Rio de Janeiro Citizens Eschew Further Mangrove Loss in Preference to a Potential Development of a "Guanazilla"

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Abstract: Symbolic transformation of "Guanazilla" (a melding of an indifferent and ignorant public with NWO groupthink from professional politicians' mindsets) from villain to magnificent virtuousness is a transition that is positively well-worth seeking. It is posited here that Guanabara Bay can again become a naturally functional coastal marine ecosystem! The purely fanciful model "Guanazilla" is used as a mentated or metaphorical approach to address the mega-problem of potential environmental harm to the upper-bay's precious mangrove stands. This metaphor is applied with a purposeful yet playful attitude and a curious perspective. This unique perspective, which provides a forward-looking expression for both the mega-mangrove problem and its potential remediation, is offered for consideration without apology. Because Guanabara Bay is a Brazilian cultural keystone, it is prudent to avoid the development of an unwanted and degraded "Guanazilla." This avoidance of potential eco-catastrophe is possible via implementation of environmental training that will ensure the iconic mangrove's proper long-term maintenance, protection, preservation, and enhancement.

Key words: Macro-engineering, Guanabara Bay, Rio de Janeiro, Godzilla film, plastic debris, seawater cleaning, mangrove park preservation.

Resumo: A transformação simbólica de "Guanazilla" (uma fusão de um público indiferente e ignorante com o pensamento de grupo da NWO da mentalidade de políticos profissionais), de vilania para virtuosidade magnífica, é uma transição que vale a pena procurar. Postula-se aqui que a Baía de Guanabara pode voltar a se tornar um ecossistema marinho costeiro naturalmente funcional! O modelo puramente fantasioso "Guanazilla" é usado como uma abordagem mental ou metafórica para lidar com o megaproblema de possíveis danos ambientais aos preciosos manguezais da baía superior. Essa metáfora é aplicada com uma atitude propositiva, porém lúdica, e uma perspectiva curiosa. Essa perspectiva única, que fornece uma expressão voltada para o futuro, tanto para o problema dos megamanguezais quanto para sua possível remediação, é oferecida para consideração sem desculpas. Como a Baía de Guanabara é uma pedra angular da cultura brasileira, é prudente evitar o desenvolvimento de uma "Guanazilla" indesejada e degradada. Essa prevenção de uma potencial catástrofe ecológica é possível por meio da implementação de treinamento ambiental adequado que garantirá a manutenção, proteção, preservação e enriquecimento do manguezal icônico no longo prazo.

Palavras-chave: Macro-engenharia, Baía de Guanabara, Rio de Janeiro, Godzilla film, resíduos plásticos, limpeza da água do mar, preservação dos manguezais.

1. Introduction

Excrement dropped by cows (manure) and birds (guano) is agriculturally valuable as a commercial soil amendment when used as a natural fertilizer to increase crop yields. In the USA, the revered Californian former farmer and political regime reformer Howard Jarvis (1903-1986) used the 1978 political campaign phrase "*That's a bunch of Bandini*" whenever his elite-class State Constitution

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Amendment 13 ballot initiative political opponents intentionally voiced voter-deception falsehoods or misleading but mind-numbing airy non-factual generalizations. (In the State of California, USA, the Los Angeles-based *Bandini Fertilizer Company* still sells bagged cattle feces, also known as *basta* in Portuguese or more rudely as bull-shit in English.) Nowadays, in the English and Japanese languages [1], the suffix "zilla" is a polysemic denotation for many kinds of fanciful creatures that are enormous, powerful, and sometimes angry. The term "Guanazilla" is a geographically localized homosemous takeoff that identifies the same ugly notion of an enlivened and putrid 'Guanozilla.' Guanabara Bay encompasses the polluted totality that currently is the city and State of Rio de Janeiro's infamously and unnecessarily polluted international touristic marvel seascape. Guanabara Bay, which is identified here as "Guanazilla", is certainly Guanozillic in nature due to its massive pollution.

The metaphoric monster's shiny multi-colored fearsome embodiment and awakening geophysical agency is caused by improperly regulated environmental management that has allowed Synthetic Biology to go awry [2]. This sad state of environmental degradation is observed to adversely impact the channel, seabed, and tidal seawater separating a famed university situated on the Ilha do Fundão from the nearby mainland. The close proximity of a major petroleum refinery with a technically troublesome discharging oil pipeline (Petrobras-II) is found on the bay's northern shoreline, the Duque de Caxias [3]. Although titled like a law-court case brief, to a degree, this inculpatory investigation (for science-fiction/ science) exposes parallels in *Mutant 59: The Plastic Eaters*, penned and published 50 years ago by Gerry Davis (1930-1991) and C.M.H. Pedler (1927-1981), where an ever-accumulating large mass of mutating bacteria, which had accidently avoided a shutdown biological research program's No. 1 safety protocol by being dumped down the laboratory's sink drain by a janitor, unstoppably wreaks havoc on human civilization's infrastructures unfortunately assembled with plastic parts! The only positive side-effect, not anticipated by the novelists, is that the world-ocean might be cleansed of plastic pollution in this way. In other words, monetary funding was inputted to support the investigative scientific "workforce." This defamatory pejorative for 'research' is commonly used to relegate practical scientists and macro-engineers to perceived inferior societal status. The metaphorical bacterium was developed as thru-put and the semi-fictional 'Guanozilla' is the industrial output of a poorly-operated, lax, and corrupt government plus disinterested citizenry combined.

Fictively and quickly self-assembled by gigantic organismic willpower, constituted from Guanabara Bay's vast aggregation of urban trash discards (*e.g.*, macro- and microplastic debris), 'Guanozilla' possesses the power to permanently sterilize Guanabara Bay. This situation obtains because flushing and rejuvenating tidal waters will, in effect, soon become poisoned effluent that is caused by the inevitable degradation of uncontrolled plastic waste. This degradation of the marine environment will adversely impact waters of the South Atlantic Ocean water outside Guanabara Bay as well as inside the bay proper (**Figure 1).** The metaphor of 'Guanozilla' thus represents foolish, greedy, and complacent political elites as well as careless, inconsiderate, and ignorant residents as well as employees of Rio de Janeiro city and State since both groups have had a direct hand in its formation and "existential maintenance." Their extreme mishandling of their own waste products begs to be displayed in artworks such as those produced by Estelle Chretien. In her *Operation Terrestre,* for example, an actual well-trimmed lawn outside a stately home in France, which is vertically incised by a trench, obviously requires some

minimal healing suturing. She deftly demonstrates therein by using a pseudo-surgical thread as half-done actual garden repair work [4].

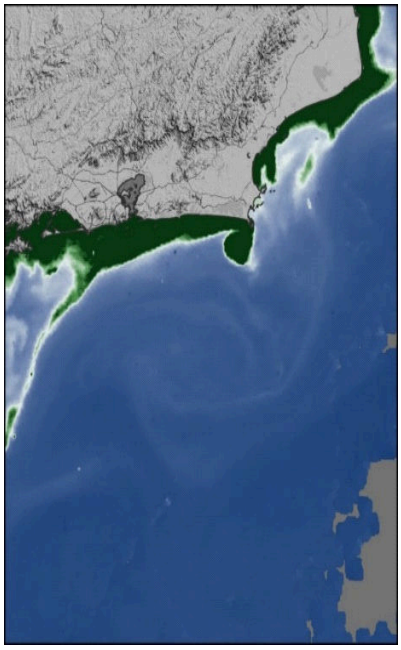

Figure 1. State of Rio de Janeiro beachgoers were constantly plagued by a smelly Red Tide (dark reddish-brown color) caused by a massive blooming of dinoflagellates, *Mesodinium rubrum*, *etc*., from 3 November until this captured satellite image on 26 December 2021. Gradually, as the season changed, the bloom dissipated and disappeared; the dark green color along the shore is the normally non-toxic bloom that sometimes becomes toxic.

Authorities of the State of Rio de Janeiro, during 2021, privatized the failing urban sanitation service *Cedae.* The operating responsibilities of this service were handed over to the city and 26 other Guanabara Bay-bordering municipalities to the company Águas do Rio. Staffed by a surviving cadre of an apparent civic leader's sacrificial aquatic zone, as well as being monitored by the so-called bay-protecting *Baia Viva*, the visible results of this transaction so far remain unimpressive. During 2021-2022, professional politicians sought to privatize about 10% of beaches located in a city for the purpose of development intensification of beachfront businesses. Presented as PL n.4444/2021, the question arises as to whether the care and cleaning of privatized beaches becomes the sole responsibility of private owners. In other words, the State is devolving its obligatory public duty in Guanabara Bay to keep the public's waterfront property safe, clean, and useful. From the perspective of the citizenry of Rio de Janeiro, the surpassing of its noble original concrete ***Cristo Redentor*** (1931), in April 2022 by Rio Grande do Sul's new ***Cristo Protetor***, seems ominous. Only Rio de Janeiro's amazing granite geomorphology (incidental steep-sided rocky domes) sets ***Cristo Redentor*** apart from other similarly religious commemorative outdoor anthropogenic statues [5].

2. Huge Sauropods and miniscule plastic pieces

Significantly and previously, all three authors have recounted several reasonably available macro-engineering techniques and macroprojects that were meant to markedly improve the living conditions of the people of Rio de Janeiro as well as to conserve and, it was hoped, expand the geographical extent of the remaining mangroves situated in Guanabara Bay's uppermost tidal area [6]. Further to these intentions, the 'Guanozilla' metaphor cum "Guanazilla" reality was partly modeled after an inspiring 'Frankensoil' Hollywood-style commercial horror film. The purpose of that message was to popularize a geoscience discipline that is referred to as *pedology* (a branch of soil science that studies the formation, characteristics, and distribution of soils) [7] which reveals how difficult it is for people to change their daily behaviors from negative-result outcomes to positive results that improve the national territory.

Half of the surveyed worldwide feature-film fanbase for the Japanese "Godzilla" (premiered on 3 November 1954) apprehend the monstrous grey-green scaly skin reptile as the villainous embodiment of evil. The other half think its corporeal appearance is a mutated, scarred, and

disfigured creature that was unsympathetically mauled by unwise ever-increasing atomic-powered geophysical depredations wielded by the elites. The film's fictional phantasmagorical monster is finally dissolved in Tokyo Bay by a ludicrous invention called a seawater Oxygen Destroyer (**Figure 2)**, which is a <1 m-long glass-enclosure shaped like a turd. Subsequent to its use, all Tokyo Bay becomes devoid of life. **Figure 2** (top) illustrates the fictional Godzilla floundering in bubbling seawater as the weapon painfully dissolves its flesh. Imaged below is the purported blueprint of the super-weapon employed by Japanese Self-Defense Forces to rid the nation of this city-stomping, perniciously pesky beast. The deadly "Oxygen Destroyer" was invented by the reclusive, yet in the movie's finale, the nobly suicidal "Dr. Serizawa Daisuke".

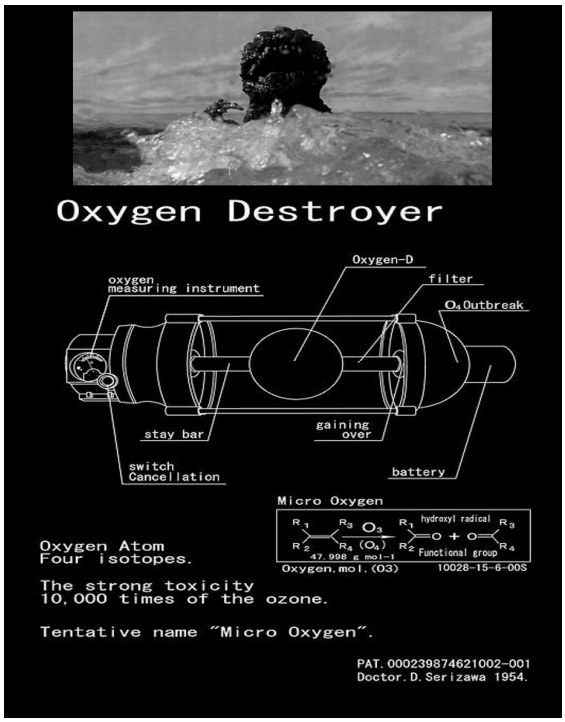

Figure 2. Fanciful Godzilla killer weapon of mass destruction. (Image courtesy of *Quora* at Google Images.)

With Tokyo Bay an anthropogenic oceanic graveyard, will it ever recover its oceanographical fertility and aesthetic acceptability? "Godzilla" (1954) leaves that mind-boggling conundrum unresolved, the single most vital question not even posed by its otherwise wondering actors and actresses [8]. "Turd" may seem vulgar, but even today, especially at numerous places where raw sewage streams off the landscape, all too many of those fragrant and disgusting capsule-like putrefying objects are visibly afloat in Rio de Janeiro's allegedly beloved Guanabara Bay! Considering that Cretaceous dinosaurs fed on ancient shoreline mangroves [9], that survival stratagem for enrapturing Guanabara Bay-emerging 'Guanazilla' does not arise to real-world intellectual impact.

But, what of discarded plastic particles in all their varied compositions, physical forms and state of chemical (de)composition that have entered Guanabara Bay? Brazilians have long displayed *ufanismo*, their righteous pride in the abundance of landscape and natural resources. Yet, until recent years they have markedly ignored the nation's coastal marine environment mainly because ocean literacy in Brazil's public-school curricula is weakly presented [10-11]. For instance, many Brazilians are aware of the once attractive beachfront of the small resort town of Atafona, located north of Rio de Janeiro, that has almost been erased from the shore due to the lack of natural coastal sand deposition. What is not appreciated is that the dearth of beach sand results from upstream agricultural practices, mining, and other human activities along the Paraiba do Sul which has reduced fluvial outflow of freshwater and potential granular beach sediment deposition. Additionally, some futurists are concerned with sea-level rise at the shoreline of southeastern Brazil, but what really matters at the nation's coastline in terms of national societal geophysical impact is relative sea-level rise [12]. The 2016 Olympic Games held in Rio de Janeiro [13] raised public hope for a restoration of the bay with amplified public and private monetary

investments in efficient sanitation systems. Those hopes, however, faded quickly [see #6]. Many metric tons of raw sewage, solid-waste (those turds and other equally repellent readily encounterable stuff) and even basic petroleum hydrocarbons continue to enter the bay every day! Horrifically, residents and tourists today eat aquatic foods (the animals, plants and micro-organisms) caught or cropped within the bay!

"Whereas favela inhabitants tend to live nearer city centers, non-favela inhabitants tend to concentrate in peripheries" [14]. Thus, in the example of Rio de Janeiro's Guanabara Bay, both social groups observe, enjoy, and interact with its marine shoreline. They appreciate its singular liminal threshold, the bay's cliffed and sandy beach littoral, as well as transitions from freshwater-brine-seawater aquatic ecotones to mangrove swamps as occur in a minimally preserved mangrove parkland APA de Guapimirim ("APA" means Environmental Protection Area). On 18 January 2000, REDUC's Petrobras-II pipeline leaked ~1,292 m^3 of MF-380 fuel oil into Guanabara Bay which formed a slick that covered >50 km^2. The drifting slick came very close to fatally impacting the bay's mangroves [15]. Unfortunately, natural tidal flushing and photo-dissolution [16] accompanied by some manual and technical clean-up of the bay only modestly reduced adverse biological impacts of the oil spill. In previous *CALIBRE* expositions, the authors have noted that sewage, insufficiently treated discharge from the city (including industrial and residential district wastes) and discharge from bordering commercial agricultural farms, poses a well-known public health hazard. This kind of environmental degradation has visible macroscopic impacts on wildlife and invisible microscopic deleterious effects on aquatic bacteria! Since about 1950, myriad types of plastic debris has complicated the macro-problem of achieving water cleanliness in Guanabara Bay. More recently in 2020, harmful chemicals were added to the stewpot in Guanabara Bay [17], including uncountable numbers of Covid-19 facemasks [18].

The pervasive contamination of Rio de Janeiro's landscape and aquatic environments with a plethora of plastic waste has brought attention to the landlubber citizenry's increasing their awareness of this stable and nondegradable anthropogenic material. Associated with plastic pollution are marine microplastics that were first generally recognized in the 1980s [19-20]. Because of their vast areal spread and large volumes, many types of plastic polymers are so nondegradable (persistent in the environment) that these waste products have been proposed to become an official Geological Time stratum indicator [21]. Because particulate pollution is so obvious, it is unnecessary to alert bay-care authorities to the macro-problem of plastic waste visually disfiguring Guanabara Bay. On the other hand, and unfortunately, international tourism only has a myopic perception of Rio de Janeiro's negative externalities, even though there is holistic degradation of the bay environment. Closer observation, however, shows that mangled Marine Anthropogenic Litter (MAL - as in malodorous, malady, malpractice and malignant) mainly consists of persistent solid materials that have been improperly discarded ("trashed") by State-delegated agencies. Plastic refuse is thus noticeably widespread in and about Guanabara Bay. Because these materials tend not to chemically dissolve, they tend to breakdown by attrition into ever smaller fragments, similar to minerals in the rock cycle via energy transfer that is often simply described as weathering, of which there are many distinct biophysical and chemical phases. Knowledgeable observers appreciate the importance of complexities of this natural erosive and communitive process perhaps more than the impact of Darcy's Law (1856) on groundwater flow reveals that the gravitational force is ~300 times greater at the Equator in the

Amazon River Basin (about 34 N/m^3) than elsewhere (~10^4 N/m^3) on Brazil's landscape! Floating plastics are now an integral part of the Amazon River's freshwater plume [22] that reaches out into the Southern Atlantic Ocean. It is a well appreciated fact that smaller fragments are much more difficult to remediate in mitigation efforts which, on that account, eventually become financially burdensome. The more obvious larger pieces entangle and entrap wildlife while ingestion by living organisms eventually sickens and kills them [23-24].

3. A Propositional Futurism: Guanazilla Wisely-Counseled Becomes a Force for Good

APA de Guapimirim, the socially delimited and demarcated legal conservation unit, is compatible with the semi-preservation of Rio de Janeiro's other biological and geological heritage sites such the Pão de Açucar, Urca Hills, Dois Irmãos and Pedra da Gávea [25]. Even after a loss of 50% of area during the past 50 years, mangrove forests currently cover 14-15 million hectares worldwide. Whilst scientists decry that loss, there is an obvious geomorphological and biological need to retain Guanabara Bay's mangrove footprint. So far, the need to preserve mangrove stands has not convinced the Public-Government metaphorical hybrid 'Guanozilla' to alter its destructive actions into more positive forms of Nature-Human interaction! Can it thus be hoped that the 21st Century mentation of a "Guanazilla" becomes more manageable as it peacefully undergoes some kinds of social behavioral improvements that are self-induced?

In chaos theory, the concept of the so-called "Butterfly Effect" revealed in 1963 by Edward Norton Lorenz (1917-2008) [26] and dramatized on 29 December 1972 with his oral statement: "…a butterfly flapping its wings in Brazil" consequently causes "…a tornado in Texas" inspired the authors to cogitate deeply. Lorenz' point was that the phenomenon of a minute localized change in a complex system can have large effects elsewhere. In the 1950s, IBM employees were encouraged to think out of the box and become innovative and creative forces. Such was the case with the fanciful film "Mothra vs Godzilla", which premiered in Japan on 29 April 1964. Therein, a Japanese insect god is summoned to save Japan from the ravaging very big bad-boy, Godzilla. However, there is no necessity for citizens of Rio de Janeiro, whether lodged in favellas or luxurious abodes, and their elected and bureaucratic elites, to become a different collective creature psychologically! Because of macro-engineering education, causing anxiety alleviation, the increasingly deliberately reformed mentation of a "Guanazilla" will become capable of kindly tweaking local *terra firma*, namely by expanding wetlands of the vital mangrove forest of northeastern Guanabara Bay.

Propositional macro-engineering is a cognitive variant of "dreamwork" that occurs both at nighttime and during daylight. Such pondering may encourage forward-looking goodwilled people to work with Nature by protecting environments in which they live. Utopia is the obligatory twin of dystopia because it represents inspiration which is the only way to a less painful new normality. The degradation of Guanabara Bay coastal marine ecosystems, however, appears to exceed the intentions of Rio de Janeiro State politicos for macro-problem-solving. Their lack of concern and realization of the extent and magnitude of ecosystem collapse militates against successful and meaningful restoration via bay cleanup efforts. Because human suffering cannot be eliminated, macro-engineers can only attempt to provoke a political debate by increasing public awareness and referencing possibilities for remediating degraded ecosystems such as occur in Guanabara Bay.

The option presented here is to generate a newly perceived world where ecosystems are allowed to develop, unfettered by adverse human interventions, in their own natural ways that are fresh and faithful. The old *Umwelten* based on the metaphorical "Guanazilla" environmental monstrosity of Guanabara Bay can be reimagined in terms of an antithetic 'Guanozilla' that is more manageable and based on elevated morality that allows movement towards bay cleanup that results in sustainable coastal marine ecosystems. To paraphrase a famous NASA manager in the USA: "Aphantasia is not an option"! In order to avoid environmental disaster and achieve the goal of revitalized aquatic ecosystems, Rio de Janeiro's populace must eschew selfish minority elitists in knowledge-based social institutions. City planners, for example, too often fail to explicitly define so-called "Green Infrastructure" [27]. The well-intentioned and amiable authors now demount their soapbox.

4. Mangrove restoration and enlargement has ecological and economic benefits for Rio de Janeiro

Currently, Rio de Janeiro secures shoreline beneficiation from mangrove stands that protect Guanabara Bay. Because this natural coastal protection requires no tax-supported maintenance [28], it should be clear that preservation and protection of mangroves provides beneficial assets to the magnificent Guanabara Bay shore! These mangrove stands face a polluted upper-bay zone where the seabed composition is mainly sand that is intermixed with some river silt and clay. Many decades of dredging were mostly confined to the estuary's seaward or lower-bay zone where there are ship approach-ways, moorings and berthing areas for the seaport and international airport. As a consequence of dredge and dump, an enormous spoil pile has built up on the seafloor immediately seaward of the entrance to Guanabara Bay. This shoal area composed of dredged bay-sediment contains contaminants that should not ever be returned to the bay by artificial re-introduction, natural tidal action and seawater current flow. Extension of tidal flats that can support the growth of mangroves, as imagined by coastal macro-engineers, requires identification of appropriate sediment sources that can be placed in a manner that increases the areal footprint of mangrove stands. For such a venture, new sources of appropriately graded sediments (composed of admixtures of sand, silt, and clay) are required for the proposed restoration megaproject. (The proposed Guanabara Bay *Organum Hydraulicum* chiefly devised by Dr. Nilo Serpa might be adaptable to useful sand displacement mega-projects.)

As occurs in the development of similar mangrove restoration projects elsewhere, appropriate sediment sources must be located. Two obvious possibilities that are relevant considerations include: (1) ore-snad as pioneered in Brazil by Vale S.A. and Vale International S.A. and (2) glass cullet (recycled glass) as pioneered by Dr. Charles W. Finkl and his co-workers [29]. Ore-sand is an industrial concept where "no tailings mines" result [30]. Interestingly, laboratory researchers have discovered that nanoplastics can be 99.9% removed from potable water by using simple sand filtration [31]. Additionally, "Kiln-Boats" can be deployed to collect marine plastics that occur in the water column. This possibility is worth consideration because of the opportunity to clean up Guanabara Bay while at the same time increasing employment for fisher-folk [32]. Related to these local suggestions for Guanabara Bay, on a broader scale the UN Decade on Ecosystem Restoration (2021-2030) has prioritized worldwide mangrove regrowth and expansion macro-projects. The landward shorelines of Guanabara Bay provide ideal environmental support for mangrove forests that are

composed of shrub and tree species that tolerate ambient hot, muddy and salty environmental conditions. Because mangrove forests are comprised by a tangle of intertidal plant roots and branches, they provide a biophysical barrier that is not easily permeable to ocean storm surges and wind storms. These mangrove belts are structurally diverse ecosystems that sustain high biodiversity as well as rich seafood supplies. The ecological and environmental value of mangroves accrues from their function as nurseries for seafood species, as well as birds and other wildlife. Amazingly, the Amazon River Basin rainforest stores only 25% of the aerial carbon dioxide gas per equal area unit as mangroves [33]!

A final possibility for mangrove protection might be concepts that feature moored cast concrete hull barges that can provide shallow-water protection by blockading violent wave action and accidental oil slicks [34]. Upper-Guanabara Bay moored barges could comfortably accommodate personnel and provide on-site safety in standard steel shipping containers decorously modified specifically for that purpose. Shipping containers for homes have a documented long history of availability and are well-tested for that purpose, as reported for instance by the IBA Dock in Hamburg (Germany) on the Elbe River Estuary between HafenCity and Hamburg, inhabited since AD 2009 (www.iba-hamburg.de).

5. Guanabara Bay: From the *Portais de Hércules*, an appeal for virtue and conscience

Guanabara Bay, together with its Proterozoic molding known as "Serra dos Orgãos", constitutes not only a geographical-geomorphological configuration of rare beauty, but also an ecosystem of incredible biodiversity. The eroded granite relief of Serra dos Orgãos, nicely exemplified from the "Portais de Hércules" (Figures 3, 4 e 5) — an integrant part of a larger mountain system called "Serra do Mar" —, shelters the springs of most of the rivers that flow into Guanabara Bay. However, the crystalline waters that descend the mountain range are transformed into black ditches when they receive untreated sewage from the Baixada Fluminense, the plains that surrounds Guanabara Bay.

In fact, it is in the dark waters (if the lead-colored liquid impregnated with garbage can be called "water") of the Canal do Cunha and the surroundings of the Tom Jobim International Airport that we see the birthplace of the monstrous Guanazilla. In the short and medium terms, the emergence of an honest and enlightened political will capable of reversing this terrible situation seems unlikely. We don't need to delve too far into the past to realize that villainy and ignorance dominate the history of our predatory species. Guanazilla is an obvious evidence of this disastrous combination. The *Organum Hydraulicum* associated with the complementary measures pointed out in our previous works, as well as the protective measures for mangroves, would need the support of an education more grounded in the discoveries of modern cognitive neuroscience, for which the old division of the brain into rational and emotional regions is no longer valid. Only in this way, we believe, would it be possible to build a human profile more connected to the essence of life and to transform villainy and ignorance into virtue and conscience.

Figure 3. View of the “Serra dos Orgãos” taken from the famous "Portal de Hércules" (image courtesy of Mariana Araújo, 2022).

Figure 4. Two views also taken from the famous "Portal de Hércules", the second with an emphasis on the “Pedra do Garrafão” (image courtesy of Mariana Araújo, 2022).

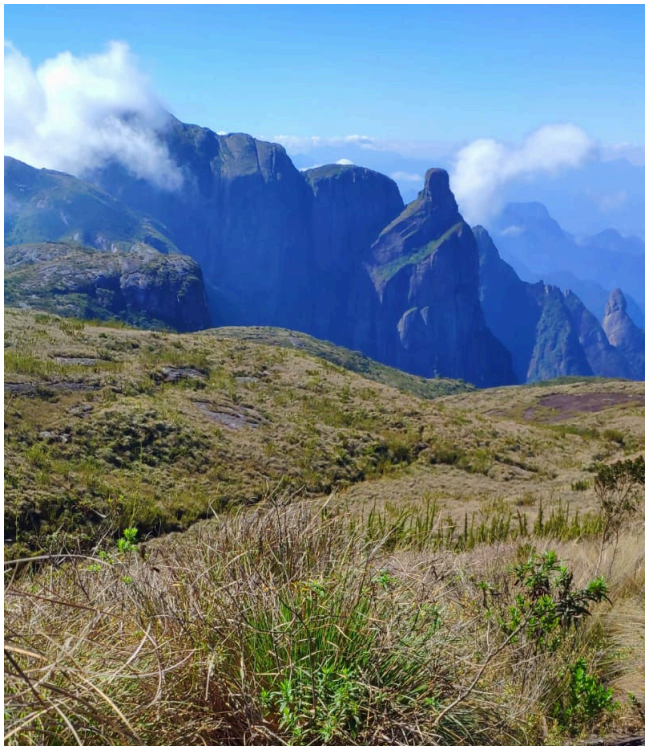

Figure 5. Another view of the “Pedra do Garrafão” (image courtesy of Mariana Araújo, 2022).

Lastly, the main problem with what remains of the primitive mangroves is the accumulation of garbage, mainly plastics, and, associated with this, the absence of an effective urban collect system that covers the potentially bathing shores of Guanabara Bay (garbage includes mattresses, latrines, cans, car parts, and every kind of debris one can think of!). Isolated initiatives by groups of fishermen help, but do not account for the growing volume of waste. A broad social program would be needed, involving private companies and educational institutions, as well as government agencies that define serious environmental policies. Unfortunately, we are a long way from that. In the civilization of disinterest, Guanazilla is massively fed every day.

6. Conclusion

Guanabara Bay, a valuable ecological resource for Rio de Janeiro, is threatened by multifaceted pollution and environmental degradation that is derived from improper disposal of municipal and suburban waste products. Because of its present rate

of degradation and the enormous threat to viable environments, the metaphor of a Godzilla-like monster was approbated to Guanabara Bay as a potentially monstrous Guanazilla. Present rates of pollution will no doubt result in a shameful Guanazilla of unmitigated proportions that will be a disgrace for this fatedly amazing part of Brazil. The suggestion of remediation and rejuvenation of the metaphoric monster Guanazilla bay into a revitalized and more manageable monster Guanazilla bay was proposed as a mentated entity that can be salvaged to advantage. The transition from a monstrous Guanazilla bay to a remediated and manageable Guanazilla bay hinges on the possibilities of mangrove protection and restoration as well as cleanup of pollutants in the tidal seawater column. The question is thus posited whether the fictitious and threateningly uncontrollable Guanazilla bay (a take-off from the fanciful monster movie-star Godzilla) will be transformed into a manageable cleanup Guanazilla bay that has potential for serving the needs of Rio de Janeiro state and city as a beautification and asset to the area. So much depends on the success or failure of Rio de Janeiro's currently enlarging civic epistemology [35] which can give credit to the agency of ordinary as well as elitist citizens in responding to the 21st Century's advancements of science and technology.

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