Another Look at
Burke's Butte

INTRODUCED BY MATTHEW BASSO

In 1935, when Franklin D. Roosevelt, as part of the Second New Deal, created the Works Progress Administration (WPA) to provide jobs for unemployed Americans included was a work relief program for artists, musicians, actors, and writers. "Hell, they've got to eat just like other people" remarked Harry Hopkins, then head of the WPA. Identified as Federal One, the program provided paychecks to an average of thirty-eight thousand men and women each year between 1936 and 1939.1

Of Federal One's four programs, best known was the Federal Writers' Project, which sought to address "questions about the nature of American identity, nationality, and culture" through literary production.2 Among the project's achievements were the recording of life histories of former slaves; the production of state, local, and highway guides as part of the American Guide project; and the launching of the literary careers of project alumni Saul Bellow, Zora Neale Hurston, and Richard Wright.

Unfortunately, other intended Federal Writers' Project productions never materialized. Perhaps the most notable of these was a set of planned volumes focusing on aspects of the wider national culture instead of on local or state topics. A number of reasons explain the program's failure to realize this important objective. High staff turnover and the enormous amount of time and resources required to research and write the various guides significantly strained the program. Furthermore, in 1939, a newly empowered Republican Congress slashed the budget of the project's national office and assigned what tasks remained to state offices. Together, these factors brought an end to the dream of national collections by the Federal Writers' Project.

Remarkably, though, a folder containing six short stories I discovered while researching at the Montana Historical Society Research Center indicates that the Federal Writers' Project may have achieved more than scholars previously realized. Titled "Men at Work," the folder contained, among other things, a letter from the project's national office indicating that...
the stories had arrived too late to be included in a collection by the same name. Months later I found the completed— but never published— "Men at Work" manuscript in the Library of Congress's WPA records. Edited by Harold Rosenberg, who became a well-known postwar art critic, "Men at Work" emerged in late 1940 from an understaffed national office struggling to be both productive and relevant as the U.S. was being drawn into World War II.

Administrators of the Writers' Program (renamed in 1939) viewed "Men at Work" as an important example of their efforts to show the commonalities among Americans as well as to highlight the labor movement's dedication to the nation's collective aims. Readers of the collection, the Writers' Program prophesied, would "catch the spirit of American labor with its pride in craft, satisfaction in accomplishment, and desire to contribute to the national welfare." Rosenberg, however, had slightly different goals. Echoing the dream of the anti-Stalinist Left of which he was a part during the 1930s, Rosenberg hoped that the collection's unusual requirements might foster an innovative writing style that would capture ordinary Americans' interest in a way that the radical writings of the 1930s had not.

Like the thirty-four stories eventually included in the "Men at Work" manuscript, the six "Men at Work" stories at the Montana Historical Society reflect the expectations Rosenberg set forth for authors like William Allen Burke, whose "Greenhorn Miner" story is printed here for the first time. A Writers' Project employee could submit "an article, a short story, a descriptive sketch, an autobiographical account, an interview. He may describe an individual at work or a team working together. But the writers must have seen the work done, or perhaps have done it themselves."

Burke met that qualification. Born in Butte in 1893, the year of another great American economic collapse, he began, at the age of sixteen, working in the mines as a "napper," or tool boy. Between 1909 and 1914, one of the most calamitous periods in the city's history, Burke labored in over a dozen Butte mines. After a brief absence, he returned to Butte in 1921 and took up work in the local entertainment business, only to "[be] forced on W.P.A. by hunger" in 1940. George Marsh, the state supervisor of the Montana Writers' Project, credited Burke for almost single-handedly writing Copper Camp, the Federal Writers' Project volume about Butte that is arguably more famous than the Montana state guide itself. It was during his tenure as a WPA writer that Burke wrote "Greenhorn Miner."

Burke's story hints at the tensions among miners as they competed for work in the late Depression era, in particular the hiring of "greenhorns," "sodbusters," and others considered outsiders by Butte miners. It also suggests how skill, safety, and ability to produce, rather than brawn or boasting, made a man respected in the mines. But the story succeeds most fully in illustrating the many aspects of a miner's working world. "Greenhorn Miner," like the other stories in Rosenberg's "Men at Work" manuscript, reveals the act of work and the process of production as of central importance to understanding the lives of ordinary men and women. When considered within the context of national and Montana histories of the Great Depression, "Greenhorn Miner" and "Men at Work" afford exactly the sort of new archive one of the leading scholars of the period, Alan Wald, described as essential for a deeper understanding of one of the country's most fascinating and determinative historical moments.

And, finally, "Greenhorn Miner" deserves our attention because it is simply a good read. Enjoy!

*See notes beginning on page 97.
Well, I’d finally landed a job. They told me when I at last made up my mind to give the Butte mines a whirl that it would be a cinch.

“All you have to do,” they encouraged, “is to go up and get yourself a rustling card—go down to the Union Hall for a list of mines that are hiring—then go up to one of the mines listed and tell the foreman that you are a miner, and he’ll tell you to come out that night or the next morning.”

Very simple, only I wasn’t a miner or had never been down in a mine in my life. I got the rustling card okay. I had to fill out a questionnaire giving my life history and where I worked for the past ten years. The last was easy. I worked on the old man’s farm before the dust had got both the farm and the old man.

There was a long list of mines hiring posted on the Union Hall bulletin board. It also told the hours of rustling each mine. I decided on the Mountain Con because it was close to my boarding house. The time for rustling the Con was twelve, noon.

I was feeling pretty happy. I was on my way to being a hard-rock miner. Six or eight bucks a day looked like a jackpot after a winter of $52 a month on WPA.

This view of the Mountain Con Mine was taken circa 1930.

There was a long list of mines hiring posted on the Union Hall bulletin board. . . . I decided on the Mountain Con because it was close to my boarding house.
I hurried up the hill to the Mountain Con. It was about five minutes to twelve when I got there and there was a long line of rustlers ahead of me. I was the last one in the line when the noon whistles blew and the line started moving past the foreman’s little window stuck in the center of the big red fence.

The line was moving fast and it didn’t look like he was hiring very many. I noticed that most of the rustlers in the line were well dressed, warm and neat. They didn’t have that hang-dog, down-at-the-heels look like the factory rustlers have in the East. These miners were happy and laughed and joked, and didn’t seem to care if they landed a job or not.

The line slowed up and it looked like the foreman was hiring several from the middle of it. I could see them handing in their rustling cards through the window. It slowed up again and two or three more were hired, then started moving fast once more and before I knew it, the guy in front of me was asking if there was any show for a miner. The foreman looked him over and shook his head. It was my turn next.

I was nervous. It seemed like my innards were trembling and trying to turn over. I hate like hell to get caught in a lie. I had my head in the window, and the foreman, a big, gruff, red-faced man was sizing me up.

“Any show for a miner?” I gulped, and the words were sticking in my throat. He was still giving me the once-over but he shook his head, and then glancing behind me and seeing I was the last in line, he called me back.

“Did you say you were a miner?”

I nodded my head. Here it comes, I thought. He’ll catch me in a lie sure as hell. But he merely grunted, “Let me see your rustling card.”

Boy, I guess I was lucky. I handed him the card and he copied down my name and number and told me to take it over to the timekeeper’s office to sign up, and for me to report to a shift boss named McDougal at eight o’clock the next morning.

Well, I’d landed a job, and at ten minutes to eight the next morning I was at the shaft of the mine, all changed into my work clothes; rubber shoes with hard toes, heavy underwear, waist overalls, cardboard hat with an electric light on front of it, a battery strapped on my back, and a jumper coat. I thought maybe I looked like a miner, even if I didn’t feel like one. I was damn near scared to death and I was looking for that shift-boss named McDougal.

A big swarthy-skinned miner pointed him out to me. This shift-boss was a strapping fellow with a red nose and a yellow mackinaw. I walked over to him and told him I was to report to him.

He had a pleasant kind of face and looked like he might be a good head. He took out a little book and asked me my name. I told him.

“Miner, eh?” he said, and I could feel him looking right through me.

I guess my face must have turned red, but I did manage to mutter “Yeah.”

He looked out over the crowd of miners gathered around the shaft, and then gave me the once-over again. My heart was thumping. Then he closed his book and said,

“See that little, weazed fellow sitting on that bundle of wedges and tying his shoe? That’s McCarthy. His partner’s off on a bender. Work with him today.”

“And, say,” he added as he gave me a wise sort of look, as if he knew damn well I was lying, “stick close by him, and do what he tells you, and be careful. The two of you get off at the thirty hundred.”

I walked over to McCarthy. He had finished tying his shoe, and was filling his stump of a pipe with an evil-looking brand of tobacco. He looked like he might be about sixty years old.

I was wishing I wasn’t so damn timid and nervous, but I stammered, “Mister McCarthy, Mister McDougal told me to work with you today.”

He looked up at me with a start. I guess those
Russell Lee took the photograph he titled *John Herlihy, shift boss, Butte, September 1942* (right) while working for the Farm Security Administration.

“Misters” must have given him a jolt. He eyed me up and down.

“Hm-m, all new clothes—a greenhorn,” he grumbled. He had a little touch of brogue. I wish I could show you how he talked, but I’m no good at taking anyone off. “You never worked in the mines before, and I’m damn glad you’re honest enough to own up to it.” Before I could say anything, he went on, “I don’t mind working with a greenhorn if he’ll admit it. It’s those smart alecs who think they know it all, that burn me up. You’ve a good pair of shoulders on you, and you look smart. Stay by me and I’ll make a miner out of you in no time at all. There goes the whistles—follow me lad.”

He had his lunch bucket under his arm. I picked up mine and followed him over to the shaft. I had a cold feeling around the pit of my stomach and it seemed to be getting colder and bigger every minute. Sizing up McCarthy as he walked in front of me eased my nervousness a little. He was a banty-legged little fellow, short and chunky, but not fat. His hair was a greenish-grey. I found out the reason for that afterward; it’s the copper water. He had a hard, tough face, and I was thinking he must have been a tough customer in his day. Even now despite his years and size, you would never pick him as any weakening.

He stepped into a little shack with a sign on it saying “Tool House.” He came out with a saw, an axe, and a big handful of small pieces of steel. He handed these to me. He said they were bits for the drilling steel and for me to put them in my jumper pockets.

I was damn near scared to death and I was looking for that shift-boss named McDougal. . . . "See that little, weazedn fellow. . . . That’s McCarthy. . . . Work with him today."

He walked over to where they were loading men on the cages and I followed him.

I was getting more jitty every minute. A big, burley worker was loading the miners on the cages. He packed nine men on a cage, tight up against each other like sardines. When the men were on, he closed a big iron gate on them and fastened it from the outside. Then he gave a pull on a signal rope, and the cage was lowered about ten feet. Then the cage on top of the first one was loaded the same way. There were three cages like this, all built together, one on top of the other like stories in a building.
### Glossary

**Adit:** Horizontal or nearly horizontal opening into the earth through which a mine is entered, drained, or ventilated

**Bar (drifter bar or drill bar):** Length of steel pipe that is wedged securely in a vertical or horizontal position across an underground workplace to serve as a base on which to mount a drill

**Bar (scaling bar):** Heavy steel rod with pointed or flattened ends used to pry or dislodge loose rock from roof or sidewalls of an underground workplace

**Barring down:** Prying off loose rock after blasting to keep it from falling on workers

**Cage:** Enclosure or platform for raising and lowering miners or equipment up and down the shaft to the different levels in the mine; an elevator

**Cap:** Detonator or blasting cap

**Chute:** Underground wooden flume through which ore is directed by gravity from a higher to a lower level

**Drift:** Horizontal tunnel in or near an ore body and parallel to the course of the vein

**Drill:** Tool operated by compressed air and used to bore holes in rock for blasting

**Drill bit:** Cutting tool that produces a circular hole in rock

**Drill steel:** Hollow steel component connecting a percussion drill to the bit

**Fuse:** Cord used to detonate an explosive

**Lead (pronounced leed):** Deposit of minerals found in a rock outcrop; lode

**Level:** Horizontal passage for accessing ore deposits; used to transport ore to the shaft for hoisting: comparable to the term “floor” in a building, as in first floor, second floor

**Miner’s con (consumption):** Silicosis, a lung disease caused by inhaling silica dust

**Powder house:** Magazine for the temporary storage of explosives

**Primer:** In blasting, the cartridge that contains the detonator or blasting cap

**Rill stope:** Stope shaped like an inverted pyramid so that miners can stand on the ore they have excavated and work horizontally outward along the side walls of unbroken ore, dropping ore downward toward the apex

**Rustling card:** Employee identification card issued to a worker by the Anaconda Copper Mining Company; also used during the 1910s to identify “trouble makers” and union members

**Sill:** Floor of a gallery or passage in a mine

**Station:** Enlargement of a drift or level at a shaft where cages stop to receive and discharge workers and material

**Steel skip:** A large bucket for hoisting ore, equipped with a door in the bottom for dumping; at a station, chutes direct ore into a skip which is then hoisted up the shaft to the surface

**Stope:** Excavation from which ore has been removed, usually above a level, in a series of steps working upward

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When all three were loaded, he gave another signal and the whole business dropped out of sight into the darkness of the shaft, the big steel cable that was holding them following them with the speed of an express train. I watched the cable and looked up into the air where it was running into the engine house. I was thinking it was a pretty thin piece of rope to be holding all those men.

"Geeze," I was saying to myself, "what if it broke?" The palms of my hands and my neck were clam with sweat and I was feeling hot all over, though the morning was plenty frosty.

Another cage was coming up on the other side of the shaft. It was making a hell of a noise like it was being shook to pieces. It stopped in front of us with a crash. The fellow who was doing the loading called out: "Thirty hundred!"

There was a rush for the cage. McCarthy pushed me ahead of him, and somehow or other I was jammed in between him and another guy. Our cage was filled in a minute and they lowered it down in the shaft a little ways to load the other two decks on top of us.

We were in the darkness. I was bellied up tight against the fellow in front of me. I didn’t know if it was McCarthy or who. Whoever it was, he had been eating onions. Someone turned on the light on his hat, but we were packed in so tight I couldn’t see anything but the guy up against me. It wasn’t McCarthy.
McCarthy was behind me and had his hand resting on my shoulder sort of comforting like. I liked that. It was something like what maybe your old man would do, if you had an old man.

Whis-s-h! the cage was dropping. For a moment my heart almost stopped. I could feel it catch and hold. Funny, I was thinking, this must be the way a guy feels when he jumps out of an airplane and his parachute doesn’t open. Talk about express elevators in skyscrapers—they don’t travel any faster than a mine cage in Butte. And noise! You’d think the whole shaft was coming in, the way those steel cages pounded and rattled. Then—Swish! Bang! the cage had stopped, then sprung up and down in the shaft for a minute or two. I found out later that this was the spring of the cable when three thousand feet of it was hanging in the shaft. That’s a lot of cable.

Another husky worker was opening the door of the cage. McCarthy said, “Here’s where we unload lad,” and we stepped out into the light. We were in a big, concrete room with a high-powered electric light overhead. McCarthy said it was the station. He was starting my schooling early. He pointed out a big hole in the center of the station as the skip chute and told me all the ore from the level was dumped into it. He said there were air doors in the bottom of it from which the big steel skips in the shaft were loaded. I looked down into it. It seemed a mile deep and it gave me a funny feeling in the pit of the stomach.

There’s one thing I like about McCarthy. He wasn’t going around pointing out and explaining things like he was a guide on a sight-seeing bus, and letting everyone know I was a greenhorn. He did it easy and simple like. That guy was a good head.

There were about thirty more miners on the station besides us. They were all joking and chewing the rag. A few of them were trying to josh McCarthy, but he had an answer for all of them. He was a pretty popular guy around the mine. He showed me how to light my battery lamp and filled a canvas water bag with water and gave it to me to carry. He also gave me half a dozen little, white “salt pills,” he called them and told me to put them in my lunch pail. He said they were in case I got heat cramps.

McCarthy led the way into the place where we were going to work. I followed him. I was beginning to get my bearing now and wasn’t so nervous. It seemed we walked about a mile. We were going through what McCarthy said was a drift. It was solid rock all over with no timber. In places water was dripping off the top. Our voices sounded hollow like we were in an auditorium or swimming pool. The air had a funny, stale sort of smell, and the farther in we walked, the hotter it was getting. I was sweating and could feel my undershirt getting damp.

There were steel rails in the center of the drift. McCarthy said this was the motor track. He talked all the time we were walking. He said the rails were used by the motors powered by big storage batteries and which pulled the cars of ore from the various chutes and drifts on the level out to the station from which we had just come. This ore, he said, was dumped into a big chute on the station. He said it was called a skip chute, and that the big steel skips in the shaft unloaded this ore through air-operated doors in the bottom of the skip chute and hoisted the same to the surface where it was automatically dumped into the big ore bins. Railroad cars hauled it from there to the smelters in Anaconda. He said that in the old days they used to have trolley motors with the trolley wire overhead, and that they had to be careful and not touch it or bump into it and get knocked for a row. He said that the only danger from battery motors was that you had to look out for them because they went like a bat out of hell and might run you down if you didn’t stay in the clear.

Pretty soon we came to a turning off place in the drift, and McCarthy said we were close to where we were going to work. He pointed to a ladder nailed up to the side of what he called the “sill.” He said we were going to climb up here and for me to put my lunch bucket over my arm, and the water bag over my shoulder and to follow him and take it easy.

We climbed about thirty feet. It sure was hot. My undershirt and jumper were soaking, and I could feel the sweat running down my back and legs. The air was hot and stifling too, and everything stuck like an old well that was being cleaned out. I was puffing and glad when we came to the end of the ladder and stepped off into another kind of a room-like place, only this room looked like it was set on a hill with everything going straight up at about a fifty degree angle. It was an awful mess. Rocks and boulders and dirt were scattered in all directions. Pieces of broken timber lay in different places. Over our heads was solid rock. Here and there hung big slabs of rock that
Whis-s-h! The cage was dropping. For a moment my heart almost stopped. I could feel it catch and hold.

The Anaconda Company and the International Union of Mine, Mill, and Smelter Workers featured these "caged" miners at the Mountain Con Mine in the first issue of their jointly produced wartime newspaper Copper Commando on August 22, 1942.

looked as though they might tumble down on top of us, if we touched them.

The place wasn't very big—maybe about twenty-five feet wide—but it went up at an incline as far as you could see. In several places, sticks of timber were propped up like trees in a forest.

It sure didn't look good to me, and I was thinking to myself: This is a hell of a place to earn a living. I was thinking I'd put in this shift and then say "To hell with it—I'd go out and get a job on some farm." You could hear the rock making funny noises like it might be going to cave in on top of us. I was glad I wasn't up there alone, and that McCarthy was with me.

But McCarthy didn't seem to mind. You'd think he was working in an office, the unconcerned way he went about stripping off his jumper and hanging it and his bucket on a spike nailed to a piece of timber. This made me feel a little better and I hung up my
bucket and jumper and listened to what he was saying. He sure was a good miner and you could learn more by listening to him for an hour than you could by working with some men a whole week.

"This is your home for the rest of the day, lad," he was telling me. "They call this a rill stope—easy-money mining for the company. They don't need much timber. They follow the lead from the bottom and blast out all the ore to the next level, a hundred feet up. At the bottom of the stope, next to where we got off the ladder, is a chute mouth. The whole stope is really one big chute. As we drill and blast out the ore, it tumbles down the incline to the chute mouth below. We scrape down with a scraper all that sticks along the sides. When we have the stope worked out to the next level, the motor spots as many trains of cars as they need down at the chute mouth and they pull all the ore out at one time. Then they fill in the worked-out stope with waste and forget all about it. A wise Gazabo mining engineer figured it out. Where they used to have as high as ten men in the old style square-set, timbered stope, now two men in a rill do the same work."

That was a long speech for McCarthy but just listening to him was giving me a lot of confidence. It was still hotter than the hobs of hell up there, but McCarthy had turned on the compressed air coming out of a heavy rubber hose. Taking off my jumper and opening up my undershirt had helped too. McCarthy had told me if I felt it getting too hot, and began to feel weak to take a couple of the salt pills. He said it was the salt you lost from your body from sweating that made you feel wobbly, and that the pills put the salt back in your system again. I noticed he didn't sweat near as much as I did, and I guessed that was the reason he looked so dried and withered up. He must have been all sweated out.

We started to work. McCarthy had a long iron bar and he was doing what he called, "barring down." He used a long, steel bar, like a crowbar, only thinner. With this he pried down all the loose pieces of rock and ground that had been shaken loose by the "blasting" done by the night shift. This, he told me, was the most important part of the shift, as it made the place where we worked safer. He said we couldn't take a chance on a loose slab or boulder crashing down on our heads.

That man sure knew his stuff. He made me stand out of the way in the clear, and went to work with that bar like nobody's business. You couldn't imagine how much loose rock there was. He barred down a couple tons I guess. He wasn't satisfied until the ground over our heads had a clear, ringing sound when hit with the bar. He told me that when the ground sounded like a drum it was still loose, and that you had to keep at it with the bar until every loose sounding rock was pried down and the whole place had what he called "no undertaker's music in it." It was a pleasure to watch that weezened-up McCarthy work with that bar. He reminded me of a boxer. He never made an unnecessary motion, and I think he was the strongest and wiriest little man I had ever seen. He could sure step around lively on those banty legs.

When he had everything barred down and safe he told me he would let me do that job the next day as he didn't expect his old partner to come back any more. The fellow was a good miner, McCarthy said, but he couldn't leave the red-eye alone and never worked steady over two pay days without going on a binge.

McCarthy told me we were going to drill and blast that shift, and for me to give him a hand in getting up the drill and bar. I followed him over to the side of the stope where the drill and bar was cached under some old canvas. We picked the heavy steel drill and packed it to the place where we were going to work. It was plenty heavy for the two of us. We went back and next carried up the bar, a big cylinder-shaped affair about ten feet high and six inches across, with a steel clamp on it. It was heavy too. I was puffing, but McCarthy wasn't even breathing hard.

He showed me how to hold the bar up straight while he tightened it against the overhead rock with several wooden wedges. He drove the wedges in place with an axe. When he finished it was as solid as a building pier. Then the two of us lifted the drill and attached it to the clamp on the bar. It swung around, and up and down on the clamp, like a machine gun. We pulled up a long, heavy rubber air hose which McCarthy screwed onto a valve on the drill. McCarthy showed me a valve at the bottom of the stope. He told me that this was the main air valve and that I should turn it on when we were ready to start drilling, but that first we'd better have a smoke.

I broke out my cigarettes and McCarthy fished out a yellow package with a "Peerless" label on it and took about four fingers of black, stringy tobacco and
stuffed it into his mouth. He then dug out two more fingers of the same tobacco and crammed it into a stump of pipe. When he lit it and started puffing, the smell reminded me of a burning dung heap on a farm. McCarthy was the first man I ever saw who smoked and chewed at the same time. He called the tobacco “Michigan hay,” and said it was great to keep the dust from you lungs, although there wasn’t any dust where we were working because everything was damp.

While we were smoking McCarthy told me a lot about the dust which caused silicosis or “Miner’s Con,” as he called it. He said the company made them use water in drilling dry places. Water coming through a hose and running into holes in the drill steel, and plenty of water sprinkled on the mud piles kept down the dust, but made it sloppy as hell to work in. He said, in the old days before they used water, the miners died like flies from the Miner’s Con, although real tight, and there was a funny, biting smell. And that old drill was sure cutting into the ore. In no time at all, it had a hole started, and then McCarthy shut off the air valve.

He then showed me how to “tend the chuck.” All I had to do was stand by with a big wrench, and if the drill got stuck I was to give it a few healthy clouts. It didn’t look like it was going to be such hard work. McCarthy had the knack of making any work easy. He told me his job was to turn the crank which worked on a sort of a ratchet principal, and allowed the drill to keep moving in the rock. It looked to me like a big auger, only instead of turning and grinding its way through, it pounded into the rock, a half turn one way, whack!—a half turn the other way, whack!—and the handle had to be turned all the time to keep the drill tight into the face of the hole. The compressed air did all the hard work. He turned on the air again and the drill kept pounding into the hole. I was hoping it would get stuck so I would have something to do, but it didn’t.

When the drill was in the rock about two feet he shut off the air once more and showed me how to change drills. This time he used what he called a “second.” It was much longer than the first drill. When we had it changed he gave the air valve a flip and the new drill with a sharp bit, was pounding away—Brrrrrrrrrrrr—Clackety-clack!—Clackety-clack!—and all McCarthy and I had to do was to keep the crank turning and watch it bite into the rock. I was getting to like the job fine, and wasn’t a darn bit scared any more.

The drill was making so much noise we didn’t hear the shift-boss, McDougall, come up to us. He didn’t have much to say. He kidded McCarthy a little and asked him how I was making out. You could see that he knew McCarthy knew his stuff and didn’t need any bossing. McDougall was a good head too. McCarthy told me later that he worked with him as partners in the old days on the Comstock Lode in Nevada when they drilled their holes by hand with hammer and hand steel. When he was leaving he laughed and told McCarthy to keep an eye on me.

Everything was running hunky-dory. We had changed drills again. This time a long eight-footer. We had three seven-foot holes all finished when

“\textbf{This is your home for the rest of the day lad.}... McCarthy told me we were going to drill and blast that shaft, and for me to give him a hand in getting up the drill and bar."

he said a hell of a lot that was blamed on the dust in the mines, really was caused from the miners drinking too much rot-gut whiskey, and hanging around the saloons all night, instead of going home to bed and getting their rest.

When we finished smoking McCarthy told me to go down and turn on the air. When I came back that old drill was vibrating on the bar like it would shake itself to pieces. McCarthy hadn’t turned on the little drill valve on the machine yet, and with all that compressed air waiting to be turned loose, the drill reminded me of a race horse before a race—raring to run its legs off. McCarthy put in a short drill steel in the machine, a “starter” he called it; attached one of the drill bits; set the drill against a place in the ore he had marked; and turned on the valve.

Boy, there was noise. You couldn’t hear yourself think. It sounded like a whole army of riveters, and the air was whizzinz’ out of a few places that weren’t

\[\textbf{Burke’s miners are using equipment like that shown in this 1942 photo taken at the Mountain Con Mine,}\]

\textit{Fred Schmook and Phil Larson setting up drifter to drill, published in the first issue of Copper Commando.}\[\textbf{28 MONTANA THE MAGAZINE OF WESTERN HISTORY}]}
McCarthy looked at his watch and said it was dinner time. The time sure had gone fast. We climbed down the ladder out of the stope as he said the air was better down on the sill. I was hungry as a bear and tied into my bucket. McCarthy didn’t seem to have any appetite and just nibbled at his sandwiches. He told me after you worked underground a while you lost your appetite and didn’t care if you eat or not.

When we finished eating, he showed me how to make a miner’s bed out of a dry plank or “laggin” and a few wedges, and we both stretched out to “take five” as he put it. I could see McCarthy liked me pretty well, and he was telling me about the early days. He had been working in the mines for over forty years, all over the country. He started as a greenhorn in Nevada in the Comstock mines when he was only a kid. He said they worked ten and twelve hours a day.

He started working in the Butte mines when there weren’t even places to change your clothes and the men had to go home with the same clothes they wore at work all day. He said a lot of the men would hang around the saloons in the wet clothes and catch pneumonia. In winter time, he told me, the clothes would freeze stiff and stand up by themselves when the miners took them off.

I asked him about accidents in the mines, and then wished I hadn’t. He said that was a sure sign of the greenhorn. But he did tell me that in all the years he worked in the mines he had only one broken leg to show for it. I noticed he knocked on a piece of wood when he said it. There were a thousand ways, he said, to get hurt in a mine, and that you had to watch out and be careful, for nearly all accidents happened from miners being careless and getting too sure of themselves. Watch your step, he told me, from the time you step on the cage at the start of the shift, until you get off at the end of it. I could see that he would rather talk about something else, so we changed the subject, and McCarthy told me a lot about different ways of mining. He told me that in some stopes where the ground was not so hard they used a different kind of a drill called a “buzzy.” He said the miners called them “widow-makers” because they were operated by one man and were terrible dusty. He said they were a lot lighter than the drill we were using, and he hoped I would never have to mine with one of them if I could get out of it. McCarthy looked at his watch and said it was time to go back to work. We climbed back into the stope.

I guess we were having pretty good luck, because after dinner we drilled three more seven-foot holes without having any trouble. I was getting the hang of it, and felt like I had been drilling for a month instead of six hours. We kept changing drills and putting on sharp bits and McCarthy said we were making a good showing and that he would go down to the powder house and get the powder and caps and fuse and that he would let me drill the last hole myself.

McCarthy helped me start the hole and when he left I was on my own. Boy, I was feeling happy and proud. Here I was making that old drill whirl through the rock, and only a few months before I’d been just a punk kid on the farm with manure on my shoes. I guess I got too much imagination, but the noise of that drill sounded to me like the music of a big brass band. I thought myself just like some old sea captain or army general. That old drill was a big cannon. The rock was an enemy, and I was just peppering it full of holes.

I changed the drills like an old-timer, and I got to thinking—boy, this beats following a plow all to hell. Here I am, pounding out copper out of this mountain—right down in its bowels, three thousand feet deep. I’ll be getting maybe six or eight dollars a day for eight hours work and won’t have to get up at sunrise in the morning like on the farm. When my eight hours are in, I’ll be all through for the day and

We were ready to start drilling, but . . . first we’d better have a smoke.
do anything I feel like. I might even get a girl, and if I
like her, get married and stick with mining and some-
day, maybe know as much about it as McCarthy.
I had the hole pretty near drilled and was still hav-
ing pipe dreams when McCarthy came up behind me
and shut off the air. You know, that old geezer must
have been pretty darn wise or had second sight or
something, because he said, "You're feeling pretty
damn cocky and proud, ain't you? You're okay.
You'll make a miner. I used to
feel exactly like you do a long
time ago—guess I still do
or I wouldn't be sticking to
mining. You're damn right,
lad, you're as big a cog in
the wheel as any Wall Street
broker or banker or anyone
else in these whole United
States. They can't get along
without you."
I guess this speech sort of
got McCarthy a bit frustrated
because he tried to cover up
by acting gruff and telling me
to help him tear the machine
and bar down and get ready to blast.

When we had the machine down and cached
away, he loaded the holes with the dynamite while
I watched him. He put plenty of it in each hole and
tamped it in with a long wooden stick. He first put in
what he called the primer, a cap and fuse stuck into
a stick of dynamite, and then tamped the rest of the
dynamite on top of it. He was sure a fast worker and
didn't seem to be afraid of the powder. He said there
was no danger, if it was done right and you were care-
ful. In no time at all he was ready to blast.

I looked at my watch. It was four o'clock. We were
supposed to quit at four-thirty. McCarthy said it was
time for me to "light" the fuses, so while I held my
hat-lamp for him, he lit a piece of candle he had in
his pocket, and touched off each fuse. He said there
was plenty of time as he used long fuses, so we didn't
hurry getting our buckets, jumpers, and tools. We
climbed down out of the stope and waited on the sill
for the report of our shots.

Pretty soon we heard them—Boom! Boom!
Boom!—seven times. Every hole had fired. We could
hear the ore rolling down the incline stope into the
chute mouth. It was sure sweet music. Every rock of
it was copper for the smelter and the mills and factories
and McCarthy and I were the two who made it pos-
sible. It was a fine feeling.
I kept on feeling good
as I followed McCarthy
out to the station. I wasn't
even a little bit nervous. A
few minutes later, we piled on
the cage and it slammed its way
three thousand feet up the shaft into
the daylight.

I followed the miners into the big, noisy change
and wash room—the miners called it the "dry"—and
took off my wet, muddy and smelly digging clothes,
hung them in my locker, and got under the shower
bath. That shower bath was all I needed to make me
feel perfect. If there hadn't been so many miners in
there I think I would have started singing.

I hurried into my street clothes and passed McCar-
thy in the mine yard on the way to the timekeeper's
office. He said, "Well, I'll see you in the morning,
lad,"—and I knew he'd see me there alright, and
the next morning too—and the next—and the next.
Right then I knew I was going to be a miner, and I
was happy.

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pleting a book about masculinity on the Montana
World War II homefront for the University of Chi-
cago Press.
The Development of the Funeral Business in Butte

CARING FOR THE DEAD
by Zena Beth McGlashan
Coroner's Inquest.

Section 98. If any person is killed by any explosion or other accident, the operator must also notify the coroner of the county, his authorized deputy or, in the absence of either or in the inability of either to act, any justice of the peace of said county for the purpose of holding an inquest concerning the cause of such death. At such inquest the State Coal Mine Inspector, his deputy or authorized representative, shall offer such testimony as he may be possessed of, and he may question or cross question any witness appearing in the case, and the owner, agent or manager of the coal mine, either in person or by counsel, shall also be at liberty to examine or cross examine any witness at any such inquest.

Any person having personal interest in or employed in the management of the mine in which the accident occurred shall not be qualified to serve on the jury empaneled on the inquest; and it shall be the duty of the constable or other officer not to summon any person disqualified under this provision, and it shall be the duty of the coroner not to allow any such person to be sworn or sit on the jury; nevertheless, when possible, one-third of the jurymen shall be miners.

Unless the State Coal Mine Inspector, or some person authorized by him, is present at an inquest held upon the body of any person, where death may have been caused by such accident, the coroner shall adjourn the same and, by written notice or telegram delivered or sent to the State Coal Mine Inspector at least two days before holding the adjourned inquest, give notice of the time and place of the holding of the same. Before such adjournment the coroner, his authorized deputy or the justice of the peace, may take evidence to identify the body and order the interment thereof.

Code of Signals at Coal Mines.

Section 99. At any coal mine operated by shaft more than one hundred feet in depth, or by slope, the manner of signalling to and from the bottom man, the top man, the rope riders and the engineer shall consist of wires or a tube or tubes through which signals shall be communicated by electricity, compressed air or other pneumatic devices.

The following signals are provided for use at coal mines where signals are required:

One ring or whistle—One ring or whistle shall signify to hoist coal or the empty cars or cage, and also to stop either when in motion.

Two rings or whistles—Two rings or whistles shall signify to lower cage or car.

Three rings or whistles—Three rings or whistles shall signify that men are coming up; when return signal is received from engineer, either by bell, whistle or slight movement of the trip, men will get on cage or cars and the cager or rope rider shall ring or whistle "one" to start.

Four rings or whistles—Four rings or whistles shall signify to set slowly, implying danger.
Five rings or whistles—Five rings or whistles shall signify accident in the mine and call for stretchers.

From top to bottom—One ring or whistle shall signify all ready get on cage or cars.

From top to bottom—Two rings or whistles shall signify to send empty cages or cars.

Provided: That the management of any mine may, with the consent of the State Coal Mine Inspector, add to or change this code of signals at their discretion for the purpose of increasing its efficiency or of promoting the safety of the men in said mine, but, whatever code may be established and in use at any mine it must be approved by the State Coal Mine Inspector, and shall be conspicuously posted at the top and at the bottom of every shaft or slope, and at the landing place on all rope haulage systems, also in all engine rooms for the information and instruction of all persons. In any coal mine, where more than fifty men are employed underground, one or more telephones shall be installed communicating with the surface.

Duties of Hoisting Engineers.

Section 106. The hoisting engineer on any shaft, slope or drift at any mine shall be in constant attendance at his engine during working hours when there are workmen underground. He shall not permit any one to enter or to loiter in the engine room except those authorized by their positions or duties to do so, and he shall hold no conversation with any officer of the company or other person, or leave his engine, while in motion or while his attention is occupied with the signals. A notice to this effect shall be posted on the door of the engine house.

The hoisting engineer must thoroughly understand the established code of signals, and such signals must be delivered in the engine room in a clear and unmistakable manner, and he shall not recognize any signals other than those provided for in this Act, or such as have been approved by the State Coal Mine Inspector; and when he has the signal that men are on the cage, car or cars, he must work his engine only at the rate of speed herein provided for by this Act. He shall not permit no one to handle or meddle with any machinery under his charge, nor suffer any one who is not a certified engineer to operate his engine except for the purpose of learning to operate it or repair same, and then only in the presence of the engineer in charge and when men are not on the cages, car or cars.

Qualifications of Miners.

Section 107. Each person desiring to work by himself at mining or loading shall first produce satisfactory evidence, in writing, to the mine foreman of the mine in which he is employed, or to be employed, that he has worked at least nine months with, under the direction of, or as a practical miner; provided, however, that if the mine in which such person is to be employed generated explosive gas or fire damp, he shall have worked not less than twelve months with, under the direction of, or as a practical miner. Until a person has so satisfied
Putting a strong leather harness on a mule to be lowered underground at the Diamond Mine — Butte, Montana

The final step in trussing the animal.

Pictures showing how they trussed the horses or mules to be lowered down into the mines of Butte. The cages were very narrow and the animals had to be bound for their journey. When they were released down in the mine they gave a few wild kicks and then were ready for their jobs of pulling the ore cars along the tracks.

Tying up an animal's legs before being lowered underground at the Diamond Mine — Butte

Prior to the lowering and hoisting, the animal was “gaunted” (no food or water) for three days. If this was not done, there was danger of a ruptured bladder or suffocation. This particular horse is being lowered at the Buffalo Mine in Centerville.
Bell and Diamond Mine, employs 557 men underground and 97 on surface; depth of main shaft 3555 feet; daily production 1000 tons.

Steward Mine, employs 400 men underground and 60 on surface; depth of main shaft 3200 feet; daily production 700 tons.

Original and Gagnon Mines, employs 525 men underground and 230 on surface; depth of main shaft 3400 feet; daily production 1000 tons.

Moonlight Mine, employs 230 men underground and 30 on surface; depth of main shaft 1700 feet; daily production 400 tons.

St. Lawrence Mine, employs 270 men underground and 30 on surface; depth of main shaft 2800 feet; daily production 500 tons.

Never Sweat Mine, employs 425 men underground and 60 on surface; depth of main shaft 2,400 feet; daily production 600 tons.

Anaconda Mine, employs 800 men underground and 100 on surface; depth of main shaft 2,800 feet; daily production 1,200 tons.

Mountain View Mine, employs 827 men underground and 100 on surface; depth of main shaft 2300 feet; daily production 1800 tons.

Pennsylvania Mine, employs 500 men underground and 80 on surface; depth of main shaft 2400 feet; daily production 950 tons.

Berkley Mine, employs 400 men underground and 50 on surface; depth of main shaft 2000 feet; daily production 1000 tons.

North Butte Mining Company, Norman B. Braly, Manager; Lester Frink, Superintendent, Speculator and Granite Mountain Mines; employs 1233 men underground and 137 on surface; depth of main shaft 3700 feet; daily production 2500 tons.

Butte & Superior Mining Company, J. L. Bruce Manager; Angin McLeod, Superintendent; Black Rock Mine, employs 1350 men underground and 200 on surface; depth of main shaft, No. 1, 1925 feet; daily production 1800 tons.

Clark Realty Company, W. D. Mangam, Manager Ed. Lohman, Superintendent, Elm Orlu Mine, employs 300 men underground and 65 on surface; depth of main shaft 2100 feet; daily production 600 tons.

Davis Daly Copper Mining Company, W. L. Creden, Manager, William Frazer, Superintendent, Colorado Mine, employs 200 men underground and 50 on surface; depth of main shaft 2500 feet; daily production 225 tons; also Hibernian Mine, employs 8 men underground and 8 on surface; depth of main shaft 50 feet.

Colusa Leonard Extension Company, Paul Gow, Manager, M. Little, Superintendent; Colusa Leonard Extension Mine, employs 6 men underground and 13 on surface; depth of main shaft 8 feet.

Butte Main Range Mining Company, Paul Gow, Manager, M. Little, Superintendent, Main Range Mine, employs 43 men underground, and 20 on surface; depth of main shaft 700 feet; daily production 150 tons.

Mines Operating Company, A. Frank, Manager, F. E. Turner, Superintendent; Butte and Duluth Mine; employs 10 men underground and 46 on surface and mill; depth of main shaft, open cut; daily production 200 tons.

East Side Mining Company, A. Frank, Manager, F. E. Turner, Superintendent; Bullwacker Mine; employs 26 men underground and 7 on surface; depth of main shaft 100 feet; daily production 75 tons.

East Butte Copper Mining Company, Oscar Rohn, Manager; Andrew Ray, Superintendent; Pittsmont Mine, employs 590 men underground and 500 on surface and in mill and smelter; depth of main shaft 1800 feet; daily production 575 tons; also the Dutton Mine, employing 83 men underground and 9 on surface; depth of main shaft 900 feet; daily production 100 tons.

Clark Realty Company, W. C. Siderfin, Manager; J. M. Bennetts, Superintendent; Moulton Mine, employs 28 men underground and 9 on surface; depth of main shaft 650 feet; daily production 30 tons; also the Evelyn Mine, employing 6 men underground and 8 on surface; depth of main shaft 400 feet; and the Travonia Mine, employing 3 men underground and 1 on the surface; depth of main shaft 300 feet.

Butte Britannia Mining Company, W. L. Creden, Manager, William Frazer, Superintendent; Brittania Mine, employs 4 men underground and 4 on surface; depth of main shaft 400 feet.
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Tuolumne Mining Company, Paul Gow, Manager; Mr. Steward, Superintendent; Tuolumne Mine, employs 80 men underground and 20 on surface; depth of main shaft 2600 feet; daily production 100 tons.

Great Butte Copper Company, F. W. Bacon, Manager; John C. Smith, Superintendent; Calumet Mine, employs 16 men underground and 16 on surface.

Plymouth Leasing Company, A. B. Cohen, Manager, Silver King Mine, employs 6 men underground and 2 on surface; depth of main shaft 750 feet.

Butte Detroit Copper Mining Company, W. L. Creden, Manager; R. L. Blitz, Superintendent; Ophir Mine, employs 17 men underground and 40 on surface and mill, depth of main shaft 1000 feet.

Butte and Zenith City Mining Company; William Gibson, Superintendent Butte and Zenith Mine; employs 35 men underground and 10 on surface; depth of main shaft 1400 feet.

There are employed in the above mines, 12,852 men underground and 2,706 on the surface.

FATAL ACCIDENTS.

There were 327 fatal accidents occurring in the mines of Silver Bow County, during the year from July 1st, 1916, to June 30th, 1917, a complete report of which is found under appropriate headings in another portion of this report.

CONDITIONS OF THE SPECULATOR AND GRANITE MINE, AT THE TIME OF THE FIRE.

The most terrible of all mine accidents in the history of quartz mining, happened at the Granite Mountain and Speculator mines, on the night of June 8th, when 163 men lost their lives, by being suffocated with smoke and gas, caused from fire which started in the Granite Mountain shaft. The origin of the fire was purely accidental.

While the rope men and electricians were lowering 1200 feet of heavy electric cable into the mine, for the express purpose of moving back electric equipment, away from the shaft to a concrete station, to guard against fire in said shaft, cable broke away from its fastenings, falling down shaft and lodging 60 feet below the 2400 foot station. This cable is covered with a lead casing and in falling down the shaft, a great deal of the lead was stripped off by coming in contact with air and water lines and timber in the shaft, leaving exposed the inside insulation, which is of a highly inflammable nature. It is called by the electricians, an oiled fabric. While working to remove cable from shaft, a carbide lamp used by one of the men came in contact with the insulation, setting fire to it. There was no water available to fight fire, as the water line had been broken when the cable came down the shaft, and the fire spread with such rapidity that after fighting it a few moments, the men were forced to flee for their lives.

This shaft was a strong, downcast shaft, and everything in and about it was perfectly dry. The fire burned so fiercely fanned by the strong draft in the shaft, that in a very short time the mine was filled with smoke and gas.

EXITS OF THE MINE.

The 700 and 800 foot levels were both connected with the Granite Mountain and Speculator shafts, and cages operating in both shafts to each of those levels.

There were 30 men found dead on those two levels. There were men working on between the 800 and 1800 foot levels.

On the 1800 foot level there were two connections to the Badger State Mine. On the 2000 foot level there was one connection to the Badger State Mine; on the 2200 foot level a connection to the Badger and the High Ore Mines. In the drift leading to the High Ore Mine, there had been placed recently a concrete bulkhead of a thickness of from three to four inches. This bulkhead had been placed there to keep back the gas from the fire that was burning in the Modoc Mine. It was broken down by men from the Speculator, and several men escaped through to the High Ore to safety.

On the 2600 foot level there was no exit to other mines, but was connected to the 2400 and 2800 foot levels by a series of manways. On the 2800 foot level there was a connection to the High Ore through what is known as the drain tunnel. Several hundred feet from the Speculator shaft was another bulkhead that had been placed there to keep out gas from the Modoc Mine. This bulkhead was about four inches thick, and was broken down from the High Ore side by res-
cued parties. There were no men found near this bulkhead, nor between bulkhead and the Speculator shaft, a distance of 600 feet.

Approximately two hundred feet from the Speculator shaft, was another opening to the High Ore Mine, that had been closed off after the breaking out of the Modoc fire. One man was found dead near this bulkhead. This was the only man found anywhere near a bulkhead.

The 3000 foot level had no connection to any other mine, but was connected with raises to the 2800 foot level.

The 3200, 3400 and 3600 foot levels had no connections. The only work being done on those levels was crosscutting to the ledge.

There was an engine on the 2800 foot level and a cage independent of the other cages operating between the 2800 and 3600 foot levels. At the time the fire broke out, there were only 3 men working below the 3000 foot level.

On two different occasions prior to the breaking out of the Granite Mountain fire, the men had been rushed out of the mine and hoisted through the Granite Mountain shaft, to escape gas that had broken in from the Modoc Mine. As there were several bodies found on different stations of the Granite Mountain shaft and in crosscuts leading to the shafts, it is very evident that when the unfortunate men first detected the odor of gas and smoke, they started for the Granite Mountain shaft, directly into the fire, thinking that it was the gas and smoke from the Modoc fire.

In addition to those exits mentioned, there was a connection to the Rainbow shaft, on the 2000 foot level.

Respectfully submitted,
D. J. McGRATH, Inspector.
Butte, June 30, 1917.
Mining Museum

- Lamp room: picked up the mine lamps, 6 work watches from shift bosses. Miners waited in here until last-min. run to "sheet" in front of shaft to board cages to go underground.
- W/ names: large, black 'grim' spreader - aged (4) beast
- Ore car: 4' long x 2' wide x 2' deep (25"
Evan Kelley phrases;

--I am sure you fellows out in the field will find ways and means of speeding up...

--(it) will be a dividend-payer

--It is hoped you will sift the attendant circumstances to the bottom

--the color of fact
MontSt

WPA -- Men at work, Edward B. Reynolds story

Anaconda slang: how are you: "What shift you on?"

hello: "How's she going?"

goodbye: "Tap her light."
KILL and SHELTER JARGON

Assay Ton -- A sample of ore weighing but a few pounds, adopted by assayers to determine per ton values.

Bag House -- Structure equipped with cloth bags and curtains through which gases and flue dust from the blast furnaces pass; most of the values in the flue dust and gases drop to the floor or lodge in the curtains and bags.

Ball Mill -- Grinding machinery that crushes ore to the fineness of powder by the action of steel balls falling on the ore as the mill rotates.

Barrels -- Small amalgam traps at edge of amalgamation plates which catch gold values that pass over the plates.

Bar-room -- Place where bullion is stored.

Bath -- Acid solution used in the electrolytic zinc and copper methods of refining.

Belt -- Wide rubber composition belt which carries ore from mill feed bin to the crushing department; in some mills pickers take off the large chunks of waste and the high grade ore, thus increasing capacity, and also the grade of the mill heads.

Big Boy -- The smelter manager.

Brains -- The assaying and chemical departments.

Bull-gang -- Gang of men who do the common labor around smelters; repair crew at a mill.
Bullion -- Semi-pure gold, silver and lead bars as turned out either by blast furnaces or by small assay furnaces or retorts.

Bullion Room -- Place where bullion is stored.

Bull-of-the-Works -- The smelter foreman.

Charge -- A "charge" for a blast furnace consists of roasted ore that is mixed with certain percentages of limestone, silica, coke and powdered coal.

Charge Floor -- Where the smelter furnace charges are mixed.

Charge Pit -- A pit below the charge floor into which limestone, roasted ore, coal and coke are dumped to make up a furnace charge.

Cone -- A cone-type of crusher which grinds ore with a rotary movement; it crushes finer, and is able to handle more ore per day, than crushers of the jaw-type.

D and L's -- Dwight and Lloyd machines that roast ores to release excess sulphur content in ore; the ore passes to the charge floor to be mixed into a furnace charge.

Dishwasher -- An assayer's helper.

E. K.'s -- Mining engineer's who hold college degrees in mining engineering and metallurgy.

Floaters -- Experienced operators of flotation machines.

Flow-sheet -- A plan of the interior arrangement of the equipment of a mill; the system used in concentrating the ore.

Frothers -- Agencies which cause bubbles to rise from the bottoms of flotation machines. The bubbles carry with them fine particles of metal and mineral; pine oils, creosote, etc.
Furner -- A plant which treats zinc-bearing slag by causing the zinc to pass off in fumes and thus be recovered from the fumes.

Heads -- The ore that comes from a mine to a mill feed bin.

Ink Slingers -- Timekeepers and bookkeepers.

"Insulter" -- Ironical name for consulting engineers.

Jigo -- Concentrating machines that make separations by an up and down motion and the use of screens. Obsolete now, being replaced by flotation machines.

Leaching -- Applies especially to copper ores and involves system whereby low grade ores are subjected to the action of acid-bearing water which removes most of the copper in solution; copper is then precipitated by introduction of scrap iron.

Lead Well -- Receptacle where lead gathers in a blast furnace.

Long Change -- Mill and smeltermen, when they change from the day shift (7 a.m. to 3 p.m.), have what they call a "long change" as they leave work at 3 p.m. Saturday and do not report again until 11 p.m. Sunday.

Kud -- A mixture of fireclay used to close the slag and matte openings of a blast furnace.

Pebble Mills -- A grinding mill resembling a ball mill, using hard flint-like pebbles for grinding the ore; the pebbles are imported from Sweden.

Pota -- Huge iron bowls used to receive molten matte, slag, lead, copper, etc., as the blast furnaces are tapped; matte pots at lead smelters are hauled out to the smelter yard and
allowed to cool; when cool the matte is removed from the pots by overturning them and the matte, resembling a huge cup-cake, falls out.

Pulp -- Mill term for finely ground ore.

Recovery -- Percentage of the metals and minerals in the mill heads that is finally recovered in the concentrate produced by the mill; modern flotation plants recover as high as 99 per cent; former mechanical methods of concentration rarely recovered more than 85 per cent.

Red Dirt -- Oxidized ore containing a high percentage of iron.

Reverbs -- Reverberatory furnaces in a copper smelter where copper matte is treated to produce a product known as "blist" copper, which is about 98 per cent pure copper.

Roast -- Product of a D and L (Dewitt and Lloyd) roasting plant at a smelter; the product is sometimes called "sinter".

Roasters -- Men who operate the roasting machines at smelters; the machines that remove excess sulphur from ores.

Run-A-Way -- When the slag of a furnace contains a high percentage of metals, the furnace is said to be "running away". The cause is improper charging of the furnace.

Salamanders -- Huge open outdoor stoves used in cold weather around furnaces and other smelting departments where the work is out in the open; fuel used is coke.

Short Change -- Mill and smeltermen say they are on "short change"
when they change from the 3 p.m. - 11 p.m. shift to the 7 a.m. -
3 p.m. shift.

Slag -- Molten limestone, silica and iron, containing little or
no other metallic or mineral values.

Snoopers -- Chemists who travel over the area around a smelter tes-
ting soils, garden truck, grains, etc., and examining cattle
alleged to have been killed by arsenic and other poisonous
gases coming from the smelter stack; smelters are constantly
harassed by suits brought to recover alleged damages resulting
from smelter fumes.

Stamps -- Ore crushers which crush ore with an up and down stamping
motion; formerly the crushing system used in gold mills; now
largely replaced by cone crushers and ball mills.

Sweetening -- Mixing high grade ore with medium grade to boost
the tenor of the mill heads.

Tails -- Waste reject of a mill.

Tappers -- Men who poke holes in the fire clay that closes the
opening to bottom of the furnace and thus releases the molten
slag.

"Tears" -- Set of pipes and valves that regulate and supply air
for the blast to furnaces; spelled "tuyeres", but pronounced
"tears" by furnace workers.

Wheelers -- Men who wheel buggies of limestone, silicocu ore,
coal and coke to the charge pit on the charge floor, where
the furnace charge is mixed.
HUNTING AND FISHING

Bar -- Name of any brown, black, or cinnamon bear.

Big Neck -- Buck deer in mating season.

Buck Fever -- Mental state, excitement when firing at game.

Bugle -- The call of a bull elk.

Cannon -- Large bore rifle.

Drilled Center -- Head shot.

Drumming -- Rating call of partridges. Flaps wings against log.

Flies up and down log striking sides of log with wings.

Cut Shot -- Animal shot through intestines.

High Bank -- To cast fish over shoulder when fishing. (honing 'em)

Lollipalooza -- Big bird, fish, or game animal.

Heat in the Pot -- Name given trusty rifle by owner.

Howitch -- Venison killed out of season.

Open Up -- To begin shooting at game.

Pill -- Poison bait, or bullet.

Play Him -- To wear fish out by giving him line and allowing him

to fight before landing him.

Porky -- Porcupine--(Called a pest by campers.)

Side Hill Pork -- Venison shot out of season.

Spoiled Meat -- Game animal badly shot up.

Track Skip -- To report at camp without any game.

Tracking Snow -- New snowfall.

Whistle -- Call of a buck deer to its mate.

Winged -- To hit feathers or fur when shooting at game, no damage
done to animal.
HUNTING AND FISHING

Bar--- Name of any brown, black or cinnamon bear.
Big Neck--- Buck deer in mating season.
Buck Fever--- Mental state excitement when firing at game.
Bugle--- The call of a bull elk.
Cannon--- Large bore rifle.
Drilled Center--- Head shot.
Drumming--- Mating call of partridges. Flaps wings against log.
Flys up and down log striking sides of log with wings.
Gut Shot--- Animal shot through intestines.
High Bank--- To cast fish over shoulder when fishing.
Lolipaloozer--- Big bird fish or game animal.

Meat in the Pot--- Name given trusty rifle by owner.
Mowitch--- Venison or meat, killed out of season.
Open Up--- To begin shooting at game.
Pill--- Poison bait, or bullet.
Play him--- To wear fish out by giving him line and allowing him to fight before landing him.

Porcupine--- (Called a pest by campers.)
Pick Up--- Venison.
Side Hill Pork--- Venison shot out of season.

Spoiled Meat--- Game animal badly shot up.
Track Soup--- To report at camp without any game.

Tracking snow--- New snowfall.

Whistle--- Call of a buck deer to its mate.

Winged--- To hit feathers or fur when shooting at game, no damage done to animal.
Commissioners' Opinion. Appeal from District Court, Cascade County; J.B. Leslie, Judge.

action by E.A. Shaw, administrator of estate of Joseph L. Adams, deceased, from a judgment for defendant, plaintiff appeals. Affirmed.

Joseph L. Adams was miner in Old Bach mine, employed by miner in drilling, blasting, driving a tunnel.

Shaw argues that it was duty of mine to provide and maintain a reasonably safe place for plaintiff to work in, and to keep and maintain tunnel in a safe condition, so as not to expose the plaintiff to any unnecessary or extraordinary hazard or peril.

on morning of Sept 25, 1900, while two men employed on day shift were in tunnel, they loaded a hole with blasting powder in bottom of tunnel. Then foreman came and directed them not to fire the blast. They left it. They quit work at 6 p.m.; plaintiff and partner went to work at 7:30 p.m. in there. Started to clean up bottom of the tunnel, his duty, and he drilled holes to load with powder and clean up the bottom, when blast went off, "which explosion caused plaintiff to receive severe and grievous injuries, his left eye being blinded and the sight in the other eye being seriously affected, his jaw being fractured, most of his teeth being knocked out, his side and chest being severely bruised and injured, his left hand being almost blown off, so that it was necessary to have the same amputated, his right hand being rendered crippled and useless, and suffering also a compound fracture of the left arm between the elbow and the wrist, said injuries causing him great and excruciating pain and suffering, and confining him to the house and hospital for several months..."

Says foreman was vice principal of the defendant in all matters relating to the working and operating of the Old Bach mine, foreman's negligence was the negligence of the company.

"The answer of defendant denies that the injuries to plaintiff were caused by the negligence of defendant." ... defendant says "that the danger from unexploded blasts was incident to this class of employment; that those engaged in the work of running the tunnel assumed the risk;

"At the close of plaintiff's testimony, defendant moved for a nonsuit, which was granted, and judgment entered in favor of defendant. From this judgment, plaintiff appeals."

Adams died before the trial.

"While it is a general rule that a master is bound to use reasonable diligence to provide a servant with a safe place in which to work, and to maintain such condition during the term of employment, such rule should have no application to a case when the plaintiff and his fellow servants are creating the place of work; when it is constantly being changed in character by the labor of the men working upon it; when it only becomes dangerous by the carelessness or negligence of the workmen, or by the negligent manner in which they use the tools or materials furnished by the mine for their work; when the dangers which arise are very short-lived; or when, by the very nature of the workmen, the place is rendered unsafe without the master's fault or knowledge.

Cites Davis v. Trade Dollar Cons. M. Co., 117 Fed. 122, on how master can't furnish servant a safe place where danger is temporary and when it arises from hazard and progress of the work itself, and is known to the servant.

No negligence shown by defendant. Neg. is a reach of duty.

When foreman Winston told miner Lacourier not to fire the holes, it was because the waste from the blasts would become mixed with the ore that had been stope by Roberts and lay on the floor of the tunnel. It will be noticed that no instructions were given to Lacourier not to fire the holes after the ore had been removed.
they testified that they heard all rounds go off.

plaintiff's 2d theory based on idea "that there was an unexploded hole near the breast of the tunnel which the defendant knew about, or by the exercise of reasonable diligence could have known about, and did not inform Adams of its existence. We cannot conceive how the defendant could have known of an unexploded hole. Neither do we believe that it was defendant's duty, before allowing the next shift to go to work, to investigate the conditions and ascertain whether all the holes fired by Roberts and Lacourcier had exploded.

no one knew there was a missed charge—so how could they warn Adams of it?

Plaintiff "presents a still further proposition to the court, and that it is that it became the duty of the defendant to make reasonable rules and regulations for the protection of the miners, whereby they might be notified of hidden dangers from unexploded or missed shots in the breast of the tunnel.

cites Johnson v. Portland Stone Co., 67 Pac. 1013, whereby the Supr Ct of Oregon said "'The mere failure to adopt rules is not proof of negligence unless it appears that the master, in the exercise of reasonable care, should have foreseen and anticipated the necessity for such precaution.'"

"We agree with the doctrine thus announced. It was not shown what particular rules could have been adopted that would have been likely to prevent the accident. See, also, Davis v. Trade Dollar Cons. H. Co., supra.

"But, again, it is clearly apparent that the method of driving the tunnel was only a detail of the work in which Adams was engaged, and it is well established that the master is never liable for any negligence in carrying out the details of the work if the place in which the work is conducted is in itself safe, and the dangerous condition is brought about only by negligence of the men working there." cites Davis v. Trade Dollar Cons. H. Co., 117 Fed. 122, 54 CCA 363; Johnson v. Portland Stone Co. (Or.), 67 Pac 1013; Cullen v. Norton, 125 NY 1, 26 NE 905; Mancuso v. Cataract Cons. Co. (Sup.), 34 NY Supp. 273. (CITED MANCUSO CASE FIRST)

we haven't considered question of whether Winston was fellow servant or vice principle.

"The unfortunate accident disclosed by the record arouses the sympathy of all, but, 'in view of all the circumstances, as they appear by the evidence, the calamity seems to have been a casualty from a cause unforeseen, and not within reasonable apprehension.'" (Mancuso v. Cataract Cons. Co., supra), and 'no mere sympathy for the unfortunate victim of an accident justifies any departure from settled rules of proof resting upon all plaintiffs!'(Patton v. Tex. & Pac. Ry. Co., supra.)"

(Patton case is 179 US 658, 21 Sup Ct 175, 45 L Ed 361.
McLEARY, J. "The plaintiff, William Kelley, brought this action against the defendant, the Cable Company, to recover damages in the sum of $30,000 for personal injuries sustained by him while working as a carman in the defendant's mine. There was a trial by jury, and a verdict for the defendant, and, after motion for a new trial overruled, the plaintiff appeals to this court from the judgment, and from the order overruling the motion for a new trial."

Facts admitted: at Cable mine, in Deer Lodge County, Mont; on July 19, 1884, Kelley employed as common laborer removing ores and dirt, filling cars with the same, and running such cars... was ordered by foreman to go to work in a certain cross-cut... while there he was injured by an explosion, ..."...and that plaintiff was injured, without any fault on his part; and that, previous to the explosion, the plaintiff did not know, and had no means of knowing, whether or not there were at said place charges not shot off, and could not have discovered the fact except by being informed thereof."

He worked at night, removing ore blasted during day... explosion gave him very severe injuries, "both of his eyes being blown out, and one ear being blown off, his head, face, and neck and chest lacerated,...thereby entire destroying his sight and the hearing of one ear, causing him great and excruciating pain, and confining him to the hospital for several months, and rendering him forever incapable of working at his occupation."

went to work at 7 p.m., one hour after day shift miners had XXX quit work. Blast had been fired at 5 p.m. explosion took place between 11 and 2 o'clock "while he was loosening rock and debris with his pick... and he was hurled for eight or ten feet against a car, and was rendered senseless for some time, and injured as already stated." no warning given of a missed charge... "On previous occasions he had been warned by the foreman to look out for XXXX 'missed charges.'"

"The admissions of the defendant entirely eliminate all questions of contributory negligence (BY KELLY) from this case. The defense is based on the theory that the explosion was an unavoidable accident, which could not have been foreseen or prevented by the exercise of ordinary care and prudence on the part of the Cable Company, or else was the result of the negligence of some one of the miners, fellow-servants, of the plaintiff, or of the foreman while acting in the capacity of a miner and fellow-servant of the plaintiff.

"The evidence does not bear out the defense that the explosion was caused by the negligence of the a fellow-servant. If it was caused by negligence at all, it was the negligence of the foreman, in his capacity as such, and was thus the negligence of the company whom he represented."

Instructions to jury exclude altogether the idea of defendant's liability for negligence of any other agent than the the foreman himself, but instructions asked by plaintiff ruled out neg. of fellow-servant... "and this view of the matters at issue seems to be borne out by the evidence."

"The employment of skillful, prudent and sober men discharges the master from any responsibility for injuries caused by their neglect to their fellow-servant; but the master does not have the right, after employing such men to impose upon them his own duties, and, without supervising them in any way, impute to their negligence any injuries his other servants may sustain, and thus escape responsibility. But such might reasonably be inferred from the charge. It seems that this instruction might readily have misled the jury to the prejudice of the appellant. Foreman had duty to check missed charges... not duty of laborers... Foreman had power to hire and fire the plaintiff."

So send case to be tried again, because plaintiff's cause was prejudiced in the way it was presented to the jury.
appeal from district court, Silver Bow County.

verdict for plaintiff was set aside, and he appeals.

LIDDLE, J.

(pleadings and issues for this case found in former opinion, 14 Pac. 633, 7 Mont. 73).

"The second trial has resulted in a verdict in the plaintiff's favor for $10,000, which, on a motion for a new trial, was set aside by the judge a quo, and an appeal from that order brings the case before us for review. The defendant relied upon two grounds for a reversal of the verdict, either of which, if good, will sustain the order appealed from; first, that the verdict was contrary to the law and the evidence; and, second, that the court gave the jury certain erroneous instructions, -- but in passing upon this motion we are not informed upon what specification the court made its order setting aside the verdict."

"The plaintiff bases his right to recover upon the sole ground that he had been injured by what is known, in miner parlance, as a 'missed charge,' which was in the drift or cross-cut where he was sent to work by the foreman of the mine, whose duty it was, under the instructions of the company, to see that all blasts had been exploded, and that this duty was neglected. By way of defense, the company contends that there was no negligence on the part of its agent, who was a skillful person, and exercised all due care and prudence in the performance of his duties, but that the injury suffered by the plaintiff was the result of an unforeseen and unavoidable accident.

foreman and the two miners had checked after the blast, and found no missed hole.

but Kelley showed blast came from pile of ore. probably not a missed hole.

"How the powder came to be in that place cannot be accounted for, except upon one of two theories, -- either it was left there through the carelessness of some one doing the blasting, or it was thrown out of the chamber in the face of the drift by the force of one of the other explosions; and it was sufficiently proven that such accidents occasionally occur, without there being any way to prevent it.

plaintiff has to show neglect of foreman. ... "and, while slight proof may have shifted this burden upon the company, yet when the defendant has shown the employment of a prudent and skillful foreman, who carefully and thoroughly, in company with the blasters, examined and satisfied himself that all the charges had been fired, and who adopts all the reasonable and usual precautions for finding out that fact, we cannot but conclude that the company has exercised all reasonable care and diligence for the protection of its employes."

plaintiff tried to show through testimony of four miners, sworn as experts, that it was a missed hole, "and, such being the fact, it was negligence in the foreman not to have discovered it."

"Notwithstanding the progress and advancement in the art of mining, it yet remains a hazardous and dangerous occupation, which, in spite of the many obligations of the owner of a mine to the employes, embraces other risks which the servant assumes as incident to the calling."

company exercised "all care" in selecting good foreman. "Shall it now be subjected to the payment of damages after its foreman has exercised all the diligence and care that could be thought of to insure the safety of the miners? ... The obligation of the company was not to insure the plaintiff against all injuries, but that through its agents it would do all that human foresight, care, and diligence could reasonably do to protect him from the danger of unexploded charges or blasts." we believe a foreman exercised all prudence and care he could reasonably do. ...

that plaintiff injured not from missed charge but from hitting piece of giant powder in the loose rock, "the presence of which was unknown to and could not have been known with reasonable diligence to the defendant's foreman; and that the plaintiff's loss is the result of an unforeseen and unavoidable accident incident to the risk of mining."

affirm lower court ruling, at cost of appellant.

McCONNELL, C. J., and BACH, J., concur.
death of Samuel Currow, at Elkhorn mine in Jeff. Co.
on Sept 22 - by missed hole. had been notified by
previous shift that there was a missed hole. after
drilling 8 holes, they lowered machine to put in two
bottom ones. Currow stopped to locate missed one, when
it went off. "From my examination I learned that the
shift that went off at 3 o'clock had fired a round of holes
at about 1:30 P.M. one of them missing. The explosion
took place at 7:30 P.M., 6 hours after the other holes
had been fired. The men stated to me that the holes were
tamped with old sacks and in my opinion the fuse got
broken and the tamping held the fire until it caught
the powder train again which caused the explosion. The
Coroner's jury returned a verdict that deceased came to
his death by an unavoidable accident and that no one was
to blame."

DEPENDING - 1/15/1900 - Butte has many blastdeaths
"FATAL DAY IN BUTTE..."
"Butte, Jan. 14.--Two more fatalities from blasting occurred
this morning at 2:30 o'clock, making four men killed by explo-
sions of giant powder in Butte mines inside of 10 hours."

men picking at the bottom, "preparatory to putting down a
floor, when the pick of one of the men struck some powder and
a terrific explosion occurred. The powder is supposed to
have been an old missed hole that had never been discovered.
The two men were literally blown to pieces."

also reports one more mining accident, where fuse
problem brought blast which badly injured one man and his
partner lost his sight.

ONT INS P 1891 - ventilation bad so candle almost out
8 the Tacoma mine at Elkhorn:
"At the bottom of the winze, where one man was at
work, it was with great difficulty a light of any kind
could be made to burn. He requested me to move carefully
as the least motion would quench his light."

... "I notified Mr. Botcher to timber his mine properly
and to attend to the ventilation, where necessary. Mr.
West, the foreman, informed me that they knew how a mine
should be timbered and ventilated, but when the air became
bad they generally stopped work on it."

22 employees.
Clancy - 4/3/1897 - dynamite-thawing practice almost a tragedy

Clancy - 4/3/1897 - dynamite-thawing practice almost a tragedy

Clancy - 4/3/1897 - dynamite-thawing practice almost a tragedy

"Almost a Tragedy."

Clancy - 4/3/1897 - dynamite-thawing practice almost a tragedy

"What might have been a very serious accident happily turned all right one day this week at the King Solomon mine. It is part of the duty of the whim tender to thaw the sticks of giant powder, and when they are called for to lower them into the mine. The custom has been to place eight or ten sticks of powder in a cracker box, and then light a short candle and cover the box up. The man fixed the box as usual, set it on a bench against the wall in the blacksmith shop, lit his candle and went about his work. About twenty minutes afterwards he went back to examine the powder and see how it had progressed in the thawing process, when he discovered that the box containing it was on fire, the blaze reaching almost up to the roof of the shop. The box had to be removed or the building would be burned, even though the powder did not explode, which was momentarily expected. Immediate action of some kind was necessary. The whim tender decided that the safest plan was to put as much ground between the burning box and himself in as short a space of time as possible. Mr. George Redding, one of the owners of the property, happening to be present, went into the shop, took the burning box in his arms, carried it out and pitched it down the side of the dump into the snow, where it remained until the powder was entirely consumed." ...

Clancy - 2/8/1896 - powder explosion kills cook

Clancy - 2/8/1896 - powder explosion kills cook

"Martin Linnell, a cook, instantly killed, and George Bradley and Joseph McIntyre, quarrymen, probably fatally injured, is the result of a powder explosion at Wm. Seba's silica quarry five miles west of Anaconda "Wednesday. Fifteen sticks of giant powder were placed in the oven of the cook stove at which Linnell was cooking to thaw out, and they did so with the above result."

Mont Insp 1892 - example of exploding a missed stick; death

Mont Insp 1892 - example of exploding a missed stick; death

Mont Insp 1892 - example of exploding a missed stick; death

"It was their first shift in this place. After picking down some ground and shoveling back some dirt, Shifler took the scraper and put it into the hole that was drilled about five inches and said to Cahill that they had just as well drill this hole down. Cahill took a drill and put it in the hole and Shifler commenced striking. He struck the drill six or eight times when the hole exploded driving the drill through Shifler's head, and both were struck by the flying debris. Cahill says that the hole was round and that the ground around it showed no signs that would lead them to think it had been blasted." ...

Hank Shifler killed; Maurice Cahill had right hand injured so had to be amputated below the elbow, plus some other injuries about the shoulders.

INSPECTOR: "...I am of the opinion that the hole was blasted, but that all the powder did not burn, just enough to break the collar of the hole and blow the tamper out. (CAHILL) told me he thought they were drilling in solid rock."
"D.W. Ross and John Hansen, prospectors, had a thrilling and somewhat realistic experience one day last winter at their cabin near the head of Quartz gulch. The two men had been prospecting in the new gold lode discovered by Mr. Ross last fall, and had just before the extreme cold weather set in last February left Clancy one day with two boxes of No. 2 giant powder with which they expected to tear nuggets from the gold lode from end to end.

"One morning they crawled out of their bunks bright and early, intending to do a big day's work, and started a roaring fire in the cook stove. Before they had finished dressing, however, they took three or four sticks of the giant powder and opening the oven door set one end of the sticks on the floor and inclined the other forward into the oven, so that it would be thayed ready for use by the time they had finished breakfast. Then they forgot all about the powder until they discovered it had caught fire and was blazing and sputtering at a furious rate. The two full boxes of powder was not more than three feet away from the stove, and half dressed as they were they dashed out of the door and made tracks up the gulch as fast as their legs would carry them. Above the boxes of powder, on a shelf, were two or three boxes of caps. After they had reached a point above safety above the cabin they stopped to await results. In a short time their cabin caught fire and they expected every moment to hear an explosion which might easily have been heard in Clancy. The caps exploded, but the cabin burned to the ground before their eyes and the powder failed to go off. In the meantime they had been standing, half dressed, in the snow and cold, their retreat effectually blocked for more than an hour, the thermometer registering in Clancy that morning 40 degrees below zero. After the cabin had completely burned down, so that they no longer feared an explosion they ventured down to it, and eventually made their way to neighbors down the gulch where they borrowed sufficient clothing to enable them to go to town and purchase a new supply. They frosted their feet, however, by the long exposure to the cold, Mr. Ross having no covering for his feet except a pair of slippers. They lost everything they had in the cabin, nearly all of their clothing, and their winter's supply of food, etc. Mr. Ross says that the next time he wants to thaw giant powder he will hunt some other method than in a cook stove."
Butte Miner - Sept. 24, 1878 - First serious Butte accident p. 5 - "Injured by a Blast. / The First Serious Accident in the Butte Mines." / "Last Wednesday night one man was very seriously injured and two others slightly hurt by a blast in the Alice mine." . . . "Towards twelve o'clock they found it necessary to blast, and having drifted drilled a hole they charged it with black powder, then retreated to the station at the shaft where they had room to stand aside and avoid any fragments of rock that might be sent through the open passage from the blast. At the explosion they returned immediately, but found that the tamping had blown out, the rock being only slightly shattered by the force of the powder. The hole was immediately reloaded with a much heavier charge of the same kind of powder and the men again sought the shelter of the station." heard dull sound.. went back.. leaned over it.. "when all at once hell seemed to yawn wide open at their feet. With a sudden heave of the ground, lurid, sulphurous flames shot out in every direction, a rush of hot scorching air seemed to penetrate to the very marrow of their bones, clouds of dust filled their eyes, they felt their persons impinged upon by countless fragments of rock, while over and above and through all other sensations rang the tremendous report of the blast." one guy cut in forehead.. another cut with rock.. "After the accident it transpired that the shot heard in the station had been fired in the 300-foot level, the sound, wafted up the shaft, being as distinctly audible to the men listening in the station as the report of their own blast fired a few minutes previously."
SERIOUS ACCIDENT.—A serious accident occurred in the vicinity of Crow Creek, on Friday last, by which two men came near losing their lives, by the premature discharge of a blast. The men—John Keating, an old Colorado miner, and a Spaniard named 'Rioflank'—were working in a lead and engaged in 'tamping in' a blast, the former tamping with a wooden tamp and the latter holding the fuse, when the blast, from some almost inexplicable cause, went off. The Spaniard had his right hand dreadfully torn and lacerated and his left also somewhat injured, while Keating was badly cut and burned about the breast, and both eyes severely injured. The Doctor took a sliver out of the ball of his right eye and several small pieces of quartz from his left, but he is of the impression that his right is not injured. Thinking that in all probability the Spaniard's right hand would have to be amputated, signs of mortification having set in, the Doctor humanely brought him to the city, but after a few days careful attention, it is thought that it will be unnecessary."

MONT INSPIR 89 (deputy) — premature blast dangers; 3-hr wait until proper time, and men rush back to reload them too early. Many accidents happen through the explosion of blast and most of them from blasts which fail to explode at the proper time, and men rush back to reload them too early. No man ought to go near a 'missed hole' for at least three hours, and it is to the interest of the company and employees to adopt such a rule; although miners themselves are too careless in regard to such matters, and rush back to such holes without giving anything more than an ordinary amount of time for the powder to explode."
SOURCES OF WYMAN PHOTOCOPIES ON MINE ACCIDENTS --

**key word on note:** Clancy, POST, MONT INSPECTION 89 (OR OTHER NUMBERS), MONTANA NEWS MISC, INDEPENDENT

**source is:** Clancy (Mont.) Miner (earlier called Lump City Miner), Montana Post (Virginia City, later Helena, Mont.), Montana Inspector of Mines Report, year from Bancroft collection of various Montana papers, as noted, Helena Independent
Dear Ivan,

Just a quick note to get these photocopies off to you. They may not be what you want, but if not you can fire back at me again and I will get to work on it. If you want to read through the Montana Inspector of Mines reports, check with me because they are scattered all over—a few here, a few there. I think I probably got them from four sources, at least.

I indicated some of the sources of the cryptic key words, which might be of interest if you want to pursue something further.

I'm devoting myself right now to my "Cigarette Power" article, and hope to have something on paper in a few weeks. Right now my major concern is getting word out of Norton on my DP ms.!

Best of luck to you and yours. Thanks for the clippings on Ivar and modern history.

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P.S. — The Montana Mining Inspectors' reports sometimes listed all mine accidents of a serious nature [I think]. Your short-handed character might appear therein.
The plaintiff in error was an experienced miner, engaged in the work of driving a tunnel in the mine of the defendant in error. The work was being continuously conducted by three shifts of men, working eight hours each. In each shift there were seven men, one of whom was the foreman or shift boss. Each shift operated two Burleigh drills, and bored from nine to seventeen holes in the face of the tunnel, which were charged with blasting powder and exploded, after which the shift retired to give place to the succeeding shift. At times some of the blasts failed to explode. It was the custom of the men of the retiring shift to note the number of explosions, and inform the incoming shift how many, if any, of the blasts remained unexploded.

On May 26, 1900, at 7 a.m., Davis began work in tunnel. Foreman of shift that had just gone off informed incoming shift that two shots had not been heard—a back hole and a lifter. "A back hole is a hole in the top of the tunnel, going in straight, and a lifter is one that goes in down on the ground at the bottom of the tunnel." Davis went then to tunnel, examined face, and found one unexploded back hole on left-hand side of tunnel; and at bottom on right hand side he saw a pile of muck or debris, behind which he supposed was the unexploded hole. "The fact was that the second unexploded hole was in the breast of the tunnel. The fact that it was unexploded was not discernible upon a casual examination, for the reason that the other blasts had broken off a portion of the rock into which it was sunk."

Began to work. "While they were so working, one of the drills bored into or near the unexploded blast, and caused it to explode, killing two of them outright, and very seriously wounding the plaintiff in error."

He brought action, alleging it was duty of owner to keep him informed whether all holes drilled and loaded by previous shift had been exploded; that, by exercise of ordinary care and prudence, it might have known that some of the holes fired by the preceding shift had failed to explode; that the plaintiff in error was injured by reason of the negligence of the defendant in error in failing so to inform him.

After trial, court instructed jury to return verdict for defendant in error, "on the ground that the plaintiff in error was injured by the negligence of the foreman of the preceding shift, it was the negligence of a fellow servant." Plaintiff makes this ruling main subject of his principal assignment of error.

GILBERT, Circuit Judge, delivered opinion. (2 other judges)

"We think the ruling of the trial court was clearly correct.

"Not only was the foreman of the shift of men who retired from the tunnel just before the shift to which the plaintiff in error belonged going in to work a fellow servant with all the members of that shift, within the doctrine of Mining Co. v. Whelan, 168 U.S. 86, 18 Sup. Ct. 40, 42 L. Ed. 390, and Railroad Co. v. Conroy, 175 U.S. 323, 20 Sup. Ct. 85, 44 L. Ed. 181, but we think the evidence upon which the plaintiff in error rested his case fails short of showing that the foreman of the preceding shift was negligent."

Foreman located position of unexploded blasts solely by sound of explosions; "a method which was uncertain, as the plaintiff in error must have known."

Plaintiff didn't check to see under the rock at bottom—he supposed it covered an unexploded blast, but it didn't.

"It is true that the law of master and servant requires that the former furnish the latter a safe place in which to work, but the master is not required to furnish the servant a safe place in which to work where the danger is temporary, and when it arises from the hazard and the progress of the work itself, and is known to the servant. The master is not required to be present at the working place at all times in person or by a representative, to protect a laborer from the negligence of his fellow worker or from his own negligence in the course of the work."
Commisioners' Opinion. Appeal from District Court, Broadwater County; W.R.C. Steward, Judge.

E.C. Allen against R.A. Bell. From a judgement in favor of defendant, plaintiff appeals. Reversed.

POORMAN, C. In spring and summer 1901 Bell was owner of and was operating the East Pacific mine. D.E. Blair was in immediate charge of the mine.

Allen was a miner working at the bottom of the shaft, when a blast exploded, causing the injury complained of.

The lower court backed the defendant's move for nonsuit.

About 40 men employed; Blair had charge of operating dept; authorized to hire and discharge men; directed them, when, and how to work. They consulted him or the shift boss about material required. Blair's authority superior to shift bosses.

"No one was over him except the owner, Bell."

"The owner of the mine was anxious to have the sinking of this shaft expedited, and for that reason Blair spent more time at the shaft than he did at other places about the mine."

Machine drill used. Three shifts of two men each.

on June 30, 1901, Johnson shift began at 7 a.m.; until 3 p.m. followed by the Allen shift, until 11 p.m.

"At the time this Allen shift commenced work, they were informed by the preceding shift and also by Blair that there was a missed hole, when Allen said, 'I will go down, clear out, and blast it.' Blair then remarked: 'It is in the west end of the shaft, and you will be drilling in the east end, and it will not be in your way. Let it go, and I will see that it is blasted when the next round is blasted.'"

Custom: Missed hole should be discovered and blasted by the succeeding shift.

Unknown shift began at 11 p.m., until 7 a.m. on July 1st.

Followed again by Johnson shift—which wasn't notified that this missed hole had not been discovered and blasted.

Then Allen shift came on, and received no notice from Johnson that missed hole had not been blasted.

"...but prior to the time when Allen went down into the shaft, he inquired of Blair how everything was below, and was informed that it was all right, and that all the holes had been blasted, and was also instructed by Blair to muck out what dirt and debris remained in the bottom of the shaft. In cleaning out this dirt and debris, the blast was discharged by a blow from a pick in the hands of Allen, resulting in the injury complained of."

Questions:
1) was Blair a vice principle, or fellow servant?
2) was Allen negligent?

"Decisions of courts differ as to the method of determining when one is the fellow servant of another. These conflicting decisions have given rise to two distinct rules: (1) The superior servant criterion, based upon the rank or grade of the employee. "Stands in place of master. "(2) That the character of the act in the performance of which the injury arises, and not the rank or grade of the employee, determines his relationship to other employees, and that, if the act is one pertaining to the duty the master owes to his servant, he is responsible for the manner of its performance, without regard to the rank or grade of the employee to whom it is intrusted, but, if it is one pertaining only to the duty of an operative, the employee performing it is a fellow servant, whatever his rank, and for his negligence the master is not liable. Mast v. Kern (Or.) 54 Pac. 950, 75 Am.St. Rep. 580.

... "It has been repeatedly decided that a mere foreman or shift boss is a fellow servant with those working under his direction and supervision, although the shift boss or foreman has the authority to hire and discharge men. Kelly v. Cable Co., 7 Mont. 70, 14 Pac. 633, [Cited]"

under 2d rule, a foreman may temporarily join other workers, and becomes their fellow servant.

"Under the facts as disclosed by this evidence, which here stand admitted, there is no doubt that Blair was a vice principal, whatever rule may be followed."

Rule that worker assumes ordinary risk of employment, and that master not fully responsible when for providing a safe place when the employees are chaining it. Shaw v. New Year Gold Mines Co. case...

"But this rule does not justify a master in neglecting to give information known to him, or with the knowledge of which he is charged, regarding concealed danger. Much less does it justify him in giving false information regarding any danger. When Blair ordered Allen to depart from the custom of searching for and blasting missed holes, and directed him to leave the missed hole, and said that he (Blair) would see that it was set off when the next round was blasted, he took upon himself the duty of seeing that this was done, for he knew that Allen relied upon that statement.... It is also in evidence that it was the custom that Blair was notified of the existence of missed shots, and that he frequently notified the oncoming shift of their existence. Under these facts, Allen was not negligent in relying upon the information given him by Blair, nor did he violate any duty or subject himself to the charge of carelessness by obeying the orders of his superior."

so reversejndgment.. must submit it to a jury.

Clayberg, C.C., and Blake, C., concur.

Holloway, J., disqualified.
nary dictates of prudence, had made himself aware of the approach of the train, and would either increase his speed or turn aside in time to avoid the danger which thereby was a threatened him. In Holmes v. Railway Co., supra, it is said: "As the deceased was a man of mature years, and nothing to indicate that he was not able to take care of himself,—as he was in fact,—the engineer might reasonably believe that he knew of its approach, and would, in obedience to the ordinary instinct of self-preservation, move away from the track before being overtaken by the engine. Railroad Co. v. Miller, 25 Mich. 279." See, also, Campbell v. Railroad Co. (Kan.) 49 Pac. 967. The motorman was not required to assume that the deceased would continue his negligent conduct to a point which would endanger his life or limb, and it was not negligence in the driver, under the circumstances, to indulge the presumption that the deceased would get out of the way, up to the last moment. There is nothing in the circumstances to indicate any wantonness or recklessness on the part of the engineer, or that he did not take all the precautions to warn the deceased and to stop his train that would have been suggested to one more experienced, or to any other reasonable mind.

But, were it to be conceded that the evidence disclosed a case tending to show negligence on the part of defendant's servants, the plaintiffs could not recover under the circumstances of this case. The rule which renders a defendant liable for injuries, notwithstanding some negligence on the part of the plaintiff or the person injured, can only apply "in those cases where such negligence was the remote, and not the proximate, cause of the injury, that is, where the negligent acts of the parties are independent of each other, the act of the person injured preceding that of the defendant." Holmes v. Railway Co., supra. In that case, quoting from O'Brien v. McGinchy, 68 Me. 552, it is said: "But in cases falling within the foregoing description, where the negligent acts of the parties are distinct and independent of each other, the act of the plaintiff preceding that of the defendant, it is considered that the plaintiff's conduct does not contribute to produce the injury. If, notwithstanding his negligence, the injury could have avoided by the use of ordinary care at the time by the defendant. This rule applies usually in cases where the plaintiff or his principal is in some position of danger from a threatened contact with some agent under the control of the defendant, when the plaintiff cannot and the defendant can prevent the injury. But this principle cannot govern where both parties are contemnaneously and actively in fault, and, by their mutual carelessness, an injury ensues to one or both of them." See, also, Hager v. Southern Pac. Co., 98 Cal. 306, 33 Pac. 119; Esrey v. Southern Pac. Co., 103 Cal. 541, 57 Pac. 500. The rule can never apply to a case where, as here, the negligence of the party injured continued up to the time of the injury and was a contributing and efficient cause thereof; for it is apparent that, by the slightest care and effort on the part of the deceased, he could have put himself out of danger up to the last moment before he was struck.

Our conclusion is that the plaintiffs did not make out a case entitled them to recover, and that the refusal of the trial court to grant the motion for nonsuit was error. It may be added that an examination of the evidence on the part of the defendant serves only to strengthen the case as to the negligence of the deceased, and the absence of negligence on the part of the defendant, and makes it clear that the court should have granted defendant's request to instruct the jury to find for the latter. It follows that the judgment and order must be reversed, and it is so ordered.

We concur: HARRISON, J.; GAROUTTE, J.

EVERETT et al. v. LOS ANGELES CONSOLIDATED ELECTRIC Ry. Co. (L. A. 62.)

(Supreme Court of California. Jan. 9, 1896.)

Department I. Appeal from superior court, Los Angeles county; J. W. McKinley, Judge.

Action by Amanda P. Everett and others against the Los Angeles Consolidated Electric Railway Company. There was a judgment for plaintiffs, and defendant appeals. Heard on motion to strike out portions of respondents' brief. Denied.

John D. Pope, for appellant. W. J. Hunsaker, for respondents.

PER CURIAM. Motion to strike out a portion of respondents' brief, because not pertinent to anything contained in the record, and therefore improper. In view of the conclusion reached on the merits of the appeal, whereby the judgment and order denying a new trial are reversed (see opinion this day filed, 43 Pac. 207), the purpose of the motion becomes inconsequential; and, for that reason the motion is denied.

DEEP MINING & DRAINAGE CO. v. FITZGERALD.

(Supreme Court of Colorado. Dec. 4, 1895.)

MASTER AND SERVANT—CONTRIBUTORY NEGLIGENCE—INSTRUCTIONS—NEGLIGENCE OF VICE PRINCIPAL—EXCESSIVE DAMAGES.

1. An instruction that if plaintiff committed some act which proximately caused the injury, and it but for which act the injury would not have occurred, he could not recover, was erroneous in limiting the contributory negligence to an act of commission, where it was in issue that plaintiff omitted to perform some act which, if performed, would have protected him from injury.

2. An instruction in an action by a servant for personal injuries, that if the master orders the servant into a situation of danger, and he obeys and is injured, he is entitled to recover
DEEP MINING & DRAINAGE CO. v. FITZGERALD.

unless the danger was so glaring that no prudent man would have entered into it: and when an employé is suddenly commanded by his employer to do a particular act, and exorted to diligence therein, he cannot be required to exercise the same degree of care in guarding against accidents as when he has more abundant time for observation and reflection, —was a question where there was no evidence which justified the giving thereof.

3. The master is liable for the acts of a vice principal done within the scope of his employment, and such as properly devolve upon the master in his general duty to his servants, while for all such acts as relate to the common employment, and are on a level with the acts of a fellow laborer, except such as are done by the vice principal against the reasonable objection of the injured servant, the master is not responsible.

4. A verdict for $37,500, awarded to a minor for loss of eyesight, appearing to have been given by some motive other than the desire to make merely a reasonable compensation, is excessive.

Error to district court, Pitkin county.

Action by Edward Fitzgerald against the Deep Mining & Drainage Company for personal injuries. Plaintiff had judgment, and defendant brings error. Reversed.

This was an action brought by the defendant in error to recover damages for personal injuries sustained by reason of the alleged negligence of the plaintiff in error. In substance the complaint alleges that the defendant was a corporation engaged in the business of mining in the city of Durango and state of Colorado, and the particular work in which it was engaged at the time of the accident was the sinking of what was known as the "deep shaft on the Homestake lode"; that the plaintiff was at the time employed by the defendant as a miner to work with other miners, under the direction of defendant, at the bottom of the said shaft; that one James Thomas was at that time in charge of the work on behalf of the defendant, and was employed by it as its agent and representative to conduct and control the working and sinking of said shaft, and was acting in pursuance of said employment at the time of the injury; that Thomas was vested with full power over said work and over the miners employed thereat, with the right to direct and control the action of the miners to discharge them for violation or disregard of his directions, and generally to hire and discharge men in the prosecution of said work; that while engaged in the sinking of the shaft Thomas commanded plaintiff to clean out a "missed hole," that is, a hole which had been drilled in the shaft, and in which had been placed a cartridge consisting of dynamite and other explosive material, connected with a cap and fuse, which had been lighted, but the fire of which had gone out, and failed to light the explosive; that in part plaintiff did this, but refused to clean it out beyond a certain depth, giving as his reason for disobeying that he thought the hole was deep enough; that thereupon Thomas himself, against the protest of the plaintiff, took up the unfinished work, which he prosecuted in so negligent a manner and with such force and violence that he thereby caused an explosion, which resulted in the loss of plaintiff's eyesight, and deprived him of the power of earning a living. A further allegation as to negligence is "that said injuries were caused by the act and negligence of the defendant, and its agent as principal and representative as aforesaid, without negligence on the part of the plaintiff." An answer was filed to this complaint, consisting of several defenses, one being a general denial; also that said Thomas was a fellow servant of the plaintiff, engaged in the same kind of employment as plaintiff's own negligence was the cause of the injury; and that the plaintiff had equal means of knowledge with the defendant as to whether the act which it was alleged caused the injury was dangerous and unsafe, and yet, nevertheless, continued in the service of the defendant, and by his own act caused the injury. To this answer a replication was filed, and upon the issues thus joined trial was had before a court and jury, resulting in a verdict for the plaintiff in the sum of $37,500. Upon this verdict, after the overruling of a motion for a new trial, imposed by defendant, the court entered judgment, and to reverse this judgment the defendant prosecute its writ of error.

A large number of errors have been assigned by the plaintiff in error, but, in view of the conclusion which we have reached, it will not be necessary to consider all of them. The main errors relied upon are that the facts stated in the complaint are not sufficient to constitute a cause of action, and the evidence is insufficient to sustain the verdict; that the court should have granted a nonsuit at the close of plaintiff's testimony; that the court erred in its instructions to the jury upon various grounds (which grounds will be stated more specifically hereafter); and that the verdict of the jury is excessive, and appears to have been given under the influence of passion and prejudice.

A brief statement of the evidence, as well as the allegations of the complaint, will serve to elucidate the legal questions involved. That the testimony was contradictory as to nearix, if not quite, every material point, is conceded, but it tended generally to show the following: Thomas was a foreman of the defendant company, intrusted by it with the superintendence of the sinking of the deep shaft upon the Homestake lode. Of this work he had entire charge. To him the miners employed therein looked for directions; by him they were employed and discharged; and, in general, he represented his principal (the defendant company) in all things in this particular department of its general enterprise. It was one of the duties of plaintiff, whenever so ordered by Thomas, to clean out the shaft, and prepare them for recharging with dynamite. To the work of cleaning out this particular hole Thomas
had assigned plaintiff on the day in question. The latter had obeyed the order to the extent of cleaning it out as deep as he thought it should be made, and then ceased from the work. When Thomas descended into the shaft to ascertain if compliance had been had with his instructions, the plaintiff informed him that the hole was deep enough for the purpose in view. Thomas thereupon took the sand pump, and inserted it in the hole, and replied that it ought to be sunk deeper, and, handing the instrument to plaintiff, ordered him to finish the work. The plaintiff refused to obey, assigning as his sole reason thereof that the work, in his judgment, had been sufficiently performed, not that the further prosecution of it was attended with any greater danger than that incident to the antecedent work. Thomas then, as was his province, determining that for safe recharging the sinking should be further prosecuted, took from the plaintiff the sand pump, and proceeded with the work. While engaged therewith, he ordered plaintiff to throw water into the hole. The plaintiff scooped up from the bottom of the shaft with his shovel water that was standing therein, and threw it into the hole, when Thomas remarked that it was water, not dirt, that he wanted. Thereupon the plaintiff, evidently concluding that there was dirt mixed with the water standing in the shaft, reached for a bucket containing drinking water, and threw water from it into the hole. Almost immediately occurred the explosion which caused plaintiff’s injuries. Up to the very last, plaintiff says that Thomas was working the sand pump gently, and it was only when he was about to throw water from the pail that, according to his statement, Thomas began churning the pump into the hole in a violent manner, which, he claims, caused the explosion. From this brief statement, as well as from the allegations of the complaint upon which plaintiff must rely for a recovery, it will be seen that, if there was any negligence, it was that Thomas improperly worked the sand pump, and not that the use of that instrument for the purpose was, of itself, negligence. This act by which the injury was occasioned was not the result of an act done by the plaintiff as a servant under the order of a superior. The throwing of the water is not alleged or claimed to have contributed to the injury, and that act of the plaintiff was the only one connected with the accident done by him in obedience to orders. The act done by Thomas was necessitated by the refusal of Fitzgerald to do that which he admits was his duty, as a miner, to do whenever Thomas gave the order; and plaintiff, notwithstanding in his complaint he avers it, did not offer any objection to the assistance of his foreman. Although it is so contended by the plaintiff, there is no proper evidence that it was a part of the duty of Thomas to assist in the manual work of cleaning out missed holes; but, on the contrary, as asserted by the plaintiff himself, it was the duty of the plaintiff to do this, whenever Thomas so directed.

C. W. Franklin and Thomas, Bryant & Lee, for plaintiff in error. W. W. Cooley and W. O'Brien, for defendant in error.

CAMPBELL, J. (after stating the facts). One of the errors assigned is to the giving by the court of the fourth instruction, which purports to state the law of contributory negligence. In the third instruction the court had defined negligence to consist in “performing some act, or omitting to perform some act, which an ordinarily prudent and careful man would not perform or omit to perform, under all the circumstances of a particular case.” In instruction No. 4 the jury were told that, if they found from the evidence that the injuries were caused through the negligence of Thomas, and that Thomas stood in such relation to the defendant as that his negligence was the negligence of the defendant, then their verdict should be in favor of the plaintiff, unless they also found that the plaintiff committed some act which proximately caused the injury, and but for which act the injury would not have occurred. This instruction did not go far enough. It conflicted, as to one element, with the preceding one, and we do not find that it was elsewhere in the charge clearly supplemented or corrected. The issue was squarely raised, and the jury should have been instructed that an omission by the plaintiff to perform some act which, if performed, would have protected him from injury, would defeat a recovery by the plaintiff just as much as if the latter had committed some act which proximately caused the injury, and but for which it would not have occurred. There was given to the jury an instruction, not numbered, wherein they were, in substance, told that if the master or boss orders the servant into a situation of danger, and commands him to do certain things, and he obeys, and is injured, the fault of the servant being obedience, the law will not deny a servant so acting in obedience to command a remedy against the master on the ground of contributory negligence; “unless the danger was so glaring that no prudent man would have entered into it; and where an employé is suddenly commanded by his employer to do a particular act, and exorted to diligence therein, he cannot be required to exercise the same degree of care in guarding against accidents as when he has more abundant time for observation and reflection.” There was no evidence before the jury which justified the giving of such an instruction. It is altogether inapplicable to the facts of this case, and, whether right or wrong, if given when the facts called for it, its only effect was probably to confuse the minds of the jury and mislead them. A somewhat similar instruction, where the same was inapplicable to the facts, was held by this court in Railroad Co. v. Lief, 17 Col. 290.
29 Pac. 175, prejudicial error; and equally grave was the error in giving the instruction in this case.

In his complaint, by alleging that he protested against Thomas' engaging in the work which it was a part of his duty to perform, plaintiff seeks to bring his case under the rule announced in Shearman & Redfield on Negligence (4th Ed.) in the last sentence of section 223. This naturally brings us to an examination of the contention of the plaintiff in error that for the act of Thomas—assuming it was negligence that caused the injury—the defendant is not liable. The discussion of this point, and its determination, will dispose of many of the errors assigned, not only as to the ruling of the court upon the motion for nonsuit, but as to a number of the instructions, and as to the sufficiency of the evidence. While the complaint brings the case within the rule announced, the evidence does not support the allegations of the pleading. As has already been said, the plaintiff did not protest or object to the further sinking of the hole by Thomas, and it was conceded that Thomas was a competent miner. Plaintiff merely objected to doing so himself. He anticipated no danger therefrom, and was actuated by no fear of its result. The injury was caused, not as the result of an act done by plaintiff in obedience to orders, but by the negligent doing by Thomas of a proper act, admittedly within the line of duty of the plaintiff, and occasioned by the refusal of the latter to obey orders. To reconcile the conflicting decisions upon the liability of a master to a servant injured by the negligence of another servant would be a task, not only beyond the power of this court satisfactorily to perform, but one which, in the inextricable confusion resulting from the various authorities, it would be well-nigh impossible, as we think, and as has been often said by eminent authorities, for any court to accomplish. The so-called English rule, adopted in Massachusetts, New York, Maine, Pennsylvania, Indiana, Wisconsin, and some other states, if applied to the facts of this case, would exempt the defendant from liability, because, under such rule, Thomas would be merely a fellow servant of the plaintiff. Under the so-called American rule, which is the one adopted in this state, and declared in Ohio, Connecticut, Virginia, Kentucky, Missouri, Illinois, Nebraska, Kansas, California, and other states, Thomas would be considered a vice principal of the master, for whose negligence, within the scope of his employment, the master would be liable.

The authors of Shearman & Redfield on Negligence, who are strong advocates of the American rule, at section 223 of the fourth edition of their work, say: "There are certain principles affecting the liability of a master which are equally applicable whether the American or English rule is adopted, and whether the agent, for whose negligence he is responsible to servants, is called a manager or a vice principal. In either case the master is responsible for all the acts or defaults of the agents in his capacity as a manager, or "vice principal," and for no others. On the one hand, the master is responsible, not only for the negligence of such an agent in selecting servants, selecting or inspecting materials, implements, etc., and giving orders which the servants are bound to obey, * * * but in short for every act which he does that would naturally fall within the province of a master personally conducting the business, and for every omission of an act which it would have been the duty of the master, if personally present, to do. On the other hand, the master is not responsible for the negligence of such an agent in the performance of acts which are in no sense part of a master's work, and are precisely upon a level with the work of the other servants. When the manager or vice principal undertakes work in simple cooperation with other servants, and upon precisely the same footing with them, he becomes, for the time being, a mere fellow servant with them, acting as such. Thus, for example, a conductor, while acting as such, in starting or delaying the train, in warning or failing to warn the other train hands, or in any other respect performing the usual duties of a conductor, is not, under the American rule, a fellow servant with a brakeman on the same train. But when he offers to assist the brakeman in handling his brakes or in coupling cars, he acts only as a fellow servant; such work being no part of the duty of a conductor, as such. If, in such a case, the inferior servant should distinctly object, however guardedly, to the risk involved in such assistance, the common master should be held liable, in case the superior servant insisted on taking part in the work, since his superior authority would enable him to overcome the objection, and the inferior servant could not be expected to persist in it."

It is upon that portion of the foregoing section italicized by us that plaintiff rests his case. We do not find that any of the authorities cited contain this statement, and evidently it is a principle formulated by the authors, which, in their judgment, is within the reasoning of the courts. With the further qualification, probably implied, that such objection of the servant shall be a reasonable one, we think the doctrine sound. Testing the case at bar by this rule, it clearly is outside its provisions, for there was no objection at all by the plaintiff to the participation in the work by Thomas; so, as to this phase of the case, the liability of the master depends upon whether or not he is to be held liable for acts of his vice principal on a level with the acts of a colarborer. Assuming that Thomas was a vice principal of the defendant, and that the jury were warranted in so finding under proper instructions of the court,—which, under the decisions in Railroad Co. v. Discoll, 12 Colo. 220, 21 Pac. 708, and Railway Co. v. O'Brien,
to the duties which the master owes to his servants, or whether the acts be merely on a level with those of a fellow servant. These cases are: Sweeney v. Railway Co. (Tex. Sup.) 19 S. W. 550; Stone Co. v. Kraft, 31 Ohio St. 257; Connally v. Iron Works, 61 Mo. 492. The better rule, as we extract it from the best-reasoned cases, is that for the acts of the vice principal, done within the scope of his employment, and such as properly devolve upon the master in his general duty to his servants, the master is liable; while for all such acts as relate to the common employment, and are on a level with the acts of the fellow laborer,—except such acts done by the vice principal against the reasonable objection of the injured servant,—the master is not responsible. In other words, the test of liability is the character of the act, rather than the relative rank of the servants. Tested by this rule, the instructions of the court Nos. 2, 5, and 6 are wrong, and No. 7 in No. 18 was correctly given the test for determining the general relation of Thomas to defendant, yet, in so far as it may be considered as stating the true test for determining the liability of defendant for the particular act of Thomas that caused the injury, it conflicts with the above statement of the case, and with the rule we herein lay down. The court should have given to the jury those instructions asked by defendant and refused, which embody this rule. This rule is not inconsistent with the doctrine of the Discoll and other Colorado cases, supra, but it is in harmony therewith, and the logical result of those adjudications.

The last point made, though not necessary to be decided, is that the verdict for $37,500 was the result of passion and prejudice upon the part of the jury, which, in a degree, was the result of the rule for the measure of damages given them by the court. In a case of this kind, the true rule, as here expressed, is that the jury should, in the exercise of a reasonable and sound judgment, give to the plaintiff reasonable compensation, and no more, for the consequences of the injury; and necessarily the amount is largely discretionary with the jury. It is true, we do not find that the instruction seriously violates any well-established principle, but we think that, under the circumstances of the case, the court should more clearly have laid down the rule to the jury based on such compensation, and that no attempt should be made to ascertain and render a money equivalent for the priceless sense of eyesight, which the jury may have supposed they might do by the use of the words "pecuniarily compensate him for such injuries." While we would not be disposed to reverse this case because of any vice in this particular instruction,—especially as the defendant tendered no instruction upon this branch of the case,—we still think that, were there no other error in the case, we could not sustain the verdict here, because by comparison with
verdicts of juries in many other cases of like nature it is not only much larger than any that has been called to our attention, but the entire record satisfies us, giving the nature of the instructions given, that the jury were influenced by passion or prejudice, or by some motive other than the desire to give to the plaintiff merely a reasonable compensation. It is no answer to this to say that no man would be willing to lose his eyesight for the amount of the verdict rendered in this case, because that is no proper criterion for the measure of damages in a case of this sort, and all the money in the world, if offered, would be no inducement to a sane person to part voluntarily with this priceless gift to man.

An instructive case, in harmony with our view, wherein a large number of authorities are reviewed, is Railroad Co. v. Fox, 11 Bush, 455.

Distressing and painful as were the plaintiff's injuries, and attended by consequences so permanently disastrous to him, their simple recital before the jury unavoidably aroused the sentiment of pity that every man possesses, and strongly appealed to their kindly nature. It therefore behooves the trial court in such a case to keep within proper bounds the deliberations of the jury. However much we are compelled to sympathize with the plaintiff in his sore distress, we would be recreant to our sense of duty were we to shrink from expressing our disapproval of the excessive verdict returned in this case. For the foregoing reasons the judgment is reversed, and the cause remanded for further proceedings in conformity with this opinion. Reversed.

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JEROME v. CARBONATE NAT. BANK OF LEADVILLE.

(Supreme Court of Colorado. Dec. 16, 1895.)

Unrecorded Deed — Lien of Attachment—Notice—Priority of Rights.

1. Under Mills Ann. St. § 440, providing that until a deed is recorded no rights can be acquired under it as against subsequent "bona fide" purchasers and "incumbrancers" without notice thereof by mortgage, judgment, or otherwise, a grantee of land, who fails to record his deed till after the land has been duly attached by a creditor of the grantor, who has no notice of the deed, takes the land subject to the attachment lien.

2. Under Mills Ann. St. § 446, providing that until recorded a grantee can acquire no rights under his deed as against subsequent purchasers without notice thereof, the assessment of taxes on land claimed under an unrecorded deed to and payment thereof by the grantee when not in actual possession, and occasional improvements to the land by him, will not charge a subsequent purchaser with notice of the deed, where, with consent of the grantor, the grantor has exercised concurrent acts of ownership.

Appeal from district court, Arapahoe county.


This is an action brought by Jerome against the Carbonate National Bank to quiet title to real estate. On the 11th day of July, 1893, Richard Cline was the record owner of certain lots in Bohn's subdivision of the city of Denver, in Arapahoe county, Colo. Upon that day the appellee bank began suit in the district court of Lake county against said Richard Cline upon an overdue promissory note, and in aid thereof sued out a writ of attachment, which, on the same day, it caused to be levied upon these lots. On the 18th day of March, 1890, Cline had given to the appellant, Jerome, a warranty deed for the same property, which, for more than three years thereafter, the same was not recorded, with the county clerk and recorder of Arapahoe county, and was not recorded until July 12, 1893,—one day after the levy of the writ of attachment. This deed from Cline to Jerome, it seems, was executed in pursuance of a contract entered into between them in the year 1889; and it is alleged in the complaint that Jerome at once entered upon the premises under such contract of sale, and thereafter has continuously been in possession up to and until after the levy of the writ of attachment. The acts of possession relied upon are as follows: In January, 1889, when the appellant contracted to buy the land, it was inclosed by a fence, and the premises of the former owner, and was used for market gardening. After the appellant got the option to purchase the property, he secured a relinquishment of the leases of the tenants, removed the fences from the land, and, with the owners of contiguous tracts, platted the same into lots and blocks, marking out the streets and alleys. Some parts of the land were hilly and rough, some low, and in September and October of 1889 Jerome employed a contractor, who, with 15 or 20 teams, graded and leveled the surface of the land, in places cutting it down from 5 to 8 feet, and removed from 8,000 to 10,000 yards of earth from one portion of the premises to another; all at the cost of about $1,000. Thereafter, and before the levy of the writ of attachment, the new streets and alleys were again marked out, rounding the surface, plowing out gutters, and marking out the alleys. Some of these things were done before, some after, Jerome secured his deed, but all after his option to buy. At various times appellant went upon the premises, alone and in company with others to whom he was attempting to sell the land. The property was assessed in his name from 1889 to the present time, and during such time he paid the taxes thereon. The appellant cooperated with owners of adjacent lands in constructing an electric road passing through the property, and in subscribing for a schoolhouse on adjacent property, and the erection of a church on the same ground; and joined contiguous owners in grading Mississippi
answer. The court also erred in refusing to permit defendants to file a cross complaint bringing in William & Walker, and setting up their cause of action for damages on the agreement alleged to have been made by William & Walker and plaintiff with defendants. Judgment reversed, and the new trial ordered. Costs awarded to appellants.

SULLIVAN, C. J., and HUSTON, J., concur.

HARVEY v. ALTURAS GOLD MIN. CO. LIMITED.

(Supreme Court of Idaho. Jan. 16, 1893.)

MASTERS AND SERVANT—RECIPIROCAL RIGHTS AND DUTIES—DEFECTIVE MACHINERY—PROMISE TO REPAIR—LIABILITY FOR INJURY—QUESTIONS FOR JURY.

1. The general rule as between master and servant is: A servant undertakes, when he engages in a certain kind of work, that he has the necessary skill and experience to perform the work he undertakes, that he understands the management of the machinery necessary to perform this work, the machinery generally used to perform this work, or the particular machinery which he is in use in this particular instance.

2. That he will exercise the necessary care used by a man of prudence in doing such work as he is obliged to perform for his employer. If he fails in either of these, and is injured in consequence thereof, he is guilty of contributory negligence, and cannot recover.

3. On the other hand, his employer engages to furnish machinery and tools ordinarily used in the performance of such work; that he will keep such machinery and tools in a reasonably safe and good condition while such work is being performed. If the employer fails in either of these particulars, and the servant is injured thereby, the servant, having full knowledge of the conditions required on his part, can recover a reasonable sum for damages by him suffered.

4. If the servant, after engaging in the work, finds the ends defective, and not in good condition, and that some of them are dangerous, then he is charged with another duty; that of informing his employer, or his agent who is directing the work, of such defect.

5. If the employer, after being informed, refuses to put the machinery or tools in good condition, the servant should be entitled to do the work with such machinery. If he does not do so, and is injured thereby, he cannot recover. And if, when so informed, the employer promises to remedy the defect within a reasonable time, the servant may continue in the work, and, if he is injured within such reasonable time, without any fault on his part, he may recover for such injury.

6. The question as to whether the injury occurred within a reasonable time after the promise made to repair the defective machinery is a question for the jury, with proper instructions from the court.

7. That the promises are such that a prudent man might reasonably rely upon them with confidence that they would be fulfilled, he may continue in the work, and, if injured thereby, he may recover damages from his employer.

(Syllabus by the Court.)

Appeal from district court, Elmore County; James H. Newberry, Judge.

The cause was tried by James Harvey against the Alturas Gold Mining Company, Limited, to recover for personal injuries caused by defective machinery of defendant. From a judgment for plaintiff, defendant appeals. Affirmed.

This is an action at law, brought by the plaintiff to recover damages for certain injuries suffered by him in the use of the defendant's mining machinery. It was in the Ida Elmore mine at Rocky Bar, in Elmore County, Idaho.

The defendant, a corporation, was operating, working, and mining that certain mine in Rocky Bar, Alturas County, Idaho, known and called the "Ida Elmore Mine." That the plaintiff was working at said time in said mine as a pump man, and had charge of the pump used in said mine in the night time. That, as such, it was his duty to attend to the running of the pump and the running of the pump in said mine, which is of that class called "Vernish" pumps. That said pump was in said mine and in said condition, and, when it required repairing or repairing, was dangerous by reason of certain defects in its construction, and of the injury and injuries which it was sometimes in said mine. That the door plate of the pump had been broken and in replacing the same, instead of using a new one, the said broken one had been used and, instead of fixing it so that it might be removed when required, as the same was devised and intended in the construction of the pump, it had been permanently fastened to the said cylinder by rivets and bolts in such a manner that it could not be removed as intended, thus making it necessary, in reaching the valves and any part of the inside of said cylinder, instead of removing said door or plate, as intended, to remove the top or head of said cylinder, together with the columns and pump rod, suspending the same by use of a yoke devised and in use in said mine for that purpose. That the said Ida Elmore mine had been for a long time prior to the said 15th day of August 1886 filled with water, and by reason thereof the defendant, and particularly the yoke above mentioned, had become slimy and sick, so that it did not hold well, and was unsafe to use for the purpose above set forth. That the defendant had at said mine, on or before the said 15th day of August, duplicate doors or plates of the kind above mentioned fitted to be used as a substitute for the said pump cylinder, but had failed and neglected to replace the said defective and broken door or plate with one of the said duplicate perfect ones mentioned, and willfully and negligently permitted said pump to remain in the defective and dangerous condition before alleged. That before the said 15th day of August, plaintiff, having discovered the defective and dangerous condition of said pump, reported the same to the foreman of said mine, and told him it was unfit for use, and dangerous, and asked for the repair or the said mine. That the foreman of said mine did not order the repair or the said mine, and put it in a good condition, by replacing said broken door or plate with one of the perfect duplicates aforesaid, to
which said foreman refused his assent, and directed plaintiff to continue the use of said pump as theretofore, and informed plaintiff that no change would be made until after the first of the following month. Plaintiff protested against the use of the said pump in its defective condition, but was required and compelled, in the regular course of his employment, to use the same, notwithstanding its dangerous condition. That on the 18th day of August, 1886, it became necessary to repair the valves and packing in the said cylinder, and, being unable to remove the said door piece for that purpose, as hereinbefore described, plaintiff reported to the shift boss in said mine, who requested and directed him, as was the duty, to have some miners under his direction hoist the pump column and rod with cylinder head away from and above the cylinder, so that plaintiff could reach the bucket thereof. That thereupon blocks and tackle were attached to the said rod and column, and the same were, by the miners at work in said mine, hoisted through the yoke above described, and the said yoke clamped together with the bolts and appliances aforesaid as firmly as its condition would permit. The cylinder head and lower end of column and rod were then about two feet above the top of the cylinder, thus leaving the top of the cylinder open when the same was so hoisted and clamped as aforesaid. Plaintiff, who was using the cylinder at the bottom of the mine, called up to the miners who were at work as aforesaid, a distance of about 15 feet above him in the shaft, if certain thing was ready, and made fast and safe, to which they replied that it was. Thereupon plaintiff commenced making the repairs. That in preparing for said work as aforesaid, and in doing the same, plaintiff took every precaution to protect himself from injury that the condition of said pump and appliances would allow, and neglected no means that were then and there to be had and used to prevent accident and avoid danger. That said cylinder head, column, and rod are of great weight. That while plaintiff was doing the said necessary work in said cylinder as aforesaid, the said pump column, by reason of the said defective condition of the yoke, slipped through said yoke, and fell with great force and violence, with the combined weight of the column, cylinder head, and pump rod, upon plaintiff's arms, crushing them between the cylinder head and the cylinder, thereby inflicting upon him injuries of dangerous and painful character. That said injuries have completely and permanently disabled him from pursuing his occupation above mentioned, or any avocation involving or requiring any physical strength or the use of his arms. That by reason of the injuries aforesaid he has been rendered, and is now, and will be hereafter for the remainder of his life, unable to maintain himself and family by his labor, or any occupation with which he is familiar, and demands damages in the sum of $30,000. The defendant, answering, admitted its corporate character, admitting that at the time alleged it was mining, operating, and working the said mine as set forth in the complaint; admits that the door plate of the chamber, as described in plaintiff's complaint, had been broken, and for the purpose of preventing leakage in the cylinder the same had been permanently secured and fastened; also avers that the injuries complained of as resulting from plaintiff's negligence on the part of the plaintiff, and denies all the other material allegations. Trial was had before the court and a jury, resulting in a verdict and judgment for the plaintiff in the sum of $10,000. Defendant moved for a new trial, on the ground that the verdict is against law, and on the ground of error of law occurring at the trial, and excepted to by the defendant. Said motion was heard upon a statement of the case by the Honorable C. O. Stockslager, judge of the Fourth Judicial District, and a new trial refused, from which order refusing a new trial said defendant appeals to the supreme court.

R. Z. Johnson, for appellant. Littleton Price, for respondent.

MORGAN, J. (after stating the facts.) The parties, by their attorneys, filed a stipulation to the following effect: "That the defendant waives upon appeal all exceptions to the amount of the verdict, and consents that the grounds of excepting damages stated in defendant's notice of intention to move for a new trial may be stricken from the record; and defendant admits, for the purposes of this appeal that the injuries and damages sustained by the plaintiff were sufficient to support the amount of damages found by the jury if plaintiff was entitled to recover damages against the defendant, and it is agreed by the evidence as to the character of the plaintiff's injuries and the amount of damages sustained by plaintiff be stricken from the record."

Morgan then submits in consideration in this court all questions except the question as to whether the verdict is against the law, and as to whether improper instructions were given or refused.

The evidence shows that the plaintiff was injured in repacking the bucket upon the pump rod; that he had done this work but once before the occasion on which he was hurt; that this was on the 15th day of July, 1886; that one Able Rowe was foreman of the said mine, and that when the plaintiff undertook to repack the bucket he discovered that the floor piece of the chamber, which is usually taken off for the purpose of repacking the bucket, had been broken. This was on or about the 15th day of July, 1886. The plaintiff, sworn as a witness on his own part, in reference thereto, testifies as follows: "I was a pump man and was employed for that purpose of the Idaho mine. I worked on the night shift. I am acquainted with the working of the Cornish pump—the kind used in this mine. I have been mining all my life. Able Rowe was foreman of the mine. He worked superior and principal. When I was going to work on the evening of the 17th day of August, 1886, I met Mr. Rowe. He told me that the bucket at the fourth level was hanging, and that it would have to be changed, so
that I could get the water up for the men to work in the morning. After supper I told the men I was going to change the bucket rod, and told them to stop at the 300 foot level. The men got all the blocks down, made the frame, and then I went down. I lifted the pump column about 10 feet. Then I put a block under it, about 20 feet between the two joints. This block was there for that purpose. The men lowered the column back onto this block. Then I called up to them to screw up the yokes tight as tight as they could draw them. I told the men then to take off the blocks, and put them on the bucket rod, which they did, and then lifted it up to where we could change it. I took off the old bucket and put on the new one. Then I called to them to lower away. They tried to lower the bucket to its place, but it was not right, I put my hands into the top, to keep it straight, and make it go into the cylinder. The men above gave the rod a little jar, and the whole thing came out as we wanted. I was fastened tight there. I told the men to take the yokes off the bucket rod, put them on the column, and lift it off. They did this, and got me out, and afterwards took me to the surface. This is not the usual way of changing the bucket. When the column is the same size as the working barrel, we took the bucket clear out at the top, and changed it; otherwise we took off the column piece. I could not take it out at the door piece because it was broken, and had been made in such a way that it could not be taken off. I first knew the door piece was broken on the 26th of July. I changed the bucket then. I put this block in between the joints where the column was broken. It was a 3½ scantling. I used everything there to make it safe. There was nothing else there to use.

Mr. Rowe the next morning, and asked him if the door piece was where it was lying there at the surface would not be. He said it would exactly. I said, "You had better look that new one put on, because if there are any slips when a man is changing the bucket, he will have his arms cut off." He said he would ask Capt. Anthony superintend about it. I asked him afterwards if he had seen Capt. Anthony about it. He said he had, and that he said he would have the new door piece put on as soon as possible. It went on three or four days, and I spoke to Mr. Rowe again. He said he had been talking to Capt. Anthony about it, and he (the captain) said he was going to change the pole. Rowe then told me they were going to lower the pole. This would do away with the draw lift with the broken door. They wanted to get one enough ahead to keep the mill running while they were making the change. Somewhere about the first week in August I met Capt. Anthony myself. He asked me how the men were going. I told him there was nothing on the main rod, if the thing should break, to keep it from going to the bottom of the shaft, and in case of a leaky pump when the men are changing the bucket there will be some men get hurt, if not killed. He said they were going to change the pole from the third level to the fourth, and do away with that draw lift with the broken door piece that was there. He said he was going to do it as soon as they got quartz enough to keep the mill running while they were making the change. If the door piece had not been broken we would have lowered the bucket down from the working end to the chamber, and changed the bucket through there. This would have been perfectly safe. I had to call the men to help me fix the pump. The night before I hurt I called five men, and men might be in. I could not have put in more props. If we had we could not work to fix the bucket. I changed the bucket about twice while I was the first time the 26th to the 28th of July, and then I was hurt. I did it the first time the same way as the last. The column might have been supported without the block being put in. It might stay all right, but I did not think it safe. I put the block in to make it perfectly safe. I considered that when I had the block in, and the yokes on top, it was pretty safe. I thought the thing was safe enough. I considered I was taking very little chances when I had the prop in, and I say that I considered that it was taking any chances. I had no suspicion it would fall.

George Slack, sworn on the part of the defendant, testified as follows: "That the bucket was put in a number of times while I worked there, and was always done the same way; that is, by having the pump column, and lifting the bucket to this place, and changing it there. Never so far as he knew, changed at the door plate. Didn't know whether the bucket door piece was then put on or not. Sometimes the block was used between the parts, and sometimes it was not. Either way he considered safe. He assisted in changing the buckets himself every day while there.

P. E. Erickson, sworn, testifies that he was a machinist, and had been one for years; that he understood the pumps, and describes the method of changing the bucket on the pump. The witness testifies that the yoke will hold up, when properly screwed up, and that you can put on it; that it will hold between three and four tons; that this column, above where it was taken apart with the rod, would not weigh between ten or eleven hundred. In a test they put on 2,369 pounds, and held it up. If the yoke was screwed up tight, any little shaking done on the top would not make it down. This a man who had never tightened up the yokes could not be trusted to do, unless he was shown how first. The proper piece to change the buckets in a Cornish pump is through the door piece, but this was broken, and it could not be done there. That pipe does not rest on timber at all. It is suspended by the yokes altogether, and works that way.

Donovan, for the defense, swears that sometimes the pump in the Elmora mine was filled with water, and they could not change the bucket at the door piece. Then they would have to break the column in
he same way this was done. That he had assisted in doing this since this accident occurred, and it was safe to do so, but he did not do so until the last bit of oil was put in the column. He had to fix the pump at the last moment to keep the oil from running out. He had two or three conversations with the foreman, and the latter fixed the oil in the last day of August, 1888. The last time the oil was fixed, he saw the superintendent, Anthony, and spoke to him about it. He told him that it was not safe to use the yoke and that he would fix it immediately. Anthony replied that he was going to fix the yoke, and that he would do it as soon as possible. The oil had been fixed for two or three months and it was not safe to use it.

E. Koch sworn. Witness on the part of the defense. He swears that he is a mining engineer, and has made a study of mining. He knows how much one yoke will support: it is sufficient. It will support 3,000 pounds, and would support more. C. S. Watson, an experienced mine foreman, swears that the column may be suspended by the yokes with perfect safety: no danger at all. If the yoke was properly set up, there was no danger at all. Yokes are generally used: sometimes with yokes and props. There is always more risk in breaking the column than in changing it at the door. In the latter case there will be no risk at all.

There is much of the testimony on this subject that we have not thought it necessary to copy into the opinion, as it substantially agrees with that already given. A few facts must be held to be fully proven: that the column was defective in that it had a broken door piece to the chamber below where the bucket worked. While the evidence shows that the bucket might be changed in safety, it is probable that the column, still the fact remains that, if the door piece had been whole, and in good condition, so that the bucket could have been changed through the door piece, the accident would not have occurred, and the plaintiff would not have been hurt. The court is unable to say that such negligence on the part of the company, in not requiring the company to furnish the company, would not have been prevented. The court is also unable to say that the company would not have been negligent in not furnishing the company, and in not requiring the company to furnish the company, if the column had not been broken.

The case of Bannister v. Railway Co., 100 N. 217, Justice Hylan says: "The master is under obligations to see that the plaintiff is not exposed to any danger by reason of the negligence of the servants, in conducting the master's business, to perils or hazards against which he may be guarded by proper diligence on the part of the master. It is the duty of the master to be sure that the master is bound to observe all the care which prudence and the exigencies of the situation require in providing the servant with machinery which is safe for use by the employer. If the servant, after discovering the defect in the machinery, continues to use it without giving notice to the company, he shall be held to be bound to observe all the care which prudence and the exigencies of the situation require in providing the servant with machinery which is safe for use by the employer. 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was such that none but a reckless engineer, utterly careless of his safety, would have used the engine without it being removed. If, under all the circumstances, and in the absence of the promises to remedy the defects, the engineer was not wanting in due care in continuing to use the engine, then the company will not be excused for the omission to supply proper machinery, 
upon the ground of contributory negligence."

See also, Ford v. Railroad Co., 110 Mass. 261; Lanning v. Railroad Co., 49 N. Y. 521. The facts in Hough v. Railway Co., supra, are almost precisely similar to those in the case at bar. In both cases the plaintiff knew of the defects in the machinery, and complained to the proper person to have the defects remedied. It was not done, but a promise was given that it would be remedied within a reasonable time. In the case of the engine, the appliances were in constant use; while in the case at bar there was no danger whatever, except when they were required to change the bucket. The plaintiff had been required to change the bucket but once before the accident occurred, embracing a period of over two months. Then it was done without any accident, but after this time the plaintiff repeatedly complained to the foreman and the superintendent, of the defective pump, and was promised that it should be fixed, or the use of the chamber with the defective door piece done away with; and the promises seemed to be such that he had a right to rely upon. This was also a question for the jury. Green v. Railway Co., 111 Ky. 378.

O'lcorke v. Railway Co., 22 Fed. Rep. 191, is cited by appellant, and the following language quoted: "He [the employee] had the right to wait a reasonable time to consider the circumstances of the case, and to give notice to his employers that he is in danger; time enough to see whether the employer means to have the defect remedied; time to see the general way in which he conducts his business. And if he finds that he intends to use defective machinery, he at least has the right to conduct his business in a dangerous manner: finds it is to his interest; finds that after he has been notified he still intends to conduct his business in that way, and then goes on and continues in the work,—it is fair to presume that he takes the risk." This may be assumed to be the law, and no one knows better than the attorneys for the plaintiff that the language of the court in this and any case must be taken with reference to the facts in such case. In the above case the facts were that the plaintiff was a car repairer; that he was accustomed to make such repairs as could be made, with the car to be repaired standing with other cars on the side track; that it was the duty of the company to furnish him with a red flag, to set up near where he was at work, to warn the engineer that he was at work under the car, and that the car must not be moved. He had done this work six or eight months, and no flag had been furnished him in all that time, and he had asked for none. He had made no request to be furnished with a flag, and, while so engaged under a car, repairing it, the cars were moved, and he was injured. He was held to have taken the risk upon himself. In the case at bar no such circumstances exist. The plaintiff had been at work for two months, it is true, but he had complained to the foreman on several occasions of the defect in the machinery, and at each time he had been promised that it would be remedied. It was not done, but during all that time he had been obliged to repair the bucket two or three times. Once, very soon after he commenced work for the company; and in the latter, when he was hurt,—and he had been promised only a short time before the accident occurred that the chamber in which the defect existed would be remedied. Had the plaintiff a right to believe, in view of the statement, that they were going to change the pump, by putting the pole down, and taking away the broken door piece, thereby removing the danger entirely, before he would again have to change the bucket? Might he rely upon the promises? Would a workman so act as to rely upon all of the facts, that he had changed the bucket once by using the yokes and prop, which other persons having knowledge of the machinery believed had been remedied? Having repaired the bucket once without accident, he doubtless believed he could do it again with like success; but in doing it the second time under these circumstances, it would hardly be said as a matter of law that he took the risk. As has been said, this was a question for the jury under all the circumstances of the case, with proper instructions from the court.

The case of Foley v. Electric Light Co., (N. J. Sup. 144 Atl. 487), is cited. The language used by the court in this case is very strong, and in some instances seems to overstep the true rule as to assumption of risks by the employee, but in doing it the court is like the other cases. It is substantially stated in the syllabus, which is by the court, and is as follows: "(1) While entering a repair service he assumes all the ordinary risks that are incident to the employment; and where the employment presents special features of danger, such as are plain and obvious, he also assumes the risk of those; and (2) the cases rigidly hold the doctrine that the servant takes upon himself such definite and determinate risks as are obvious, and no action will lie against the master for injuries to the servant in such cases where he himself has not induced the servant to remain by a promise to remove the danger." There can be no question but these quotations correctly state the law. The servant, when he accepts the service, assumes all the risks incident to the employment; that is, incident to the employment when the employer furnishes proper and reasonably safe machinery, an obligation to do which is always upon the employer. A risk which arises from the use of defective machinery is not a risk incident to the employment; and where the machinery is defective, and is complained of by the servant, and a promise is given to have the defect remedied within a reasonable time,
The servant does not assume the risk incidental to the employment with such defective machinery within such time. The court, in the above case, goes on to say: "If the servant has full and equal knowledge with the master that the machinery or materials employed are defective, and he remains in the service, this may constitute contributory negligence; but if it appears that the master has promised to mend the defect, the mere fact of his continuing in the employment does not, of itself, as matter of law, exonerate the master from liability, but the question of contributory negligence is one for the jury." This language is specially applicable to the case at bar. In which it was made that the defect should be remedied. In the case of Alcorn v. Railroad Co., (Mo. Sup.) 18 S. W. Rep. 188, the court held that the servant violated one of the rules of the company, which forbade the switchman going between the cars while in motion to uncouple or uncouple cars, by reason of which he was injured, and therefore he could not recover. The various propositions of law are stated in this opinion, adapted to different circumstances and facts, but they do not differ from those already laid down. In the case of Baltimore & P. R. R. Co. v. State, (Md.) 23 Atl. Rep. 310, there were no facts that would enable the plaintiff to recover under any state of the case. The principle stated in the opinion of the court does not differ in any respect from those cited in other cases herein mentioned. It appeared that the deceased had been accustomed to pass through the tunnel two or three times a day for two or three months, and was therefore entirely familiar with the tunnel, and had done this without complaint. He was afterwards killed by a projecting roof in the tunnel. It was held under such state of facts that he assumed all the risks incidental thereto. The case is not in point. A reference to the facts in the case of Gibson v. Railway Co., 64 N. Y. 433, will at once show that it is not at all in point in the case at bar. Beach, Contr. Neg. § 329, referred to, and states the true rule under that state of facts, and the next section (140) gives the rule precisely applicable to the facts in the case at bar, thus: "It is the rule applicable to this matter that if the servant, when the defect or danger is brought to his knowledge, when he discovers that the machinery or the instruments furnished for his labor are unsafe or unfit, continues in the employment without protest or complaint, he is deemed to assume the risks of such danger, and waives any claim upon his master for damages in case of injury," that is, if he continues in the employment without protest or complaint. The protest or complaint takes it out of the category of those cases where the servant assumes the risk. It is, of course, true that the employer, having notice that the employer intends to use old or defective machinery, may enter into an express contract to use such machinery. If then he is injured thereby, he cannot recover. Hemay go further. Without an express contract, he may enter upon the use of defective machinery, knowing it to be such, or having almot or even reasonable opportunity to know its defects or its dangerous character, and continue in the use of such defective or dangerous machinery without complaint, and without any promise on the part of his employer to remedy the defect, or remove the danger, and, if injured thereby, he cannot recover. Hickey v. Taaffe, (N. Y. App.) 12 N. E. Rep. 296; Michael v. Stanley, (Md.) 23 Atl. Rep. 1065; Plunkett v. Donovan, (City Ct. Brook.) 12 N. Y. Supp. 454; Hayden v. Manufacturing Co., 29 Conn. 518. The state of facts and conditions, however, set forth above do not exist in the case at bar.

It is scarcely necessary to comment upon all the cases cited, as none of them change the principles already announced, which govern this class of cases. The general rule is, first, the servant cannot recover when he engages in a certain kind of work, that he has the necessary skill and experience to perform the work he undertakes; that he understands the management of the machinery necessary to perform this work,—the machinery generally used to perform such work, or the particular machinery which he sees in use in this particular instance; that he will exercise the ordinary care used by a man of prudence in performing such work as he has engaged to perform for his employer. If he fails in either of these, and is injured in consequence, he is guilty of contributory negligence, and cannot recover. On the other hand, his employer engages to furnish machinery and tools ordinarily used in the performance of such work; that he will keep such machinery and tools in reasonably safe and good condition while such work is being performed. If the employer fails in either of these particulars, and the servant is injured thereby, then the conditions required on his part can recover a reasonable sum for the damages by him suffered. If the servant, after he engages in the work, discovers that the machinery or tools furnished him are defective, or are not in good condition, and that they, or some of them, are dangerous, then he is charged with another duty: that of reporting the employment of his agent who is directing the work, of such defect. If the employer, after being informed, refuses to put the machinery or tools in good condition, then the brain should decline to do the work with such machinery. If he does not do so, and is injured thereby, he cannot recover, but if, when so informed, the employer does not, by the time. The servant may continue in the work, and, if he is injured thereby within such reasonable time, without any fault, on his part, he can recover for such injury. The question of the fault of the fellow servant does not, as we think, enter into this case, as there is no evidence that there was any fault on the part of the fellow servant. Tested by these rules, and by the principles herebefore stated, with the facts as they appear in evidence in this case, we think the plaintiff is entitled to recover a reasonable amount for the injuries suffered by him. The question as to the amount of damages to which plaintiff
entitled having been taken out of consideration by the stipulation, we give no opinion in regard to it.

As to the admission of improper testimony. The plaintiff was permitted to produce over the objection of defendant, that shortly after the accident occurred the broken door piece was replaced with the new one. This was improper evidence. In view of the fact that we think the plaintiff was entitled to recovery upon the evidence that was entirely competent, it cannot be held to have prejudiced the case of the defendant. The same may be said of other evidence that was questionable.

Objection is made by appellant to the second instruction given by the court, and a portion of said instruction is quoted, because no mention is made in said instruction of the ignorance or knowledge of the employee as to the actual condition of the appliances and machinery, and his consequent assumption of the risk. This point was covered in three or four of the instructions given by the court at the request of defendant, and the instructions must all be taken together. The third instruction given by the court at the request of defendant is objectionable on the ground that the jury might infer from it that the servant only assumes ordinary risks, and that, although he gets knowingly and voluntarily, he does not assume extraordinary risks. This defect is also covered by instruction 5 of the court, and also in those given by the court on its own motion, and by instructions 3 and 4 given for defendant. And these instructions are so strongly in favor of the defendant, under the circumstances connected with this case, that, and the verdict been given by the defendant, the plaintiff might well have complained of them, as they ignore the fact that plaintiff had complained of the defect, and had been promised that it should be remedied. Instructions 2, 5, 6, 7, 9, 10, and 11, asked on the part of the defendant, while correct as abstract principles of law, are not applicable to this case, for the reason, as stated above, that they ignore the fact that complaint was made by the plaintiff and on other occasions, and promises were given that the defective machinery would be repaired or taken away. No. 8, requested by defendant, is scarcely intelligible, (perhaps, by reason of the copy in the record being incorrect,) and was properly refused for that reason. Judgment affirmed. Costs awarded to respondent.

SULLIVAN, J., concur.

HUSTON, J., having been of counsel in the court below, took no part in the hearing or determination of this case.

ROACH et al. v. CITY OF EUGENE.
(Supreme Court of Oregon. Jan. 9, 1883.)

MUNICIPAL CORPORATIONS—STREET IMPROVEMENTS—LETTING OF CONTRACT—NOTICE—SUFFICIENCY.

1. Where a city charter provides that the notice required to be given of the letting of a contract for street improvements shall state the time when, and the place where, such contract will be let, and the time within which the work must be done, and requires the contract to be let to the lowest responsible bidder, a notice which states that bids will be received at the recorder's office until a date named, the work to be completed within 30 days after letting the contract, is sufficient, as at the date specified the lowest bidder will be entitled to the provisions of a city charter requiring notices of the letting of street improvement contracts to be posted in such places.

Appeal from circuit court, Lane county; MARTIN L. FLYPS, Judge.

Petition by J. E. Roach and others against the city of Eugene for a writ of review to examine into the legality of defendant's proceedings in making certain street improvements. From a judgment for plaintiffs, defendant appeals. Reversed.

Geo. B. Dorris, J. J. Walton, and E. B. Skipworth, for appellant. A. E. Gallagher, for respondents.

LORD, C. J. This is a petition for a writ of review to examine into the legality of the proceedings by the defendant in making certain improvements by grading and graveling a part of Madison street in said city, etc. A return was made to a trial had thereon, which resulted in a judgment in favor of plaintiffs, declaring such proceedings irregular and void. From this judgment the defendant has appealed to this court.

The petition, inter alia, recites that the plaintiffs are owners, respectively, of separate pieces of property upon which the defendant declared the cost of improving in front of such property a lien thereon, and that the defendant threatened and was about to enforce such lien by sale of said property; and prayed for an order directing the city recorder, who had charge of the record and proceedings of the defendant, to return into said court a certified copy of that part of all ordinances pertaining to the establishment of a grade, grading and graveling, and levying assessments upon the property along Madison street, etc., and such parts of ordinances 164, 165, and 161 as relate to said Madison street, together with a certified copy of the notice to contractors of the letting of the contract, etc., and the proof of posting the same, etc., pursuant to ordinance No. 166, together with a certified copy of all records and minutes of all proceedings had by the common council of the defendant pertaining to the grading and graveling of said street, etc. The contention for the plaintiff involves substantially two points: First, that the notice of the letting of the contract to make such improvements is fatally defective; and, second, that the proof of posting the same is insufficient. The notice to contractors and property owners along Madison street is as follows: "Notice is hereby given that pursuant to an order of the common council July 30, 1881, bids will be received by the street committee at the recorder's office until 7 o'clock P. M., August 11, 1881"
and Taft Hill Members) consists mainly of marine sandstone, siltstone, and shale; the upper part (Vaughn Member) is of continental origin and is composed largely of tuffaceous sandstone, siltstone, mudstone, and bentonite. The lower part of the Marias River Shale (Floweree Shale and Cone Members) is predominantly dark marine shale, the middle part (Ferdig Member) contains significant amounts of marine siltstone and sandstone, and the upper part (Kevin Member) is mainly dark fossiliferous marine shale. The Telegraph Creek Formation consists of alternating beds of marine shale and sandstone. The Virgil Sandstone is chiefly a massive, thickbedded feldspathic marine sandstone. The Two Medicine Formation consists of two spatially separated rock sequences that differ greatly from one another in overall lithology. The western facies, largely of continental origin, is divided into a lower sedimentary member composed mainly of sandstone, mudstone, and carbonate shale and an upper volcanic member composed of clastic volcanic rocks, latitic and trachytic lava flows, and ash-flow tuff. The eastern facies, also largely of continental origin, is made up of sandstone, mudstone, carbonate shale, bentonite, and clastic volcanic rocks. The St. Mary River Formation is formed largely of sandstone, siltstone, and mudstone of continental and brackish-water origin.

Strata assigned to the Cretaceous and Tertiary Systems include the Willow Creek Formation of Late Cretaceous and Early Paleocene (?) age, the Adel Mountain Volcanics of Lyons (1944) of probable Paleocene age, and older colluvial deposits of probable Pliocene age, all of continental origin. The maximum aggregate thickness of these rocks is about 4,520 feet (1,371 m). The Willow Creek Formation consists largely of variegated tuffaceous sandstone, siltstone, mudstone, and volcanic-pebble conglomerate. The Adel Mountain Volcanics of Lyons (1944) is composed mainly of trachybasantic and trachyandesitic lava flows and clastic volcanic rocks. The older colluvial deposits consist of coarse unconsolidated rock debris of local origin.

The Quaternary System is represented by terrace gravel and glacial-lake deposits of Pleistocene age, colluvial and landslide deposits of Pleistocene and Holocene age, and alluvium of Holocene age. These deposits, widely distributed throughout the area, have a maximum aggregate thickness of about 275 feet (84 m).

Intrusive rocks in the area include gabbro of probable Precambrian age; latite and trachyte of Cretaceous age; diorite, rhyodacite porphyry, and quartz monzonite porphyry of probable Cretaceous age; rhyolite of Cretaceous or Tertiary age; analcime gabbro, trachybasalt, and quartz monzonite porphyry of probable Tertiary age; and hornblende monzonite of Tertiary age. The intrusive rocks are found mostly in the form of dikes and sills.

The area contains insignificant metallic mineral deposits and more promising industrial mineral resources. The metallic mineral deposits consist of small veins bearing copper, silver, and gold, and sedimentary deposits of tanniferous iron ore. The industrial mineral resources include gravel and sand, several types of construction stone, clay and clay shale, bentonite, silica, and coal. Construction stone, including both dimension stone and crushed and broken stone, is the most abundant mineral resource. The rocks that may be utilized as construction stone include welded tuff, latite and trachyte, trachybasalt, quartzitic sandstone and quartzite, argillite and siltite, and limestone.

INTRODUCTION

The Wolf Creek area, as here defined, covers about 200 square miles (518 km²) along the eastern front of the northern Rocky Mountains in western Montana. The area is bounded by long 112°30' W. and 112°15' W. and by lat 47°00' N. and 47°15' N. (fig. 1). About 8 square miles (22 km²) in the northeastern part of the area is in Cascade County; the remainder is in Lewis and Clark County. The town of Wolf Creek, population about 100, is the only settlement. Helena, the State capital, is 28 miles (45 km) south, and Great Falls is 40 miles (64 km) northeast. The Wolf Creek area encompasses four 7½-minute topographic quadrangle maps of the U.S. Geological Survey—the Wolf Creek, Coburn Mountain, Comb Rock, and Roberts Mountain quadrangles. (See fig. 1.)

PREVIOUS STUDIES

Earlier geologic studies have touched upon this region. Alden (1932, p. 17, 48) noted Pleistocene terrace gravel along the Middle and South Forks of the Dearborn River and along Little Prickly Pear Creek. Pardee and Schrader (1933, p. 108–114) described small lode deposits of copper, silver, and gold in the Wolf Creek district of the greater Helena mining region and noted several salient features of the geology. Lyons (1944) described the igneous rocks of the northern Big Belt Range and made general observations on the stratigraphy and structure. He included most of the eastern part of the Wolf Creek area in his study. Cobban (1945, p. 1296–1297) described a section of the Sawtooth and Swift Formations on the north side of the Missouri River in the adjacent Craig quadrangle. Glassy welded tuff from the adjacent Sheep Creek quadrangle was described by Barksdale (1951), and a chemical analysis of this rock was later given by Knopf (1957, p. 87). The Two Medicine, Horsethief, St. Mary River, and Willow Creek Formations north of the Wolf Creek area have been discussed by Viele and Harris (1965). Most recently, Robinson and Marvin (1967, p. 606–607, table 1) have reported on the composition and radiometric age of glassy welded tuff from the area.

PRESENT WORK AND ACKNOWLEDGMENTS

Fieldwork was carried out in the area from 1959 to 1966, and preliminary uncolored geologic maps of the Wolf Creek, Coburn Mountain, Comb Rock, and Roberts Mountain quadrangles were...
Figure 1.—Map showing location of the Wolf Creek area (shaded) and location of U.S. Geological Survey quadrangles mentioned in this report. 1, Comb Rock quadrangle; 2, Coburn Mountain quadrangle; 3, Roberts Mountain quadrangle; 4, Wolf Creek quadrangle; 5, Craig quadrangle; 6, Sheep Creek quadrangle.

PRECAMBRIAN ROCKS—BELT SUPERGROUP

published at a scale of 1:24,000 (Schmidt 1963, 1966; Schmidt, Swanson, and Zubovic, 1964; Schmidt and Strong, 1968). Final multicolor maps have now been published, also at a scale of 1:24,000 (Schmidt, 1972a, b, c; Schmidt and Strong, 1972). The geology of the four quadrangles is somewhat generalized at a scale of 1:48,000 in plate 1 of this report. In the report, new information is provided on the stratigraphy, paleontology, and petrography of the rocks and on the mineral resources of the area. The rock descriptions, which constitute the bulk of the report, are rather technical and are intended primarily for geologists; the section on mineral resources, which should be read in conjunction with plate 1, is more suitable for the general public.

Herbert R. Shaw, Ceylon P. Strong, Jr., Donald A. Swanson, and Peter Zubovic assisted ably with the fieldwork at various times. Charles E. Erdmann and Andrew F. Bateman, Jr., of the Great Falls, Mont., office of the U.S. Geological Survey, provided office space, storage facilities, and supplies that aided the work in many ways. Many other colleagues on the staff of the U.S. Geological Survey have contributed ideas and information that have been helpful to the study. William A. Cobban, Montis R. Klepper, and the late William T. Pecora made reconnaissance geologic studies in the Wolf Creek area prior to 1959 and introduced the writer to the geology of this part of Montana. William A. Cobban visited the field party in 1959, 1960, and 1962, and assisted greatly by skillful collecting of fossils and by providing information on the stratigraphy of the Cretaceous rocks. Discussions in the field with James R. Gill, Montis R. Klepper, Melville R. Mudge, W. Bradley Myers, G. D. Robinson, Harry W. Smedes, and Robert L. Smith aided in solving several lithologic and stratigraphic problems. Fossils collected during the course of the fieldwork were identified by William A. Cobban, J. Thomas Dutro, Jr., Allison R. Palmer, William J. Sando, and Norman F. Sohl.

STRATIFIED ROCKS

The stratified rocks in the Wolf Creek area include a wide variety of sedimentary and volcanic rocks of Precambrian, Cambrian, Mississippian, Jurassic, Cretaceous, Tertiary, and Quaternary age. The maximum aggregate thickness of these rocks is about 24,000 feet (7,316 m).

PRECAMBRIAN ROCKS—BELT SUPERGROUP

Precambrian strata are represented by the Greyson Shale, Spokane Formation, Empire Formation, and Helena Dolomite of
and sphene. The phenocrysts of potassium feldspar form stubby crystals as much as 2 cm wide and 4 cm long in some of the sills and thin tabular crystals as much as 8 cm long in others. A chemical analysis of one of the sills is given in column 6 of table 3.

Some of the sills intrude rocks of the Willow Creek Formation of Late Cretaceous and Paleocene age. Others are folded, a few are cut by small thrust faults, and several are intruded along thrust faults. These relations, though inconclusive, suggest that the sills may range in age from Late Cretaceous to Paleocene. A sill of quartz monzonite porphyry that crops out along the Middle Fork of the Dearborn River about 3 miles (4.8 km) west of the Wolf Creek area appears to be definitely of late Paleocene age. It is in secs. 2, 3, 11, and 12, T. 16 N., R. 6 W. and has been dated by the potassium-argon method as 58.3 m.y. old by H. H. Mehnert of the U.S. Geological Survey (U.S. Geol. Survey, 1971, p. A87). The age of this particular intrusion is especially significant, for the sill is intruded along and across the Eldorado thrust zone at the eastern front of the Lewis and Clark Range and is clearly younger than the thrust.

**TERTIARY**

**HORNBLende MONZONITE**

Hornblende monzonite forms thin dikes and sills, chiefly in the eastern, central, and south-central parts of the area. The typical rock is light gray, fine grained, and equigranular, and is composed of andesine, sanidine, hornblende, augite, biotite, magnetite, and apatite. Abundant small bladelike crystals of hornblende, as much as 5 mm long, characterize the rock. A chemical analysis is given in column 4 of table 3.

A dike of hornblende monzonite in the south-central part of the area contains large inclusions of crystalline basement rock of probable early Precambrian age. This is the only intrusion in the Wolf Creek area that contains such inclusions. The dike is about 7 miles (11 km) long and has a maximum width of about 12 feet (4 m). The inclusions of basement rock are present throughout the entire length of the dike; they are most abundant and largest within a short segment in the SW1/4 sec. 16, T. 15 N., R. 4 W. The inclusions consist of subangular to subrounded fragments of granite, granitic gneiss, quartzite, schist, and anorthosite that range from pea-size to large blocks as much as 5 feet (1.5 m) across. The largest blocks are of granite and granitic gneiss; the inclusions of quartzite, schist, and anorthosite are mostly less than a foot (30 cm) across.

The dikes cut thrust faults and folds, were intruded after the deformation that affected the enclosing rocks, and are the youngest bedrock unit in the Wolf Creek area. Their young age is confirmed by a potassium-argon date of 46.3 m.y. (middle Eocene) obtained on hornblende from one of the dikes by H. H. Mehnert (written commun., 1970). This dike is in the south-central part of the area and is the northernmost of two parallel northwest-trending dikes that crop out in secs. 20, 28, and 29, T. 15 N., R. 4 W. (pl. 1). The dated sample is from the east side of the Stearns-Wolf Creek Road in the northeast corner of sec. 29, T. 15 N., R. 4 W.

**MINERAL RESOURCES**

The Wolf Creek area contains insignificant metallic mineral deposits and more promising industrial mineral resources. The metallic mineral deposits consist of small veins bearing copper, silver, and gold, and sedimentary deposits of titaniferous iron ore. The industrial mineral resources include gravel and sand, several types of construction stone, clay and clay shale, bentonite, silica, and coal.

**METALLIC-MINERAL DEPOSITS**

**VEINS BEARING COPPER, SILVER, AND GOLD**

Small lode deposits of copper, silver, and gold are present in narrow veins in the Greyson Shale, Spokane Formation, and Empire Formation of the Belt Supergroup in the southwest part of the area. These deposits, and two deposits nearby to the south, constitute the Wolf Creek district of the greater Helena mining region described by Pardee and Schrader (1933, p. 108-114). Mining in the district began after the advent of the railroad, about 1890, and was carried on intermittently until 1948 (Sahinen, 1959, p. 136). During the period 1890-1928, when mining activity was greatest, the district produced about $40,000 in copper, $10,000 in silver, and an insignificant sum in gold (Pardee and Schrader, 1933, p. 108). Since 1948, the year in which production was last reported, mining has been limited to a brief period of development at the Rosetta mine (see next page) in 1960 and 1961. Apart from the Rosetta, the old workings in the Wolf Creek district are now largely caved and inaccessible.

The veins containing copper, silver, and gold trend northeast, are steeply dipping, and are widely distributed in the area of Belt rocks. They are generally narrow, tabular, and contain lenslike
ore shoots that range from less than an inch (2.5 cm) to a few feet (1-2 m) in width. According to Pardee and Schrader (1933, p. 110-114), most of the ore is composed of yellow chalcopyrite \([CuFeS_2]\) accompanied by yellow pyrite \([FeS_2]\) in a gangue of white quartz \([SiO_2]\) and brown barite \([BaSO_4]\); some of the ore shoots also contain significant amounts of black tennantite \([Cu_9(As,Sb)S_8]\), black tetrahedrite \([Cu_5(Sb,As)S_4]\), blue covellite \([CuS]\), and black tenorite \([CuO]\); and the ore in a few of the veins is composed of iridescent bornite \([Cu_9FeS_8]\) and black chalcocite \([CuS]\) in a gangue of quartz and brown ankerite \([CaCO_3\cdot(Mg,Fe,Mn)CO_3]\). Blue azurite \([Cu_2(OH)_2(CO_3)_2]\) and green malachite \([Cu_2(OH)_2(CO_3)_2]\), which are oxidation products of the copper sulfides, are present in most of the veins.

The principal mines and prospects in the district are on Wolf Creek (Rosetta mine), Gladstone Creek, and the Middle Fork of Little Creek; along the divide between Little Creek and Wolf Creek; in the vicinity of Lanigan Mountain; near the head of Willis Creek; and along Little Creek and Sheep Creek in the adjacent Sheep Creek quadrangle. These mines and prospects are briefly described below.

**ROSETTA MINE**

The Rosetta mine, formerly the New Era or Rosenfield mine, is on the south side of Wolf Creek near the center of sec. 30, T. 15 N., R. 4 W., about 41/2 miles (7.2 km) west of the town of Wolf Creek. The principal working is an adit slightly above stream level that follows a vein southwest for more than 1,000 feet (305 m) (Pardee and Schrader, 1933, p. 111, fig. 20). Two shorter adits are on the hillslope about 240 feet (73 m) above the main adit. One directly above the main adit was driven several hundred feet (about 100 m) southwest, parallel to the vein; the second, a few hundred feet to the southeast, was driven northwest to intersect the vein. On the hillslope near the portal of the second adit is a large dump. The Rosetta vein appears to be localized in a narrow slice of green and red argillite of the Spokane and Empire Formations in the Wolf Creek thrust zone. The ore consists mainly of chalcopyrite and azurite in a gangue of quartz and barite. Pardee and Schrader (1933, p. 110) reported that the mine was operated intermittently from 1922 to 1926 and that smelter net returns for that period showed a production of $25,516, chiefly in copper but including small amounts of silver and gold. The ore ranged from 7 to 25 percent copper, contained 2 to 29 ounces, (57 to 1,106 g) of silver to the ton, and carried 10 cents or less in gold to the ton.

A small amount of development work was carried out at the Rosetta mine in 1960 and 1961. This operation ceased in 1962, presumably because of the lack of marketable ore.

**GLADSTONE CREEK**

On Gladstone Creek, a tributary of Wolf Creek, small amounts of copper ore were mined from a northeast-trending vein that runs along the south side of the creek in rocks of the Spokane and Empire Formations. The vein is about 11/2 miles (2.4 km) long. The mine workings are 1 to 2 miles (1.6 to 3.2 km) west of the Rosetta mine in the NW1/4 sec. 25, the SE1/4 sec. 26, and the NW1/4 sec. 35, T. 15 N., R. 5 W., and consist of several short adits driven southeast to intersect the vein. Near the portals are small dumps of waste vein rock carrying minor amounts of pyrite, chalcopyrite, bornite, azurite, and malachite in a gangue of quartz and ankerite. All the workings are now caved and inaccessible.

According to Pardee and Schrader (1933, p. 112), one of the adits on Gladstone Creek in the SE1/4 sec. 26, known as the Herwood mine, was under development in 1928. The adit was driven 200 feet (60 m) southeast to intersect the northeast-trending vein, which ranges from an inch (2.5 cm) to more than a foot (30 cm) in width. The ore consisted chiefly of bornite, accompanied by small amounts of chalcopyrite and chalcocite, in a gangue of quartz and a little ankerite. A sample shipment of 2,700 pounds (1,225 kg) of ore from the mine reportedly contained about $100 to the ton in copper, silver, and gold.

**MIDDLE FORK OF LITTLE CREEK**

A small amount of copper ore was mined on the Middle Fork of Little Creek. The property is on the north side of the creek, about 40 feet (12 m) above stream level, in the NE1/4 sec. 6, T. 14 N., R. 4 W. The working consists of a short adit driven along a northeast-trending vein. A pile of waste rock at the entrance is mostly iron-stained quartz that contains small amounts of chalcopyrite, azurite, and malachite. The waste pile blocks the entrance, and the adit is filled with water and is inaccessible.

**DIVIDE BETWEEN LITTLE CREEK AND WOLF CREEK**

On and near the divide between Little Creek and Wolf Creek are a considerable number of prospect pits and adits on northeast-
trending, copper-bearing quartz-barite veins. These workings are in the NW1/4 sec. 3 and the NW1/4 sec. 4, T. 14 N., R. 4 W., and in sec. 32, T. 15 N., R. 4 W. The principal mine is in the NW1/4 sec. 4, T. 14 N., R. 4 W., on the Little Creek slope at an altitude of about 4,850 feet (1,478 m). According to Pardee and Schrader (1933, p. 113–114), the workings in 1928 consisted of two adits, one more than 500 feet (152 m) long and the second more than 300 feet (90 m) long. The first adit was driven northeast along a vein a few inches (several centimeters) to as much as 5 feet (1.5 m) wide in red argillite of the Spokane Formation. Several tons of ore, piled near the entrance, consisted chiefly of barite with some quartz and a little tennantite and chalcopryite stained with azurite. The second adit, about 110 feet (34 m) above the first adit, was also driven northeast along the vein. A small stope in this adit was made at one place on an ore shoot 3 to 5 feet (1 to 1.5 m) wide that contained chalcopryite, tennantite, galena, and sphalerite. The ore body reportedly contained considerable silver. In 1960, both adits were caved and blocked a short distance from the entrance.

Other workings along the divide between Little Creek and Wolf Creek—a short adit and many prospect pits—were on outcrops of narrow quartz-barite veins stained with azurite, malachite, and limonite. These workings are now thoroughly caved; none appear large enough to have produced ore.

LANIGAN MOUNTAIN

In the vicinity of Lanigan Mountain, several conspicuous veins cut rocks of the Greyson Shale, Spokane Formation, and Empire Formation. These veins are in the SW1/4 sec. 10 and in sec. 11, T. 15 N., R. 5 W. The veins strike northeast, are steeply dipping, and are as much as 6 feet (2 m) wide and a mile (1.6 km) long. Some of the veins consist solely of white quartz, or of white quartz and crushed argillite. Others consist of quartz and considerable barite and contain pyrite, chalcopryite, and small amounts of bornite that have largely oxidized to limonite, azurite, and malachite. Prospect pits were sunk along all these veins, some to considerable depth, but apparently little if any ore was ever produced. The pits are now mostly caved; obviously they were worked many years ago.

WILLIS CREEK

At the head of Willis Creek, in the NW1/4 sec. 13, T. 15 N., R. 5 W., are several deep prospect pits that were sunk along a vein that cuts red argillite of the Spokane Formation. The vein trends northeast, dips steeply, is as much as a foot (30 cm) wide, and can be traced for about a quarter of a mile (0.4 km). The vein consists of quartz and barite accompanied by small amounts of pyrite and chalcopryite and their oxidation products. Little if any ore was produced.

LITTLE CREEK AND SHEEP CREEK

Small vein deposits of copper, silver, and gold were mined at two localities in the Sheep Creek quadrangle a short distance south of the Wolf Creek area. One is along both sides of Little Creek about 1 1/2 miles (2.4 km) above its junction with Little Prickly Pear Creek, in the northwest corner of sec. 9 and the SW1/4 sec. 3, T. 14 N., R. 4 W., roughly 3 miles (4.8 km) southwest of the town of Wolf Creek. The other locality is on the north side of Sheep Creek about a mile (1.6 km) above its junction with Little Prickly Pear Creek, in the east half of sec. 14, T. 14 N., R. 4 W., roughly 3 miles (4.8 km) south of the town of Wolf Creek. These veins and workings were examined by Pardee and Schrader (1933, p. 112–114) in 1928; the descriptions that follow are condensed from their report.

On the south side of Little Creek, the working includes three adits, one near stream level and the other two 100 and 200 feet (30 and 60 m) upslope. The two lower adits were caved and inaccessible. The upper adit, about 100 feet (30 m) long, follows a vein that strikes southwest and dips 45° NW. The vein is in gray and green argillite of the Greyson Shale, is as much as 4 feet (1.2 m) wide, and consists of crushed argillite and quartz containing streaks and bunches of bornite and coatings of malachite on seams. The vein can be traced south of the adit for 400 feet (122 m) or more. From this working, 14 carloads of ore were reportedly shipped, but no record of values is available.

On the north side of Little Creek, an adit 240 feet (73 m) long intersects a vein that strikes northeast and dips 45°–60° NW. Drifts along the vein aggregate 100 feet (30 m) or more. The vein is in black argillite of the Greyson Shale, is 4 feet (1.2 m) wide in places, and consists of sheared argillite and quartz accompanied by copper and iron sulfides. A shipment of 16 tons of ore from this mine gave smelter returns of 10 percent copper, 5 ounces (142 g) of silver to the ton, and one-hundredth of an ounce (0.28 g) of gold to the ton. An adit about 150 feet (46 m) higher on the slope yielded ore that reportedly carried 10 to 20 percent copper, 4 to 20 ounces (113 to 567 g) of silver to the ton, and 60