Chapter 2: The university that challenged excessive data infrastructures

Having looked into all the snippets that showed them the deep-seated academic culture of their university, many North~Westerners sank into a state of melancholia.[14] How could this ever change? They had lost their past, their future vanishing in a blur. Still, some of those with straight backs and large hands insisted that they had been trying for a while to learn how to land. Yet conflicts and new problems often arose when trying to find solutions. They collected an e-mail, a newspaper article and found a customer review, and noted down some conversations and observations they had about how the North~West University tried to challenge excessive data infrastructures, and how difficult it was. These can be seen in this chapter.

14. Endre Dányi (2020) has at length studied and theorised how sad-sombre sentiments are both collective and thoroughly political.

Rushing

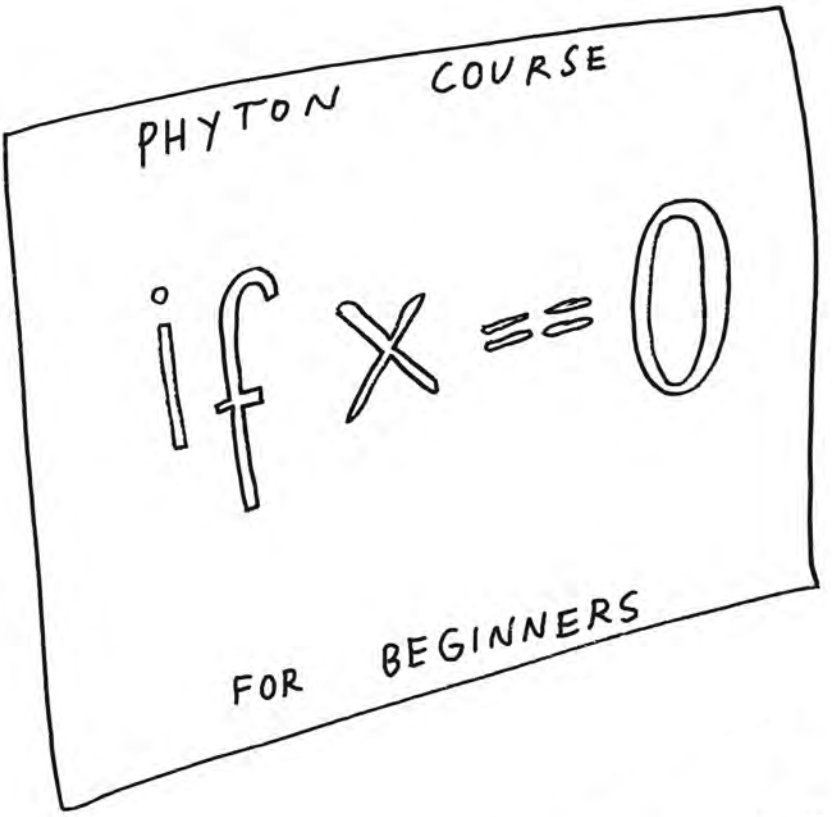
Last week, research laboratories from different disciplines experienced an unprecedented surge in demand for coding skills. Chemists, historians, medical scholars and others competed to attend introductory Python workshops, with many courses filling up within hours. Organisers rushed to open additional sessions, urging participants to "not miss out—start from the beginning."

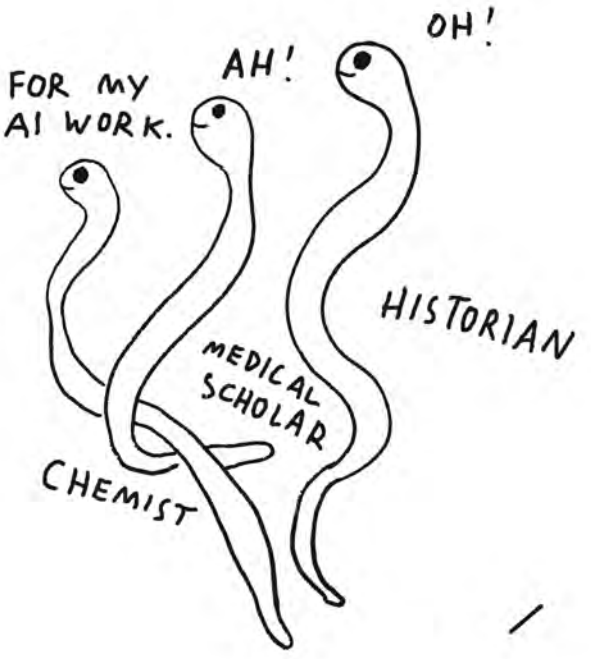
For many researchers, this is the way forward. They need[15] to sign up. "Learning Python changed my approach to experiments," said an ecologist who had finally secured a spot in the newly added night class: "Now we can analyse satellite data and run more efficient machine learning models that allow us to understand better the effect of climate change on biodiversity".

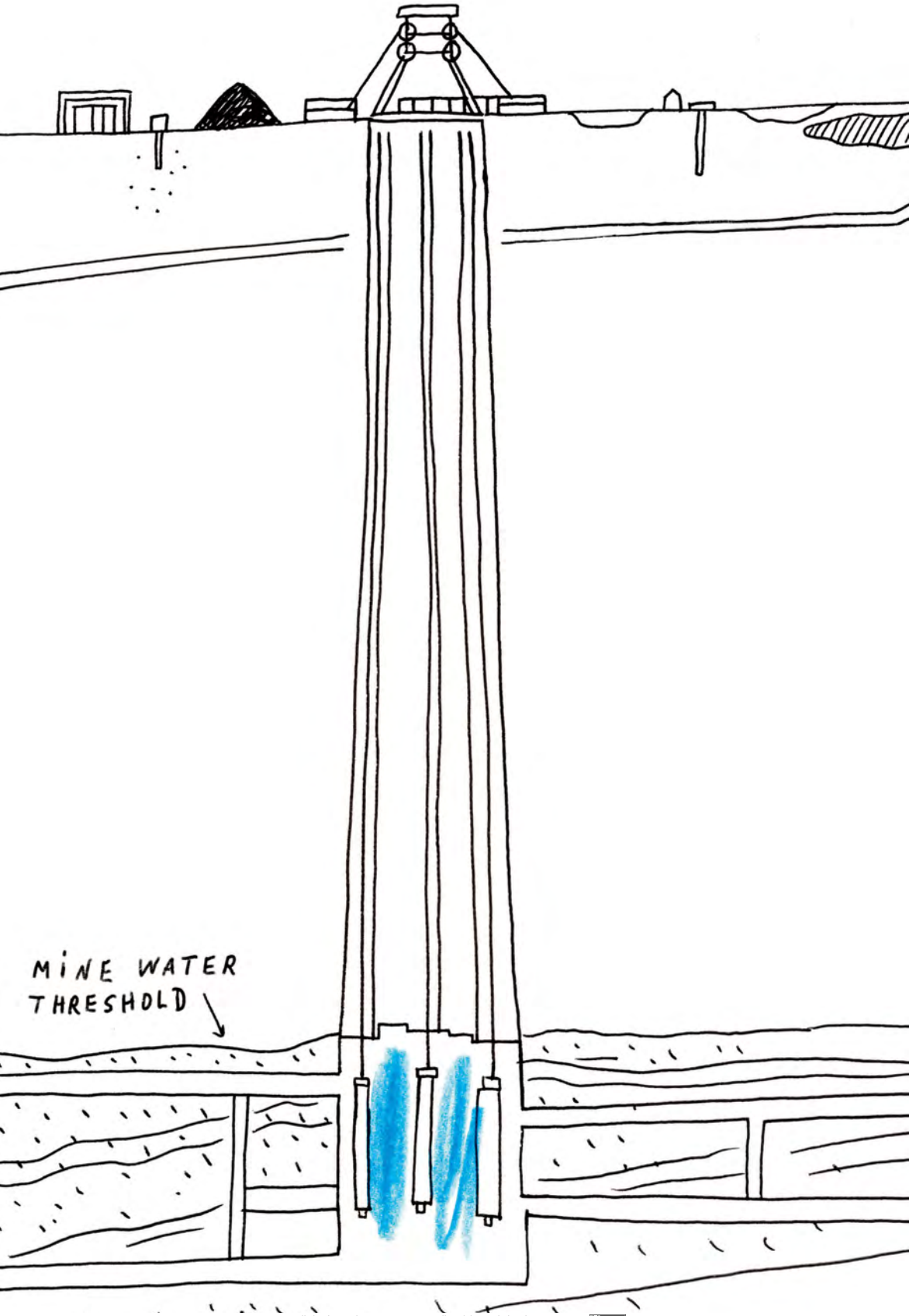
This rush is hardly surprising. As data volumes continue to grow, so do the benefits of AI-driven breakthroughs. Advocates hail AI literacy as the gateway to tomorrow's discoveries and emphasise that every scientist must learn coding to stay current. A few scientists have raised concerns that the energy demands of AI systems are so high that the lights in their seminar rooms start to flicker.

As the size of datasets continues to grow, the message is clear: scientific progress is speeding up. When organisers reopen their registration portals, hopeful participants are encouraged to sign up immediately.

15. Emily M Bender and Alex Hanna (2025): *The AI Con: How to Fight Big Tech's Hype and Create the Future We Want.* Random House UK. Random House UK.

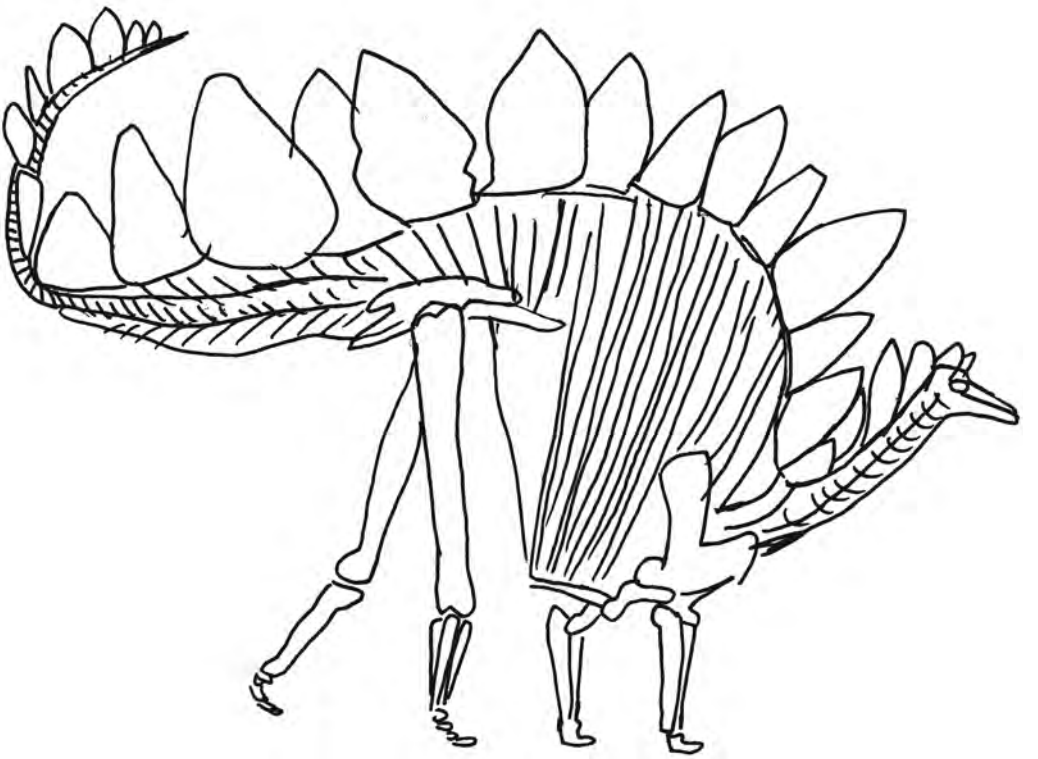






Groundworking

“Did you hear about the new data centre our campus wants to build?
While we sit on a legacy, old shafts full of mining routes,
closed down yet filled up with stuff, flying with us. With us.”
“You’re saying what’s beneath us still shapes everything what
happens up here?”
“It affects the data centre planning to avoid collapse.”
“Sounds like we’re flying with hazardous ballast.”
“I just hope they can keep it under control.”
“Hope… and control?”



Outdating

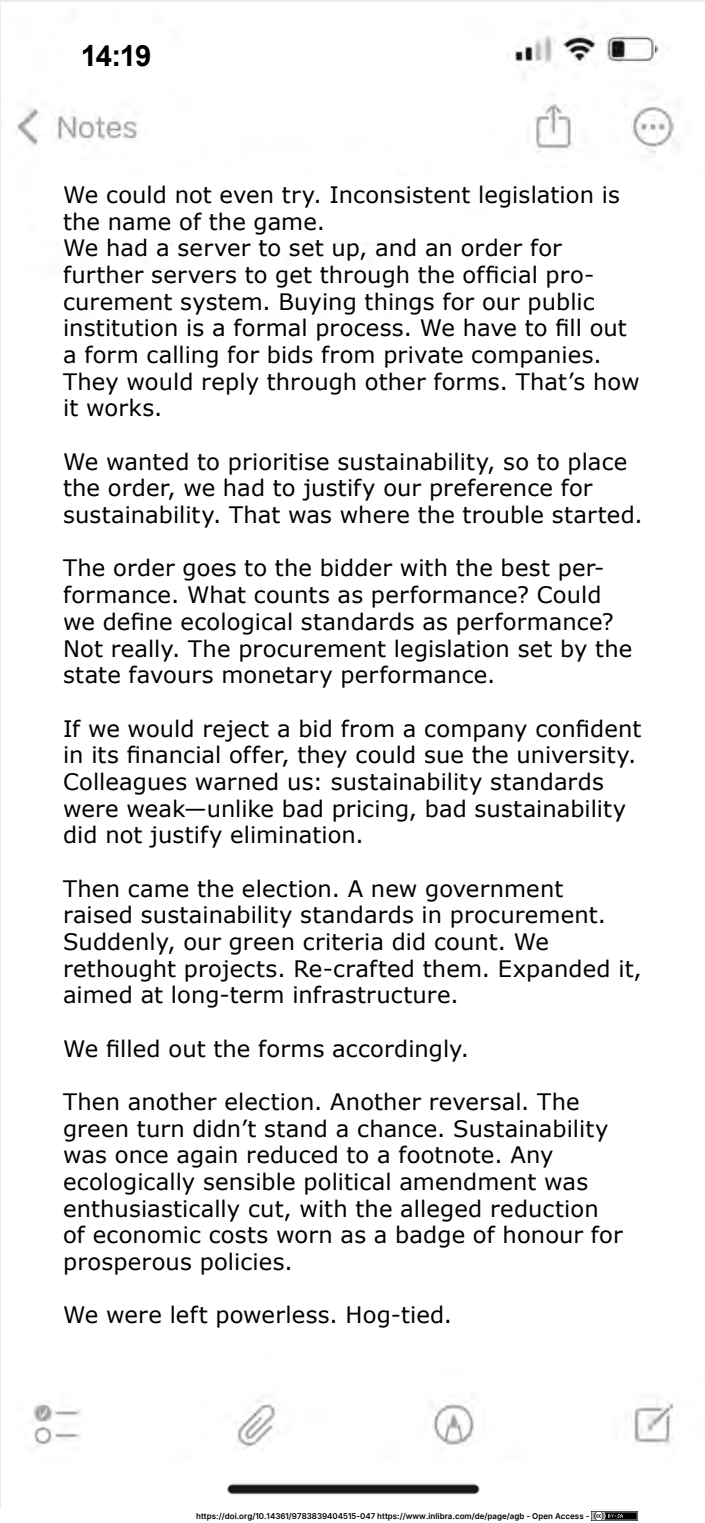
Less than stellar in practice, wouldn't buy again

★★☆☆☆

Verified customer

The university wanted a modest and most energy-efficient data centre, and since D@taHeaven's development plan sounded super sustainable, we ordered one with them. The consultation process was great. We were excited, since, of course, we are not data centre experts. We have a lot of important scientific data, so Mr. Myers from D@taHeaven made us understand that we needed a major diesel generator and a whole room full of batteries to run the data centre in case of power cuts: a Tier 3 setup. Just in case. D@taHeaven guided us through the application procedures for federal, regional and local permits involving the Ministry of Scientific Datafication, the City Council, the local Institution for Future Usage of Unsealed Earth as well as through the negotiations to convince the local landowners to sell their properties. Now, during the course of the construction time, the rectorate informed us that the university had acquired a top-profile scientist who needed to install his own high-performance computing clusters in the data centre. So, we redesigned the rack setup in the data centre, and reduced the storage capacity to free up power for the new clusters. Before the storage servers even started humming, they were already full. The process took almost five years. D@taHeaven said this was quick. But it meant that when the data centre opened, it was already outdated compared to new and more energy efficient systems that are available today. And then came maintenance. The fire-extinguishing system of this data centre dinosaur demands inspections at least four times a year, the batteries need regular checkups, the diesel engine requires test runs, etc. Moreover, energy and diesel prices then skyrocketed, and we are facing outrageous energy bills. It is like feeding an extinct species.

Succumbing



We could not even try. Inconsistent legislation is the name of the game.
We had a server to set up, and an order for further servers to get through the official procurement system. Buying things for our public institution is a formal process. We have to fill out a form calling for bids from private companies. They would reply through other forms. That's how it works.

We wanted to prioritise sustainability, so to place the order, we had to justify our preference for sustainability. That was where the trouble started.

The order goes to the bidder with the best performance. What counts as performance? Could we define ecological standards as performance? Not really. The procurement legislation set by the state favours monetary performance.

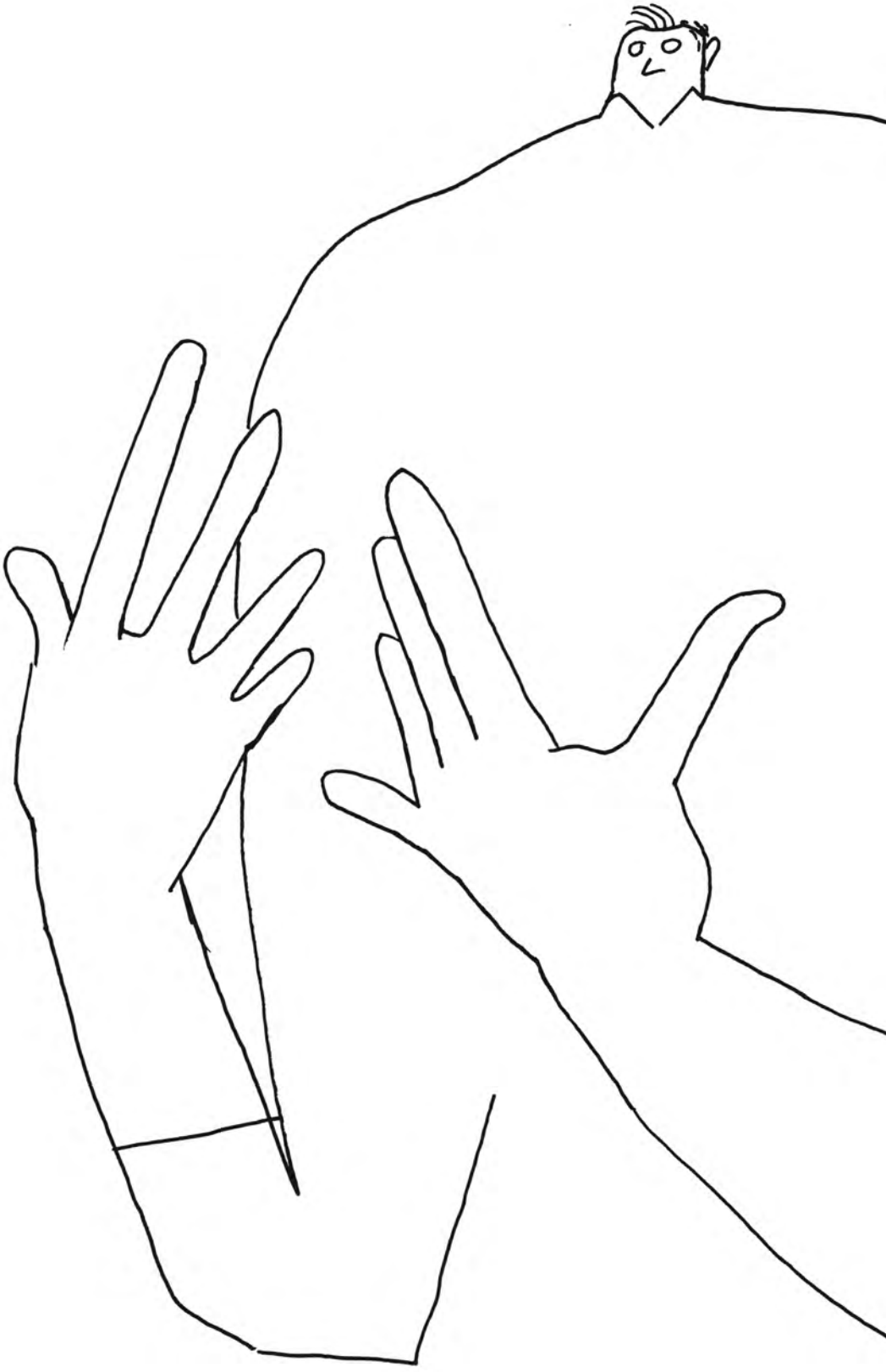
If we would reject a bid from a company confident in its financial offer, they could sue the university. Colleagues warned us: sustainability standards were weak—unlike bad pricing, bad sustainability did not justify elimination.

Then came the election. A new government raised sustainability standards in procurement. Suddenly, our green criteria did count. We rethought projects. Re-crafted them. Expanded it, aimed at long-term infrastructure.

We filled out the forms accordingly.

Then another election. Another reversal. The green turn didn't stand a chance. Sustainability was once again reduced to a footnote. Any ecologically sensible political amendment was enthusiastically cut, with the alleged reduction of economic costs worn as a badge of honour for prosperous policies.

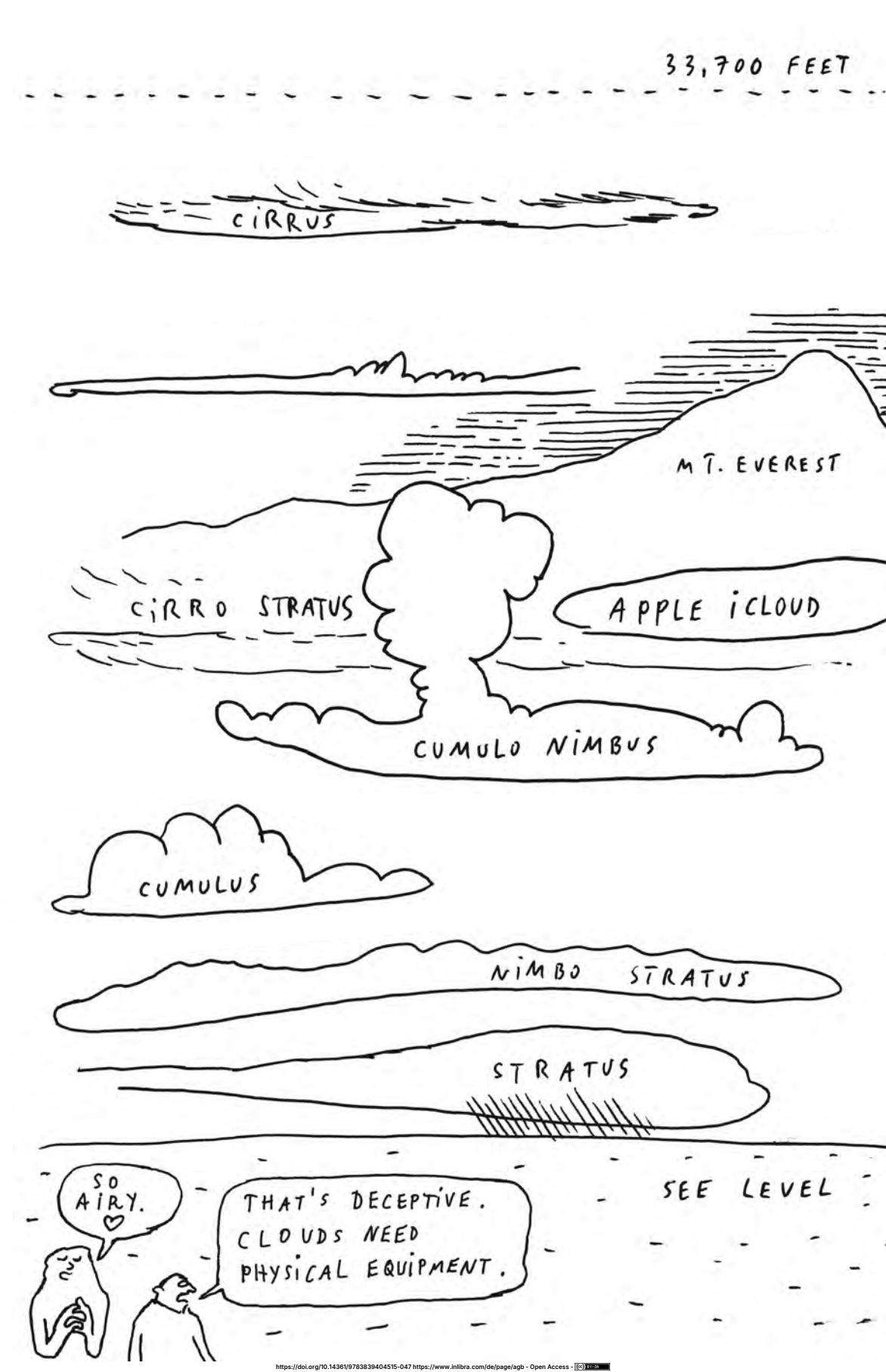
We were left powerless. Hog-tied.



Saving

“Hello, data centre manager here”.
“Hi, hello, how can I help you”?
“You are the scientist with the exceptional data storage needs, right”?
“At your service”!
“Hi, thanks, well, we are running a campaign to centralise scientific data, and I would like to ask you to move your data to the data centre”.
“And what do you want me to do when servers break down and you are at the beach? You are not going to come over on weekends to repair the servers as I do”.
“Well, since we offer 99.99% uptime at the data centre, it’s unlikely that it will happen”.
“Well… Have you ever heard about freedom of science? It used to be about protecting science against political and commercial influence. But now, it seems I need it to protect my research against the university’s own infrastructures. Data are our material and our methods. You cannot force me to save data on your central machines”.
“Freedom to stress the planet? Think about this: saving data centrally saves energy. The data centre’s cooling system is much more efficient than your own servers’”.
“I’m not sure about that, I only have the fans in the server, I don’t cool the room”.
“Right, but I just talked to the energy manager yesterday. They emphasised that your office is cooled by the central air conditioning system, and the university carries very high costs of central cooling. If your office wasn’t heated up a degree or two by the servers you have next to your desk, the university could spend more money on science, instead of paying electricity bills to cool your office”.
“You know what? I’ll rearrange my data. I have quite a bit of the data that are just stored in case someone at some time in the future might come around and ask to see them. I’ll put all the data I don’t use regularly on an external hard drive and store it in the bottom drawer of my cupboard. There, it won’t consume any energy, and it won’t burden the air conditioning”.
“Yeah, fine, not bad. And the rest of the data? We have some very fine new servers with all the capacity you need”.
“Hey, wait a minute. Weren’t you just the advocate for saving energy”?
“Still am”.

“So, think about your wonderful new servers. You replace them every five years, right”?
“Indeed, that is how we can guarantee the 99.99% uptime”.
“Did you ever think about the energy it takes to produce the CPUs of your servers? And even worse the GPUs. I keep my servers running 7-10 years”.
“Old computers are much less energy efficient”.
“Not if you include the energy spent on production in your calculation”.
...
“Eh, maybe it isn‘t about all these details, but about developing a system together that is sustainable, technically operable and practically usable for science”?
“Okay, Wednesday afternoon”?
“Sure”



Weighing

In the elevator, colleagues meet. After a few awkward seconds of staring at the floor:

"Now that we are hovering, we are at least closer to the cloud..."
"Well, I am not that sure. What you call 'cloud' is not in the sky, and far from light. These are material monsters, little elephants, with a heavy mineral and energy demand. Every file, every project sits somewhere, somehow."
"It's easy to forget, up here in the office."
"If you want to get down to earth, you'll have to learn to remember your computing's material reality."[16]
"Still, we got somewhere, right? I mean, look around. Well, upstairs, here, the innovations they do on the 9th floor. The tools, the reach they have with their new equipment. Saving lives."
"We lifted off, yes. Or drifted off. Maybe both."
"You say it like that's a bad thing. Everyone says it."
"Isn't it?"
"Maybe we're just finally able to see the horizon."
"Depends who's looking. And what they're willing to see."
"Well. You know, lifting... It also means out of touch. The machines do good work. Work for everyone."
"Everyone? Are you..."
"At least they work for many who were previously, eh, they include plenty of folks. I don't want to just give up on progress."
"But we should probably stop pretending we are not part of the weight."

The elevator beeps and opens its squeaky doors.

16. Acknowledging the heavy resource dependency of computing, and thinking about what to do, when these resources are not available anymore, and civilisation as we know it collapses, the Canadian writer and programmer Virgil Dupras has developed an operating system for exactly that moment. He calls it Collapse OS and hopes that it will allow the continuation of computing and community care after civilisation's collapse: https://collapseos.org/

Queueing

"They have no clue about physics," my professor grumbled. He was late for our Thursday meeting and kept rambling on about how they had cut the power of his decentral high-performance cluster, and from now on we had to do high-performance computing centrally with the North~West University's data centre. That we would have to fill out forms to justify resource requirements, CPU-hours, memory, storage, software requirements, etc. That they would queue up our computing tasks for their high-performance computing cluster. No-one said anything at the meeting. We all understood that he is a busy man, that he can easily get overwhelmed by such additional tasks.

But it wasn't the additional tasks. Our Thursday meetings changed. Thursday had been the day to get together, because it allowed him to plan our computing tasks for the weekend. We were 17 PhDs and Post Docs in the team informing him about our current research, and he would relate our projects to deadlines for funding or conference applications and to publication submissions. He would prioritise computing tasks coming up. He would talk about studies recently published that could be related to our research, and he would move up the calculations of those of us that did research in that area. "Action, reaction" he used to say, and he would look one of us in the eyes, and the one knew they were the one to react. This meant being first in the queue for our decentral high-performance computing cluster. He would be assessing the number of cores needed, the CPU-hours, storage, etc. We would listen carefully and comment if we thought differently. In the jumble of formulas on the blackboard he would find a space and write down the computing job queue for the coming week. I loved those Thursday meetings. Lots at stake. As being a part in a Formula 1 engine that was being calibrated to race.

But not anymore. Now, each one of us sends their own calculations to the North~West University's data centre with an application form and resource requirements. We still meet on Thursdays, and we still share our research, but deprived of the precision task of queueing up our calculations in exactly the right order for the engine to spin, he seems to have lost the momentum to push us individually to complete our tasks. And I don't learn much anymore about how to assess our position in the field, and how to prioritise and to estimate computing resources. Watching him do it every Thursday morning was like seeing the field of physics unfolding in front of my eyes.

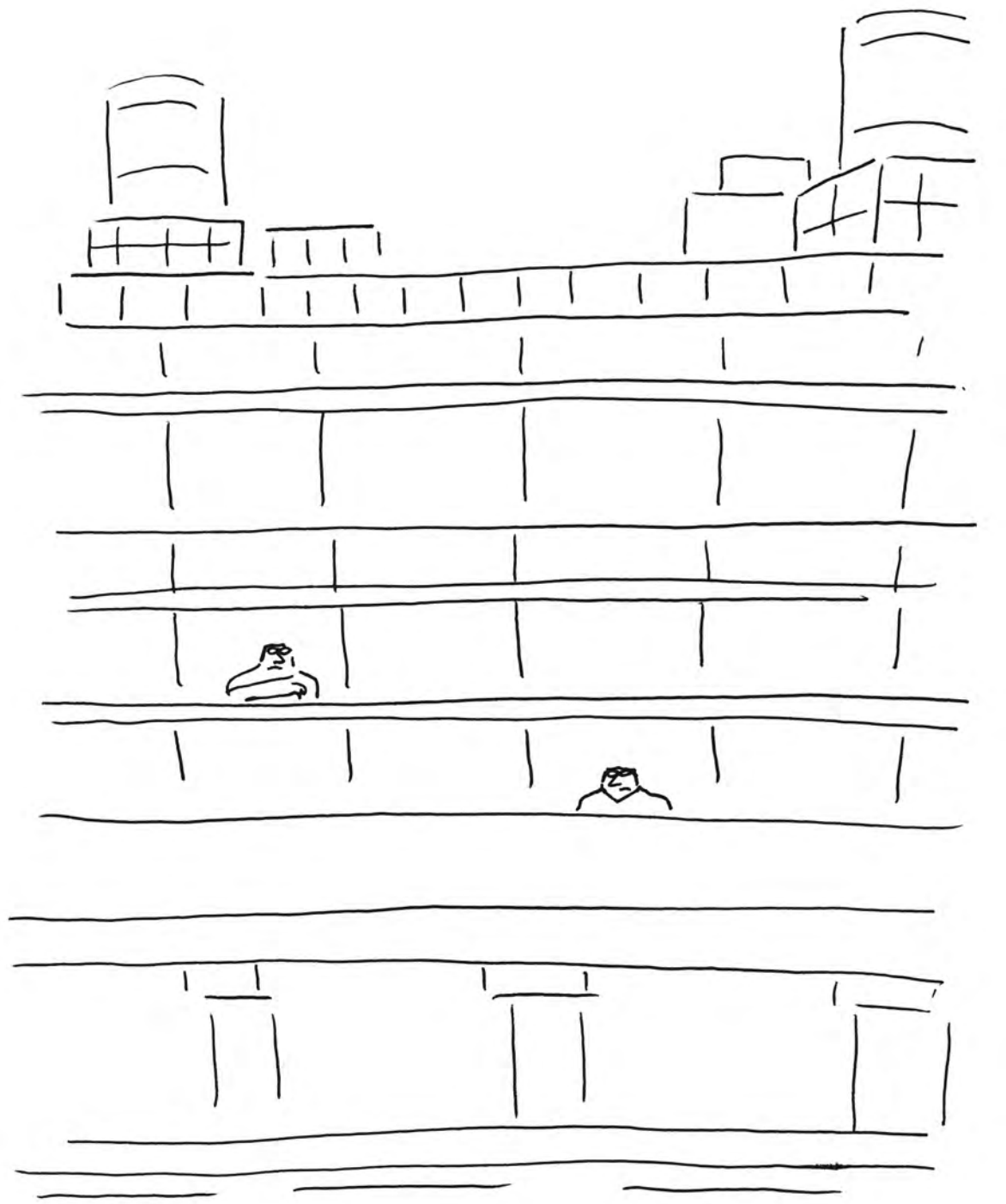
I talked to the data centre. Centralisation allows them to queue up the whole university's computing tasks much better across many more clusters, and they certainly have a better utilisation than we did. They spend less energy, and every microgram of the metal extracted for the servers and the chips fabricated under toxic conditions is utilised better than we ever could. Centralisation is justified.

But so was decentral queue formation. It fused computing and scientific practices better.

What if we didn't have to choose between central and decentral computing? If a fold adjoined the central high-performance computing with our Thursday meetings, and our scientific practice?

Prioritising

Now that we know that Professor Olson's data processing consumes only 500 kW annually, do they still have to save the same amount of energy as the high-consuming team of Professor Abbot? Or do we accept that Abbot saves less because they are more important to the university? Are all requests equally valuable? For the head of the university, I don't think that is the case – for perfectly understandable reasons. There are professors here who have a higher quality of research than others. Let's be honest: We cannot require the same cuts of all professors.



Renting

Hey,

This whole property management thing at the university is starting to melt my brain. I was just scrolling through the new EYEBALL®'s AI stream and, voilà, it pulled up this old PR document. Like it thought it would help me with my understanding:

"On January 1st the state founded the agency 'Building and Property Management North~Westernish Estate®' to centralise and modernise the administration of the North~West State's real estate. The agency is responsible for acquiring, managing, and developing state properties in line with commercial standards and policy goals. Ownership and management functions are consolidated to enhance efficiency. Users of state infrastructure now pay rent at market rates. The agency covers personnel, material, and maintenance costs, and allocates appropriate interest payments to the state budget. This framework encourages users to assess their space requirements more closely, while the agency evaluates maintenance needs with greater scrutiny, leading to improved economic outcomes for all parties."

As we have felt in the past, we're sitting in a university that doesn't own the building it's in. And the owner doesn't want any changes. We can't do anything, like install energy upgrades, rethink spatial use—not without running it through a property manager. On the other hand, I am very happy to have a third party take over most of the boring day-to-day decisions. It's great not having to care about that. Where do we go from here?

Anyway. I was going to keep ranting, but EYEBALL® just sent me a real estate ad for a freehold apartment. Talk soon.

Peacekeeping

So what happens if we follow through?

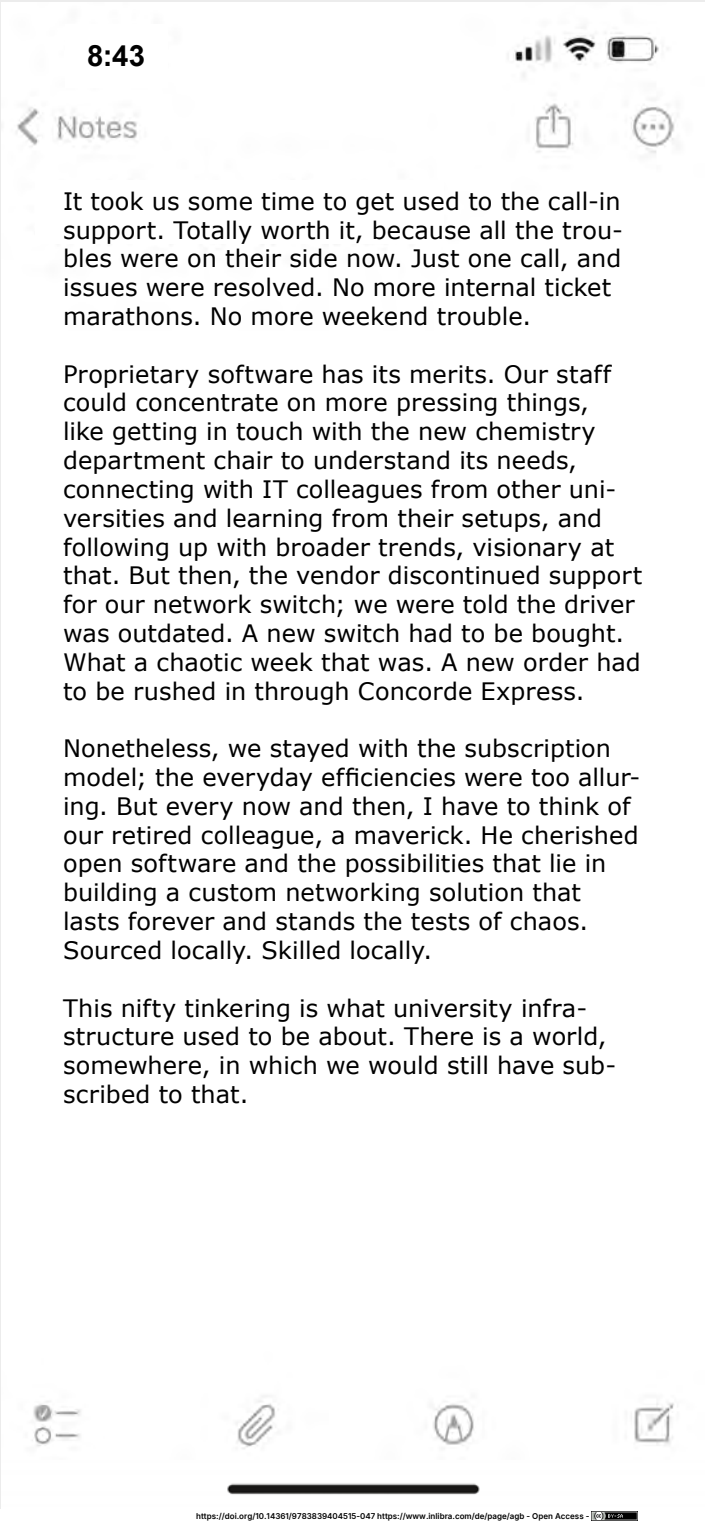
We have our vague future project of counting
and understanding the entire energy use on campus.
Down to rooms.
Everyone keeps postponing this project.

But we know, in a way, already who the major power users are
—who should be held accountable.

But can you just cut them off? Is that just?

Is the low performer actually the high performer?
How would that change the university?

Subscribing

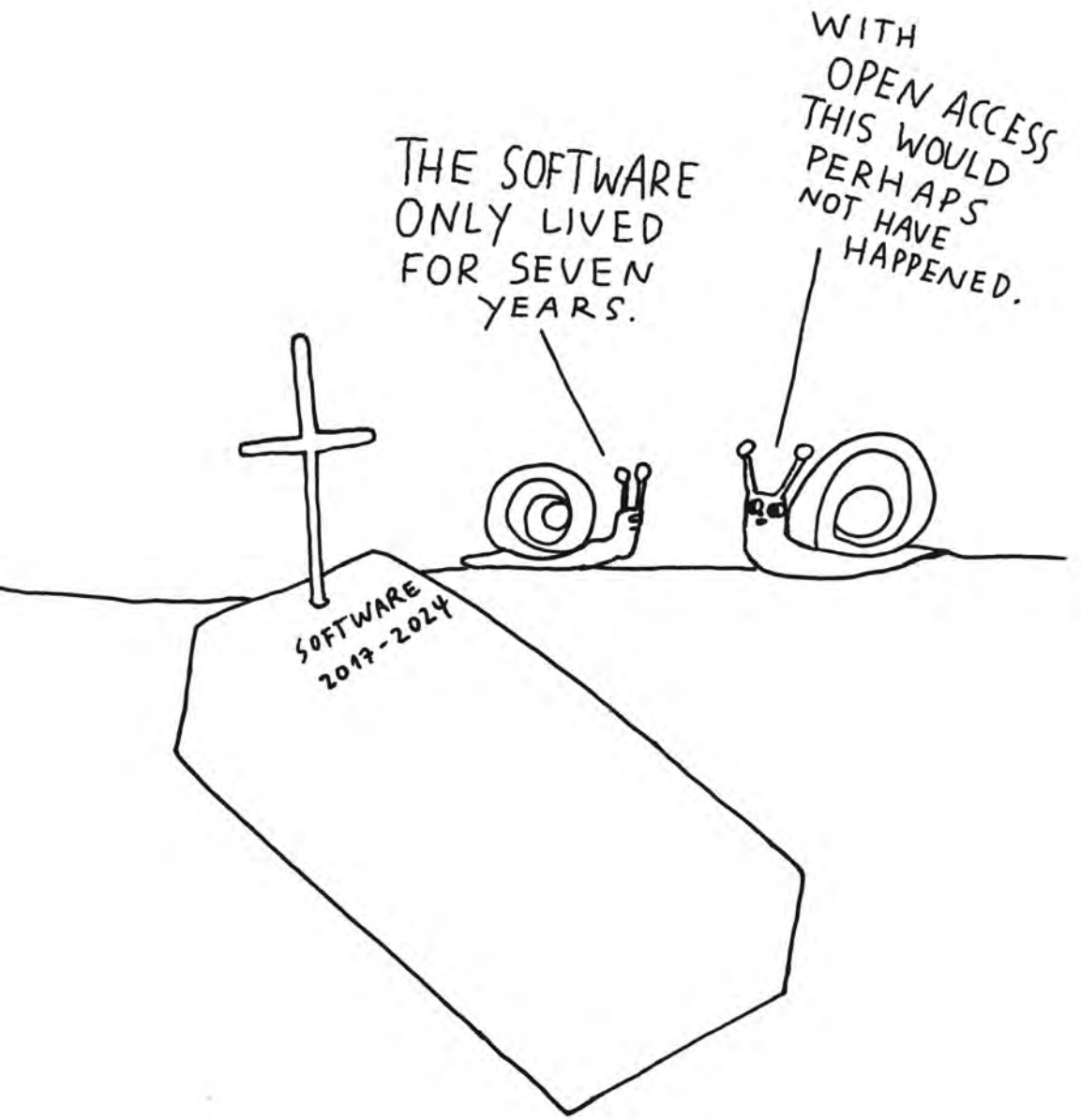


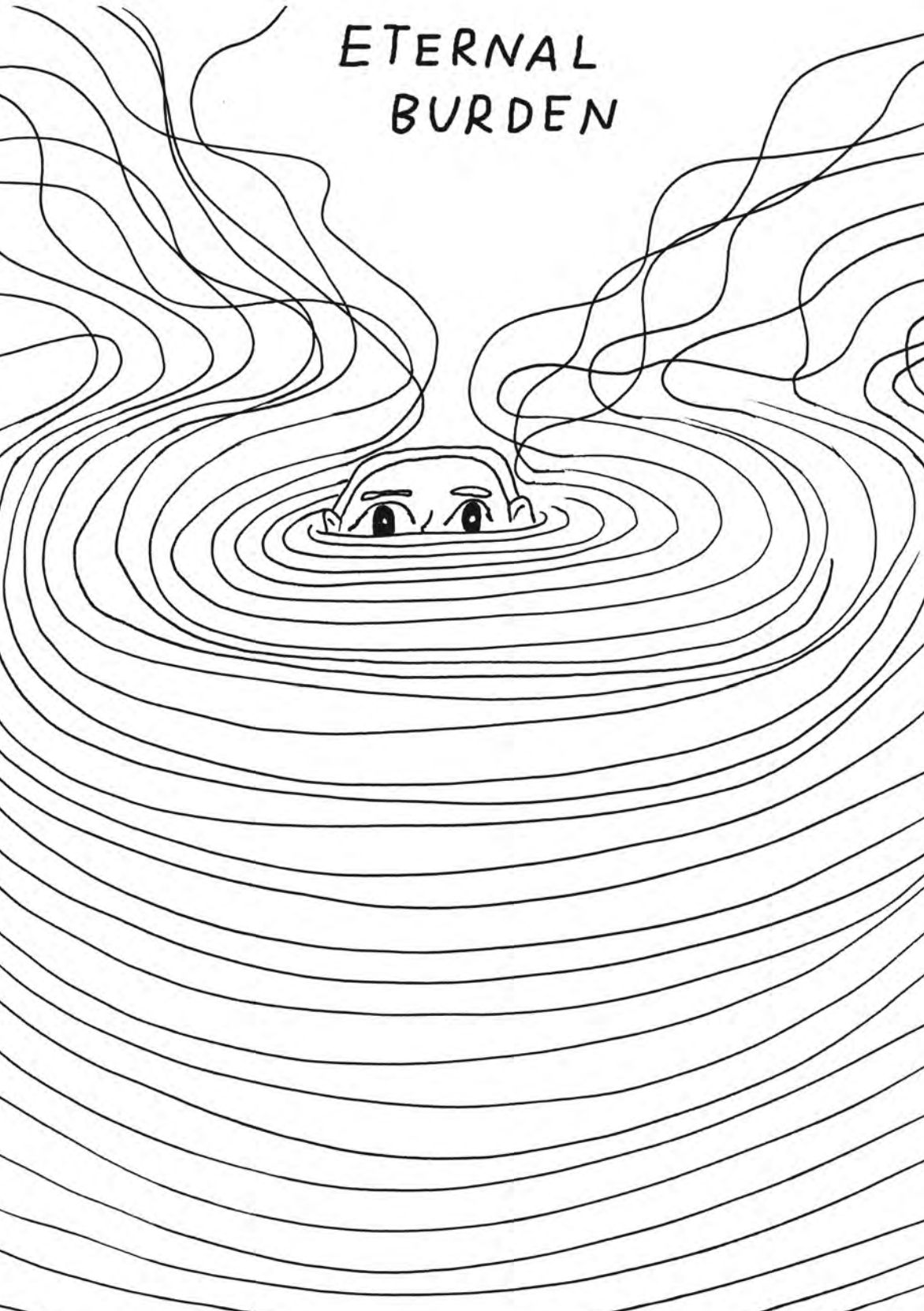
It took us some time to get used to the call-in support. Totally worth it, because all the troubles were on their side now. Just one call, and issues were resolved. No more internal ticket marathons. No more weekend trouble.

Proprietary software has its merits. Our staff could concentrate on more pressing things, like getting in touch with the new chemistry department chair to understand its needs, connecting with IT colleagues from other universities and learning from their setups, and following up with broader trends, visionary at that. But then, the vendor discontinued support for our network switch; we were told the driver was outdated. A new switch had to be bought. What a chaotic week that was. A new order had to be rushed in through Concorde Express.

Nonetheless, we stayed with the subscription model; the everyday efficiencies were too alluring. But every now and then, I have to think of our retired colleague, a maverick. He cherished open software and the possibilities that lie in building a custom networking solution that lasts forever and stands the tests of chaos. Sourced locally. Skilled locally.

This nifty tinkering is what university infrastructure used to be about. There is a world, somewhere, in which we would still have subscribed to that.





Repeating

We mined for coal,
our toxic groundwater rose,
pumping became our eternal burden.

We turned to data,
toxic mining for minerals
for our servers
unfolds elsewhere.

It becomes their eternal burden.