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The Penstocks

Stacy Leigh Pigg

“It’s interesting for two days,” he said. “Then it is very, very boring.”

Kaphle-ji tells me this while we chat over morning tea in the Hotel Dobhani in Singati Bazaar. We have time to kill. A landslide blocking the northward road up valley has left him, once again, bored and waiting. He drives a safety spotting truck for the flatbed lorries that transport penstocks.

Drive. Truck. You would think this implies whizzing along roads, or at the very least, the kind of consistent, effortless forward motion made possible by the internal combustion engine. But Kaphle-ji’s job is to steer a fancy pick-up truck as it creeps along, slower than walking pace. Sometimes his truck cannot move forward at all, for hours or for days. He must stay within a few meters of the massive, heavier vehicles transporting a single penstock to the Upper Tamakoshi Hydropower project in northern Dolkaha district of Nepal. These long trucks do not move easily through the mountains.

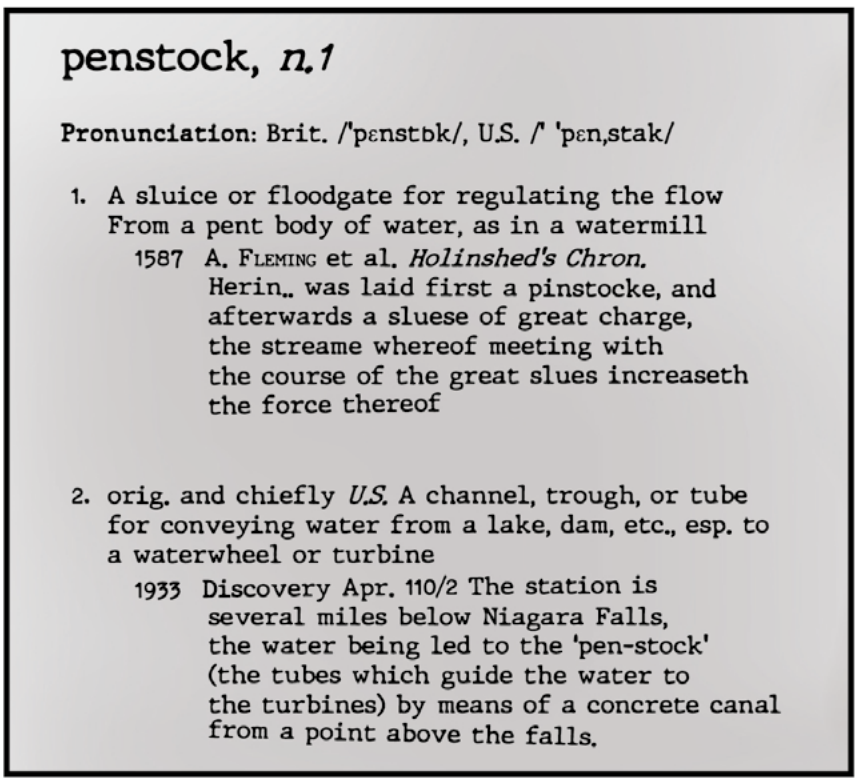

"THEY FORGE THEM IN CALCUTTA, THEN TRANSPORT THEM HERE.
27 TONNES OF CAST IRON. 5 METERS IN DIAMETER!
ALL INDIA (★) PERMIT
ACC LOGISTICS
TATA
ATP
NL-010 0126
ONCE THEY GET TO NEPAL THEY CAN ONLY GO 1 KM, MAXIMUM 2 KM IN A DAY.
IT TAKES TWO MONTHS TO BRING A PENSTOCK SECTION UP FROM CALCUTTA.
THAT'S IF NOTHING GOES WRONG."
DOESN'T SOMETHING ALWAYS GO WRONG ?
Ledge
Mountain
Ledge
Mountain
Ledge
Mountain
Ledge
Mountain

There are the landslides, large and small, of course. Vehicles break down. In the rain – hardly an unforeseen event – the road becomes too slippery. Even in the best weather the turning angle must be calculated just right, he tells me. No backing up. It can take half a day to make it around one hairpin bend.

"The local bus and truck drivers don't like us," he says. "Their jobs depend on speed. Their bosses enforce time quotas; the drivers get in trouble if they don't make the maximum number of trips in the allotted time." Sometimes the police have to come in to manage the high tempers in a traffic jam. The drivers of the flatbeds are mostly Indian. There is a nationality associated with each work role, a caste system of subcontractors: Nepali unskilled laborers; Indian drivers and engineers; Chinese technicians and skilled laborers; Danish and German and Austrian consultants.

The word 'penstock' was not in my vocabulary before I walked the 39km road from Charikot (the district center) to Singati Bazaar with anthropologist Shyam Kunwar. Shyam patiently explained to me what I was witnessing but not always observing carefully. He never missed a chance to strike up a conversation with someone, always evincing curiosity and surprise and keen interest in the slightest details of their account. (It took me a while to realize he was staging these spontaneous conversations to offer me the experience of discovery. He himself had heard everything many times, over research trips spanning several years.)

After hearing the word 'penstock' all day, I looked it up in my Oxford English Dictionary smartphone app that night.



penstock, *n.1*

Pronunciation: Brit. /ˈpɛnstɒk/, U.S. /ˈ ˈpɛnˌstak/

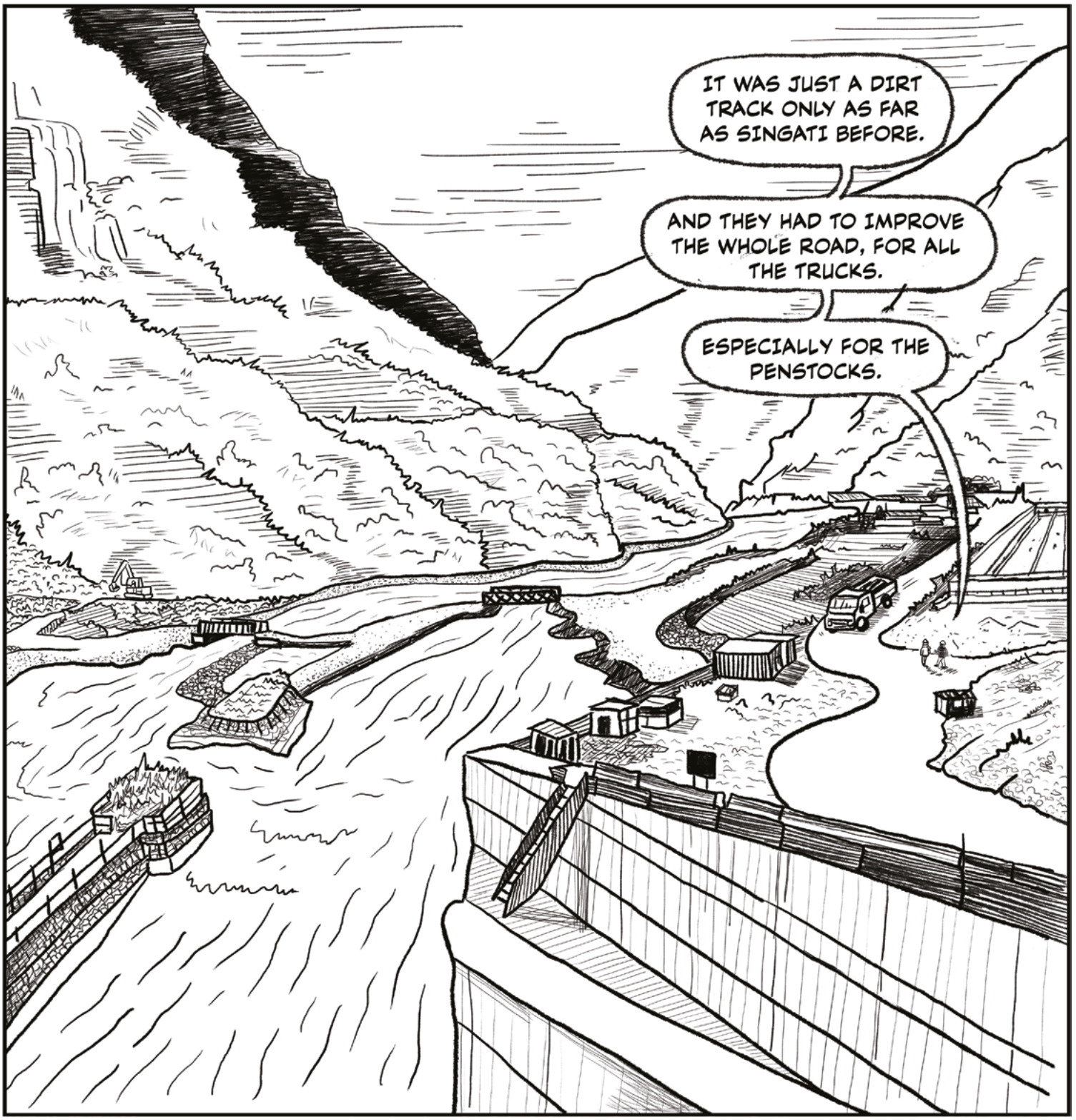
1. A sluice or floodgate for regulating the flow From a pent body of water, as in a watermill
   1587 A. Fleming et al. *Holinshed's Chron.* Herin.. was laid first a pinstocke, and afterwards a sluese of great charge, the streame whereof meeting with the course of the great slues increaseth the force thereof

2. orig. and chiefly *U.S.* A channel, trough, or tube for conveying water from a lake, dam, etc., esp. to a waterwheel or turbine
   1933 Discovery Apr. 110/2 The station is several miles below Niagara Falls, the water being led to the 'pen-stock' (the tubes which guide the water to the turbines) by means of a concrete canal from a point above the falls.

It is an old word, harking back to the days of willow-lined ponds with slowly revolving waterwheels, a term infused with new vigor in the great dam-building projects of twentieth-century USA. And now it is a Nepali word, arguably, due to the enthusiasm for run-of-the-river type electricity-generation schemes such as the Upper Tamakoshi Hydropower project. These projects allow some water to flow downstream but divert most of it into a penstock that accelerates its flow into the turbines. People living along the construction routes take a keen interest in these mechanics of electricity generation. And they hope to earn interest from the stock shares they will receive as compensation to residents of a project-affected area. How, exactly, the road and the river diversion will change their livelihoods no one can foresee.

The road is the infrastructure behind the infrastructure, if you will. Strictly speaking, the road predates the hydropower project. Plans for a road in this area were made by savvy local politicians as early as the 1970s. A narrower and rougher road was built in the late 1990s by local village laborers working almost entirely without the aid of heavy machinery, through a food-for-work program.

At that time, some said it was a road going nowhere, though I suppose what counts as a somewhere and what feels like a nowhere depend on where you are standing. And what you are looking toward. In those days, people told Shyam, it took longer to travel by vehicle than it did to walk the same journey.



It could be said that in mountain Nepal, the best roads are not built for the convenience of people, but for electricity.

The Upper Tamakoshi Hydropower project dam sits in a narrow valley where a cold, deep, turquoise river flows between eerily looming cliffs. Tunnels were blasted through these mountains, to carry the penstock tunnel and to house the turbines. An entire town came into being, first in order to build, and then to support, this machinery. Inside one mountain the equivalent of a seven-story building now descends into the earth. It houses the immense turbines in a pristine structure. Access is strictly controlled. Glossy enamel paint on the metal walkways reflects the blinking lights of control panels.

Outside this engineered shrine, though, the road is pot-holed, always morphing, as if alive; dusty in the dry season and muddy during monsoon. All that heavy equipment and many thousands of people had to be able to get to this remote site. The road from Charikot to Lamabagar had to be widened. The surface and bridges along the entire route through Nepal had to be rebuilt to tolerate the tonnage. It used to take some three or four days of fast walking from Charikot to reach the project headquarters in Gongar. And another day uphill to Lamabagar, once an entrepot on the Tibet trade route and now a seemingly sleepy village.

When I met Kaphle-ji in April 2018, only a fraction of the seventy-four steel sections needed for the 310m diversion tunnel and the 373m vertical tunnel to the turbines had arrived at the dam site. That October, on the road connecting Charikot to Kathmandu, we would come across a line of these monumental pipe segments chained to flatbed trucks whose wheels alone stood higher than a person, abandoned on the side of

the road. Was it a problem with the road condition? Or the subcontractor's failure to complete the work?

"The drivers just left them there," the locals told us. "We don't know why. We have no idea when they are coming back."

If you do an internet search for Upper Tamakoshi Hydropower Project you will be inundated with superlatives and numbers:

> "the largest hydropower plant in Nepal"
> "expected to produce 2,281GWh of electricity a year"
> "22m-high and 60m-long concrete dam"
> "an 8.4km-long headrace tunnel with 32.14m^2 of cross-sectional area"
> "total construction cost estimated to be $441 million in 2011 … escalated by $41.8 million due to the delay and disruption caused by the 2015 earthquake."

Such representations soar high above the road surface – the plane of everyday life, movement and labor. Penstock was a word unknown to me because my own hydropower-generated electricity in British Columbia, Canada appears daily in my home, as if by magic. But it is a colloquial term in Nepali used by the villagers who watch these behemoth pipe segments creeping along the new road, a road built for penstocks to fulfill their engineered purpose to create export electricity for the project stockholders.

Walking on the fine wide road from Charikot to Singati, Shyam and I turned a corner to see a lone penstock abandoned on the slope side of the road, grass growing up around it. It was incongruous, but it certainly made a handy shelter. Shyam told me that locals said it had fallen off the truck. Standing next to that iron pipe more than twice my own height, I could not get the image of it breaking loose out of my head. So when I met Kaphle-ji again, I had to ask:

"That must have been dramatic! And scary. Did it make a big crash?"

"No. It just slowly, slowly tipped. You just watch it happen and there's nothing anyone can do."

Further Reading:

Carse, Ashley. 2016. "Keyword: infrastructure: How a humble French engineering term shaped the modern world." In: *Infrastructures and Social Complexity: A Companion*, edited by Penny Harvey, Casper Bruun Jensen and Atsuro Morita, 45–57. London: Routledge.

Himalaya Times. 2019. "Penstock pipe-laying work commences at Upper Tamakoshi hydro project." 24 February. https://thehimalayantimes.com/nepal/penstock-pipe-laying-work-commences-at-upper-tamakoshi-hydel-project/

Harris, Tina. 2017. “The Mobile and the Material in the Himalayan Borderlands.” In *The Art of Neighbouring: Making Relations Across China’s Borders*, edited by Martin Saxer and Juan Zhang, 145–63. London: Routledge.

Lord, Austin. 2014. “Making a ‘Hydropower Nation’: Subjectivity, Mobility, and Work in the Nepalese Hydroscape.” *Himalaya: Journal of the Association for Nepal and Himalayan Studies* 34 (2): 111–21. Available at: http://digitalcommons.macalester.edu/himalaya/vol34/iss2/13

Lord, Austin. 2016. “Citizens of a Hydropower Nation: Territory and Agency at the Frontiers of Hydropower Development in Nepal.” *Economic Anthropology* 3 (1): 145–60. DOI: https://doi.org/10.1002/sea2.12051

Manadhar, Rajendra. 2019. “Penstock Installation Completed at Upper Tamakoshi Hydro Project.” *Kathmandu Post*, 18 June. https://kathmandupost.ekantipur.com/news/2019-06-18/penstock-installation-completed-at-upper-tamakoshi-hydro-project.html

Murton, Galen. 2018. “Nobody Stops and Stays Anymore: Motor Roads, Uneven Mobilities, and Conceptualizing Borderland Modernity in Highland Nepal.” In *Routledge Handbook of Asian Borderlands*, edited by Alexander Horstmann, Martin Saxer, and Alessandro Rippa, 315–24. London: Routledge.

Power Technology. N.d. “Upper Tamakoshi Hydroelectric Project.” https://www.power-technology.com/projects/upper-tamakoshi-hydroelectric-project/

Rankin, Katharine N., Tulasi S. Sigdel, Lagan Rai, Shyam Kunwar, and Pushpa Hamal. 2017. “Political Economies and Political Rationalities of road Building in Nepal.” *Studies in Nepali Society and History* 22 (1): 43–84.

Turin, Mark. 1998. “Essentially a Road to Nowhere.” *Kathmandu Post*, Sunday, 3 May, 6: 73, Kantipur Publications: Kathmandu, Nepal, p. 4.

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Stacey Leigh Pigg is Professor of Anthropology in the Department of Sociology and Anthropology at Simon Fraser University. Inspired by conversations with people in Nepal, her research has explored the global interconnections and uneven translations set in motion by science, medicine, and development expertise. She is currently working in collaboration with a team of artists and researchers on a graphic novel about the politics of roads and senses of place in Nepal. Through this project she is experimenting with the ethnographic form itself by exploring the potentialities of the comics medium as both a means to convey the stories ethnographers encounter in their research and as a theoretically-informed provocation to see contemporary social problems otherwise.

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