

Chapter 4 - DirtMover

Graduate Student Zemp DirtMover heard the soft chimes sounding and looked up from the papers, books, graphs and charts surrounding him and studied the pendulum clock across the otherwise deserted study hall of the SouthCentral University library. “Arrg”, he thought to himself as he saw the time was 12 ½ cD. It was the depths of the night, and pretty much everyone was in the middle of a good 30 cD sleep cycle. “No self-respecting person should be awake now”, he further concluded. But with yesterday having been LowSun day, he knew that he only had about 2 ½ dY before the SouthCentral Science Conference, and he wanted to be ready to discuss his finding. If he caught the ear of the right professor, it might help get him elevated to graduate and become an Assistant Professor by next year.

In that quest, he was happy to have the resources of the central library available for him now. He had so much additional research to do and he found he could focus when working late. The central library, like all public buildings all over Necedah, was never closed. People could come and go and use the facilities whenever they wanted. Of course, staff wasn’t going to be available in the middle of the night, but anyone who wanted could come in and browse the books, they just couldn’t check them out until staff was back during the day. There had never been a problem with people not respecting the rules and thus requiring the building to be closed and locked. In fact, locks throughout Necedah were very rare. People didn’t lock their houses, even in the big cities like SouthCentral City. There were ample resources to go around for everyone and it just wasn’t a problem with people going where they shouldn’t or taking what wasn’t theirs. The only place locks seemed to be found was where you needed to keep children out of, or where there was dangerous contents that a person might innocently stumble upon and hurt themselves or others.

So Zemp was taking advantage of the open library to prepare his findings before the science conference.

Unfortunately, he didn’t quite know yet what his findings were. It was great to be alive in this Age of Discovery. There was so much more being learned every day. Moreover, there were new techniques and procedures and discoveries happening that allowed other things to be analyzed and tested and discovered. And that was the quandary he found himself in. He had been collecting soil samples for years all over SouthCentral Necedah. Some of them very long tubes that were about 6 cL wide by about 4 L long.

There weren't a lot of surprises when he first took the samples. He had first become interested in the study of geology, and specifically what the soil could tell him about geology, when he was working with his father and grandfather digging up dirt to be moved and packed in other locations. There weren't a lot of DirtMover families in the SouthCentral area, nor in all of Necedah for that matter, as far as he knew. People normally just built on the flat ground as it was. It was only very special projects that required a DirtMover, such as building a room below ground level (for what good reason he never really understood) or to build a water hole to swim in.

He learned early on that, as you dug down, the soil had a very distinct and consistent pattern, oscillating between medium brown layers and very dark brown, almost black, layers. The pattern was very regular, with the topmost layer being a full depth of medium brown dirt. There was also something odd that he always found, and which made every dirtmoving job harder: the medium brown layer just below each black layer was especially hard to dig through, as if it was denser. He found that to be true regardless of where they dug.

As he grew into his teen years, he grew to wonder why were there the color and density variations, and why were they so consistent? When he asked his dad or grandfather, their response was, essentially, "Because it is." As an inquisitive boy and being unsatisfied with that answer, he asked his teachers in school. But their normal response was a look of bewilderment at why he was even asking the question, with a retort questioning why he would even care. It was as if he was asking them why water is wet or the sun shines; it was a pointless question.

Except for one of his science teachers in his final year of standard school. That teacher had encouraged all his students to ask all sorts of questions, even those that were unanswerable. "By asking those questions", the teacher would lecture the class, "and looking for answers, even the unanswerable might eventual be answered." So when Zemp asked his teacher the question about "Why does the soil have color patterns when you dig down?", instead of being rebuffed or chastised, the teacher responded with, "I don't know. That is a very good question. What do you think the answer might be?" (After a while, Zemp found that the teacher was very good with answering a question with another question). Over that year, they would spend several post-study sessions discussing possibilities and how to potentially test them. Of course, this drove them to the relatively new study of physical geography and all the science behind that which might yield answers. He found himself checking out books from Professors of Geology who talked about things like what the snows in the north did to the grass and

other vegetation, or why the land south of the End-of-Rain-Line was made of sand rather than dirt. But none about the strata in the soil.

Eventually, towards the end of his last year of standard school, with the recommendation of his science teacher, Zemp applied to SouthCentral University rather than joining his brother to take over the family profession. When given the news, his father brashly told him that this new way of not staying in your family profession, was not only bad for society, but was also going to hurt his entire family and they would be poorer and worse off by Zemp “abandoning them” and choosing instead to go to the university to “ask stupid questions about unimportant things”. His family then, with the patriarch’s inducement, ostracized him and cast him out. He had not spoken to them since.

So now, 6 Y later, after having studied mathematics, physics, chemistry, biology, as well as the required coursework in history, literature, writing and other essential knowledge academics were expected to have, he found himself now in graduate studies to become a Assistant Professor of Geological Science. But almost as much as the validation he sought in becoming a professor to prove to his family that he had value in the world (and, although he would not admit it to himself, would lead them to accept him again and welcome him back), he wanted to know the question that had been confounding him for the better part of the last decade. So all his energy and time were devoted to this one quest, to the point where he only got about half the sleep, or about 15 cD per day, that a normal person would get each night.

Which lead him back to the stack of books, papers, graphs and charts surrounding him in an empty library in the middle of the night. He had to have some key findings ready for the science conference, but the findings from his soil samples were confusing.

From his studies of other professors’ data over the years, he did know that it was estimated that new dirt accumulated at about 2 cL per century. No one really claimed to know where this was coming from, but the conjecture was that the loose sand below the End-of-Rain-Line would be picked up in the strong southern winds and slowly redeposited in habitable Necedah from the constant northern breeze that must (it was assumed) be coming down over the pole and coming from the central part of the planet.

The brown strata segments in the soil samples were about 90 cL long. At 2 cL per century, that came out to about 4500 Y, assuming the soil accumulation was the same during the entire period. Throughout the top and current strata the consistency and chemical makeup of the soil was largely the same, indicating

the climate, supply of new soil, chemistry and biology was largely the same throughout. This seemed to repeat between every black strata, for as far back as the samples went.

The black strata segments were about $\frac{1}{4}$ the depth of the brown strata, or about 25 cl. Unfortunately, he had no measure of how fast that accumulated, so he had no idea how long it took that strata to accumulate; it could be 100 Y, 5000 Y or 100000 Y. He just couldn't tell.

But there were other elements of the black soil that was very interesting. The physics department couldn't really determine anything specific about it. However, the chemistry and biology departments got intrigued enough that they consulted each other using microscopes and chemical analysis techniques to see what they could determine about the sample. They even used a new technology called *chemical spectroscopy* to analyze the light spectrum of the soil to tell them about its chemical makeup. What they reported back was that they believed this part of the soil had a high concentration of now dead organic biomass that exhibited signs of slow decomposition in reduced oxygen. One of the biologist said what he saw was similar to something he read about the decomposition of microscopic organisms at the far northern areas of habitable Necedah during the depths of winter. The article, so the biologist said, was from a professor at NorthCentral University, but what Zemp had sent him seemed to be, in his opinion, much longer term and with much less oxygen present, as if it had happened under a very large, air-tight, block of ice. Zemp had asked for the reference to the article, but he was still waiting for the reply. He hoped he wouldn't have to request the article from NorthCentral University, as that could take a full Y for him to send the request and receive the article copy via Yaze courier.

Of course, both the chemistry and biology departments had sent him all sorts of graphs and charts to document their findings. These were now spewn across the table in front of him and he was still having trouble making sense of what they sent. While he was a scientist, he was neither a chemist or a biologist, and it seemed like he needed to be one to understand all the data they were sending him.

But the oddest thing was the compression layers in the brown strata just under the black strata. These compression layers were about 20 cL deep and were very dense, as if they had had immense weight placed on them. They had defined horizontal layers to them and were so compressed that it was difficult for water to soak through (or a shovel to dig into them). In fact, according to the research he had done, the compression was so much that even the roots of plants couldn't take hold.

But there was one thing that seemed very out of place in the repeating strata. In all the previous brown soil strata, about the top 20 cL, or about $\frac{1}{5}$ th of the top of the 90 cL strata, consisted of this compressed

strata, getting more compressed as it got higher. He had done the calculations, and without this compression, the depth would have been about 100 cL. The current brown layer – the one that he would walk on if he went outside - was about 100 cL but showed no signs of any the compression layers. Why?

He would keep working it, and hopefully he would have some satisfying “findings” by the start of the conference. Zemp glanced up again just in time to see the clock strike 13 cD.