By all appearances, stone is a poor medium for keeping time, yet the under-rated rock has much to say about temporality. The extreme slowness of most geological processes renders them perceptible only when viewed in the appropriate timescale. Modify the perspective and new patterns emerge. Exposing a timescale based on the movements of matter, we tune in to a geologic time, that of seismic activity or of matter as a medium through which time is made manifest. Let us rewind, slow down exponentially, and accelerate, bouncing between temporalities to see this picture in the correct resolution.

Incremental change is invisible in the present, it requires a compilation of instants or frames spliced together. Time is likewise intangible except through markers to make it apparent. And though it appears amorphous, the arrow of time makes time’s directionality measurable. It points in the direction of the irreversibility of change and the continuous increase of entropy in the universe. The incredibly slow yet persistent force of change reveals itself in hairline increments, visible only to the patient observer. But the seeming stillness of stone is only relative to observer, the bustle of the quotidian. Seemingly inert material is in fact humming with activity. At a frequency of about $3.395 \times 10^{-9}$ Hz, pitch drops strike out a beat too slow to be appreciable. The “most boring experiment ever” nonetheless demonstrates the fluidity and incessant movement of matter, bitumen in continuous downward motion at a pace we cannot see. Similarly, geological formations can exhibit the results of processes over incomprehensible amounts of time. It also reveals time to us in its subtle transformations, shifting, morphing, worn down and built up in variable speeds. The formation of mountains through plate
tectonics, or the meander of oxbow lakes, occurs over timespans which make a human life appear like a blip. “When a boat reaches a certain speed a wave becomes as hard as a wall of marble.” (Gilles Deleuze, 6.) Conversely, traveling at a rate of infinite slowness, would it be possible to walk through a wall of marble as if it were water? Could one then slide between the particles of stone? Gorges gouged out by water over millennia can attest to that. Or the droop of the priory stairs, worn down from so many centuries of passages over the threshold that it slumps as if made of gelatine.

The geological record acts as a medium of time, enigmatic for stone’s simultaneous resilience and malleability. Geological duration can have to do with the time over which stone is formed, eroded away, or their level of permanence. Stone’s capacity to endure endows it with a timelessness at once as a being of time for being impervious to change. Standing as a testament to its endurance of time, the monolith watches centuries roll by unaffected, the resistance of its substrate carrying messages through ages. Sedimentation records the passage of time in layers, the gradual accumulation of earth. Archaeology and geology read these striations vertically, depth equivalent to time, remnants of epochs become interred in the depths of dirt and history. “the scattered vestiges of old things, of plants, animals, and artefacts wrapped in a new coat of stone.” (Leibniz, xcv) Reading earth as a memory, we unveil the fossilized past. Through stone as material evidence of ancestral events, the geological record tell the history of the earth from a time preceding the historical subject, and they will contain our remnants long after the last historian has perished.

As a medium of communication with temporal phenomena, stones speak volumes through their morphology, but there are a host of other factors which give greater detail: chemical composition, resonance, and conductivity to name a few. Reconstructing the distant past from a minuscule crystal of the element zircon, we can infer knowledge about the period of the hardening of the earth’s crust and date it to 4.4 million years of age. The chemical composition and structure of these earliest solid rocks act as recordings of the conditions present at the time of their formation. The decay of radioactive isotopes of elements such as carbon, potassium, rubidium, and uranium act as markers useful in judging the age of objects, based on the time it takes those molecules to break down and form new isotopes. And in the analogous, emerging discipline of forensic architecture, analyses of the material memory of buildings, traces of ballistics, spatial relations, even of air and water currents serve as evidence through which to bear witness to the recent past.

The flow of sand in an hourglass manifests the passage of time in a fluid of grains, continuous and discontinuous. Taking each grain of sand as a unit of time, each granule of silica as an event, a sand dune would amount to millennia. In a geological context, the shifting sands of a dune creep along grain by grain, yet can move at the astonishing pace of up to 12 meters per year. It is also worthy to note that time is not limited to measures of singular expanses but also in pulsations and oscillations. Resonating in an orchestra of particles, singing sand dunes produce frequencies from the friction of grains on one another. Recomposed into crystal oscillators, the humble sand particle is even
the basis of many time-keeping electronics. Interestingly, the current international standard unit of time is based on such a material measurement. Poetically concrete, the atomic clock ticks in seconds based on the time it takes caesium atoms to transition between states. As with the sand timer, metaphorical comparisons are often drawn between the movements of time and the flow of water, and this has a beautiful historical ground. One of the earliest known devices for measuring time, the clepsydra, or liquid clock, was used to count time based on the flow of water through a small hole in a vessel. Later replaced by other more reliable devices such as sand timers because of its inaccuracy due to variances of temperature and humidity, the fluid clock still bears its mark on our thinking. But this itself is a curious aspect of time and culture. The fallacy, stone: old; technology: new, is still deeply entrenched, although it is subverted by numerous instances including the exhumed remains of a fossilized analog computer found at the bottom of the sea (the Antikythera Mechanism) and the proliferation of mineral-based electronic devices which have become ubiquitous.

In the electronic stone age, minerals are the central medium of time. Living on a standardized, molecular, measure of time, the globalised world pulses in synchrony to the tempo of the caesium atom. We live among materials and objects embedded with time, from the macro- to the microscopic level. The archive takes the form of microscopic inscriptions in silicon, tantalum, aluminium, gold, and other minerals from which electronics are composed. Encoding the earth, chemically, mechanically, radioactively, we lay our fingerprints in the substrate of our world. Serving as markers of the times in which we have lived, man’s contributions to the fossil record imprint curious traces of our histories in reorganized stones: petrified skeletons of our presents standing as monuments to the past.

REFERENCES

