

Brasil's *Nomen Novun* After Future

South America Tectonic Plate Shift

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Abstract: This unusual report has a purpose: to alter the lyrics of a song too many people listen to over and over. We support an effectual re-tuning by appropriate means. One of the means available is geo-fictional. Most probably, the only constraint is that YOU will read the new song-lyrics only once!

Key words: South America, tectonic plate, Anthropocene, “Crinkle Geography”, future, Brazil, geomorphological prediction.

Resumo: Esta narrativa incomum tem o seguinte propósito: alterar a letra de uma música que muitas pessoas ouvem repetidamente. Nós exortamos a elaboração de um novo arranjo, e, para tanto, o meio disponível que empregamos é de natureza geo-ficcional. Muito provavelmente, a única limitação é que VOCÊ lerá a nova letra apenas uma vez!

Palavras-chave: América do Sul, placa tectônica, Antropoceno, “Crinkle Geography”, futuro, Brasil, previsão geomorfológica.

1. Introduction

Like many other Earth-bioshell ecosystem-nations during 2020, the economy of Brazil was racked by a strongly adverse — not essentially existential — widespread population trend in common medical conditions induced by the viral ravages of Covid-19; resilient Brazilians still exist, thrive and are unlikely to disappear anytime soon! However, with the elapse of Earthly Geologic Time, Brazil's national territory will be altered into some *thing* not yet geoscientifically foreseeable. So, instead of a “What If” outlook, we adopted an “If Only” viewpoint.

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Because we have a desire to enhance a different preferred outcome from what is commonly suggested, here we attempt to put Brazil's superficial future geological presence into a funhouse mirror manufactured by some science fiction-inspired, perhaps day-dreaming, professional geoscientists.

Very few commercial films have ever featured any players clearly identified as fictional geologists; the commercial movie we suggest to be the best example of such an entertainment is 1965's *Crack in the World* wherein three main characters were such leads. Some of our motivation for this unusual essay stems from a real-world indifference to the propaganda present everywhere in today's specialized and popular news-media urging all humankind to adopt that arrogant geo-technical stratum moniker, the “Anthropocene”. It is an improper designation since our ever-changing planet and debris from its surrounding Universe will inevitably destroy, or conceal forever, even *Homo sapiens*' most awesome cultural creations within our changeable planet



as Dr. Nigel Clark's *Inhuman Nature: Sociable Life on a Dynamic Planet* (2011) discusses; as elaborated therein, known and unknown forces acting constantly and intermittently on Earth are not always benevolent towards its gravity-restrained life. (South American Portuguese language speakers use "Antropoceno" while Europe's Portuguese speakers use "Antropocénico".) A 2013 film, *Elysium*, artfully imaged Earth's visible ground-surface as a borderless super-favela orbited by a visible torus-city owned and operated entirely on behalf of Earth's social, economic and military masters; human elites inhabiting a similar torus-city was first macro-imagined in 1929 as "Saturnia" by the Russian architect Viktor Petrovich Kalymkov (1908-1981) [1].

We felt ourselves compelled by recent revelations in Geoscience literature to ask: "Does Japanese science-friction writer Sakyo Komatsu's *The Capital Vanishes* (1985) have any serious application to 2020 Brazil's slowly abating Covid-19 crisis? Of course, Brasilia has not yet disappeared from sight, nor its city-centered lawful yoke of elected and unelected politicians, but tax-paying Brazilians remain aboard a sad cruising carnival "Ship-of-State" after its catastrophic collision with a coronavirus-instigated pandemic. Selfishly seeking to remain relevant for their ever more needful voting constituents' politicians, sometimes working in isolated Brasilia, continue to conflate a pervasive real-world disease, the novel Wuhan coronavirus, with a very unreal powerplay focused on Brazil's hypothetical climate regime futures. True, if the country's Amazon River Basin rainforest air temperature exceeds 32⁰ C, plant resiliency will weaken markedly, endangering the rainforest's existence [2]; were the South Atlantic Ocean to rise markedly its seawater could unstoppably flood vast swathes of the Amazon River Basin, killing many oxygen-emitting green plants [3]. Rather analogous to what Covid-19 does to an infected human's lungs, the falsely alleged "Lungs of the World" could become congested with dead plants and creatures! Brazil's river basins decrease in area with proximity to

its South Atlantic Ocean coastline and complicated super-computer modeling studies have illustrated that a 100 m sea-level rise is capable of triggering, or modulating, tectonic plate activity, like the State of California's San Andreas Fault Zone vicinal to the Salton Sea.

United Kingdom geographer Dr. Nigel Clark has emphasized the fact that many geoscientists have deployed "...tropes of cuts, gouges, gashes...to help...[readers and viewers] empathize with the inhuman vastness of [ordinary and extra-ordinary] violent Earth processes. Social thinkers...have long borrowed geologic imagery — rifts, ruptures, chasms, seismic shifts — to portray events so momentous that they affect our very ability to make sense of the world" [4]. Conversely, vigorous advocates of "THE Anthropocene" concept invert this three-dimensional geographical scale to accuse other humans as the history-cataloged dominant inflictors of grievous geophysical injury and destruction upon an invaluable Solar System astronomical body, Planet Earth. In fact, their voiced negative documentations and enumerations of destructive human agency often verge on "idol-worship" of a designated Devilish species of life! Yet, amazingly and with abundant faithlessness, they also wish to designate a few elite persons to direct humankind in some still-to-be-revealed-effort to reverse all such damages and inequities! Too, such highly emotionalized, sometimes barely geoscientific — publicized opinions are being currently concocted and dispersed during civilization's initial industrialized attempts at creating a supportive sustainable economy which includes garnering of the closest available energies and elements of the entire Universe. For its dronish advocates, "THE Anthropocene" is the be-all and end-all.

Reasoning that still non-envisioned, completely unrecognized or vaguely observed universal facts and factors are influencing Planet Earth, Portuguese geoscientist Dr. Fernando Ornelas Marques and his

German colleague Dr. Boris J.P Kaus embarked on a drastically different course of problem investigation and elucidation [5], their investigatory tach that might well be named “Crinkle Geography” [In Portuguese: enrugar, nodular]. “THE Anthropocene” aficionados commonly allege that, by circa 2060, the human civilization energy use system shall be comparable to the natural global energy system driving the whole Earth’s plate tectonics [6]. At least as bold as mythology’s Otus and Ephialtes who deliberately piled Mount Pelion atop Mount Ossa and Mount Olympus, in their hard effort to apprehend geoscientific fact instead of trying to gain Heaven to attack the ancient Greek gods, Drs. Marques and Kaus sought to project their combined outlooks successfully into an intriguingly speculative unique and new “If Only”-styled Macro-Imagineering [7]: prediction of Brazil’s possible far-future future national territory, its emerging and disappearing undulatory “Crinkle Geography”. Briefly, they proposed some currently unexpected future tectonic movements of the South American Tectonic Plate on which rests the ecosystem-state of Brazil after that Earth-crust subdivision’s subduction is initiated at its now passive margin beneath the South Atlantic Ocean. Possibly the South American Tectonic Plate, **Figure 1**, originated as a result of our early-Earth’s primordial expansion caused by its ever-present first internal heat source, the Earth-core [8-9]. An entirely molten Earth would have been ~5% bulkier than a solid counterpart because the radiogenic heating rate shortly following its formation as an object within the Universe may then have been 10^3 to 10^4 times greater than present-day measured values; whenever Earth’s internal nuclear fission reactions—primarily of Uranium, Thorium and Potassium—finally ceases in the non-anticipatable far-future, there would have been by then an guesstimated total planetary mass reduction of $\sim 4.32 \times 10^{17}$ kg. Although the mass of the continental crust is ~0.5% of the Earth, it covers ~40% of the Earth-surface and composes ~80% of the Earth-crust’s total volume. During our biological and spiritual homeland’s

multi-billion year Geologic Time, it has fractured into many different tectonic plates; the number extant during our lifetimes is not fully known since new tectonic plate boundaries are appraised as actually just forming (for example, the Red Sea).

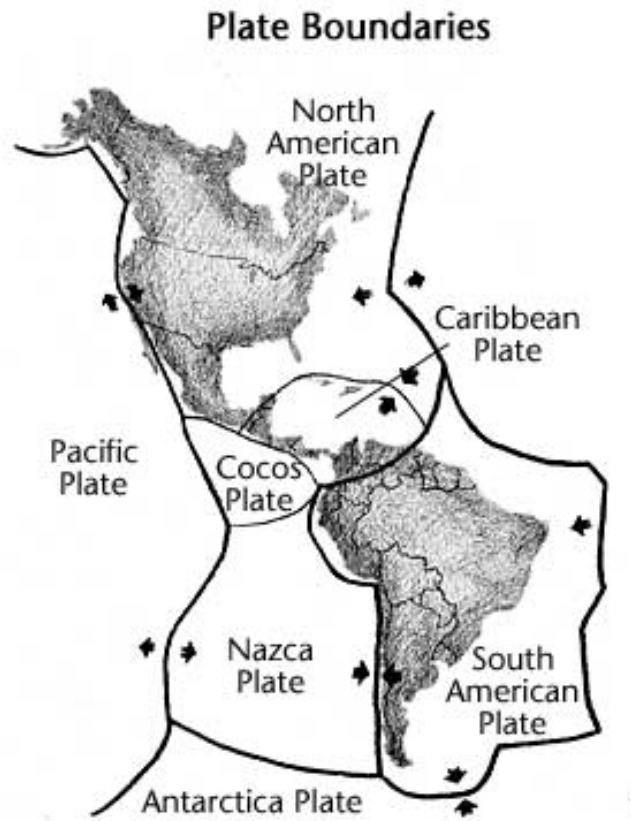


Figure 1. The New World’s Tectonic Plates as mapped by modern-day Geoscience experts.

2. THE so-called human-induced Age of Earth-surface Patina

The long-term geophysical durability of the State of California was, for first time ever, questioned during 1933 in a little-read satirical book penned by USA novelist Myron Brinig (1896-1991) [10]. At the book’s finale, he supposed as a novelty ending, that the BIG ONE [major San Andreas Fault Zone seismic event] eventuates in California sliding into the eastern North

Pacific Ocean in one massive continuous lateral tectonic movement carrying its intricately fractured landscape replete with its associated well-rattled human infrastructure [11]. By choosing that specific catastrophic event, he ensured that there never could be an “Age of Patina” as John Beck’s *Landscape as Weapon: Cultures of Exhaustion and Refusal* (2020) has comprehensively postulated a theory of dereliction — that is, his “abandoned places” which serve those who apparently endorse “THE Anthropocene” idea of Earthly Geologic Time. Four decades later, the Japanese novelist Minoru Komatsu (1931-2011) macro-imagined in his entertaining, purely fictional and highly popular *Japan Sinks* (1973; Japanese: *Nippon Chinbotsu*) that the archipelago of the western North Pacific Ocean literally submerges as a collision of two Northern Hemisphere tectonic plates causes the one supporting that Old World ecosystem-nation to buckle under. Japan disappears because of nothing more than Nature’s implacable and impersonal event-processes. Komatsu’s is a Gedanken-Experiment (German: Gedankenexperiment) on the endurability, basic nature and psychological veracity of the Japanese peoples’ identity, the old-fashion “National Character” suggested by outdated Sociology. Drs. Marques and Kaus did not address that aspect of their geophysical forecast for Brasil and we won’t try to do much with that concept either!

3. Geoscientific Macro-imagined natural Earth-crust reshaping

The first map of the Earth’s entire crust without its obscuring ocean present was published in 1690 by Willem Goeree (1635-1711). Since that time, many hypotheses and theories have been produced and presented that are focused on the Earth-crust’s formation and change during Geologic Time [12-14]. How pre-Homo sapiens Nature first broke Earth’s outermost solid rocky shell into multiple tectonic plates, thus creating Earth’s initial global “Crinkle Geography”, openly remains a subject of considerable contention among geoscientists and others [15]; for our purposes

herein, it is sufficient to say merely that such fracturing probably took place long before at least macroscopic life-forms existed. But, for our own edification and that of our readers, we introduce more astronomical and geological air-ocean-rock interface shell-shaping factors related to the Earth-crust than did Geoscience forecasters Marques and Kaus [5]. For instance, “Crinkle Geography” is produced partly by falling exogenic debris since the annual usual risk to Earth from larger meteoroid impacts is ~12% greater at the Equator than elsewhere [16]. Of course, such ballistic impacts might be just a blip in the long-duration of reshaping proposed by Marques and Kaus wherein they forecast abrupt subduction onset at the currently passive margin of the South American Tectonic Plate, followed by the collapse of the Andes Mountains [17-18] and, almost simultaneously, the increased lateral spreading rate of the Mid-Atlantic Ridge sequestered beneath the South Atlantic Ocean. Another extra-terrestrial factor might be future changes in the Sun’s energy output and the Earth’s air content of gases and overall mass that results in ozone loss and increased UV-B radiation impinging at ground-level where present-day animal and plant life abounds [19].

Normally — that is, before the onset of its extant Covid-19 times shared by Earth’s human populace — the Brazilian “National Character” exhibited a strongly and widely held outlook that conceived Brazil as a geologically “blessed land” [20]. (Few ever include Portugal’s 1755 seismic disaster in their evaluation of their own ecosystem-country’s worth.) Yet, perhaps, a little more thought ought to be elucidated about Brazil’s vulnerabilities. For example, a 1690 earthquake in the Amazon River Basin may have had a maximum magnitude of 7, at least the equivalent of the mid-USA Mississippi River Valley tremor of 1811-1812 [21]! The published work of Drs. Marques and Kaus has its true value in forcing a powerful and sustained geoscientific re-think of Brazil’s topical and Tropic Zone future “Crinkle Geography” because, undoubtedly, practical

prediction of the geomorphological condition of the Earth-surface—including both its volume susceptible to human manipulations and that volume which Nature alone has mastery of — is very likely to assume increasing importance. For sure, the market-value of accurate real-world predictions will increase markedly as humans delve further into the convoluted social and industrial mysteries of “global sustainable economies”. Therefore, Drs. Marques and Kaus have helped our achievement of this vital goal by having taken on the arduous intellectual task of acquiring geoscience knowledge of the push-pull driving endo-genetic energy system for the South American Tectonic Plate. Certainly, super-computer modelling of far-future Brazil’s geomorphology must be apprehended and treated as oxymoronic products until the precision of prediction is almost indisputably certain enough to generally satisfy the slightly informed Brazilian public and their representative political leaders.

3. Discussion

Earth’s Southern Hemisphere is enduring shifts in temperature and precipitation patterns possibly due to changes in the planet’s aerial ozone, especially above Antarctica. Brazilians are wearing lighter-weight and softer-colored clothes to acclimate to apparently warmer as well as drier/wetter territorial climate regime patterns which makes them more susceptible to the damaging skin effects of UV-B radiation. A natural or unnatural total disappearance of atmospheric ozone, more solar radiation impacting, would reach ground-level [22-23]. It is comforting to realize that ~0.3% of the air has been breathed even once by a single *Homo sapiens* throughout recorded history. “If Only” every green plant halted production of oxygen? The oxygen gas content of air would decrease by < 1% in 20 years and only if Earth-surface erosion accelerated could there be a transformation severe enough (over an unfolding four-million-year period) to consume all free oxygen remaining in the air [24-25]. Drs. Marques and Kaus (#5, page 11): “A comparison cannot be made with the

impact human activity may have on climate change”. Summarizing their significant contribution to the “If Only” genre, at page 14, specifically in their **Figure 13** — which must not be reproduced according to the publishing journal’s Guidelines — shows Brasil as Brazilians of the far-future, possibly enjoying more healthful, prosperous and politically rewarding times too, would exist in a vastly re-shaped ecosystem Nation still atop the South American Tectonic Plate. Would people living then and there want a new toponym for their beloved homeland? We cannot divine if Brasilia will be ruined, buried or scrapped into non-existence by the Earth’s subduction event-processes.

4. Last comments: the ills of our lifestyle

Earth is a geologically active planet, a fact of crucial relevance for the permanence of life as we know it. In fact, geological activity is one of the markers of the potential for the existence of life on other planets. Ironically, geological activity is also a lethal agent. Despite the widely accepted hypothesis of the impact that would have led to the extinction of the dinosaurs, the fact is that those creatures had already been suffering from the gases of intense volcanism emitted sporadically for just over 60 million years. We can say that, in a broader view, the Earth, with all its geological and biological diversity, constitutes a living system; death and life alternate in cycles of varying geologic time durations. We depend on the renewal of gases and soils, although there is an enormous gap in “deadlines” between recognized events that occur with the passing of geological time and barely recorded anthropic events that cause environmental imbalances in the planet. Earthquakes and active volcanoes, seen mainly from the side of the catastrophes they cause, are necessary in the long-term (after all, we choose to inhabit dangerous areas!).

In the last 120 years, humanity has given a considerable “push” towards the imbalance of telluric forces. If geophysical phenomena naturally involve great

uncertainties, imagine now with our contribution! A terrible example is the biodiverse natural vastness transformed into the sameness of large-scale monocultures (normally this subject is not associated with questions of Geophysics, which is a colossal mistake! For example: during 1955 geoscientist Sidney Paige (1881-1968) uniquely looked to our Sun as the source of energy for orogenesis and epeirogenesis [26]). It is not just the inability (or anthropogenic disability) of these soils for human food production, but the inability to return to harbor biodiversity precisely in the sense of the mycelial biological model (destroying biodiversity, we affect bioclimatic cycles that in turn feed back instabilities in the surviving mycelial networks). The depletion of soils is inevitable given the use we make of them. Although the demand for food grows at an alarming rate, there is a whole stimulus to the rampant consumption of agrarian products on an unsustainable scale — not merely empty market shelves, but also barren places that were once luxuriant green fields and thriving livestock. As a result, an unbelievable amount of food literally goes to waste. The grain production model adopted is highly questionable, since it elevates the capitalist interest upward the strong pressure that occurs in the natural environment. Milk and its derivatives are consumed far beyond the real nutritional needs at levels that are harmful to health. Likewise, meat, processed or not, is consumed in absurd amounts. In both last cases, the impact of livestock on soils and on the volume of greenhouse gases is undeniable.

Seismic activities in Brazil are generally seen as irrelevant, since known geologic faults are located far from the edges of convergence of tectonic plates. But Geophysics is very complex. In this domain, phenomena are largely interfering and the causal chain almost never shows clear boundaries. Climates altered by large devastation of forests for planting and cattle raising imply chains of geophysical imbalances on the El-Niño (and La-Niña) cycles, on the dynamics of glaciers, on the rainfall regime, on the level of the adjacent South

Atlantic Ocean (and, as highlighted above, the increase in seawater volume can significantly affect tectonic activity), on the volume of river runoffs, and so on.

The popular, narrow-minded “news” media prefers to show Brazil as a vast barn, a kind of breadbasket for the world. This image is both pernicious and fanciful. In the first place, because IF the country really were a barn, the inequality caused by hunger within its national borders would not exist therein (the populist “Fome Zero” was nothing more than an electoral decoy!). Secondly, because reducing the nation to a world breadbasket diminishes the prospects of scientific-technological development, and, consequently, of social development. Third, because the problem of food scarcity cannot be solved with a centralized solution. Finally, because maintained barns ultimately need to be sustainable and ecologically balanced like any warehouse, the opposite of what is observed within Brazil. Therefore, this idea of a “barn nation” creates the fiction that we can feed the world indefinitely at the expense of destroying an unparalleled Tropic Zone-centered biodiversity. The geophysical consequences of this monument to ignorance are incalculable.

In short, we are on the cusp of a dramatic socio-economic denouement. The futuristic vision that we all want shall be possible “If Only” we manage to resist the overwhelming advance of a veritable “cloud of locusts” coming from the East, greedy for our soybean and other valuable resources. Meanwhile, soil management initiatives are still very timid in face of what we actually need to reverse the current increasingly dire environmental situation. It seems that we don't really want to solve anything. The slowness with which nature operates cannot rival the predatory speed of humanity. It's hard to believe that a species devoted to power and profit, uncritically consuming animals so close on the evolutionary scale, could change its course. Extrapolating science-fiction in a very fanciful way, we

believe Earth would survive humanity as it is "If Only" we became an artificial and radically different species, a species capable of simultaneously eating and photosynthesizing!

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