our palms and up our wrists. We were supposed to "box". It wasn't too nice however to stand there facing Dickie with mom and dad watching while dad instructed us in the technique of boxing.

We had to hold our hands up in a certain way to protect us from the other guy and had to stand a certain way to protect my anatomy from injury. That sounded just fine and was exactly what I wanted. I didn't want some mug taking a whack at my puss. The problem was that when I did hold my gloves up to protect my face, I couldn't even see the other guy. I had two glove palms turned toward my face up in front of my face. That is protection, except that he was then free to attack me around the side of the gloves. And vice versa. That really didn't

seem fair but that was called "boxing" and dad and mom thought it was a great thing for us to learn to box and to be able to "settle our differences". So who was I to say it wasn't nice to take advantage of my defense and hurt me. That's exactly what I was trying to prevent by holding the gloves up. Dad would yell at Dickie or me, "Hold your gloves up, punch him with your right, protect your face, don't telegraph your punch by pulling your hand way back to hit because the other guy will see it and punch you, keep moving, move to your right, lean forward, etc." None of it made any sense. Except holding my gloves in front of my face.

I don't think that we actually boxed too many times. I don't understand how it happened even today but somehow we would get railroaded into lacing the gloves on and "boxing". It wasn't too bad for a while, but then one of us would actually get a good punch in, and the other kid's nose or lip would start bleeding. At that point, dad would scream to the wounded kid to do this or that. But he might as well have been hollering at a mule. At the instant blood was drawn, that kid's eyes filled with tears and he turned into a windmill, a flying flurry of telegraphed punches so fast and hard that the other kid was always knocked to the ground. Also injured and in tears and hysteria. The gloves were disgustingly pulled off by the parents who had nasty things to say to both of us. Which, in the end, only made the exercise as painful as it was stupid.

In the end, all I learned was how to street fight and today if I were able to turn myself loose in a fight, I can tell you that I would simply immediately powerfully unreservedly as hard as I could kick the guy squarely in his unprotected youknowwhats, and then while he was on the ground, gouge his eyes out and then bite chunks of his face off. I know because I almost got into a fight several years ago here in Portland and at the instant I almost let loose that is exactly what I was ready to do.

I experienced a shocking, powerful, primitive response like I had retreated to a cave and was going to preserve my very life. No polite rules, no cautions, no reservation, just, "Man alive, you push me a hair further and I'll just come apart in rage and kick you so hard in your privates you'll have to go to hospital....." I'm not kidding. I saw it like on a screen inside of my head and I was ready to go. If he had touched me again, he would have been gone. The poor guy would have been admitted to the hospital and I would have been put in jail. I will not be polite if I am going to fight. Either don't fight, or fight to the death is how I feel after going through the "training" I received. This crap about rules of engagement makes me sick. If you're going to engage in obscenity, which fighting and wars are,

then for hell sake, do it as evilly and nastily and powerfully as you can to (1) prevail and (2) get the dispute over as quickly as possible.

The signals we received from mom and dad, in particular from mom, were absolutely contradictory. Generally, we were not to raise a finger against anyone. We were not allowed to defend ourselves from "small stuff". I guess that seemed fair enough and the golden rule thing was carted out as instruction of how we should behave, but that approach to human relations fails to take into account the natural course of development of humans who are learning how to be humans. It is not possible to train a little kid to be "nice" and criticize him for slapping a kid back who slapped him first, and to simultaneously teach him to "defend" himself.

That's utter insanity, ludicrous, stupid and generally asinine. Don't do it to your kids. Either let them kick the crap out of other kids now and then or lock them up in monasteries and nunneries because all you will accomplish by teaching contradictory values is to confuse them. Look at you, sons. That's how it was for you. I sympathize deeply and apologize for it. I don't know how to do it, don't know how to corral and direct the impulse to mayhem that little kids come with. No, I don't endorse anarchy, but I sure as heck don't endorse what was done to me or to you. Let your kids be rowdy and rough. Pull them back so they don't break any arms and punish them in a reasonable manner every so often to put some sort of boundary on that lawlessness, but don't break their spirit like was done to you and me.

Coin Purse

As a kid I was shy and awkward around people I didn't know. Performing in any manner in school was difficult. I even felt uncertain and out of place participating in parties at school. I don't know why but it was so. Schools had carnivals in the summer, perhaps for May Day. But food and drink were not necessarily free. You had to have money for some things. The prices were in the pennies for whatever was available and all you had to do was step up to the table, announce your choice, wait while it was procured and exchange the money for the thing. Sounds like a normal transaction, nothing complicated, something I saw my mom do all the time. But when it was my turn at the front of the line of jostling, pushing, whispering kids, I was petrified. So I would just save the money mom and dad have given to me, and wistfully watch other kids eating their popcorn balls, popsicles, ice cream, cotton candy, drinking their pop, wishing I had some. Which is so sad because I had more money than I needed to fill myself several times.

Well, my uncle Grant, bless his wrinkled heart, became aware of my fear of buying stuff at a carnival at Central Elementary School. So he did what a big-hearted uncle would do who figured that the problem was fear of spending my own money - he gave me more money, all of it coins, some of them quarters and a fifty cent piece!!! to get me ready for the next school carnival that was being held in a neighboring town. Maybe not entirely logical on his part but as reasonable as any I can think of today, a fine gesture for a shaky kid who did not understand about the value of money. My leather coin purse with the brass hinge and clasp bulged so tightly by the time I crammed in Grant's gift and what I had already saved I could hardly get the clasp to lock. It bulged in my pocket, nearly pulling my pants down.

The day came to go to this other school. Buses of kids were transported down Highway 40 to the west where they were unloaded for the day, sort of a Tom Sawyer holiday from school. With stalls of all sorts and banners and screaming, laughing, feeding kids all over, none of whom I recognized, balloons, and banners and games, adults everywhere. I walked around for a long time, clutching that bulging purse tightly in my pocket lest I lose it. Looking at and wishing for food and drink. But the self-consciousness I felt at my own school was malignant in this one. I could not conceive of myself ever getting into a line to buy something to eat or getting in a line to buy a toy or trinket or play a game. People would be watching me, listening to me, wondering what's wrong with me. That's what I thought. I know today that wasn't what went on but that's what my worried, nervous soul experienced in those settings. The only place I was comfortable was being on the farm with the Cooper kids or with cousins on farms in Naples.

After wandering aimlessly this way, just waiting for the time to board the bus and go home, I needed to go to the bathroom. That, too, was an ordeal. I was so shy that I didn't dare ask anyone for directions. I had learned that there was something unsavory about toilet functions, and would have preferred to fall into a hole before I asked for the bathroom. Not being particularly insightful about just watching other kids or reading signs of doors and in hallways, it was a long time until I got to the bathroom, aching so badly that I felt I could hardly walk. I unbuttoned myself, and did the job, actually hurting from the release, re-buttoned, feeling nervous the whole time, anxious to get out of the bathroom and back in the open. After a few minutes I discovered with a stomach-churning sensation that my coin purse was not in my pocket. Stricken and panicked, I ran back to the bathroom because that was the only place it could have been lost. It was not there, but in this I was confident. I had lost it there. I was perfectly clear

about it. I had not removed the purse from my pocket at any other time. And having been raised in a house of rigid morality, I took the next logical step to collect my personal property.

I went to the Office where the Lost and Found would be kept. I knew that my purse would be there, because it wasn't in the bathroom where I knew, accurately, I had lost it. Hence, someone had found it and dutifully turned it in to the lost and found to await its owner. The effort required to open that door was enormous. I did it. I walked into a strange place where an old woman -probably 25 years old- impatiently looked at me. In halting words, probably looking at the floor or anyplace but her face, I explained what had happened and politely asked her if a brown leather coin purse filled with coins had been turned in. She said, "No, no such thing was turned in, but here. Here's a brown coin purse. Is this what you are looking for?" She held out a coin purse. Mine. Empty.

It was empty. This was really, and please don't laugh, my first personal contact with the evil of the world. It was inconceivable that I would personally experience robbery like this. I was devastated and held back the tears of anger and frustration and disbelief. Just stunned that someone would take all of my money and then have the audacity to turn the empty purse in to the lost and found. I had done nothing to deserve that treatment, I knew my mom would be angry at me for losing all that money, I had denied myself everything to save the money, and now it was gone. There are no words to describe the feeling- except devastation. I sit here, 59 years old, with tears when I relive that devastating experience. A simple innocent farm kid stripped of his largest treasure because of his own carelessness and irrational fears in public.

Dick ate with the Blood Hounds

This is a true story. Ask Dick. Grant lived the grandpa Merrell's store in one of the bedrooms in the back and had several bloodhounds. We liked them, with their long ears, saggy eyes and a skin that was about 3 sizes too large. For reasons that only Dick knows, he decided that he would eat with these dogs. It wasn't because he was hungry, it wasn't because he had been ordered away from the dinner table. It was simply because he knew he needed to do that. Perhaps he was comforting the dogs. Or preferred their company.

Grant filled two large flat Pyrex bowls with the food and when it was ready, set them on the ground behind the house. He called the dogs and after they were eating, went back in the house. It was then that Dickie knelt down on the ground,

pushing his way between the bigger dogs to eat with them. The food that Grant cooked a pot was a mixture of dried bread and milk. Perhaps Dickie just liked warm bread and milk, but he could have had it on the kitchen table.

Wylie Pope, Chess and Carboys

When grandma and grandpa lived at the small country store in Naples, the one where I fell into the storage tank pit at the grand opening, there was a machine shop almost directly across the street. It was owned by a man named Lloyd Pope. He was another large man who was also a genius who did all sorts of things anything he wanted to. And successfully. His shop was a large domed structure that looked to me to be impossibly large for a private residence, as it in fact was. He and dad were great friends and remained so until he was found dead on his kitchen floor a mile from dad's house in Provo. He did a lot of electrical work and his preferred method for testing light sockets to see if they were hot was to stick his finger into the socket. He had no difficulty determining whether or not there was juice and he wasn't bothered by it.

He had two sons, one of them my age. His name was "Wylie" and he was a nice guy. When Dickie and I visited grandma and grandpa, I often went across Highway 40, after looking carefully both ways, to play with Wylie. One day he convinced me to learn to play a game called "chess". I'd never heard of it before. So he taught -or tried to teach- me how to play chess. What a weird game. Chess.

I was used to playing "Fish" and "Parcheesi", but "Chess" was completely outside the realm of "possible games" for me. I had no ability to comprehend a game wherein there was such a complicated set of characters or was such a complicated set of rules. I played Chinese Checkers or plain checkers. Each piece had about two possible roles, in the most extreme version of the game. But a game where one character could move in straight line, and another could move diagonally, and another could move one square, and another could move 2 and 1 or 2 and 2? And you had to be able to "see" a thing called "check" and "checkmate", neither of which made a bit of sense? What a weird game. I obviously never got interested in Wylie's game. Checkers was complicated enough for me. Wylie would proselytize me every now and then, thinking, apparently, that I was a better bet than most of his neighbors. But I wasn't. Or maybe he was just desperate because he had exhausted the supply of kids in his neighborhood. What a boring game. I remember sitting at a kitchen table with him while he set up the board and pieces, explaining again, how each weird-shaped piece was to move. I couldn't

even remember how each one, let alone what I was supposed to do. I played just to make him shut up for a while. I was unable to even understand the rudiments of a game. I simply did not understand what he was about. So we would both get tired of the game and wander off in search of something more interesting to both of us.

One thing in his dad's machine shop that always interested me were the carboys. These were large greenish glass bottles, the biggest bottles I had ever seen, even bigger than a milk bucket. They must have held 20 gallons. Lloyd was a welder and jack of all trades and in the shop he had on his property, he repaired everything brought his way, from a carburetor to refrigerator. Some of the jobs required acid, probably as a flux or a cleaner. Whatever it was that Lloyd, consumed large quantities of acid so he bought it in bulk. In carboys. It obviously wasn't fluoric acid because that has to be stored in wax bottles. You've seen highly diluted fluoric acid used to etch glass. This acid was probably sulphuric, hydrochloric or muriatic acid. I don't know what he did that required so much acid, but he large quantities of the stuff in enormous green glass bottles.

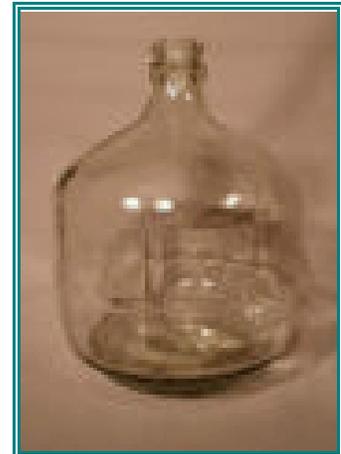


Figure 38 Carboy
<http://images.google.com/images?q=%22glass+carboy%22&hl=en&sa=N&tab=wl>

I wanted one of them, which was a silly wish because it would never happen, but oh, how I wanted one for my own. These bottles came in large crates built of wood lath, and were protected by layers of excelsior, stuff that protected the bottle from shocks during transit.

They were seductive in their size and color and shape, but all I could do was admire them and wish I had one, though what I would have done with one was basically 'nothing'. That's the way of kids, to wish for a thing they can't have - which they cannot even use if they have it.

Excelsior is probably foreign to you because it had pretty much disappeared from the scene by the time you woke up. But in my



Figure 39 Excelsior
<http://www.libertyequipment.com/excelsior.htm>

childhood, excelsior was a prime packing material because it was effective, it was cheap, and it could be easily shaped to protect anything that needed protected. It was simply long shreds of wood that were mixed together like the wires in a steel wool pad, only much larger. These "threads" of wood were half the diameter of a pencil lead and were made from a kind of wood that didn't break when converted into these "threads" that were then wadded up and bent. It was perfect to pack a carboy in a crate for travel to keep it from breaking en route to its destination.

Carbide, Moon Rockets and Milkweed Pods

The amount of acetylene gas used by Payton's shop must have been substantial. Dad brought home several empty barrels for us to play with. They were distinctive for two reasons: in addition to being made out of metal, their sides were corrugated circumferentially for some reason, and the lids were absolutely tight, like the lids on metal cans of baking powder. The reason for the tight seal, obviously, was that the carbide chips must be protected from water, even humidity, for two reasons: first, to prevent the production of acetylene in an uncontrolled environment where a spark could ignite and it and second, to simply preserve the product so that it was viable when the time came to use it.

The volume of these barrels were a grayish black color and probably held about 5 or 6 liquid gallons though the carbide chips were probably sold by weight. This made a nice sized barrel for little kids to play with. The barrels initially had a peculiar but not offensive smell from the carbide. We had few real toys so used our imaginations to create fun out of all sorts of odd things around the place. The barrels were exciting, actually, because they were different than anything else we had around. They were a highlight of summer.

We had a wooden wheelbarrow around the place that we played with when the urge or imagination struck us even before these acetylene barrels showed up. Once the barrels were there this wheelbarrow became all sorts of things. If we laid the barrel flat in the wheelbarrow, it didn't take much of an imagination to make it into a Prairie Schooner. Such a grand name. Not just



Figure 40 Prairie Schooner

<http://memory.loc.gov/ammem/today/images/0814wagon.jpg>

a "covered wagon" but a Prairie Schooner. They were pretty much the same thing but I remember how grand the name sounded, Prairie Schooner. So we had Prairie Schooners when we wanted them. You can see the shape in this image, particularly if we draped a sheet over the top of the barrel. Even had a little dog hanging around. Jelly bean, a black dog with short hair.

We'd be out there puffing and panting, nearly dying of thirst in our covered wagon. For real. Little kids don't like to interrupt their play for trivial things like eating or drinking. Cougars prowling, hanging overhead in trees waiting to drop down on us or waiting for us to stop so they could sneak up and grab us.

After assembling the prairie schooner, one of us laboriously struggled to hoist the heavy wheel barrow up off the ground and simultaneously push it forward, not a small task for a 6 year old. The other of us preceded the thing around the yard, calling out whatever came to mind, or pointing out to the driver a hazard like a rock or cat. Or just argued about things. On these trips in the prairie schooner we struggled across the desert to the next settlement, not quite sure we would make it before we died of exposure, or of thirst, or from Indian attacks. We had to fend off attacks or robbers with our cap guns, yelling and shooting, feeling what the danger was and thrilling at knocking the bad guys out of their saddles.

Remember that the days were long and hot and dry so any play that involved dying of thirst or heat stroke had a certain verisimilitude in those conditions. It is important for you to keep the context in mind as you go back to my childhood, not because it is wrong to not keep it in mind, rather because that is the best way for you to reconstruct in your own mind today what was going on in my mind at the time. This was a dry hot summer climate and cold winter. Prairie Schooners were historical artifacts at the time but they were still vividly present. The pioneers had come across the plains in such and their stories were present.



Figure 41 Cougar

http://www.tpwd.state.tx.us/adv/nphoto/a3_9.html

Other days the wheelbarrow with the horizontal carbide barrel took on an entirely different character. It became a steam engine roaring and smoking its way up impossibly steep mountains, snow slides hanging over us, more Indians and robbers ready to steal the mail. One of us being the choo-choo sound while the other yelled to put more coal in the fire box, "Where's the coal?! Hurry, hurry, we're losing steam We're going to roll backwards!"



Figure 42 Steam Locomotive
<http://library.thinkquest.org/20331/images/locomotive.jpg>

We were familiar with steam engines because they were the most prevalent type we saw in movies. There was no railroad into Vernal so our exposure to trains was in the media. Diesel locomotives were in use on the main lines, and were romantic modern devices but were not as common yet as the old coal-fired steam-engined locomotives. Steam engines have a long boiler as in this image so we had a locomotive to drive around the driveway when we wanted. Until we got bored or tired.

The wonderful thing about this train was that we were not constrained by train tracks. We could cut across the yard or the driveway, going anywhere we pleased, even out into the weedy fields to the north of the house or east of the garden. The only place we couldn't take it was over the cattleguard but we had so much territory to play in that we didn't need to get out on the road. Mom doubtless discouraged us from going on the road so that's the real reason we stopped at the cattleguard, not just the fact that we had 2 acres to play in. To give you a frame of reference for the size of our property, 2 acres is five times larger than the 5111 plot. Remember when you were a little kid how big our yard was. Add that to Baumhoff's un-divided pasture - that's 2 acres.

One day in August we set the barrel upright in the wheelbarrow and pushed it out along the driveway, and along the east side of the row of lilacs. All along drive and on the east side the lilacs were the milkweeds that grew profusely in the area. The lovely clusters of pinkish flowers like these had a sweetish scent. I always smelled flowers to see what their flavor was, how they would strike my nose. These were sweet. The leaves are flat here, not at all fuzzy but the ones we had around the place were apparently a different specie and had rougher leaves that had some sort of fuzz on them.

I can't help it. You're going to get a lesson in natural history about now.

During the time us little kids were blithely hurrying about the yard, the flowers were maturing. Then we were visited by another mystical visitor, the large monarch butterfly. Dad was so excited to see them that I became excited. Just because he was at first, but I grew to love these large slowly flapping orangish black-webbed winged butterflies, larger than any other except for the yellow and black striped tiger swallowtail that was of comparable size. I didn't understand why the monarch picked the milkweed as the proper source of food for its offspring, especially since the adults prefer thistle for food. Whatever, the monarchs visited our area in large numbers and slowly paddled about the milkweeds, about the same time the pods were forming. The same time we were forming. Wonderful coincidence.

This image captures the beauty of the creature. The flower is not our milkweed but that's not the point. Just look at the gorgeous creature.



Figure 43 Monarch butterfly

<http://www.garysgarden.com/monarch%20on%20milkweed.JPG>

After the monarch laid its eggs on the underside of the milkweed leaves, a short period of time passed before the eggs turned into caterpillars. They are among the most beautiful caterpillars I have known. Aren't they gorgeous? We watched them grow, hunting on the milkweed leaves for these



Figure 44 Monarch caterpillars

<http://www.gpnc.org/images/jpegs/animals/monarch1.jpg>

striped beauties. Beautiful pattern of yellow, white and black stripes. The black stripes are always between white stripes. See the babies starting. In their early life they look like a moving pile of birdlime.

The largest caterpillar in the preceding image is about ready to do his magic. He's fat and ready to form his chrysalis. And to undergo the process of metamorphosis, one of the most astonishing things in nature. Here it is, you saw it at Valley View elementary when teachers brought the creatures into class for you to see the. During the process his body shape is completely reshaped and he sprouts wings and legs, antennae and a head. Mystifying isn't it.

That's the end of the lecture. But know, please, that our world really was filled with instruction like that, both in the flesh and by instruction. We experienced our world first hand and saw its creatures and learned about them and their habits and life patterns. Thank you dad and mom.

While the monarchs are appearing, the flowers had been pollinated and the sun had done its duty in conjunction with some water, so the lovely flowers on the yard high leafy stalks withered.

Leaving behind an odd little button that didn't look like much but over the next few weeks that little button turned into a fabulous thing, a milkweed seedpod. Even the name is fun.

These velvety full pods about 3-4 inches long just begged to be picked and used

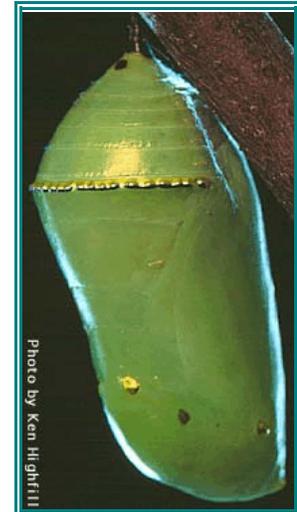


Figure 45 Chrysalis
www.gpnc.org/monarch.htm



Figure 46 Milkweed Seed pods
<http://www.rce.rutgers.edu/images/weeds/full/milkweed-seedpods-full.jpg>

for something. It didn't matter what. Anything. They just waited for a little kid to come along and pull them off. Which we did.

So back to the carbide barrel wheelbarrow truck where we started before someone threw in that lecture about monarch and milkweeds. We parked the wheelbarrow by the milkweeds loaded with these plush pods and pulled them off. Two fistfuls at a time, as many as we could hold on to, just to get as many as we could as quickly as we could so that we could put them into the carbide barrel, fill it to the very top, 8 gallons worth. Dripping white sticky milk from every stem, drops falling on our hands and arms and bare feet and the ground and the barrel and the wheelbarrow, dripping from the wounds in the stalks flowing down to the ground, flowing rapidly. Smelling like milkweed sap, tasting like milkweed sap, bitter. If it collected and dried in the warm sun, a sticky residue resulted, but still didn't taste good.

Turns out that the bitter taste is oxalic acid and something else nasty. When caterpillars eat the milkweed sap they do a neat trick. They retain the oxalates in their tissue instead of excreting them. When birds eat one of these brightly colored caterpillars, they get sick for that reason. Amazingly, the oxalates survive in the tissues during metamorphosis. A bird who eats an adult monarch butterfly, also throws up. And never eats another one in its life. Clever worms.

So why did we fill the carbide barrel with milkweed pods? We don't know. Just because. Just because those pods begged to be harvested. Remember, we lived on a farm, a place where the later summer and fall was the time of harvest. Somehow this was harvesting, this was helping, this was contributing. So what did we do with the milkweed? The obvious thing one does with carbide barrels filled with ripe plump milkweed pods.

We powered our rocket ship to the moon with them. We kept the barrel upright in the wheel barrow, moved it from under the lilacs lest we snag our ship on the dead branches - and prepared to launch. Flash Gordon was hanging around, you know, in the funny papers. We sat on the wheel barrow and its handles and looked up at the sky and imagined that our barrel of



Figure 47 Flash Gordon
<http://posters.imdb.com/Covers/03/24/75.jpg>

fuel was a rocket, thrusting and burning and screamingly firing up to the heavens, to the moon, modern men, blazing a trail through the unknown. In our milkweed filled carbide barrel rocket ship.

JC Penny's and Cousin Marion

Mom stayed at home with us kids as long as she could but eventually the financial needs of the family required her to take a job. This was in the era when women were moving out of the home and into the workforce, as WW II ended, a profound transformation was taking place that reverberates in our society today, a shift away from the farm-based agrarian model to an urban model with the different needs and mores.

The only job I remember her having in Vernal was working as a clerk at JC Penny's store in town. I liked to go into the store because it had the exotic smells of new clothes, women's cosmetics, and leather goods. I believe that she first worked as a cashier at one of the tills near the entrance to the store. Pushing the buttons in the large cash registers was impressive since white enamel flags with numbers popped up into a little window with each push of a button, but what impressed me most was the system of overhead wires and tubes that connected each cashier in the store with a centralized cashier sort of person on the mezzanine.

After mom would ring up the purchase and get the total, the customer would give her money.-Credit cards didn't exist and checks were rarely used - it was a cash basis for most families. She would put the cash register receipt and the paper money and change into a small plastic tube and screw the lid on. Then she hung this tube on a small cable-car affair that rested on a stout cable at head level. After the tube was secure on this little tramway, she'd yank a handle and the tube would shoot overhead along the wire to the central cashier who would remove the tube, make the correct change and reverse the process. The customer and the cashier just waited for the tube to return, everyone knowing that this is how business was done. The tube sped home and engaged with a satisfying snick, ready to be sent back up. The tube was removed, opened and the customer took the receipt, the change and the goods and left.

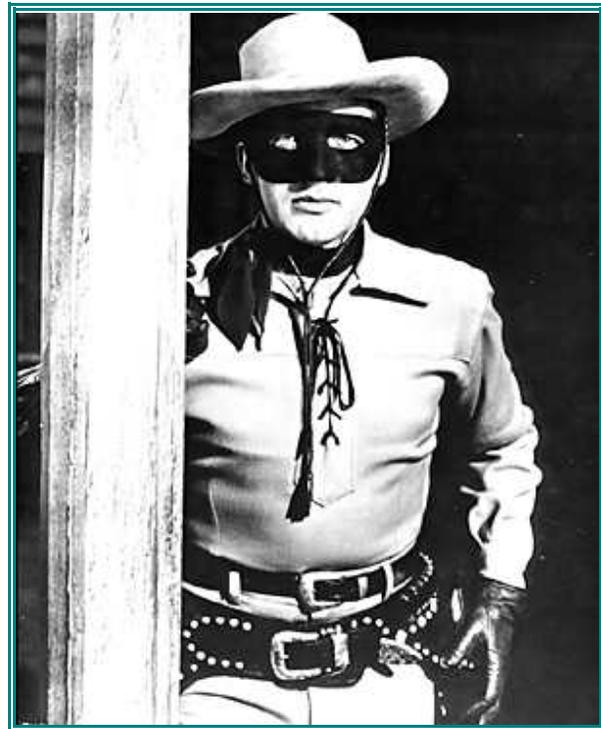
On the days when Mom was at work when we got home from school, she made arrangements for her niece Marion, Pearl's oldest daughter, to be at the house to

baby sit us. I liked Marion. She was a high school student so was unbelievably old and wise and sophisticated and she treated us well. That is perhaps the most delightful thing about her because I had limited experience with these things called "high school students" and they were uniformly unpleasant. Marion was always nice. She would make us a snack as instructed and then the highlight of the week took place. We would sit down at the kitchen table to listen to a small radio. If we didn't dawdle on the way home from school, a choice we actually were allowed to make as long as we didn't get into trouble, steal anything or get into fights, we could listen to the Lone Ranger.



Figure 48 Marion

I don't imagine that video games are any more exciting to kids today than these radio programs were to me. We would sit transfixed as Marion turned on the radio which took perhaps 15 seconds to warm up, it being the standard tube type affair. She would tune it for us, scrolling across the numbers with corresponding pops and hisses and groans as the radio encountered whatever it is that a radio encounters when being tuned. Then she had to fine tune the reception by going back and forth across it. The announcement of the show was accompanied with the William Tell Overture, a hair-raising piece of music. In my mind's eye I could see The Lone Ranger and Tonto riding up over a hill hard in pursuit of some bad guys, guns blazing in the air. We became addicted to listening to shows, just like kids become addicted to watching TV.



The kind of radio that we really liked to listen to, one that we had in Vernal, was a large console radio, the size of a stove:

But radio probably was more intellectually stimulating because there were only sounds to portray the whole situation. Sound effects were as revealing as the words and virtually any sound could be mimicked in a studio by sophisticated sound men who drew on their inspiration and experience to know how to make a sound they needed. Squeezing a box of corn starch produced the sound of walking in snow and so on.

When I talked to mom last week about Marion baby-sitting us, I discovered something I had forgotten. There was some sort of difficulty for Marion at the high school, and Marion was moved out of Vernal to live with us. I do remember that there was a problem that involved Pearl's kids but don't remember what was going on that put Marion in our place. I liked Marion.

I don't have any memory of her being at our place for a few months, but it is apparently so. I don't know where she would have slept because there were only 2 bedrooms but she was with us for several months which obviously made it convenient for mom to have a sitter and for us to have a cousin around that we liked.



Figure 50 1940-50 Console Radio
-I lost URL!

Greyhound Bus station and egg sandwiches

Several times, for reasons that I don't remember, mom had me come to Penny's for lunch while she was working. Central Elementary School was only a few blocks away so I walked all the way over to JC Pennys alone. That wasn't a great distance but it seemed long to a kid. There was no danger of getting lost because the street that ran in front of the school ran straight up to Pennys.

When I met her in the store on these occasions, she gave me a quarter and then sent me over to the café in the Greyhound Bus Station for lunch. The busses



Figure 51 Old Grayhound Busses

<http://www.privatecoachmagazine.com/oldbus1.htm>

that Greyhound used at the time were about the same as the third from the left in this photo. That's about the vintage of the bus that we took from Vernal up to Seattle in 1951 on our way to Seward. Going into that Greyhound café was a mighty large affair to a little farm boy. It was intimidating and exciting at the same time to go in there alone, with all the noise and hubbub going on, bus drivers in their uniforms, people buying tickets, checking and hauling luggage, porters, people nervously looking at the clock, people smoking and chewing gum, sitting waiting for their bus to be announced overhead on the scratchy hollow-sounding PA system.

I would solemnly climb up on a stool at the counter and wait for the waitress to take my order. The person was polite and asked me what she could do for me and I sort of felt like saying "Nothing", but knew I had to get this thing done because mom would be angry with me if I didn't. So I would always ask for an egg salad sandwich and a root beer. The sandwich was on commercial white bread so was a treat and it was served on a large plate with a pickle, and a pile of crunchy salty potato chips. We never ate potato chips at home. The rootbeer was Hires, the best rootbeer ever made. It was served in a large heavy mug, either a nickel size or the giant dime size. I got the nickel size with my quarter since the sandwich plate was 20 cents. The neatest thing about the mug was that it was stored in a freezer. When it was filled with rootbeer and set on the counter, the mug grew a thin layer of frost on the outside and was icy cold to the lips. This technique avoided the use of ice and had the advantage of not diluting the drink. By the time I finished the sandwich, pickle, nickle rootbeer and potato chips, I was filled. Then I'd wander back down the street to Pennys to see mom before I

returned to school.

Lawn Mower

There was grass in the front yard in Vernal but few flowers. The climate is arid and hot in the summer so the grass was wiry and sparse. It was not fertilized. Weeds, of course, grew better than the grass. Irrigation water was turned onto the lawn occasionally to deep soak the roots. When the grass got long enough, which was only a few times during the summer, Dad pushed the manual mower around the yard. After he sharpened the blades with a file. The reel of curved blades whirred quietly as the blades spun across the rigid bar. The sound would rise and fall as he speeded up or slowed down. He didn't have a catch basket so the clippings were thrown up onto his feet. In an arcing green cascade.



Figure 52 Push lawn mower
<http://www.artizan.demon.co.uk/olc/mowhist.htm>