WELCOME TO THE MGS DIRT LAB

When I first stepped into the sediment laboratory at the Minnesota Geological Survey, I didn't quite know what to expect from my new student job. I was an eager anthropology major about to be tucked away inside a basement laboratory during my junior and senior year of college. I secretly call the sediment lab the *Windowless Dungeon of Dirt*, and while that may sound uninviting, I was excited to know that I would be contributing to a research department at the University of Minnesota.

Let me give you a brief description of the sediment lab, a.k.a. the dirt lab: It's dark, it's dusty, it's windowless and the geologists don't often come down that way to make small-talk with me and my coworkers. The dirt lab serves two purposes and that's to prepare sediment samples from numerous locations across Minnesota's landscape, and store them in the lab so geologists have easy access to them for their research. My job is to handwash water-well drilling samples that are given to the survey by local drilling companies. I also perform a texture analysis whereby I quantify the amount of sand, silt and clay in samples of sediment collected by geologists. The lab is filled with glass beakers and cylinders, and other laboratory objects necessary to get our work done.

One might think the allure of washing dirt in a basement laboratory would wear off after two years but I thoroughly enjoy my work, even though I'm surrounded by dirt and have little communication with the outside world. I've packed so much dirt into coin envelopes and washed so many samples over the sink that my left hand pales in comparison to my right, with its lackluster and stubbly nails -a huge sacrifice for a young woman who attempts to take pride in her outward appearance. Some days I'd rather arm myself with a dusting cloth and bottle of Pledge to

clean the place up. The point would be mute because the build-up of dust and dirt particles is quick and residual. We have buckets of sediment samples that are constantly coming into the lab, and dust adheres to practically every surface and crevice exposed to air.

After my co-workers and I inspected the laboratory's furniture and equipment, we decided that each piece falls roughly within an era between 1875 and definitely no later than 1971; depending upon the item in question of course, seeing that in circa 1875 humankind had yet to invent the free-standing, electric *Speed Queen* washing machine which triumphantly sits in a corner of the lab. And we currently do not make use of the 3 pound vintage *Kodak Minute Timer* that you wind-up in the back like an old mechanical toy soldier. The most beloved piece of vintage equipment that we recently put to rest is the lime green *Hamilton Beach* shake-maker, used during the texture processing to mix sediment samples. Each time I turned that reliable puppy on I was beamed back to a 1950s local diner, surrounded by poodle skirts and original teenyboppers.

Even amidst the dated furniture and old-fashioned equipment that we raise our [presumably] modern eyebrows at, the dirt lab nevertheless houses an important part of Minnesota's geological history. My inner intellectual fondly grasps onto this place and I feel a part of something meaningful and respected each time I look around me. There are rows and rows of metal shelves that line the wall behind the area where we do our lab work, and stacked on top of them are rows and rows of boxed sediment from various locations across Minnesota. The shelves take up the majority of lab space holding roughly 10,000 boxes of processed sediment. Behind me sits a record of approximately 4,900 water-well drill holes, amounting to about 200,000 samples that were collected by local drillers. In addition, around 20,000 samples that were collected by geologists have been processed and shelved in the laboratory. These numbers increase as drillers and geologists continue to contribute samples.

Apart from the more material aspects of the dirt lab that lend meaning to Minnesota's geological history, speaking with geologists from their memory brought an additional sense of meaning. I wasn't able to get my mind past the dated equipment -to see the lab for what it really was- until I heard what the geologists had to say about it from their perspective. It dawned on me that I wasn't even aware of what the old *Kodak Minute Timer* was used for, and I Googled the make and model to get a feel for what era I was dealing with. The closest hit was from an EBay auction for *Vintage Red Kodak Darkroom Timer Metal Stand-Nice*. I'm not sure what the seller meant by *Very Good to Excellent* condition because they noted, *it will work some of the time and then it will stop for the rest of the time* –with time being its most important function. I suspect the seller was referring to the timer's vintage quality as being in excellent condition. Either way, this information was very unhelpful. I thought it would be

more fitting to ask the first geologist who came down to the lab. It just so happened to be the very geologist who helped initiate the dirt lab in 1972.

I was pleased that his information about the timer's use in the lab was better than my Google search. In the 1970s and '80s, former dirt lab employees used it to determine when to take precise readings during textural processing. When the timer went off, it would let out an unbearable screech that the employees had to endure. My coworker and I tried to repeat this noise but we couldn't figure out how the thing worked. Go figure -all the while I thought current technology was more complex and harder to use. Oh, and in talking to the geologist it turns out the lime-green *Hamilton Beach* shake-maker hasn't only been used for mixing dirt. Rumor has it an occasional gathering in the dirt lab may have required the use of a mixer. Maybe my nostalgic vision of the shake-maker isn't so far-fetched after all -minus the poodle skirts, teenyboppers, and 1950s diner, of course. Rumor also has it a former dirt lab employee and his buddies were using the lab at night for their rock band's practice spot. The dirt lab has, indeed, seen its fair share of activity.

After learning something about the dirt lab's intriguing past, I wanted to dig deeper and I found myself going farther back than I ever imagined. I discovered that tallying each box we shelve into the dirt lab's worn logbook isn't such a mundane task. We are actually connecting with Minnesota's historical record of geological research spanning the last 150 years. The oldest sample recorded in the logbook is No.111, a well drilled to a depth of 710 feet beneath the surface of the earth. It was examined in July of 1872 by Alexander Winchell, the brother and colleague of Minnesota's first Geological Survey director, Newton H. Winchell. Whoever recorded the information on No.111 in the 1960s, when the survey supposedly began using a logbook, luckily left a clue about the sample. Scribbled in pencil under the notes column for No.111, the person wrote *Pg. 80, 2nd Annual Report*. Feeling as if my investigative skills were at their peak, I strutted to the survey's library and after a few minutes of searching the bookshelves I found, *Survey of Minnesota: Second Annual Report*, compiled by N.H. Winchell et al. in 1873.

This report was one of several on the geology and natural history of Minnesota, and it was given to the University of Minnesota president each year beginning in 1871. I found myself staring at an original print complete with tattered and weak pages. I could have destroyed it on the spot if I hadn't noticed a photocopy of it on the shelf, but I couldn't resist turning the first few brittle pages and breathing in the mildewed smell of the paper. After I finished admiring the antiquities in the library, I looked up No.111's location in the report and found that it was collected in the township of Belle Plaine in southwest Scott County.

Using handy tools such as water-well ledgers, quadrangle maps, and a trusty geologist (also known as my boss), I was shown how to use the quadrangle map library so I could find the map showing the city of Belle Plaine. The water-well department had previously marked the location of No.111 on the map, and I was then given a short lesson about the squiggly contour lines and waterways near Belle Plaine. The best visual estimation I can give where No.111 was collected is north of the city, just south of the Minnesota River. It was dug near the current Chicago & North Western rail lines, north of Fountain Park off West Forest Street.

In the Annual Report of 1873, I didn't only stumble upon the geological details of the sample; the report also included correspondence between the geologist who first examined the samples, Alexander Winchell, and Minnesota's 6th state governor (1870-74) Horace Austin. It turns out the significance of the Belle Plaine samples has not only to do with its geology but with the relationship that science can have with those who seek its knowledge.

The situation arose when Governor Horace Austin, who previously had the samples collected, sent them to Alexander Winchell in Ann Arbor, Michigan for geological interpretation. Governor Austin had requested a geologist examine the drilling samples to see if the well could be used for commercial salt or freshwater production.

In Alexander Winchell's correspondence letter to Horace Austin, Winchell informed the governor that based on his analysis drilling beyond the depth of 242 ft. (past a sandstone formation particular to that region) would unlikely produce anything of commercial value. As I was reading the letter and trying to get through marginally obsolete words such as *wholly*, *lest*, and *intimated*, I was struck by Winchell's gutsy tone concerning the governor's intentions:

> *If these conclusions are correct, there is no hope, either of salt or a well of fresh water, by boring deeper, and not another dollar ought to be expended in this hope. It will be noted that my recommendation in my former report suggested the propriety of boring only to the bottom of the Potsdam Sandstone…Belle Plaine, as I feared, does not prove to be favorably located. Places suitable for borings, at public expense, ought to be intelligently selected, without any regard to the interests of localities, and the State ought not to be committed to unwise expenditures by the precipitate and ill-advised enterprise of smart business places.*

Winchell's response to the governor made the hairs on my arms raise and my skin tingle. The feeling was similar to when you are cheering the underdog on from the sidelines, except this time the underdog is actually winning! His strong language stemmed from the wasted and misguided efforts by 19th century business zealots at the expense of the public's hard-earned tax dollars –Nothing irritates a public more, even in this day and age, than tax-dollars wasted on fruitless ventures. Later in the letter, Winchell put his personal opinion on the governor's public affairs aside, and relayed the exciting data he managed to gather from the sample: The possible occurrence of porphyry *Pipestone* rock most commonly found in Pipestone, Minnesota -a reddish, metamorphosed, clay rock. After Winchell gave his geological description to the governor, it seemed to me he immediately remembered his audience, offering this bit of insight about the governor's drilling prospects and his use of science to leverage a cause:

> *Lest this remark, however, should be thought to apply too severely to Belle Plaine, I ought to add that considerable reason existed for boring at that place-though by no means as good reason as many supposed. The fault committed here, as in so many other cases, was an attempt to proceed*

independently of geological knowledge in the beginning, and to call for scientific aid, not so much to guide an important enterprise, as to help it out of difficulty.

Alexander Winchell closed his letter to the governor with that statement, and when I first read the manuscript I had completely missed the meaning of his words. I chose to concentrate instead on Winchell's concern for the public. I was impressed with his former remarks and the strong-will to express a passion for proper research, and how business enterprise can affect the community when their efforts result in failure. Somehow, I think I was more impressed with the hero-villain role the geologist and governor seemed to be playing. Were it not for a geologist who was better able to help me understand the murky language and geological details of the well that was dug, I would have missed an important point in the letter's closing remarks. Winchell had informed the governor that the Belle Plaine sample might have been drilled at a better location that could have produced commercial salt or freshwater. Instead of originally using science as a guide to make a justified decision, the governor was now using science to create a justifiable reason to continue drilling.

The letter's closing remarks reveal the adversarial relationship that science can sometimes develop when not used as a guide prior to starting an enterprise, and later requested as an aid to help that enterprise out of difficulty. In Winchell's case, the relationship between the scientist and the businessman may have grown antagonistic when the value of science was diminished because its conclusions did not support the businessman's agenda. I can't speculate with certainty about the relationship Alexander Winchell had with Governor Austin, for all I know the families of the two men vacationed together in the Thousand Islands. I do know, however, the well was later dug to a depth of 710 feet and the governor then requested the samples be reexamined in 1873 by Alexander Winchell's brother, Newton H. Winchell, who was by then the State Geologist of Minnesota. In Newton H. Winchell's remittance letter to Gov. Horace Austin, it seemed to me that he wasn't as harsh towards the governor as his younger brother had been. *"There is almost a certainty that no salt would be obtained…The only other reason for sinking the well deeper is on purely scientific grounds."*

Newton H. Winchell's letter ended the documentation of the Belle Plaine sample in the annual report. After thumbing through its pages for more information, I couldn't help but long for a handwritten diary tucked away on a back shelf of the library, or a journal entry neatly slipped into the original annual report with more juicy details. No.111 was a terrific example of those who seek science and later abandon its results when it does not support the cause, only to then rely on science to pick up the pieces when in need of leverage to further the cause. There are countless scenarios where this can be seen in our own day and age. In the laboratory my raised eyebrows no longer mock the antiquity of the old-fashioned objects I'm surrounded by. Now, I appreciate them as clues to the past where I can discover earlier steps that science continued to carve on its ideological path. It's those very ideological paths that many of us walk along today.

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