

English 467
Professor Anne Fadiman

By submitting this essay, I attest that it is my own work, completed in accordance with University regulations. Paul Gleason

Breaking Rock

by Paul Gleason

Dino pulls a brass plunger, thick as a screwdriver, off his belt and punches a hole in the yellow-tissue-covered stick of dynamite. He then replaces the plunger with a small cylindrical blasting cap. The late October cold makes the Blasting Gelatin stiff, he explains, raising his voice over the sound of shattering rock coming from under Donnie's drilling machine. If he tried to shove the blasting cap right in, it might break, and if it broke—"all over," he says, grinning broadly and waving a hand in circles around his face and chest. "Blood and guts all over you."

Together, the blasting cap and dynamite make a charge. The cap connects to an orange "shock tube," full of a powder that burns at a rate of three miles per second. Several charges linked together make a shot. Dino drops the charge down one of Donnie's thirteen-foot holes, letting the tube run between his fingers until it goes slack. He picks up the sixteen-foot-tall pole lying on the ground; it has black circles and numbers marking every foot. He steadily lowers it into the hole and taps the dynamite into place. This is the first of eight holes, eight charges that will go off as one shot.

Cox Drilling and Blasting, Dino and Donnie's employer, is one of several companies working at 18 Temple Street, a 200'-by-100' lot in the middle of downtown Hartford. Above us, demolition crews hollow out a building while union steel workers lift new support beams to the roof. The project safety coordinator, Dwight, a recent Trinity grad with degrees in architecture and neurobiology, roams the site and snaps pictures with his digital camera. Behind us, where the

blasting is finished, a team of cement workers from Tilcon Connecticut Inc. is already laying the foundation of what, in a year or two, will be an underground parking garage. Norman, the cheerful Tilcon foreman with a brown moustache and no front teeth, is directing trucks from P&D Trucking and A. Lomaglio to a Caterpillar that loads them with broken rock. The trucks can shoulder up to thirty tons. They drive the rock to a crushing site where the rock becomes cement and other raw building materials. The fact that Dino makes those materials available is a point of pride. "It's like trees," he says, "without trees you wouldn't have houses." Without blasting we might still have granite, gold, quartz, and limestone, but we also might still be sweating at the bottom of mine shafts, chipping at the walls with pickaxes, nervously eyeing support beams, and waiting for the canary to drop. We certainly wouldn't have underground parking.

Next, Dino turns to a fifty-pound paper bag of ammonium nitrate blasting agent, a fertilizer soaked in diesel fuel, and rips a hole in the top. Bending at the waist and gripping the bag around the middle with one arm, he tilts it and sends a stream of white pebbles into the hole. With his free hand he works the pole up and down, slowly packing the ammonium nitrate around and above the dynamite. He assures me that you could pour this stuff right on your lawn and make the grass grow—that is, of course, if it weren't for the diesel fuel.

He lifts the bag and offers to pour some of the ammonium nitrate into my hands. The pellets feel greasy in my palms, and the smell is unmistakable, the rich scent of exhaust and burning oil. Dino lifts the pole and drops it back on the ground. The hole is now only ten feet deep. Thirteen feet to ten. I do some calculations: two sticks of dynamite, each eight inches tall and two inches in diameter; enough fertilizer to fill in the extra inch around the dynamite and twenty inches on top of that. This particular dynamite has a detonation strength of 5,000 lbs. per

stick. Double that, and the shaft holds 10,000 lbs. of pressure. Multiply that by eight holes, and when all the charges are set (forgetting for a moment the ammonium nitrate, which is, pound for pound, stronger than the fertilizer McVeigh used in Oklahoma City), I will be standing on at least 80,000 lbs. of explosive force.

“It’ll go, ba-r-r-r-rupt—*boom!*” Dino says.

Dynamite is a mixture of nitroglycerine and diatomaceous earth, a porous rock composed of algae shells. Alfred Nobel—inventor; Robert Burns enthusiast; namesake of the Nobel prizes; and, according to the speeches available in *Explosives in the Service of Man: the Nobel Heritage*, virtual saint—made nitroglycerine available for commercial use in the middle of the nineteenth century. The fact that Nobel is responsible for both the world’s most prestigious peace prize and high grade explosives is not ironic but tragic: he was an avowed pacifist and found the military appropriation of his work appalling. Pure nitroglycerine is a highly unstable yellow liquid. During an 1864 factory explosion in Helenborg, Sweden, Alfred’s brother Emil died. Nobel dedicated himself to inventing another, safer explosive. In 1867 he patented a solid mixture of nitroglycerine and guncotton, marketing it first as Nobel’s Safety Blasting Powder. The physical compound is still by necessity unstable. Detonation causes a change in the powder’s molecular structure, transforming it from an unstable solid to a stable gas and releasing massive amounts of potential energy in the process. While Dino stems the hole, filling it with dirt to prevent the dynamite from shooting straight up, I secretly pray that my name will not be the impetus for a further revolution in chemical safety. He grabs two more tissue-wrapped sticks from a cardboard box and begins to prepare another charge for the second hole.

Dino Neville, a former high school hockey player, has the hockey player’s build. He is thick-shouldered yet compact, of medium height but with a center of gravity around his hips, low

to the ground. His eyes are pale blue except for an odd green-gray spot on his right iris. The black goatee surrounding his mouth has only a few silver hairs. He spits constantly. This morning he wears mud-stained boots and faded Carhartt work pants, an off-white J. Crew fleece pullover, and a brown Carhartt vest with a dark blue lining. His white hard hat is plastered with stickers for Furukawa Drilling, Rockmore International, and Super Penetrater. One sticker says, “I ♥ Explosives!” with the name “Dyno” written in loopy white cursive on the red heart. On either side of the helmet is an American flag.

No one with a felony on his or her record can become a professional rock blaster, a job that requires three years of on-site training, a written test, and three letters confirming good character, one of which must be from the local police department. The Bureau of Alcohol, Firearms, and Tobacco gives the license, and the Patriot Act now requires fingerprinting once a year. Blasters who commit a felony, Dino explains, whether it’s having a bag of pot in the car or failing to pay child support, automatically lose their licenses.

Dino drives a white Ford 4X4 F-250. A fire-resistant steel box covers half of the truck bed and holds the explosives. Every time he collects or returns equipment, he snaps the heavy padlock closed and tugs it to make sure it stays that way. The warning plates on the front grill, doors, and back gate are diamond-shaped and blaze orange. Each has a picture of a black dot blowing into pieces and the word “explosives” in block lettering. The truck is registered with the Department of Transportation; he is not allowed to speed or drive it in the left hand lane or deviate from a planned route between the company magazine in Branford and the blast site in downtown Hartford. A violation of any of the transportation rules is punishable by arrest. The worksite has its own equally thorough set of rules, with none as annoying as the one that governs

where a worker can and can't smoke. According to industry and state law, smoking is illegal within a hundred feet of any explosive. Violation, once again, could mean arrest. "They treat us like fucking criminals," Dino laments.

Dino began training as a blaster on the advice of a friend in the restaurant business. His vice principal didn't let him repeat his senior year in high school, a common practice for young hockey players hoping to catch the eye of college scouts. "So," he explains, "I said, 'Fuck you. I'll go join the working class.'" At fifteen he had worked in a kitchen washing dishes, and joining the working class meant more of the food industry. He worked at pizzerias and once owned his own hot dog stand. In 1987 he joined the blaster's union, and in 1990, after finishing his training, he went to work for Cox Drilling.

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Dino has been working at 18 Temple Street for a month, placing and then detonating dozens of shots of similar to this one. Temple is one block long and connects two arteries of downtown Hartford traffic, Main and Market Streets. The site's next door neighbors are the Hartford Marriott and State House Square, which houses another parking garage and both ING and Bank of America. At the Marriott, Dino tells me, the desk clerk warns new guests not to be alarmed by the shaking overhead lights, and there has been a pre-detonation announcement in the State House food court ever since the first blast sent panicked investment bankers running into the streets. The UConn School of Business is across Market Street. Its walls are made of blue glass, and a ticker displays the stock prices as they slide from right to left around the building.

Opposite the School of Business, a gravel ramp descends into the site. Most of the site is already thirteen feet below street level. The enormous Caterpillar machine idles near the wall, waiting to knock apart and then scoop up the blasted rock with its arm. Beside it lie a stack of

“blasting mats,” sheets made of layers of flattened tire treads. Each is a foot thick, and steel cables running through the middle of the tires hold the mats together. These sheets prevent “fly.” Despite the cold (my fingers are white and sluggish, and it is almost impossible to take legible notes), the mud on the ground is inches deep and holds half-buried Gatorade bottles and Reese’s Peanut Butter Cup wrappers. Dino describes the red rock as having “the strength and personality of basalt.” The jagged cliff I stand on, thirteen feet high in some places, marks the border between the blasted and un-blasted areas. The exposed rock beneath me is not a single, solid wall. Dozens of levels of ruddy-brown rock pile one on top of another, some as short as the width of a finger, some as tall as a hand.

While Dino prepares more charges, Donnie drills more holes. The rectangular body of the drilling machine rests on treads, and a chute in the back coughs a fine dust of pulverized rock. In front, a long neck of metal and tubes holds the drill upright over the ground. The sharp cracking noise it makes when Donnie lowers drill head into the rock is almost unbearable. Dino speaks admiringly of Donnie, the older of the two. Donnie has worked on a drill for more than thirty years. Once, when he was twelve, he rode his bike right up to the presidential convertible and shook JFK’s hand. Dino tries to get Donnie to retell the story, but without success. Donnie says little, but any reference to Dino’s cell phone, a chunky yellow Nokia that rings every five minutes, wins an exaggerated scoff and eye roll. Dino is more talkative and has a few more stories about presidents. One time, the Clinton Air Force One flew right over their blast site, and in 2002, during Yale University’s graduation ceremony, Dino and Donnie and hundreds of pounds of explosives were seven blocks away from the keynote speaker: one George Walker Bush. Despite the supposed vigilance of the ATF and the Department of Transportation, no one

inspected the site. Norman, the Tilcon foreman, walks by and has obviously heard this one before: “No secret service guys came and saw you, right?” Dino shakes his head in disbelief.

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The garage will cover three-fourths of the site. On the other quarter, between the blasting and Main Street, demolition crews are taking apart the old, three-sectioned building above us. The middle section, though hollowed out, still has its façade of white bricks intact; the window openings are decorative stone arches. The flanking sections of the building are nothing but skeletons made of perpendicular steel beams. The colored work lights hanging from the concrete ceilings on each of the eight stories look like Christmas lights, or a parody of the festive rigging on a Caribbean cruise ship.

This eight-charge shot will go off only a few feet from the building. Above us, a team of masons are assembling a wall. They tell Dino not to worry; it won’t fall over. Dino is less than certain. The waves of vibrations, he tells me, have been dislodging chunks of what remains of the roof all month. Ground vibration is a concern in urban areas where it could potentially damage surrounding foundations, or in this case drop a hail of concrete blocks. If this site were “in the woods,” as Dino puts it, he could blast an area this size with a single shot. But, in any urban project, the fire marshal sets a Hertz per blast limit before each job begins, and overshooting the limit can, once again, result in arrest. Dino hopes to keep this shot under 2.0 Hz.

Paradoxically, the size of the charge is not always proportional to the level of seismic vibration. The major factors are the hardness of the rock and the direction of the blast. Harder rock, although it requires a larger load of dynamite, breaks cleanly instead of transferring the energy of the blast to the rock around it. Softer rock is better at absorbing explosions. Instead of

breaking, it wiggles. Although the type of rock is beyond the blaster's control, the direction of the shot is not. An explosion towards the "free face," an exposed plane, minimizes vibration. The order of the blasting caps determines which way the rock will move. A group of charges going off together will expend its force equally in all directions, but if the charges near the free face go off first, loosening the outer rock, the inner rock will travel in the direction of least resistance, spilling out into the open space instead of ruining an I-banker's lunch hour.

The charge box now empty, Dino begins to connect the orange tubes with delay blasting caps that look like red plastic dog bones. Starting with the free face charge farthest from the building, he snaps the tube into place on one side of the bone. He then collects the next farthest tube and snaps it into the opposite end. If all goes well, the powder from the first tube sets off the cap, which sets off the second tube 25 milliseconds later, which sets off the third tube, and so on. The result is wave after wave of concussions tearing through the rock, the "r-r-r-rupt!"

Dino motions me back to the drilling machine with one hand and waves the Caterpillar towards him with the other. He fastens a hook to a steel rung on a blasting mat and directs the Caterpillar as it drapes the mat over the tangle of wires. Three overlapping mats soon cover the holes and flop over the cliff. Dino attaches the blast cap on the yellow starter tube to a thicker plastic cord and places the cap under the empty cardboard box. That first cap, I suppose, standing directly underneath the neck of the drilling machine, must be the "ba."

While Dino opens his cell phone and makes his calls (one to the fire marshal, one to the State House Square security manager, and one to Dwight the safety coordinator), some of the men explosives didn't serve so well come to mind. There was the operator of a Glasgow fireworks show in 1988 who lost his leg to shrapnel when the grand finale went off in the mortar tube; the truck driver in Peterborough who went over a speed bump and then, glancing in the

wing mirror, noticed flames shooting from his 1,600-lb. load of explosives; and six hundred residents of Texas City, who died in 1947 when a fire on the French freighter *Grandcamp* started a chain reaction that began with the ammonium nitrate in the hold and ended with the entire industrial district in flames for five days. Unfortunately, harbor explosions were a common spectacle in Texas City, and many who rushed to the shore line to see the show were engulfed in the subsequent blasts. That example strikes me as especially pertinent because, I suppose, I'm here for the show myself.

Dino flips his phone closed and attaches the yellow cord to a galvanometer to test the conductivity of the circuit. He bends over at the waist, legs spread apart in an athletic stance. If the reading is too high, there may be a short circuit; if too low, a poor or loose connection. Satisfied, he lifts his air horn and blows it three times. The high-pitched honk cuts through and quiets the noise of cement mixers and sledgehammers. Norman directs his Tilcon crews to the far corner of the site where they watch expectantly. The hard hats of curious steel workers appear in the windows above us. Dino stops. Then he yells and waves impatiently at Dwight, who stands on the opposite side of the pit, but directly in line with the blast, camera at the ready.

Ideally, the mats will catch the exploding rock. None of it should even come near Dwight, but Dino isn't taking chances. "He's a little bit nuts," Dino says of the safety director, "he wanted to take a picture of the blast from over there, but God forbid something should shoot out at him."

Dino blows the horn three more times and then exchanges the galvanometer for a palm-sized red box. I confess I have been hoping for a Wile E. Coyote style plunger; instead, the blasting machine is battery operated and has two black buttons: one to build the voltage, and one

to release it. For the first time since my arrival, the site is completely silent. Dino remains bent at the waist, but then his quads flex against his pants and his head shoots up.

“Fire in the hole!”

BA!

The cardboard box over the main blast cap performs an aerial somersault.

R-R-R-RUPT!

Blasting caps crackle like Hollywood machine-gun fire.

BOOOOOM!

The detonation tosses the blasting mats, trailing thick brown smoke behind them, into the air as easily as if the ground had suddenly become a trampoline. The tires twist against their steel cords and hang, for a moment, twenty feet above the ground. Then they fall and tumble away from the cliff along with the breaking rock.

One of the masons, popping up over the unharmed wall, pumps his fists above his head and cheers: “Wooooooooooooo!” The operator restarts the Caterpillar and combs the fragments into a pile for the waiting trucks. The cement mixer turns, the trucks roll away, the masons lift blocks, the din returns, and the work site is as before.

“Look at that.”

Norman taps me on the shoulder, smiles, and points.

There, behind the driller, Dino and Donnie are chatting easily, whether about the next shot, hockey, or presidents I couldn’t say. Dino notices me watching and waves me over. He pulls the “Blastmate,” a small blue seismograph, out of the ground and shows me the readings.

Transversal—1.57. Vertical—.6. Longitudinal—1.5. All three numbers are neatly within the limits.