

Three Clocks

On the three durations every made object carries, and the one we live in.

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I was waiting for lunch. Two in the afternoon on a Sunday, a crowded place in Palermo, the queue out on the pavement. It was cold, so they let me wait inside, at one of the small marble tops by the door that they keep for people who are fussy about standing out in the weather. I had nothing to do, so I looked at the marble.¹ Running across the polish was a network of fine cracks, the kind you only see when you have been staring at something for ten minutes.

I recognised the mechanism, which is the trouble with being an engineer. You cannot look at a table and see a table. The cracks were hygrothermal. Marble is calcite, and calcite does not expand evenly when it warms — it grows along one axis and contracts across the others. So every crystal in that slab pulls against its neighbours a little differently every time the temperature moves, and moisture works into what opens. Hot cups, cold glasses, sun through the window, a wet cloth at closing time. Nobody is damaging it. It is being warmed and cooled, and the crystals are levering themselves apart.

Polishing marble, I thought, is like putting a lion in a cage. It will hold, but it is still a wild creature. It will always want to go back.

I was reading Michael Pollan² at the time, on consciousness, and there is a passage about why we cannot see that plants are doing anything. The problem is not the plants. It is us. We run on animal time, and on animal time a plant looks like furniture. Speed the film up and the whole argument collapses: a bean plant casts around for a pole, finds it, climbs

it. Intent the entire way through. It is there all along, and we miss it because we are watching at the wrong rate.

That is when the table as a wild creature made sense. We can see it in the lion and not in the marble top, and nothing separates the two but rate. We believe objects hold their form peacefully because they are keeping a clock we do not share. The marble is not still. It is going back, at its own speed, and at that speed a century is an afternoon.

Then a second, more disturbing thought came to me. Making that tabletop started more than the marble on its way back, and not all of it is here, patiently struggling for a way home. There is a residue of the process of putting that slab in front of me — quarried, sawn, shipped, ground, polished, every step of it burning something. Where has all that carbon gone?

Nobody was going to seat me for a while. I photographed the cracks.

THREE CLOCKS

There is a footbridge in Buenos Aires, seventeen years old, and water is coming through it. You can see this from underneath. Dark tracks run down the soffit where water has found its way past the deck and emerged on the other side; algae has taken the ledges where it stays wet; and at two points along a lower band there are pale marks that turn out, on inspection, to be limestone. The bridge is going back, on its own outside surface, by putting back a little of the carbon the kiln drove out of it.

The bridge is made of concrete, and concrete is made of cement, and cement is limestone that has been heated to around fourteen hundred and fifty degrees until the carbon is driven out of it. That carbon does not disappear. It goes into

the air, and it stays there. David Archer³ gives the shape of the return, and it is not one process but three, each an order of magnitude slower than the one before it.

The ocean takes most of it within a few centuries, and then slows, because water already loaded with carbon dioxide will not take much more: between a seventh and a third of a release is still airborne after a thousand years. The sea floor takes the next share. Acidified water dissolves the carbonate sediments lying on it, and that neutralises more of the carbon over roughly ten thousand years, leaving something under a fifth. What is left after that is cleared only by rain weathering silicate rock on land, which carries the carbon to the sea as bicarbonate and buries it again as limestone — on an e-folding time of about four hundred thousand years, which is why six or seven per cent of a release is still up there after a hundred thousand.

Each sink fills and hands what it cannot take to a slower one. That is why there is a tail at all. Averaged across the whole release, the mean time a molecule spends in the air comes out at thirty to thirty-five thousand years.

The limestone came from Olavarría, in Buenos Aires province: the Loma Negra Formation, Ediacaran, around six hundred million years old. The cement company took its name from the rock it quarries.

Six hundred million years as limestone.

Thirty thousand for the carbon to come back down.

Seventeen years of bridge.

Three durations, each separated from the next by three or four orders of magnitude, and we live in the shortest.

The first is the material's own, and it is the only one that ran without us. The second is the interruption — the tabletop, the

floor, the rendered wall, held in a state it did not arrive in and will not keep. The third is the carbon it cost to impose the second on the first.

Which is the whole of it. The consequences of making things are consequences only at the second clock. At the first, nothing has happened. The carbon leaves and returns. The marble cracks and rejoins the rubble it came from. The ledger balances, and no one living on the second clock is there to read it.

THE MADE STATE IS THE TEMPORARY ONE

A material taken out of a condition it held for an enormous span, and forced into another that lasts decades, begins returning the moment it is left alone.

Rust is the clearest case. Iron ore is iron oxide; steel is the anomaly; rust is the metal remembering what it was. Bronze does the same thing more beautifully — the patina on a statue is malachite, a copper ore mineral, and the statue is turning back into the mine. Glass is silica melted out of crystalline order, and water takes it back: the surface of an old pane leaches its alkalis and returns toward the hydrated silica it came from. A dressed sett under a century of wheels goes back to sand, which is what it would have made on its own given a million years and no traffic. Brick is clay fired out of its mineral state and weathering back.

And the imposition is not always chemical. The onyx of that café tabletop was itself a filled crack — hot water opened a fracture in the rock and packed it with carbonate, band by band, until it closed. The slab is that fracture, sawn across and polished. The polish is the human contribution, and the crack network spreading over it is the stone resuming. Nothing was

transformed there. An order was imposed on a surface, and the surface is shedding it.

The mark is not decay. It is reversion. These photographs record materials returning to states they were interrupted from.

Which reframes the built object. A bridge is not a thing falling apart. It is a short chapter in the life of a carbonate, and the water is closing it.

WHY PHOTOGRAPHS

Photography is constitutively a medium of traces — light that left a thing and struck a surface. This subject is knowable only by traces: nobody watches a bridge revert, and the process is invisible at every timescale a person can occupy. What can be seen is the mark it has left so far. The match between medium and subject is exact, which is not a claim one gets to make often.

It also sets one rule absolutely. If the argument is that these are traces, they have to be traces. Nothing in these frames is generated, staged, or fabricated. The concept enforces that, not an ethics.

Each image is a composite of several exposures of the same object, taken where the mechanism shows, so that a frame shows a condition rather than a specimen. The method carries over from my previous body, which photographed cities by superposition, attempting to get something too distributed to see into a single frame by smearing it. That attempt was impossible by its own logic, and the images read as beautiful failures to see. This work stops attempting it and photographs the residue instead.

Every plate carries a label with three lines: the mechanism, then two durations, then the place and the date. The two durations are the first clock and the second — how long the material was what it was, and how long we have had it as something else. The ratio between them is the sequence.

WHAT IS NOT CLAIMED

There is no villain here. No industry, no policy, no generation is the target, and the pictures neither accuse nor console. Almost all work in this territory places the human at the centre as destroyer, which is still anthropocentrism — us as the main character, guilty rather than heroic, but still the protagonist. This work decentres.

Harm, in any case, is not a property of matter. It requires someone standing there holding a preference, and the material holds none. At its own scale nothing in this process is damage; there is only reorganisation, proceeding relentlessly toward a different configuration. The atmosphere changes state. Ocean chemistry changes. Ice volume changes. All of it re-equilibrates, and none of it has a stake in its own condition.

Which makes *save the planet* an anthropocentric slogan, however it is meant. The planet is not in danger and cannot be. It keeps the first clock, and on that clock this is a brief excursion: it will leave a thin line in the rock, and the system will come back as it has come back from larger. There is nothing there to save.

There is a reason we talk that way, and it is the same reason plants look inert: we are watching at the wrong rate. We can see one clock. So we assume everything keeps it, and a world keeping our clock is as brief as we are and as easily ended.

Fragility is what a short-lived observer projects onto whatever it looks at.

Only living things hold interests that can be set back, so the biosphere is the single place where harm is even a coherent category — and the biosphere is itself robust, having survived the end-Permian and reassembled, differently. What does not come back is this particular arrangement of living things, ourselves included.

THE ARITHMETIC

Calcining limestone releases carbon dioxide as unavoidable chemistry rather than inefficiency — no temperature and no technology avoids it, which is why cement accounts for something near seven to eight percent of global emissions, and steelmaking, where carbon is the reducing agent rather than merely the fuel, roughly as much again. Between them, two materials, about a sixth of the total.

Carbonation takes back a fraction, slowly, and never the whole. At our clock the ledger does not balance, and was never going to.

*The only durable thing we made was the change to the air.
The structure was the incidental part.*

That is not a moral statement. It is arithmetic, and it indicts nobody — which is exactly what makes it difficult to put down.

THE THIRD LABEL

Each plate carries a third label that is not printed on it. It reads the same on every one, and Archer has already written

it, in *The Long Thaw*:

"The lifetime of fossil fuel CO₂ in the atmosphere is a few centuries, plus 25 percent that lasts essentially forever."

The two clocks on the wall are properties of the object, and they differ wildly: two point one to one on a pine floor, seven point eight billion to one on a soot-marked paver. The third is not a property of the object at all. It is the carbon released to make it, and its return has the same shape whatever was made. The same label, on every plate.

Note what the sentence actually says, because the strange part is the fraction rather than the forever. Most of it clears in centuries. A quarter does not clear on any scale we can use — *essentially* is carrying the weight in Archer's line. It does clear in the end, by weathering rock into carbonate: the carbon comes back as stone, well before the first clock ticks.

The plates hold what a surface can hold: a mechanism, a material's age, a length of use. What they cannot hold is the clock that does not vary, because it is not in the wall or the wood or the render. It is in the air, and it is in us.

What is missing from the plate is the real subject of the work.

C O D A

The tabletop will be fine: it is already rubble, in slow motion. The bridge will be fine too, in the sense that the calcium in it will be fine; it will be limestone again long before anything else about the twenty-first century is legible. Even the carbon will be fine; it comes back as stone too, on a clock of its own. The only anomaly anywhere in the process was us, and we were brief.

¹ Not strictly marble, as it turned out. The stone is sold as onyx marble, and architects use that name for any compact, translucent, layered carbonate that takes a polish. Most of the traditional cafés in Buenos Aires have these and call them marble. It is a commercial name, not a geological one, and it is wrong twice over. Onyx proper is banded chalcedony, a silica, cousin to quartz. Marble proper is limestone baked and compressed deep in the earth. This stone is neither: it is calcite and aragonite grown in layers from mineral water — flowstone, in principle, the dense polishable end of the travertine family. It has collected names the way such stones do. The ancient world called it alabaster and quarried it in Egypt for vessels; when alabaster came to mean the softer gypsum stone, this one became Oriental alabaster to keep the two apart. The Victorian trade called it onyx marble. The twentieth-century trade called it Mexican onyx, after the quarries in Puebla, so that a slab from Argentina, Iran or Turkey is still sold under a Mexican name. The colour grades have names of their own — white, amber, honey — and the café's slab was a honey. The geologists in San Luis call it *ónice calcáreo*, and the English name that agrees with them is calcite onyx. Every one of these names is borrowed: alabaster now belongs to gypsum, onyx to a silica, marble to a rock that has been cooked. Calcite onyx at least puts the right mineral in front of the wrong word. I only knew this later. For some weeks the table sat in my register as an unidentified marble on an assumed Jurassic protolith — two hundred million years, a figure I could not source. Further examination, aided by an AI agent, tested the stone against hundreds of geological and stone-trade sources — marble against calcite onyx against travertine against true onyx — and arrived at Argentine calcite onyx with 90–95% confidence. The photograph agreed once I measured it: the surface has the least fine texture of anything in the body, because it has none of marble's grain, and its bands of colour curve with the fabric instead of cutting across it. That is water laying carbonate down in sheets, not rock recrystallising under pressure. The geology settled it. La Toma, in San Luis, sits on a Tertiary volcanic belt whose hot springs deposited banded calcite and aragonite in fractures between twelve and two million years ago — the shallow end of an epithermal system, with the aragonite named in the literature. So the slab is a fossil crack. Hot water opened a fracture in the rock and filled it, band by band, until it closed; someone sawed across it and polished the face; and it is cracking again. Three stones, then, from one ingredient. Limestone is calcium carbonate laid down as sediment, shells and all. Marble is that limestone baked and compressed. Calcite onyx is the same carbonate grown from solution, layer on layer. That is why it takes marble's polish and shares marble's sensitivity to acid, and why it glows, and why the banding shows through it as it never does in marble — which is the character of the photograph. The mechanism is unchanged in principle — calcite expands unevenly however it was made — though in a banded stone the strain gathers at the bands rather than at every crystal. The stone is younger than a marble would be, by a factor of forty.

² Michael Pollan, *A World Appears: A Journey Into Consciousness*, Penguin Random House, 2026. The time-lapse argument is older: Michael Pollan, "The Intelligent Plant," *The New Yorker*, 23 December 2013.

³ David Archer, *The Long Thaw: How Humans Are Changing the Next 100,000 Years of Earth's Climate*, Princeton University Press, 2008. The mechanisms and residence figures throughout are his; the three-sink analysis is set out in David Archer, "Fate of fossil fuel CO₂ in geologic time," *Journal of Geophysical Research: Oceans* 110, C09S05, 2005.