23. In the Bowels of the Earth

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The Wheat Cap Lamp looks very similar to the cap lamp designed in 1912 by Thomas Alva Edison. A wide-faced light clips onto a hardhat, and the wire is fed over the hat to where the battery is held on a belt. The lamp can provide twelve hours of light for each battery charge, and the battery is rechargeable five hundred times. Each bulb has two filaments that add up to 550 hours of bulb life. This is not the type of battery-powered lamp that waited in the storeroom in March 1924 when my great-grandfather Zeph sent in his crews to Castle Gate Mine No. 2. The batteries of those lamps were heavier and worn as a backpack. Zeph would have called them *Edisons*. In 1924, any electrically powered lamp was cutting-edge technology, employing two late nineteenth-century developments: the rechargeable battery and the light bulb. Why the Utah Fuel Company didn't issue the lamps immediately was a question Zeph often agonized over after the accident because this invention became a life-saver. The Castle Gate explosion was not the only disaster battery-operated lamps could have prevented. At the time, open-flame lamps caused 53 percent of mining explosions.

Not long after Edison developed his cap lamp, inventor Grant Wheat developed a cap lamp for the Koehler mining company in 1919. By the time Edison received his patent in 1928, the US Bureau of Mines had already approved Wheat's lamp. In 1935, a deal was struck with a British manufacturing company, and this reliable miner's light came into frequent use in the 1940s and 50s. Currently, the Wheat Cap Lamp is used by 85 percent of US and Canadian miners. You could call it karma. Edison's ample means allowed him to purchase the first patent for the light bulb

Erin Thomas, 2008

Skyline Mine

developed by Henry Woodward and Matthew Evans in 1875, and for Edison's improvement on the Woodward-Evans invention, history has dubbed him the Father of Electricity. Due to Wheat's improvement on Edison's invention, when I pulled on my gear to enter the Skyline Mine in 2008, I attached a Wheat lamp to my cap, and not an Edison.

The black rubber boots from the guest locker pinched a little, suctioning to my calf. I stuffed the legs of the blue disposable coverall into the top of the boots, because the floor of the mine was likely to be wet. A heavy leather belt hung on my hips, with a pouch for the battery to my Wheat Cap Lamp. When I visited her in Scofield, Ann Carter was kind enough to invite me back to visit the mine where she works in accounts payable. The Skyline mine operates just up the canyon from Winter Quarters, and it began operations in 1981.

A safety trainer equipped me with two self-rescuers from the checkout room. Since the Sago accident, MSHA has required each miner to take two into the mines and leave one within a fifteen-minute walking distance. Each one provides an hour's worth of oxygen. The trainer showed me how to inspect them for functionality, and I realized how much it is a miner's responsibility to ensure his own safety. In the Sago accident, only three of the ten self-rescuers were functioning. This was avoidable.

One enters the Skyline Mine through a level. There is no shaft, just a hallway that angles down to the heart of the action, hundreds of feet underground. The Skyline intake tunnel was not the arched burrow I used

to envision. It was more geometrical, a rectangular hallway, causing me to recall the Chinese miners run out of Carbon County. This was the sort of tunnel they would have dug. My guide for the day, Stan Christianson, drove us through it in his truck. He was tall, broad-shouldered, and mustached, a gentleman-miner practiced in promoting his trade to those from the outside.

The roof and walls were not the slick black of my trip to Big Pit, but a chalky brown color that reflected the light murkily. This was the result of rock dusting—discovered to be a fire deterrent after the Castle Gate explosion. Perhaps some good has come out of the accident for which my great-grandfather Zeph felt so responsible. As a result, fewer miners have died since. Stan told me the air in the mine is required to be from 60 to 80 percent nonflammable.

A rope line hung from the roof, flagged at increments. Stan pointed at it, as he would point to a variety of things throughout the time I shadowed him, explaining yet another possible violation of the Mining Safety and Health Administration's standards. This was also why the floor was so level. The rope was "one of the new safety guidelines. You can get fined if it droops too much. This year so far, MSHA has levied $400,000 in fines. Much more than any year before," Stan explained. Each mine is required to submit to forty days of inspection per year; "some inspectors were friendly, but others could be really cranky."

After Sago, Congress passed the Mine Improvement and New Emergency Response (MINER) Act of 2006, in order to increase safety guidelines. According to Stan, from the operators' and the miners' perspectives, these additional safeguards made a mine nearly impossible to operate. One self-rescuer added weight to an already heavy outfit—rubber boots, the Wheat Cap Lamp, and battery—two seemed like overkill. When I visited Skyline, self-rescuers were stashed throughout the tunnel along with two contraptions the miners dubbed "EBOs," or easy bake ovens. These *refuge chambers*—long metal boxes that resemble trailers—were equipped to provide oxygen for eleven men over a period of thirty-six hours in case of an explosion. Stan informed me that each cost $125,000. "They don't ask," he said referring to MSHA. "They just said, 'Put them in.' But I tell you, if there was an explosion, and there was any chance of gettin' out, they'd all chance that instead of going inside that thing."

From a legislative point of view, these new technologies "represent the most significant improvement in mine safety technology and mine safety practices in three decades." Despite the financial burden of the new regulations, Skyline seemed to be doing well. Most miners made $65,000 a year, working three thirteen hour shifts that were always separated by a couple of days off in between. Some who worked overtime could clear as much as $100,000. Stan was near retirement and felt confident about

his benefits; he had money tucked away in a 401(k) retirement plan and a full-service medical plan he could pay to have extended beyond his retirement.

Another part of the MINER Act involves new safety procedures to track miners throughout the mine. Each mine is divided into zones; when crossing into a new zone, the miners radio an operator, who maps out their new location. Every miner has a number. I was visitor number 6, a designation I wore as a circular metal tag attached to my self-rescuer. This tag reminded me of the unidentified miners killed in the Winter Quarters mine, now reported to haunt its premises. Although logically I knew there was little chance of danger, my heart had been beating fast all morning, and I was short of breath. I reflected grimly that they would have no trouble identifying my body.

Stan stopped his truck at the end of the intake tunnel, and we stepped into the paused operations of a longwall. A longwall is a remarkable piece of machinery. Skyline's was nine hundred feet long. Hydraulic jacks support the roof, creeping forward as the shearer spins, scraping coal off a thirteen foot tall face. The jacks are set side by side, and can weigh up to forty tons each. Stan walked across the foot jacks to talk to the longwall operators, and I followed him.

"Don't step in front of the jack," he warned me. "It could move forward and take off your foot." Longwall mining replaced the room and pillar method in the 1950s. After the jacks shudder forward, the wall behind is left to collapse, causing the land above to sink. This can result in changes in the water table and other instabilities, but the longwall makes it possible to retrieve 80 percent of the coal in a mine in contrast with 60 percent using older methods. It is completely automated, extracting ten thousand to thirty thousand tons on a typical day. A scraper sends the coal down a conveyor belt, which moves the coal through a crusher to standardize the lump size, and then sends it out to the tipple, where it lands on the top of a pile. There are no shovels, picks, or trams. No boys sort the coal from the rubbish or the lump from the bedlam.

One of the miners changed a bearing in one of the jacks, and then the roar of the machine sent the scraper spinning up and down the length of the wall. Fewer men work a mine than ever before. At Skyline, there are no more than twenty-five to thirty men in the mine at a time. Only two men operated the longwall, standing on the footpads of the hydraulic jacks under the protection of the arms that held the roof above their heads.

As we left the longwall, Stan pointed to the belt: "We get fined if we get any accumulation under the belt. Coal can spark from the belt if it gets too high. But accumulation," he gestured at the few bits of stray coal several feet under the suspended belt, "that's ridiculous."

Stan had his lines down pat. From what he told me of his appearances at public educational forums, he did quite a bit of promotion for the mine and for coal itself during his free time.

"These environmentalists, they care about the environment, I understand that. But we've got ten disturbed acres here. We saved topsoil and boulders for cosmetic reasons, and when we leave, you won't be able to tell."

I nod. I knew that the bonds the companies posted for the reclamation of coal mines in Utah were taken seriously. And Stan was right about the impacts on the land. There is no thick forest on the lowlands of the Rockies, and it takes few years for the brush to grow back. There were no displaced towns or filled-in streams. Skyline could be considered a fairly benign operator. But it is owned by Arch Coal, the second largest coal mining company in the United States—the same Arch that refuses to save topsoil in West Virginia to spread over MTR sites because it is too expensive.

Stan parked, and we entered a part of the mine that was darker. Although the ventilation system ran along the roof, I could feel the air I breathed inside my lungs. It pained them slightly, similar to the ache of inhaling cigarette smoke. We walked into a tarped off section furnished with a dinner table, and Stan laid out some the plans to show the foreman. They were digging a new face, a process that required other sorts of heavy machinery.

The ground was wet, and my rubber boots splashed in the puddles. I suddenly felt awkward tromping after Stan with all the heft of my two self-rescuers and the Wheat Cap Lamp, which was shining out in front of me. Mines have rules governing cap lamp etiquette, designed to avoid blinding coworkers and causing accidents. Twisting a knob on the side of the lamp narrows the light to a powerful beam, which a miner should never aim directly into another miner's eyes. I tried to keep my light to the side of the coal miners Stan and I approached in the dark, while watching their lamps for signals. Moving your light in a circular motion means "approach." Moving the beam from side to side means "stop." Moving your light up and down in a nodding motion means "back up." Stan and I stopped at an intersection between tunnels.

The continuous miner, a coal cutter used before the longwall, had bored a hallway into a fresh seam of coal in the hallway adjacent to where we were. The roof bolter was arriving to shore up the new roof, a process that required six gauge steel mesh and long bolts driven into holes that were already stuffed with a tube of resin. The resin was mixed to form a stiff glue when the bolts twisted through the tube, breaking the seal between its two components.

Standing at the end of a hallway, in the dark except for the headlamps of the roof bolter and the lamps on our caps, Stan and I looked up,

shining our lights into the meshed roof above us, where loose rock was held up only by the wire. "We don't have the best roofs," he murmured by way of explanation.

The rock base of the mountain was heterogeneous and liable to break apart. The mesh held up the cracked pieces of the roof, and the glue cemented the layers together. The roof bolter drilled holes, holding up the mesh with mechanical arms. One of the two operators driving the machine slid the resin in and placed the bolt into the machine. On my side of the hallway the wall shuddered, and coal sloughed off.

I jumped out of the way, and the last of the falling coal bruised my ankles through my rubber boots. A few minutes later, another layer slid off the wall, and I jumped again.

"You'd better stand over here," Stan offered, "or that'll keep bugging you. If you were standing against that there wall you coulda got hurt. A slab could slough off and smash you flat." We traded places, exchanging sides in the middle of the hallway,

Skyline Mine has received the Safest Mine Award from the Rocky Mountain Mining Association for two years running. Miners have weekly and monthly safety meetings. Their mascot is Bobcats, which also serves as an acronym: "Being Our Best Can Achieve Total Safety." Above the supply room is a flag depicting a mother holding a child, with the logo Sentinels of Safety, an award Skyline won in 2005 for being the safest mine in America, with twenty-eight months and five hundred thousand man-hours without any reportable injury. At the time I visited in July 2008, Skyline was celebrating two hundred fifty thousand man-hours without an accident. Nearly a year before, the roof bolter had malfunctioned and shot a bolt through a man's hand.

In 2006, the latest Bureau of Labor statistics ranked mining as the most dangerous occupation in America, with 49.5 fatalities for every one hundred thousand workers, outranking forestry, farming, and construction. The jump in mining deaths this year had a lot to do with the miners killed at Sago; in other years mining has come in second or third. In terms of injuries, it often ranks lower than these other hazardous industries, and this doesn't surprise me. The Occupational Safety and Health Agency (OSHA) is in charge of regulating the safety of all industries in America. MSHA is in charge of regulating only the mining industry, and it is staffed with far more inspectors per worker than OSHA.

As Stan talked about the safety precautions they have been required to implement, I remembered all the stunts we used to pull when I worked for the Forest Service. Once, we slid a one hundred pound generator down a steep ravine covered with willows, so we could finish a fence. Even on a daily basis, we swung axes to cut the ground free of sage brush without much training in how to use them properly. I would leave Skyline

that day with one bruise, but during the two summers I worked for the Forest Service, my legs were so covered with bruises that a friend asked me if I was being abused. On one Forest Service project, the worker handling the chainsaw mis-cut a tree. The rest of the crew was relaxing on a log opposite to where the tree was supposed to fall. When the man operating the saw yelled, all my coworkers split to the sides. I ran straight, only outrunning the tree on the speed of adrenaline.

I understand the reluctance of the miners to follow their regulations and carry in that extra self-rescuer every working day. Our Forest Service crew leader, Emily, was always scolding us for taking off our hardhats or gloves. On most days it wouldn't have made a difference. One day, if Emily hadn't been wearing her hardhat, a barbwire fence-tightener would have taken off her head.

Mining is as safe as it is because of the regulations and their enforcement. Most mining accidents are the result of taking chances, but there is always that element of unpredictability. In West Virginia, they call them acts of God, but I might refer to them simply as acts of nature. Before we left the mine, Stan took me down a tunnel that was no longer being mined. We ducked under the tarp that blocked the entrance, and Stan shone his lamp up at the ceiling. I made out a dinosaur footprint—intact, with all three toes—embedded in the shattered rock of the roof.

"Arch wants it sent to headquarters in St. Louis for a gift."

Looking up at that footprint, I realized that being in the *bowels of the earth* meant dealing with powers that were supra-human because Arch Coal had no part in the laws that formed that print or the larger-than-life creature that made it. Miners call the walls of tunnels *ribs* instead of walls, because they know that being underground is like being in the belly of a prehistoric creature. There are layers built into the rock that an engineer can evaluate, but never dictate. The earth will do its own bidding, and there will always be factors beyond human control. This is something miners must respect, and something they must acknowledge each day when they step into a mine. Mining, by nature, is a hazardous occupation.

On our drive out, Stan delivered his last argument: "They call us 'evil.' Evil. The dirty fuel. They treat us like we're the plague. I'm not pretendin' that burning coal is better than natural gas because it isn't. But they make us out to be worse than we are. I just want them to tell the truth. It's not like it used to be."

Mining is *not like it used to be.* When I came out of the mine, I had coal dust smeared on my nose and across my cheeks, my ankle was throbbing, and my lungs hurt deep in my chest. But mining is not like it was, and I will never come close to approximating the experiences of my Welsh ancestors or the terror of my great-great-grandfather Evan when

he descended down the mineshaft at the age of five. No miner in the United States ever will, and that is a credit to the industry and to progress in society as a whole. It is also worth noting that mining is not the same everywhere. There are better and worse ways to run a coal mine.

Since the Sago disaster , a coal mining accident occurred within twenty miles of Skyline. On August 6, 2007, the roof collapsed on six miners retreat mining in Crandall Canyon, trapping them 1,500 feet underground. The mining company Andalex had just been bought by Robert Murray, of Murray Energy, a company out of Cleveland, Ohio, with such a bad reputation in the East that nobody would give him a mining permit in Utah.

Soon after the deal was closed, Murray "bullied" a permit from MSHA to take out the pillars. The roof gave way, causing a small earthquake of 3.9 magnitude, which was recorded by University of Utah geologists. This is what's termed a *mine bounce*: the geological consequence of a mountain readjusting its weight. Rescue workers drilled from above while others started clearing the tunnel from below.

Fourteen miles away in Huntington, Utah, fifty family members waited at the local junior high school. Butcher paper signs hung all over town: "Pray for Our Miners"; "Proud to be an American, Proud to be a Miner"; "Dios Bendigas Nuestras Seis"—the locals dubbed the three Mexican and three American miners "our six." On the tenth day, three more were added to the list of casualties when a rib collapsed on three rescuers clearing the tunnel.

During the incident, Robert Murray appeared at press conferences, expressing concern in a baby blue sweater, a touch calculated to soften the impact of his heavy frame. On another occasion, he emerged to meet the reporters fully dressed as a miner, his face evenly blackened as if he'd smudged the coal on. "Had I known that this evil mountain, this alive mountain, would do what it did, I would never have sent the miners in here. I'll never go near that mountain again," he claimed. Throughout the news coverage of the incident, he came across as agitated, overly optimistic about rescue operations, and outraged at any indication that bad mining practices had been involved. I'll give him credit for genuinely hoping to recover his workers, but I also sensed his personal terror as the hours ticked past without any sign of life. At some point, the axe of justice will fall.

Crandall Canyon and one other Utah mine owned by Murray closed according to his word, but it would be better for the mining industry and miners if Robert Murray never went near any mountain again. The final report of the federal investigation into the Crandall Canyon disaster came out exactly two weeks after I visited Skyline. The federal government found MSHA negligent in ever issuing the permit, claiming it

was "rubber stamped" without any serious oversight. The engineering firm, Agapito Associates, provided faulty recommendations for the mining design and was fined $220,000 by MSHA. A mining fine of $1.6 million, the heaviest fine in MSHA's thirty years of existence, was levied on the company. The US Senate Health, Education, Labor, and Pensions Committee recommended a criminal investigation, claiming that Murray showed "a callous disregard for the law and safety standards."

All mining pillars fail over time, but the majority fail relatively slowly. Moreover, seismologists cannot predict when mining pillars will fail. Every mountain is capricious—this is where nature comes in. But there are telltale signs. A rock burst happens when the ribs of a mine collapse because they are unable to absorb the pressure bearing down from the roof. In the section being mined by Huntington's "six," three rock bursts occurred before the mountain finally gave way. One of these rock bursts, in March 2007, prompted the mining superintendent to send this email to headquarters: "We've used all the tricks we know of to pull these pillars, and I no longer feel we can do it without unacceptable risk." The risks were sufficient enough that veteran miner Don Erickson recognized them and told his wife Nelda that the mountain shuddered violently when he worked inside. Three days before the fatal incident on August 6, another one of the ribs collapsed, and still the miners were sent in. Not only was the initial mining plan flawed (and on post-evaluation, the riskiest plan MSHA has ever approved), but the company also illegally removed sections of the pillars that were designated as off limits. After MSHA presented its report to the families of the deceased in Price, Utah, Representative George Miller, the chairman of the House Labor and Education Committee made some pointed comments. "MSHA's report affirms the conclusions reached by our own investigation: Murray Energy should not have proposed the flawed retreat mining plan, and MSHA should not have approved the plan. It is clear that Murray Energy is an outlaw company that recklessly endangered its employees' lives. It is tragic that the deaths of six miners and three rescuers resulted from the reckless actions of a few individuals and inadequate MSHA oversight."

Don Erickson was fifty years old, the father of two children, and a stepfather to three of his wife Nelda's children. His mother, Lucille, described him as "solid, loving, and considerate." Lucille and Erick Erickson lived in my parent's neighborhood in Price. "Our six" was something that all of Carbon County took personally. The city of Huntington erected a mural called "Heroes Among Us," depicting in relief the faces of the nine men who were killed. For six of the nine, it will be their only grave marker. Rescue efforts were officially disbanded by Congress shortly before the findings were released in July 2008. The miners were most likely killed by the mine bounce, and their bodies will never be recovered.

The reports on Crandall Canyon and Murray Energy shared headlines with Massey Energy Company. In 2007, the company earned record profits. In 2008, the company settled a lawsuit with the Environmental Protection Agency by paying a $20 million civil penalty for violating the Clean Water Act in its West Virginia and Kentucky coal mines. In July 2008, the company faced the possibility of losing half its estimated 2008 net income from a water pollution case in Rawl, West Virginia.

Massey's mountaintop removal operation is situated next to the town of Rawl, which lies below CEO Don Blankenship's mansion. Since Massey began mining there in 2003, the creeks have run black with coal sludge. Local townspeople have come down with rashes, and their hair has begun to fall out. Cancer, kidney and liver failure, and respiratory problems have increased exponentially over the past few years. In 2005, a study conducted by Wheeling Jesuit University revealed that the drinking water in Rawl's private wells exceeded federal limits for asenic, lead, iron, aluminum, beryllium, barium, manganese, and selenium—all chemicals typically found in coal sludge.

In the 1980s, Massey had pumped millions of gallons of coal sludge into underground cavities near Rawl. In the late nineties, when Massey prepared for its mountaintop removal operations, a blast cracked the foundations of dozens of homes. This is when the water began to go bad, and it is possible that the blast cracked the barrier between the underground sludge pond and Rawl's city aquifer. Massey refused to investigate the correlation or provide Rawl with safe drinking water. In 2004, seven hundred individuals filed suits against the company for the crimes of water pollution and manslaughter for two deaths caused by the contamination.

In 2008, Massey faced trial for the death of two miners in its underground Aracoma mine, which caught fire weeks after the Sago explosion. After pleading guilty to the safety violations that contributed to these deaths, Massey paid $2.5 million in criminal charges and $1.7 million in civil penalties, the largest plea bargain in the history of the coal industry. Widows Delorice Bragg and Freda Hatfield pleaded with the judge to reject the deal, holding Don Blakenship personally responsible for ignoring the memo sent to him six days before the fire, which clearly declaired the conveyor belt conditions unsafe.

In the same month the plea bargain for the Aracoma deaths was approved by Judge John Copenhaver, friends and family called to inform me of a devastating accident in another Massey mine. The Upper Big Branch coal mine in Montcoal, West Virginia, exploded on Monday, April 5, 2010, taking the lives of twenty-eight men and one woman—an astounding death toll for contemporary America. Montcoal is located on Coal River Road between Sundial and Sylvester, and press conferences

reporting the status of the rescue efforts and the investigations into the causes of the accident were held at Marsh Fork Elementary School.

A spark from poorly maintained cutting machines lit methane gas, possibly escaping from underground reserves up through cracks in the mine floor. A massive accumulation of coal dust caught fire, and malfunctioning sprayers failed to extinguish the conflagaration. Five hours after the accident, seven miners were confirmed dead and nineteen missing. Two miners were receiving medical attention. Like the mining families four years previously at Sago Baptist Church, Romona and William Williams waited on the grounds of the Upper Big Branch mine for news of their brother. They talked to reporters through the window of their parked pickup truck as rescuers made slow progress into a mine where rails were twisted "into pretzels" from the heat and force of the explosion.

The next day, when Don Blakenship arrived at the mine to report the toll of twenty-five confirmed dead and four missing, he was escorted from the scene after the enraged crowd charged him with caring more about profit than human life. At the time, Blakenship had just turned sixty. The hair that had begun to recede from his temples had grayed. Lines of age and stress had softened the contours of his cheeks and jowls, but the lines around his mouth remained firm, accentuated by his neatly trimmed mustache.

Throughout Massey's history of enviromental and safety violations, Blakenship has always asserted his lack of culpability: "I think the fact that MSHA, the state, and our firebosses and the best engineers that you can find were all in and around this mine, and all believed it to be safe in the circumstances it was in, speaks for itself as far as any suspicion that the mine was improperly operated."

The accident came as a shock to the nation and to the federal government, which had implemented the 2006 MINER Act to prevent mining fatalities such as the ones at Upper Big Branch. But, as in the case of Crandall Canyon, there had been telltale signs. In the two months prior to the accident at Upper Big Branch, miners had been evacuated three times due to dangerous methane levels, and they had begun to feel nervous. Josh Napper, a twenty-five year old victim of the explosion, wrote his family a note the last day he went in: "If anything happens to me, I will be looking down from heaven." Clay Mullins, who lost his brother Rex, worked at Upper Big Branch until 2007 and asserted it had always been a gassy mine. He explained that when the older supervisors began to retire, their younger, less experienced replacements didn't know how to handle the high levels of methane.

The naturally ocurring methane was improperly controlled, but more condemning is the preventable issue of untreated coal dust. At Upper Big Branch, as at Castle Gate, a small fire became a blast that killed the miners

inside almost instantly. Aside from servicing and replacing faulty equipment, simply employing rock dusting, the coal dust-neutralizing innovation that arose out of the Castle Gate disaster more than eighty years previously, could have saved twenty-nine lives.

As with Murray Energy, Massey Energy Company has a reputation for reckless mining. From March to April 2010, MSHA closed portions of three Massey-run mines due to safety violations. Inspectors, informed of illegal practices by anonymous tips, showed up at the mine sites unannounced and seized the phone lines, so mine operators couldn't tip off the men below. Hazardous conditions ranged from improper ventilation, to coal mining deep into roofs and walls beyond permitted areas, to water blocking escape routes. In November 2010, MSHA sought a federal court order to close the entire Freedom Energy mine in Pikeville, Kentucky, until the safety conditions improved—an unprecedented act in all of mining regulation history. According to M. Patricia Smith, the agency's top attorney, "This mine is basically an accident away from a possible tragedy."

A leaked memo that Blankenship sent to his deep mine superintendents in 2005 perhaps reveals the source of the company culture that leads to these failed inspections and dangerous mining conditions: "If any of you have been asked by your group presidents, your supervisors, engineers, or anyone else to do anything other than run coal, you need to ignore them and run coal … This memo is necessary only because we seem not to understand that coal pays the bills."

George Miller's denunciation of Murray Energy as an "outlaw company" is paralleled by J. David McAteer's more measured criticism of Massey Energy Company. He called it "certainly one of the worst in the industry," with one of the "most difficult" safety records—a record for which Massey CEO Don Blankenship is yet to be held personally accountable.

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There are better and worse ways to run a coal mine. Several months after the Crandall Canyon accident, I traveled to central Utah to meet with the former Vice President of Operations at Andalex. Sam Quigley had quit when Robert Murray signed the deal to take over the company. The contract went through at eleven o'clock in the morning, and Sam's office was cleaned out by noon. He was familiar with Murray's reputation and refused to work with him. Soon after, my dad recruited him to be his energy man at the College of Eastern Utah.

I asked Sam what he thought about the cave-in. "We know how to mine. We should be beyond that." At the time, he was reluctant to say anything about the case, as there was a possibility that he would have to testify in the national trials.

I visited Sam in the CEU energy center, located in the building that once served as a bath house for the Willow Creek Mine. The Castle Gate

cemetery lies below, a reminder of the devastation possible in a mine. Throughout the center are signs typical of mining buildings: "Safety is a virtue," "Center for Behavior Based Safety," and "All Mining is Retreat Mining." The latter is Sam's personal motto, one that indicates the precautions a miner should take in any mining operation. There is always a chance the roof could come down.

A veteran miner, Sam is lean, wiry, and freckled. When I first met him, he caught me off guard with his fervor. After finishing a degree in geology at the University of Utah, Sam pursued the four-generation family business (metal mining) by working off his school loans digging a shaft for a trona mine in Green River, Wyoming. He wintered there in a school bus because there was a shortage of housing. Sam is not your typical miner, but he is miner's miner, emphatic in his defense of the trade.

Sam collects mining lamps and books. He drew diagrams to show me how the lamps worked and fired mining facts at me faster than I could scribble them down. In a way, he is a curiosity to me. A miner by choice, he worked during the years my family was absent and saw the transfer from the old way of mining a longwall to the new. In the early seventies, he worked in a coal mine in central Utah, putting up timbers (to hold up the roof) "with old time miners, the Palacio brothers, Pete, Manuel, and Johnny the Smoke." In those days, there were fourteen to fifteen mining companies in Carbon County, employing four thousand to five thousand miners who extracted eight million tons of coal. By 1990, there were only 1,700 left, but they mined around twenty-seven million tons.

Sam's response to the Crandall Canyon accident was more a commentary on how the public reacts to such incidents: "There's a whole group of people in society that believe that coal mining is an outdated activity and we don't need it anymore when nasty things happen. Your toothpaste has three mining products in it. Everything that you touch—this pen, which has plastic and metal—comes from mining."

Sam's sister was a teacher who was part of "that" society. When his boys went into mining, she tried to talk them out of it, telling them that "mining is no longer a necessary evil."

But Sam believed she had lost the historic vision, which he was adamant to share with me: "There was a time when the environment was a word that wasn't included in people's vocabulary. They were concerned about providing the basics. Miners are heroes. They lived in wood shacks at ten thousand feet during winters and provided the basis for everything that we have. Our society has lost sight of this. We are a blessed generation. We have the ability to protect our air and water. We can reclaim landscape. You know what gives us this ability? We have an affluent society. Affluence has given Americans the opportunity to think about the environment."

Like Sam's sister, I am a teacher, a third-generation teacher from four generations of coal miners before. It has been almost seventy years since any family member of mine has stepped into a coal mine for a day's wages. In sentiment and socialization, I belong to the society Sam lambasts, the one that believes—or wishes to believe—that coal mining is no longer a necessary evil. But coal mining is not inherently evil, and coal mining is necessary; it will continue to be so until Americans across the nation jointly decide to turn off their lights.

What Sam failed to say, I will say for him. Our affluence has been built by coal. We think about the environment because coal power provided the means to mechanize America. The engine was built in order to mine coal more efficiently, and it is on the power of this engine, derived from coal, that industrial America has become rich. Coal has given us the option of thinking about the environment, and it has given us the luxury of mining coal responsibly. This is where our task lies now, but not ultimately.

Coal is "the dirty fuel." There are health and environmental concerns with its procurement, processing, and burning, and there may be future concerns with the storage of its byproducts. To this day unsafe practices of major coal mine operators continue without regard for human life. This is current cost of our energy, but perhaps the source that provided the locomotion to move us through the twentieth century can pave the way for the next century to move beyond it.