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Notes and Suggestions from Chapter 1, The Two Revolutions, Immigration Law and Society (Polity, 2018)

I would love a long book about human history based on migration: it would begin when humanoids walked out of Africa, tens of thousands of years ago, and some went north, others east, and over time, the migrants took on different shapes and sizes. Modern geneticists tell us that some homo sapiens had sexual relations with Neanderthals—they got to "know" each other in a Biblical way—such that even though the Neanderthals didn't quite make it, modern humans in Europe and Asia are sort of Neanderthally. From Asia, a few walked over what was once a land bridge into North and then South America, while others sailed and paddled across the Polynesian Islands, to Australia and all the way to Hawaii and the Easter Islands. I would love a popular, expansive history of human migration, if only to convince more of us that we're really all related. These migrations occurred over thousands of years, but in geological or astrological time, thousands of years is a nothing.[1]

I've also appreciated recent histories about human beings and animals, and how we've evolved together. That is, human beings domesticated animals through all of their migrations, including dogs and horses and cows and pigs. Horses and dogs vastly increased the range of humans and their migrations—Europeans and Asians learned that pigs or cows were good for eating and maybe working, but not so good for riding long distances. Horses were special in that way, and dogs could also keep up. Dogs are special: in 2008, when my family and I were at the National Archaeological Museum in Athens, we saw that the first image of an animal to appear on an ancient clay jar in Greece was of a dog. In the next room, horses were everywhere, in ceramics, drawings, and bronzes. In addition, organisms that we can't see—viruses and bacteria, germs of one kind or another—appeared in indirect ways, on the images and statues and literary productions of the lucky people who survived them. Ancient peoples knew pox intimately. Horrifying diseases killed hundreds and thousands of people in rather short periods of time, and they also forced people to move.[2]

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Contemporary archaeologists say that people in Egypt and across northern Africa developed the first sailing vessels around six thousand years ago, and that people in Mesopotamia and China developed sailboats at roughly the same time, around three thousand

years ago. Southeast Asians invented catamarans, and the Vikings also designed sleek vessels with sails and long oars. One imagines that the oars were necessary for those times when the winds died, when the vessel and the sailors would then float, listless, for hours and days, maybe until the food and fresh water ran out. All ancient travelers knew about the possibility (necessity?) of cannibalism. Of course, starving and thirsty, perhaps traumatized by having just eaten your horse and then your friend, one can only row for so many hours. The open sea has always been dangerous.

Over hundreds and thousands of years, this was how people got around—walking, on horseback, on boats with sails and oars. To avoid getting lost, and to minimize those occasions where you might have to eat your horses, dogs, and friends, they drew maps, and for those vast spaces and miles of nothing, they also looked up: by studying the stars, they could have a better sense of where they were and which direction to go. The Polynesians did this—my niece Penelope pointed this out while we were watching *Moana*—and the Europeans and Asians did this, too, looking up to see and to map the heavens and to find your place on Earth. You can find the north star yourself. Of course, all that looking up had other consequences.

Many people suspected that the Earth was round, as everything else in the heavens looked round. Still, despite strong evidence, other people insisted that the Earth was flat. The Roman Catholic fathers insisted that the Holy Scripture said "flat." In the first half of the 17th century, though, Europeans developed telescopes to see objects far away—for anyone who's been sailing or traveling across land, the telescope is an amazing invention, and its usefulness is more than obvious. You can see distant bodies of water and you can see animals far away (so that you don't have to eat your friend). Point that thing up, though, measure and record, and it's revolutionary. Galileo Galilei added mirrors to the compound lenses of his telescopes, and so his instruments magnified distant objects—he was probably the first human being to see the rings of Saturn. Have *you* seen the rings of Saturn? Trust me, it's like a religious experience. Around 2012, my daughter Isabel asked for a telescope, and so we set that up on our deck in Santa Barbara and for the first time, *we* saw the rings of Saturn. OMG.[3]

In the last five hundred years, assured that the Earth was round, and with better maps and instruments, people have been getting around a lot. Moreover, in the second half of the 18th century, early scientists and engineers developed crude turbines and engines; throughout the next century, more scientists and engineers improved these machines, such that by the second half of the 19th century, Europeans and Americans had developed internal combustion engines. Imagine how this changed forever the method and speed of transportation. It was if people had bent time and space, by hurling themselves across incredible distances. In the middle of the 20th century, Japanese engineers mass-produced engines that used far less fuel than previous versions. These machines eliminated the need for horses, sails, and oars.

For a moment, let's just appreciate how amazing all of this remains—in the space of just about five hundred years, people went from walking and sailing and riding horses to trains, automobiles, and super-sonic jets. No corner of the world was off limits. It's simply incredible.

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Throughout human history, transportation and communication went together. To relay messages across long distances, you usually needed to send someone. There were a few interesting exceptions: in Africa, for example, some people developed message relay systems using drums, very big drums, and by changing the beat and rhythm, you could say things like, "We're having a feast, please come and join us," or "We're really upset at you." In Europe and in Asia, and among the Native Americans in both North and South America, people signaled one another with smoke, the dominant message being "Hurry up! We're in trouble!" J.R.R. Tolkien referenced this kind of long-distance signaling in *Lord of the Rings*, when Gondor asks Rohan for help. As amazing and inventive as these systems might have been, they had obvious drawbacks. It's hard to say, "Never mind, we've taken care of the orcs," or "Could you please bring a salad?"[4]

Through the 17th century, larger kingdoms and empires relied on relay systems to send messages across longer distances. The Romans built roads, then provisioning stations along the roads, where officials could rest horses, maybe pick up a fresh one, and carry their messages over several days or even weeks, from Rome all the way to Gaul or to Palestine. The Chinese and the Japanese had similar systems—by the 19th century, the shogun in Edo could send riders across a set of messaging stations south to Hiroshima or north to Sendai, all within days. In the Americas, where there were no modern horses before the arrival of Europeans, people ran from one station to another—the Aztecs, the Incas, and other native peoples relied upon groups of runners, like in a relay race. If coordinated well, they could carry messages across considerable distances, passing them from one runner to another without paper or writing. The American colonists established a set of riding stations for messengers on horseback—from Boston to New York and into the Carolinas, and after they became the United States of America, the Americans created a pony express for distant places in the western frontier. Still, there were downsides, even with written messages: by the time the message got from A to B, things may have changed, the British may have already taken Charleston, the food may have run out, or the shogun may have died, replaced by another guy. Imagine how frustrating it might be to run twenty or thirty or forty miles, without good running shoes, *in the Andes*, only to learn later that your message was no longer useful or necessary because the Incan emperor didn't really need more llamas.

Americans tend to think of electricity as that "invention" associated with Benjamin Franklin, the guy who flew a kite on a rainy day, waiting for lightning. (Please, don't try this yourself.) When news of his experiment traveled to Europe, many folks tried it, some died, and this was more proof that the Americans were crazy. Michael Faraday, a British scientist, was fascinated, though, and he and others thought that "static electricity" was similar in principle to lightning, and so he used magnets inside coils of copper wire, to hold and to discharge electrical currents. We have no idea how many times Faraday may have shocked himself in his lab, but it must have been kind of funny watching him work. Fifty years later, toward the end of the 19th century, another American, Thomas Edison, toiled for hours and hours in his lab in New Jersey

to come up with a way to pass electricity through a metal coil, inside a vacuum tube, to give off light. He worked for months to produce a far superior incandescent "light bulb," which has since become the symbol of genius, discovery, and enlightenment. I pay my electricity bills to Southern California Edison.

Like many scientists, Thomas Edison considered himself a humanitarian, his invention an important contribution to civilization and human well-being. His invention certainly solved many problems: before the light bulb, before electricity, people relied on kerosene, candles made of animal fat, and liquified whale blubber to light their streets and homes. In larger villages and cities, however, that's a lot of candles, and after a few drinks and dinner, people tend to stumble around, they hold the candlesticks too close to the drapes or near the sheets, and pretty soon, whole city blocks are on fire. Before electricity, Paris and London and San Francisco and Chicago went up in flames several times, killing scores of people. People are careless with fire. Whale oil was also especially bad for ship captains like Ahab, sailors like Ishmael, and hundreds of thousands of Moby Dicks, offed for their blubber to light the major cities of Europe and North America. The 19th century was a terrible time to be a whale. Whales, cities, and people were thus big winners, thanks to Mr. Edison. Sure, electricity could be even more dangerous than fire: one of my classmates at Berkeley High stuck two ends of a paper clip into an electrical socket during AP Chemistry, and it was and wasn't funny. Used wisely, though, light bulbs and other stuff that runs on electricity are simply miraculous.[5]

Electricity revolutionized communications. Telegraph wires and then telephone lines are simply faster than horses or runners or ships. The first reliable trans-Atlantic communication cable preceded Edison's light bulb by about two decades, meaning that in the years after the American Civil War, the American President could send a complex message to the British Prime Minister by cable in a few hours instead of ten days. Within forty years, the Americans were lowering thousands of miles of communications cables into the Pacific Ocean, so that electronic messages could travel from California to Hawaii, to Guam, and then to the Philippines, Japan, and China. By 1910, Americans could send cabled messages from Washington DC to all over the world. Just fifty years later, the Russians and the Americans were putting satellites into orbits around the Earth, and thus routing their communications from under the sea and into space. Messages that easily took weeks and days now took seconds.

Your smartphone, my smartphone—aren't they amazing? It's more amazing if we have perspective—our ancestors used drums, smoke, runners, and horses to send messages, and so if they could see how *you* send *your* messages, they'd be overwhelmed. "What kind of magic is this?" It *is* magical, is it not? A deep and rich college education can change our perspective of the things that we take for granted, including all of your electronic devices, and then your relationship to basic things, like time. There is astronomical time, measured in light years; geological time, measured in long, ten-thousand-year eras; and then there is recorded human history, a mere five thousand years, if that. If we calculate from the birth of "modern" communications and transportation eras—mechanical forms of transportation, and electrical forms of communication—it's been less than one hundred fifty years. No previous generation of

human beings has gotten to know the world so well and so quickly. Travelling from one place to another, and sending messages from one person to thousands, sometimes millions, of people at once—these have become common. There are, of course, downsides. Not everyone uses the internet or jet planes wisely, and some people just shouldn't tweet at all.[6]

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This might be a great time to consider your own migration history, as well as the migration history of your family. How did you get here? By "here," I mean college (at least for most of the people reading this essay), but I also mean to ask about your family, too, about their origins and the places that they were before you got *here*. Try to imagine what life might have been like for your ancestors, whether they were from Europe, Asia, Africa, the Middle East, or North and South America. How did they get from where they were, to you in this moment? I myself am here in Santa Barbara, writing this essay, and I happen to be working at home, on my deck, looking out toward the Pacific. My immediate ancestors were from the other side of that ocean. My dear wife happens to be in China today (or is it Japan?) on a business trip, and she's flying in an airplane back here tomorrow. She just texted me from Beijing, where her plane has been delayed. Our ancestors—even our great grandparents—would find our lives incredible. Among other things, they'd be amused that I'm writing in English, and that my students reading this are of all shapes and sizes.

Please, with your peers and with your parents and grandparents, I'd like you to share with one another how you got here.

Endnotes

[1] For an example of this approach, see Michael Fisher, *Migration* (2013). For an overview of pre-historic human migrations, I'd recommend *The Global Prehistory of Human Migration* (Peter Bellwood, ed., 2014) and John Hoffecker, *Modern Humans* (2017).

[2] Please consider these wonderful books: David Anthony, *The Horse, the Wheel, and Language* (2010); Adam Miklosi, *Dog Behaviour, Evolution, and Cognition* (2016); and Dorothy Crawford, *Deadly Companions* (2018). For a single volume that combines many of these insights to explain the modern world, see Jared Diamond, *Guns, Germs, and Steel* (1997, 2017).

[3] For an interesting account of how we find where we are, and why that makes us distinctively human, see George Foy, *Finding North* (2016). My former teacher was John Heilbron, and his histories left a profound impression upon me. I would recommend two of his works: *The Sun in the Church* (2001), and *Galileo* (2012). Both books are about religion, science, scientific instruments, and our place in the universe.

[4] For a readable history of communications technologies, from drums to internet, see James Gleick, *The Information* (2012).

[5] For a single, compelling volume about electricity and its revolutionary qualities, see Jill Jonnes, *Empires of Light* (2004).

[6] Like many parents, I've worried about what the internet, apps, and social media are doing to the brains of my poor children, so connected and distracted and socially stressed out as they are. I know that when I'm lecturing, many of my students are on social media, searching for evidence of themselves and their narrow circles, and that none of this is good for them. If you suspect that you're becoming a victim of all this hyper-connectivity, and that companies who don't care about your brain are making all of this distract-ability possible, your paranoia might be well-founded. See, for example, Adam Alter, *Irresistible* (2018).