Fulcrum

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event horizon.

r.holmes

Approximately 16km southeast of Manhattan, the southern coast of Brooklyn curves into a small body of water: Dead Horse Bay, so named for the daily shipments of dead horses it once received from Manhattan.

There, on Barren Island, a tight-knit community of immigrants operated an industrial-age predecessor to Chittagong, recycling Manhattan's waste in squalid conditions. This city had an entirely different metabolism to modern cities; its waste an incredible quantity of dead and dying matter, processed in factories, smelters, bone-boilers, guano plants, and open piles. This fetid surplus was converted into an array of chemical products — glycerin, glues, fertilisers, oils — and exported to Europe.

But by the turn of the century, shifting technologies and new economies (the rise of the combustion engine and the growth of the petrochemical industry) decimated supply and demand.

Schemes sought to transform the surrounding marshy estuary, first into a "megaport" larger than Rotterdam, Hamburg, and Liverpool combined, and second into an ultra-modern airport. The megaport was never realised. The latter scheme produced Floyd Bennett Field, which at the time of completion in 1930 was the nation's most technologically-advanced airfield. Air transport evolved even more rapidly than the chemical industry, and Floyd Bennett Field was quickly surpassed by LaGuardia, and soon passed into the hands of the National Park Service. Today, slowly-disintegrating concrete landing strips share the Field with a strange concoction of ruderal plant communities, abandoned hangers, and the only urban camping sites in the National Park system. Underlying these transitions from wasteland to airfield to half-forgotten park is an unusual and often overlooked infrastructure, common to littoral cities the world over: the rapid form of artificially-induced sedimentary geology known as dredging. In order to transform ruined Barren Island into gleaming Floyd Bennett Field, six million cubic yards of sediment were sucked from Jamaica Bay and used to fill the island's channels.

This is dredging as a linear industrial process. Dredging is perhaps better understood, however, as a component of a much wider cycle of anthropogenic influences on sedimentary processes, both intentional moments of applied energy and unintentional complexes of aggregate forces, all colliding and overlapping in bizarre ways, as natural processes' timescales are alternately short-circuited and artificially extended.

Here even geology, so old and seemingly inexorable, is dragged into our orbit, through the aggregate influence of a planet's worth of agriculture, deforestation, mining, and urbanisation;

as islands are built up out of the sea from Tokyo to Dubai; as dams trap enough sediment behind them to shift seismic profiles at continental scale; and by fleets of bucket, suction, and clamshell dredgers, drawing straight lines across estuaries and deltas. Relative to a geologic timescale, this cycling is fast, intense, and concentrated, approaching the event horizon at which acceleration produces not just a difference in speed, but a difference in kind.

Dredging Jamaica Bay intensified tidal forces, accelerated erosion and degraded marine ecologies. The sediment itself is produced by human activities.

If this is what the first two centuries of industrialisation have made out of Barren Island, Floyd Bennett Field, and Jamaica Bay, we must wonder: what new landscapes will this raw material be converted into in coming decades? As new economies and forthcoming technological regimes supersede ours, obsolescing productive landscapes, what new artificial strata will we build — intentionally and unintentionally — from their ruins? Now we recognise ourselves as geologic agents, what will we do with that Promethean knowledge?

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holes in the map.

s.denizen

Gilbert Simondon reminds us that for every chair that we sit on or every building that we build, there is a hollow left in the earth exactly proportional to the materials that were extracted to build it. The city has its negative image in the ground. Far from being a speculative theory, Simondon's hole seems to appear with increasing regularity.

The "crown hole" created suddenly by the collapse of a column in a spent coal mine 26 meters below a meadow near Edinburgh (reverse) is precisely this negative image of extraction. Yet one might also say that it has a positive content of its own. It is not an utterly faithful reflection. Instead the hole left by material extraction seems to proliferate, appearing in strange places, in strange and unexpected forms: it travels 26 meters upwards through rock and soil, but also to the ozone over the South Pole. The study of these translocations and displacements of Simondon's hole have recently spawned scientific disciplines, reorganised the management of crisis and resources, and fundamentally changed the way that cities are understood in relation to their geology.

Part of why these holes are unfaithful reflections, rather than merely voids left by material extraction, is that they create the future conditions under which the city can understand itself to be either full or empty.

Geologically the consequences have been huge, especially in the United States. A century of sustained effort to map and classify every soil in all 50 US states has resulted in the world's largest soil database, and yet surprisingly, cities do not appear on any map. The city appears as a hole in the soil survey: a negative image of its own resource extraction. Recently however, this void has begun to take on a new life in the soil. Due to the need for a greater understanding of storm water infiltration and its relation to water quality, the US government agency responsible for soil surveys, United States Department of Agriculture (USDA), found itself tasked with conducting a survey of the urban soils of all five boroughs of New York City in 2005. This involved digging a lot of holes and describing the, at times, bizarre results. Things like trash, construction debris, coal ash, dredged sediments, petroleum contamination, decomposing bodies, and rock ballast needed to be classified and quantified within the same taxonomic structure the USDA applied to the soils of the Redwood Forest and the great agricultural expanses of the Midwest. The result was surprising and informative. The USDA has discovered for example that "Fishkill" soil, which "has formed in a thick mantle of industrial 'fly ash' mixed with demolished construction debris," is "good" for use as wildlife habitat for freshwater wetland plants.

The "typical soil profile" for Freshkills Landfill, also now included on the map, consists of 30 to 80 inches of "extremely cobbly sandy loam" which is "20% cobble-size biodegradable artefacts, 45% cobble-sized non-biodegradable artefacts, and 5% cobbles." Its Soil Taxonomy classification is "Coarse-loamy, mixed, active, hyperthermic Typic Dystrudepts." Classifying Freshkills Landfill in the great group "Dystrudept," means that it is dystrophic (infertile for agriculture), udic (moisture regime), and of the order Inceptisol, meaning it has poorly developed subsurface horizons. These subsurface horizons are up to 75% trash.

That the United States Department of Agriculture is no longer interested in the distinction, taxonomically at least, between a soil made by mountains and forests and the soil made by mountains of trash, should give some kind of an indication as to what the positive content of Simondon's hole's might consist of. We can see it at the moment when the city shows up on the soil survey.

Classifying Freshkills Landfill as an Inceptisol brings the USDA to the curious conclusion that this soil has a lot in common with forests on the steep slopes of North Carolina's Appalachian Mountains.

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"Crown hole" over mine workings. Rosewell Manse (Scotland), 1986. CP12/109 British Geological Survey