

Rivers, Roads, and Rails: A Tragicomedy

(This essay was begun a year ago, three stories above the desk where I'm sitting.)

[2013]

I am sitting in a 17th-floor room in Bern, Switzerland, looking out my window at an urban landscape that looks very much like a model train set. The #27 bus enters its lane just below me, the stainless steel bollards dropping neatly into the street so that it can pass, and then raising again after it goes by, just as they do for emergency and DPW vehicles. This happens every 15 minutes; but just beyond it the #101 post-bus stops every 10 minutes, and half a block to the west I can get the #8 tram, which goes by every eight minutes. All of them are always on time, but in case of the zombie apocalypse, they have digital schedules posted at each stop, which refresh in real-time. Between these options, I can reach any point in the city within about 30 minutes door-to-door. Should I need to go a bit farther, I am only two blocks from the regional rail stop, where I can hop onto the Lötschberger and be rocketing underneath the Alps at 250 km/h before I've had time to read my email (which I can do en route, of course, since *all* these options have free wifi). If that's not precise enough, I can take one of the post-buses to effectively any point in the country that is accessible by road. All of these means of conveyance have bike racks, as well, and I can rent a bike for free at the Bern train station. Should I wish to go even lower-tech, and just swim down the river—as many of the Bernese like to do—there are well-placed entry-points and exit-points, signage, and a meticulous water-quality campaign to ensure the water is free of pollutants.

This is a country that cares deeply about its transportation infrastructure. This is a country, let's be clear, that has actually written transportation infrastructure into its constitution.

As I sit here watching the trains and trams and busses go by, I have been reading the news of Elon Musk's recently unveiled Hyperloop. Actually, it is a little unclear to me that “news” and “unveiled” are the right terms for what is happening. The story is being carried in the European press with all the dignity of a global event, but nothing has actually occurred. It is more like an optical illusion: Musk has waved some concept art around for a transportation project that does not exist, which may not even be feasible, and which—fascinatingly—he says he has no plans to undertake. Moreover, the idea is not a new one—working prototypes of “atmospheric railways” have existed for a century and a half.

And yet the tone of the reporting on the Hyperloop keeps lapsing into the perfect tense, as if we are discussing something that someone has accomplished through some type of effort. Indeed, it does not take much digging on the internet to find Hyperloop fans sneering at Chinese maglev trains, which can only do 500 km/h. That is less half the speed of the Hyperloop, but it seems germane to note that the maglevs are *real* trains that *actually go that fast*, and are the result of many decades of engineering and trial and error. By contrast, the Hyperloop is just a couple of nice drawings, and its top speed of 1220 km/h is just a number typed on a Powerpoint slide, which took no more effort to produce than any other four-digit-long sequence.

This tonal shift is not at all new—it has a long history in architecture, for instance, where people have come to speak of building designs and competition entries interchangeably with actual buildings. In some cases—Utzon and Wright are classic examples—critics have played along, taking the view that real-world engineering concerns are an embarrassing philistinism. The glory of the architect's genius should not be sullied by a bunch of people pointing out that the roof leaks, or the walls are unstable. In much the same vein, Paolo Soleri's book on Arcosanti is full of the author's pen-and-ink drawings of magnificent Utopian cities, which is somewhat belied by the fact that the real Arcosanti would fit neatly in any self-respecting Wal-Mart's parking lot.

There is a wonderful promotional piece for the Iodan-Shucko-Gelfreikh vision for the Palace of

the Soviets, which shows it dwarfing the Eiffel Tower and Empire State Building, capped by 325' stainless steel monument to Lenin. The message to Western architects with their puny buildings and copper statues is clear enough. And yet the Soviets hadn't built anything of the sort, they lacked the technical capacity to even rival the Empire State Building, let alone dwarf it. Given that hubris, one wonders why their castle in the sky was only 1361 feet tall, rather than, say, eight miles. Why use stainless steel instead of gold? It's the same amount of pencil lead.



This pattern has also always been the stock-in-trade of space exploration. In the 1970s, for instance, the [Stanford Torus](#) project generated reams of pretty paintings of enormous space stations, along with lots of affirmative statements about how well these stations *were working*, rather than *might possibly work someday if someone coughed up a few trillion dollars for R&D*. ST was a joint project with NASA, and I distinctly remember being confused, as a child, about whether or not those space stations really existed. I think my teachers were a bit confused, as well. In a sense, I think NASA was (and remains) confused on this point. The concept art is so lovely. And it would be so cool to travel to other star systems, except for physics.

Elon Musk himself has a background in quasi-commercial space exploration, and here we see the pattern all over again. Every article on Spaceport America shows a picture of the gleaming concept art, which looks ever so much better than the real thing. Articles about travel to the Moon or Mars also rely heavily on concept art, presumably because the actual footage we have of both places makes them look both lethal and mind-numbingly boring. Bas Landsdorp, for instance, who has big plans to go to Mars in 2023, seems to have generated enough concept art to walk there on it. By the same hubris that points out how slow maglevs are compared to Hyperloops, and how short the Eiffel tower is compared to the Palace of the Soviets, Landsdorp has already explained that his Mars project will be a much

bigger deal than the moon landing. Quite similarly, the libertarian economist David Friedman describes a privatized version of the moon landing in glowing terms, unquestionably cheaper than and superior to that bullshit that NASA pulled off in real life...but after the glitter fades, the reader is left wondering why the private sector didn't beat the feds to the moon, or indeed ever get there at all.

People need big ideas, of course, and projects need pictures, and it all provides nice work for some art students who would otherwise be out on the street selling espresso or their bodies. But I think this pattern underscores a larger problem with American technological innovation. And it is quite relevant here that Musk's Hyperloop was very much intended as a critique of California's high-speed-rail project, which at the moment also exists mainly in the realm of concept art: if they actually start building it and stay on schedule, it's supposed to be finished by 2028, by which point Landsdorp's reality TV show will have been broadcasting from Mars for five years.

Now then.

As I look out my window at the clockwork of trains below me, I can't help but reflect that by Swiss standards, America has no mass transportation infrastructure at all. The Bernese, in a classical example of Swiss racism, call this neighborhood a “ghetto”, and in this immaculate ghetto, where I could probably drink safely out of the storm drains, I have 19 opportunities each hour to board public transportation within two blocks. (I am also awash in parks, playgrounds, day-care-centers, bike trails, clinics, groceries, mini-petting-zoos, community gardens, and so forth, but for the purposes of this discussion, I'll focus on transportation.)

Back in the US, our fastest train averages 110 km/h. Enormous swaths of the country are completely unreachable by any kind of public transit, including taxis. Our mass transit is notoriously unreliable and unpleasant even where it does extend. In a typical year, Americans spend 5.5 billion hours in traffic delays; the equivalent of about 8,000 lifetimes a year. Numbers on airlines are much harder to calculate, in part because US airlines have spent the last few decades padding their flight times to improve their statistics, but it is probably about half a billion hours annually. The *modal* passenger train in the US is 5-15 minutes late, a fact that calls into question the very meaning of a train schedule. Commuting by bicycle, in most parts of the country, is an uncomfortable form of delayed suicide. Even in the most basic, early-20th-century terms, our infrastructure is decrepit: our railways, road surfaces, rolling stock, and bridges are all badly in need of improvements. I have a friend, an urban planner from the states, who after moving to Holland told me in awe that she had never seen a roadbed built properly before...

From the viewpoint of this “ghetto neighborhood” in Switzerland, the squabble between whether California should build a HSR line or gamble on the Hyperloop seems like two men stuck on a desert island arguing about who has drawn a nicer picture of a boat.

[2014]

I am back in Bethlehem, three stories lower down but in essentially the same room, with the same view. A few more houses to the west; the concrete plant has a new wing. There are now 22 public transit stops per hour here, a bit up from last year. There's a new café. The Swiss build slow, and what they build lasts forever. There are 600-year-old buildings here that are still under builder's warranty. When the roof leaks, the same firm that built the place comes out to fix it, for free. They have accounting systems that are cognizant of these eventualities.

Meanwhile, of course, there is no Hyperloop. Nor is there an HSR line in California, or much sign of progress on one. But that will not dampen the spirit of American innovation, because our new love, like Mr. Toad of *Wind in the Willows* is “freaking solar roads”. A couple guys with some nice concept art have raised a *million* dollars to convert all the roads in the US into intelligent impact-resistant self-cleaning ice-clearing solar panels with a roadbed of rigid concrete conduits. *Awesome!*

Just the concrete roadbeds, without all the electronics, would be a great improvement. What's not to love? And the first-order approximation for what this will cost is about \$50 trillion, or slightly less than one year's worth of all expenditures on the entire planet, but that's fine. A year isn't much, and *million* and *trillion* rhyme, even. In a beautiful moment of candor, the solar roads people have explained, in essence, that they will spend their million bucks on developing better concept art.

And meanwhile, again, Musk has back in the headlines. He is complaining about the “insane degree” of media attention over the battery fires in his Tesla Model S cars (one of which I just saw here in Bern). Now, there is a bit of a Streisand effect at work: I hadn't heard about this apparently insane media blitz until Musk himself made news by complaining about it. And I have no idea if the battery-fire concern has any merit, or if it is all hyperbole, as Musk insists. But that isn't my question. Rather, I wonder where Musk's concern about vacuous media frenzies was back in mid-2013, when the entire world press went berserk with adulation over what amounted to a sci-fi twitpic.

Back in Switzerland, they have spent the last year plodding along with the Gotthard Base Tunnel, which is on schedule to open in 2016, and steal back their lost title for longest high-speed-rail tunnel from Japan. We saw the northern entrance to the excavation while we were on the Lötschberger: it is staggeringly huge. But here's an interesting thing: you can't find much concept art for the GBT. Since the Swiss are *actually building the thing*, I suppose they can afford to wait a few years and then just take a picture. Even their maps show the GBT only up to the point where it has actually been completed, in striking contrast to US (and former Soviet) maps, which have often confused the idea of a road with roads you can actually drive on.

It is also interesting to note that this spring has seen heavy rains in the Alps, which means heavy flooding, which means repairs. And those repairs are occurring so energetically that even in the most affected areas, such as the Kander valley, one hardly notices the actual extent of the damage.

Let me be clear that it is not my intention to say that Americans should be “more Swiss”. We have always had a national sport of anxiously comparing ourselves to other countries: currently it seems that the educators are all about Finland. Back when the educators were obsessed with Japan, I remember hearing someone in the trenches of NYC schools point out: “look, in statistical or demographic terms most of our inner-city schools more closely resemble the developing world than the industrial world, so we shouldn't be asking 'What works in Japan?', we should be asking 'What works in Brazil? What works in India?’”

And I feel like that is the missing piece of the discussion. The United States has let its rail infrastructure fall apart, more or less irrevocably, and is in real danger of doing the same thing with its roads, its schools, its libraries, and a handful of other systems that the rest of the developed world considers untouchable fundamentals of civilization. And yet we denigrate the effort to fix these things, because laying a decent roadbed isn't a “big idea”. We would rather wait for the messiah to arrive with His mannah 2.0 than put in the effort to cook breakfast, and we are creating a sort of theology in which cooking breakfast is seen as a sign of disbelief.

During the Hyperloop hoopla, there were a number of bloggers allied with Musk in spirit if not financially, who had dark warnings for the skeptics. The doubters, haters, and naysayers were told to keep our mouths shut, because Musk was a visionary with a Big Idea, and you don't want to squash the next Big Idea, do you? If a bright-eyed kid tells you that they want to be an astronaut when they grow up, you don't tell them that manned space travel is an absurd, quasi-military pipe dream. When scientists get misty-eyed talking about going to Mars, you don't tell them that it's much more cost-effective to go to Arizona. To borrow a handy old fascist phrase, the critics of the hyperloop were told that they were *anti-storico*: against history. And yet if we attempt to collate this hopeful etiquette with Musk's recent foray into media criticism, we get something like the following:

- Do not criticize Big Ideas just because they haven't been implemented.
- Do not not criticize implemented technologies for not working correctly.

This leaves rather little room for discussion, beyond cheerleading. And fine, I understand the rationale. Americans are understandably concerned about our industrial decline, and mixed into that anxiety is a hard-to-gauge optimism about the rise of a truly post-industrial economy, in which all problems can be solved by cloud storage and 3D printing. This easily ferments into an actual hostility towards old industry, even in its most modern forms. *Look at these poor Swiss bastards, with all their trains and buses and tunnels underneath the Alps—how could anyone keep making those same mistakes, once they've seen these amazing drawings we made, and the way we can say a noun and then say 2.0 or maybe 3.0 if we've just snorted the good stuff?*

And actually, I have to say that I'm very partial to that point of view, but I can't help but notice that it's being policed. Elon Musk and his kindred may yet save the world—someone always has to—and we may indeed enter some e7.0 quantum-bullshit economy that renders all previous industrial models obsolete. But if those things are true, it becomes *even more* important that the public and the media can question our new prophets. Faced with concept art, it is germane to ask if something can really be built for the proposed budget. It is germane to ask if a figure like “962 kmh” is the appropriate level of precision for a technology that has never been prototyped. It is germane to ask if putting solar panels *next to* the roads would not be, in a prosaic way, a simpler project. Faced with an exciting new car, it is germane to ask why it is sometimes bursting into flames. That's not *anti-storico*, that's how history works. Right now we are in far more danger of wasting billions trying to go to Mars than throwing away all our most romantic dreams of innovation. The problem we face, going forward, is not the naysayers (such as myself), but the very real possibility of getting hooked on concept art, which is ever so much cheaper than R&D.

I'm not against big ideas, god knows. I put in long hours on artificial intelligence. But I also put in long hours on laying granite walls, and putting in drainage systems, and pouring concrete. A.I. may or may not work out, but a swale is a swale, and someone actually has to dig it. Concept art will not channel water off a hillside. I worry that America's very realistic insecurities about our infrastructure and industrial potency are giving rise to an environment where Big Ideas trump Fixing Leaky Roofs, by default. Where we are so convinced that interstellar travel is our racial birthright that we forego basic maintenance on our systems for intercity travel. And I worry what the political analogies of this tendency are. The Big Idea has far too often been vaporware. A 1,361-foot tall palace was not the only thing that the Soviets failed to build.

