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Conclusion: The Fractal Logic of Life

The Micro and the Macro

In the first twenty minutes of Terrence Malick's intimate epic *The Tree of Life* — whose resolute encounter with death was touched upon briefly in our third chapter — we learn that its central character, Jack, grew up in an idyllic (if somewhat strict) small-town household in the late 1950s, that his younger brother R.L. was killed some years later (presumably in the Vietnam War) and that R.L.'s death sent their family into a spiral of grief whose ramifications are still felt several decades later. At that point, however, the film takes a rather unexpected turn, and instead of jumping forward or back in time by a few decades, as the film's rather poetic editing is so often inclined to do, it instead slowly fades in some billions of years in the past, where cloud-like nebulas spin, expand, and grasp warily against infinite fields of darkness. Jack's mother's voice is heard imploring God about the plan and purpose of RL's death, while Zbigniew Preisner's haunting and operatic "Lacrimosa" lends the sequence an overwhelming and contemplative character. As the macroscopic camera pushes it way through starbursts and dusty expanses of rock and gas, another noise grows on the soundtrack: eruption. Images of flame and molten earth engulf us, smoke spews from fissures in the ground, water cascades into endless waterfalls and misty rivers, and somewhere a small puddle of mud boils and teams with life.

Pressing forward again, the film's camera becomes microscopic, watching as cells merge, burst, and swallow one another, as chaotic strings of living organisms wriggle and multiply. Jumping ahead through the millennia, we find jellyfish and mollusks leisurely floating beneath the waves, nearby plants rising from the oceans to cover mossy landscapes, a lone tree rising against the sun. At the shoreline a head swings into view, and panning down we find a massive, beached plesiosaur, examining itself on the sand. As the camera approaches, we realize that its body is wet with more than just water, a massive, gaping wound pouring blood into the surf. Somewhere else, we go micro again, peering into veins and arteries pulsing with blood

cells — a heart beats and an embryo develops. Further in time, we're by a river in a forest, where a small dinosaur lies on the rocks, mortally wounded. A predator approaches, paws at the dying creature with its foot, and then runs away. Increasing our scale to the truly macro one last time, we watch an asteroid as it dances its way through the universe, careening into the Earth with massive, devastating force. Finally, some seventeen minutes after leaving it, the film rejoins its twentieth-century storyline, where Jack's ecstatic memories and fantasies carry him (and us) toward an understanding of death as always immanent to life.

As Jacques Choron once reminded us, death is nothing to the nonliving, for it's not simply the end of life but more importantly *of life*.¹ It follows, then, that as our understanding of death changes, so too must our understanding of life change, for in those same moments that the digital shifts our relationship to mortality, it also rapidly expands our empirical limits, making accessible or comprehensible more and more and more of our bodies and our world and our universe. As such, films like *The Tree of Life* — in their resolute confrontations with grief, finality, finiteness, and death — have begun to recontextualize mortality within the rapidly expanding boundaries of life itself, whether it be the overwhelming and sublime biological history of life on Earth, or the nonbiological “lives” of celestial bodies, the births and deaths of stars, planets, universes. In fact, Malick's polemic is quite clear: to understand the “meaning” of even one death, we must first come to grips with the very foundations of life itself. To that end, his film shows us, before it even reaches its half-way point, that every life and every death is a repetition of the same process, and no matter

FIGURE C.1 A plesiosaur dying on a beach in *The Tree of Life*.

how infinitesimal or how immense your lens, the pattern will always be the same. For Malick, and for our digital logic, life and death are *fractal*.

Fractals, as we know, are very much a product of the digital age. First described and named in 1975 by the mathematician Benoit Mandelbrot in his analysis of the incalculable lengths of shorelines — which, he argued, are always equally jagged, rough, and complex, no matter how close or distant you are as you examine them — fractals only truly took root in mathematics and “entered wide public circulation,” as Anna Powell tells us, “with the spread of computer literacy” in the late 1980s and early 1990s.² Although there are several basic types of fractals, perhaps their most fundamental shared property — infinitely repeating patterns that are similar at any scale — can be best illustrated through the familiar image of the “Sierpinski triangle,” named after the set theorist Waclaw Sierpiński. To make one, “take a triangle and subdivide its area into smaller triangles,” as Ian Hamilton Grant explains. “Following this first sub-division, repeat or ‘reiterate’ the operation on these smaller triangles, and so on ad infinitum. Such a figure is *linearly self-similar* because each part of the object is exactly like the whole from which it is derived.”³ It’s this linear self-similarity that has been adopted by moving images in their quest to face mortality, resulting in images and juxtapositions — stars expanding, lava cooling into earth, and cells dividing, for example, or universes fading out, cells being swallowed up, creatures dying alone on a beach — which suggest or reveal repeating patterns in the nature of life and death, the micro and the macro.

FIGURE C.2 *The linear self-similarity of a Sierpinski triangle.*

Consider another example from Ang Lee's filmic adaptation of the novel *Life of Pi*, in which a young Indian boy is stranded at sea after a shipwreck which took the lives of his entire family, leaving him adrift in a small lifeboat, his only companion an adult Bengal tiger by the name of Richard Parker. Mourning the loss of his loved ones, and fearful that he and Richard Parker, too, will soon perish at sea, Pi fantasizes about the endless number of lives playing out far beneath the surface of the water. As he stares over the edge of the boat, the camera plunges into the deep, where an enormous whale is caught within the tentacles of an equally massive squid, only to have its body suddenly morph and break apart, each fragment becoming as animal from Pi's family's zoo — a zebra, a hippopotamus, a crocodile, a giraffe — which swims away out of sight, unfazed and unafraid. A light emerges from the darkness as a massive angler-fish blurs past the camera, its vaguely fractal scales and tentacles revealing a starry-like expanse of bioluminescent microorganisms in its wake. Each tiny creature glows, spins, expands, and ruptures, a visual echo of an infinitely vast cosmos, thousands of universes in miniature, bursting to life and exploding in death. Somewhere far below, the ghostly remains of the shipwreck rest on the ocean floor.

Like Malick's "creation of life" sequence, Lee's depiction of Pi's fantasy is both a visual and a thematic fractal, a dream in which the smallest instances of Being are found to be identical to the largest instances of being, a smooth cosmic space where the diminutive is immanent to the immense. It was in this very sense that Deleuze and Guattari adopted the fractal in *What Is Philosophy?*, "aligning it to the plane of immanence," Powell writes, "in a series of figures beginning with the body: skeleton (concepts) and breath (plane), which are used to distinguish the plane from the concepts arising from it."⁴ In other words, the foundation or "skeleton" of our existence — i.e., consciousness — is concepts, notions, words, language. Yet the very "breath" of life is something altogether different, that pure affect which reaches in all directions and touches all beings, that infinitely smooth "plane of immanence" which extends from the distant past into the far-off future. "If concepts are 'absolute surfaces or volumes, formless and fragmentary,'" Powell continues, quoting Deleuze and Guattari, "then the plane itself is the 'unlimited absolute' and 'always fractal.'"⁵ Existence, being, life; nothingness, nonbeing, death — all things an endless repetition and recurrence, a fractal of self-similar beings and Beings playing out across infinitely varying scales.

Yet we mustn't overlook the fact that not all fractals are entirely self-similar, that they can also represent a chaotic repetition of the merely alike rather than an endless repetition of the same. Such chaotic fractals "model the behaviour of complex systems," as Grant tells us, because they are "both linearly self-similar and random, depending upon which fractal dimension" — i.e., which *scale* — "of this nonlinear, dynamical system is studied."⁶ The most famous example of chaotic fractals would be the Mandelbrot set — named, of course, after the father of fractals — whose sea-shell shaped

FIGURE C.3 *A finely scaled detail of a Mandelbrot set, where a version of the original pattern is surrounded by chaotic yet equally complex patterns.*

patterns were inescapable throughout the 1990s, plastered across personal-webpage wallpapers and trapper-keepers alike.⁷

What's unique about the Mandelbrot set is that, when treating the complex numbers bounded by the set as image coordinates, the resulting figure has a finite yet ragged boundary which reveals itself to have infinitely greater details as the scale of the image is increased. At times, these details resemble smaller and smaller versions of the set as a whole, while at other times different but equally complex patterns emerge. In other words, chaotic fractals are both finite and infinite, linear and nonlinear, consistent and inconsistent, smooth and striated, which is precisely why they model Deleuze and Guattari's concept of immanence as fractal more fully and more precisely than the linearly self-similar Sierpinski triangles and Menger sponges which the pair discuss in their work.⁸ The reason for this is that although they describe the plane of immanence as smooth space, there are always striations acting upon it, those inconsistencies which are not yet wholly affective, those problems which must be addressed rather than dismissed. As such, exclusively self-similar fractals, as Mark Bonta and John Protevi tell us, "might lead to conceptual simplification of complex, smoothing/striating processes" — the same translation of problematic inconsistencies into presentable consistencies that Deleuze rejected in our last chapter.⁹ "A [linearly] fractalized shoreline," they continue, "while intriguing, is but an abstraction of the real shoreline that is traversed by the striations contained in any system that is always-already striated by human forces."¹⁰

Intriguingly, the very digital processes which have inspired our fractal understanding of life may act as striations that stand in the way of visually

representing such smooth fractality, seeing as the infinite vastness of the universe — not to mention the intricacies of the biological systems which resemble it — are often far too complex to simulate with the same efficiency and effectiveness of simulations depicting the animated subject becoming inanimate or the rupturing and breaking apart of flesh. Perhaps this is why Terrence Malick avoided computer-generated images of nebulae and cosmic bodies, turning instead to actual chemical and biological processes which stand in for their macro cousins. In doing so, he followed in the footsteps of yet another film we've previously discussed, Darren Aronofsky's *The Fountain*, whose space traveler Tom, floating ever-upward in his bubble ship, passes by and through a miniature cosmos that truly captures the chaotic fractality of the natural universe. *The Fountain's* cosmic spaces were captured through complex macrophotography of petri dishes in which various organic and inorganic fluids and materials, such as "yeast, dyes, solvents, and baby oil," along with other substances the filmmakers declined to divulge, were combined to foster chemical reactions which echo the physical forces found in nature.¹¹ Such reactions were then digitally composited together and layered behind live-action images, which "furnished Aronofsky's film," as Steve Silberman writes, "with something neither a computer nor an old-fashioned matte painter could deliver — chaos, in all its ultra high-definition fractal glory."¹² Indeed, the chaos is one of complex randomness juxtaposed against the linear self-similarity of existence across its many scales, marrying some of the smallest known forces of our world to some of the largest known processes of our universe in order to position us — conscious,

FIGURE C.4 A nebula surrounds the bubble ship in *The Fountain*, composited from macrophotography of chemical reactions.

living organisms — as merely a reverberation in the great chain of Being, a repetition in the vast and infinite plane of immanent beings.

It's this infinite repetition of finite beings that films like *The Tree of Life*, *Life of Pi*, and *The Fountain* hope to invoke, and likewise it may be this very sense of pure and absolute immanence that we've been chasing from the very beginning, as Andrew Pickering makes surprisingly clear when he writes that the very thought of immanence "invites a connection to the mathematics of fractals, cellular automata, simulations of non-linear systems [and] the unknowable," to which we might add recurrence and repetition, determination, problematics and inconsistencies, the oneness and manyness of human life.¹³ At the same time, an understanding of death as immanent to life reveals that the study of death is not a morbid meditation on our greatest fear but rather a confirmation of our very Being, for one cannot understand *life* without recognizing its finitude. If one were to argue, as this project has, that contemporary simulations of death are a virtual enactments of the lost experience of witnessing the death of others, one is also implying that "aliveness" is concretely felt through glimpses of nonbeing. If one were to say that the compossibility of digital games is an echo of the repetition of being through which we can trace our own "path to death," then one must also say that life is the culmination of choices and chances. If one saw in our possibilistic culture relays through which we attempt to reassert the potential of death, one must also acknowledge that such potential is always and only enacted through resolute Being. And if one were to read the theoretical immortality of artificially intelligent machines as a mirror that reveals the recognition of death to be the defining characteristic of human life, one would also see within that mirror a context against which a meaningful life can be judged or assessed. Indeed, in all of these observations, one could glimpse a fractal logic of life just as easily as the digital logic of death.