Tropical Climate and Endemisms

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> "Just looking at something tells us nothing. Each look leads to an inspection, each inspection to reflection, each reflection to a synthesis, and only then can we say that with each careful look at the world we are already theorizing"
> (Geothe)

THE FOREIGNER'S VIEW of the Tropics is beyond our comprehension. After all, the longer we serve as the focus of foreign attention, the more we are transformed into foreigners ourselves, at least in the eye of the beholder. Setting paradigms is a thankless task when the subject for categorization is a people, civilization or culture different to our own. The different often strikes us as wrong, inconvenient or repulsive. We measure it against the standards familiar to us and often resent what we see. After all, when we don't find ourselves reflected in the other, we tend to veer towards prejudice and aversion.

For this reason, the same object of perception can have various representations, which is exactly what occurred with the Tropics. For some artists, historians, writers and intellectuals, like Gilberto Freyre, the Tropics were a place whose abundance, profusion and heat evoked the lost Paradise, while for others, chiefly Lévi-Strauss and his nihilistic viewpoint, the Tropics were synonymous with lassitude, indolence and promiscuity.

In his *Self-esteem and Social Development*, Carlos Lessa (2000) comments that the Europeans held a common belief that paradise was located far from Europe, which the Middle Ages had painted as a gloomy place, ridden with terror, pestilence and famine, with forests teeming with witches and evil spirits. So the closer they came to the Equator, the closer they were to paradise, which they imagined to be somewhere warm and cosy. Through the eyes of the Iberian seafarers we can see why paradise could only have been in the Tropics. Enchanted by the Indian women bathing nude, the colourful birds and scented flowers, they had no doubt they had finally happened upon the garden from which Adam had been so forlornly expelled. From the first contact with the newly-discovered land, the adjectives were no longer apt to the task of describing the nouns of this new world of colour and form, not to mention the exotic and alien presence of the natives of paradise: the Indians.

In painting, artists like Franz Post and Eckhout portrayed the nature that leapt out at them from all sides and which they struggled to keep within the frame for all its beauty and sheer exuberance. Waterfalls, forests, seas, Indians, fruits and flowers were all immortalized with their brushstrokes.

However, this sense of awe began to wane from the 18th Century, with observations by the likes of the naturalist Buffon, for whom the American continent was fledgling and feeble, starting with the fauna, which offered nothing to compare with such large mammals as the elephant, puma, tiger or lion. He even questioned the virility of the tropical menfolk, which he described as beardless and of limited reproductive prowess. The Englishman Buckle echoed the naturalist's sentiments in the 19th Century, adding that possessing such natural bounty could only actually be described as a disadvantage, as it creates a lazy population with no hardships to overcome. According to Buckle, the inhabitants of the Tropics neither economise nor toil because they don't have to worry about facing a cold winter. So civilization is only possible against the backdrop of a challenging climate and geography (Lessa, 2000). At the time, the Indian bore the stigma of being a lazy, rebellious drunkard, nothing at all like Peri, the brave and fearless hero of Alencar's novel. South of the Equator was now the threshold of hell, the gateway to a dirty world steeped in sin and orgy.

Nevertheless, one cannot expect complaisance on the part of the foreign observer when the Brazilians themselves greeted the situation with similar incomprehension. One good example is Monteiro Lobato, the creator of the character Jeca Tatu, a lazy country bumpkin who passes the hours on his hunkers, lost in listlessness. Having initially portrayed the character in a pejorative manner, it gradually dawned on the writer that Jeca Tatu had worms, suffered from malaria, and was basically a victim of the precariousness of public health in the early years of the 20th Century. In short, Jeca was a product of a disastrous public health system. From then on, Lobato sought to make amends by engaging in sanitary campaigns and penning articles for the *Estado de S. Paulo* newspaper ("Besides the three endemic torments, hookworm, malaria and Chagas disease, any one of which would be enough to bring the nation to its knees, leprosy is spreading at breakneck pace, syphilis is expanding its domains, tuberculosis is increasingly more rife, leishmaniasis, this horrendous ulcer of Bauru, the 'raging boil', is leaving thousands of creatures deformed")[1].

Years later Monteiro Lobato would create Jeca Tatuzinho, published in the famous almanac of the pharmaceutical company Fontoura, to teach sanitary habits to the population, such as washing one's hands before meals and never walking barefoot.

So what we see is a tremendous inconsistency in the defence of nationalist values, which seem to flourish or fade depending on the intelligentsia of the day, a trend that continued right up to the beginning of the 20th Century, when artistic movements began to revolt against acculturation and took it upon themselves

to rewrite the Discovery, recovering the origins of the land and its people and recasting the history in a more realistic mould.

The transformation that befell Monteiro Lobato extended to other writers as well, with poverty and abandonment by public policy now exonerating the peasant from the stigma of laziness. He is no longer blamed for the misery in which he is encountered, nor does his massive paunch provoke antipathy in others. Quite the contrary, social injustice has castigated him, undermining his health, his physical fitness and will to work. Diseases wormed their way into literature, furrowing into books by such authors as Graciliano Ramos, Euclides da Cunha and Guimarães Rosa, especially in the latter's short story "Sarapalha", from the collection *Sagarana*, which was largely about malaria, then decimating lives and hopes in the country's hinterlands:

> A ghost village. There, on the banks of the Pará River, they left an entire hamlet abandoned: houses, a manor, chapel, three grocery stores, a chalet, the cemetery; and the road, empty and long, which could no longer truly be called a road, so overgrown had it become with bush and weed. All around was good pasture, good people, good rice-growing land. And the place had been on maps, long before malaria came.
> It came from afar, from São Francisco. One day it took the road north, slipped into the mouth of Pará and started working its way up. Each year it advanced a few more leagues, closer and closer, too close, terrifying the locals, because it was swamp fever – the "relentless chill" – and it killed in droves. – Maybe it won't make it this far…
> But it did, without delay. It was a year of sorrows. In April, when the rains passed, the river – which is slow and bankless, because it rises in a day but takes a month to ebb – drained off slowly, leaving pools in a deadwood marsh, strewn with trunk, branches, sprigs and brushwood, with shoals of rotting catfish, gold-plated ray-fins, all stranded; curimatã grazing the mud of rainy winter pastures; the alligators hurriedly moving lair, canoes run aground, on the scrubland; the mottled bulls, swimming like buffalo, eating the water hyacinths floating between islands of wet grass. Then you had people with the shakes, the first bouts of swamp fever. – Maybe it won't stay the year, maybe it'll go away… But it stayed. It was the locals who went away, some to the graveyard, the rest to all the corners of God's earth". (Rosa, 1946)

The theme is also present in the majestic *Grande Sertão: Varedas* (*The Devil to Pay in the Backlands*), which celebrates its 50th anniversary this year. In this work, Guimarães Rosa draws upon his medical training to flesh-out the story of Riobaldo with outbreaks of the children's viruses, leprosy and parasitic so infections typical of backland poverty.

It seems to me that the Tropics are a little of everything, at once a lost paradise and a Dantean hell; an abundance of fruits and flavours, but where poverty leaves bellies empty of food and full of worms; the lazy chin propped up on the

handle of an inactive hoe under the searing sun, hot enough to fry a man's brain, but also the hard sole that bravely traipses for kilometres below that same sun in search of shade, water and a little luck. It's the third bank of the river, as Guimarães Rosa suggested, an alternative reading of reality, one less Manichean, less dualistic, that offers enough space in which to rethink the situation – the Tropics give vent to many conceptions, ranging from sorrow, joy, pulsating sex and sensuality to – why not? – the tedium and sluggishness of those unhurried, but nonetheless always in search of well-being.

Disease in the Tropics

Today, we know that the term "Tropical or exotic diseases" is impregnated with prejudice and an arrogant mindset that is a throwback to the European mentality that viewed all dominated peoples in a factious and superficial light. To start with the Indians, the existence of whose soul was even placed in doubt by the whites, the relationship with the oppressor brought brusque changes from the outset.

The native population had enjoyed good health and knew what plants to turn to whenever they did fall ill, but when the fever came, they also had cholera, variola and other white-man's diseases to contend with. If the Indians were exotic in the eyes of the oppressor, the former would have said the same for the ailments the Europeans brought with them and with which the Indians were gradually infected, largely because of the Tropical climate, whose high temperatures and humidity provide the ideal conditions for disease to thrive.

If we draw a parallel between what happened during the discovery of Brazil and the contents of the first book of the Old Testament (Genesis), we will see a curious similarity. In Chapter 2, God plants a garden, Eden, and sets man there to live in it. He makes all of the species of tree grow from the soil, so their delicious fruits can sate his hunger and their beauty nourish the soul. He also sent forth a river that branched into four heads to irrigate the entire land of Eden, and sprinkled the sky with birds and the earth with animals. Adam lived in harmony with nature, respecting the plants and birds, eating and drinking what the land and the rivers had to offer, without fear of the beasts or any other living creature. In verse 15, the message is clear: "And the LORD God took the man, and put him into the garden of Eden to dress it and to keep it". To dress and to keep. It seems mankind failed to understand this message, at once so simple and so emblematic. No sooner had Eve tasted the forbidden fruit, than an eternal malediction came upon them: "Cursed is the ground for thy sake; in sorrow shalt thou eat of it all the days of thy life. Thorns also and thistles shall it bring forth for thee; and thou shalt eat the herb of the field" (Chapter 3, verses 17 and 18).

According to the Biblical message, suffering descends upon man because of an act of disobedience motivated by self-sufficiency and covetousness, transforming freedom into slavery. Man must languish on the hostile earth, obliged to fend off the wild beasts and hide his nakedness, now shameful and disturbing. Thus is

nature's response, expressed so succinctly in Newton's Third Law: "To every action there is an equal and opposite reaction". Sooner or later, all the damage man does to the earth will come back to him in natural disasters provoked by his unfettered and unsustainable use of natural resources - floods, disappearing farmland, climatic catastrophes, global warming.

As Paulo Roberto Moraes, a lecturer at the Environmental Sciences Department at PUC-SP (the Pontifical Catholic University of São Paulo), states in his doctoral thesis, entitled *As alterações ambientais das areas tropicais úmidas e a difusão de doenças tropicais*[b] (Environmental alterations in humid tropical regions and the spreading of tropical diseases), unmanaged deforestation is decimating entire forests and driving hundreds of species to extinction. The result will be deep-set environmental change both locally and globally. Moraes adds that if we factor in the climatic conditions and low quality of life almost uniform throughout tropical regions, we have a scenario that is extremely propitious to epidemics. Regardless of his reasons for pushing nature beyond its limits, mankind will always feel the impact of his actions, either on his own or on future generations.

Environmental and socio-economic factors greatly influence the appearance and propagation of diseases, even modifying their manifestations and making them more resistant to medical cure. As the authors of the book *Espaço e doença – um olhar sobre o Amazonas* (Space and disease – a look at the Amazon River) (Rojas & Toledo, 1988) say in the chapter "Malaria on the Amazon":

> Malaria responds to stimulus, following its "natural course", and so each year we see it widen its transmission range, whether by contiguity or by installing new foci further afield. Punctual declines in endemoepidemic levels are only observed when control measures are intensified or when factors that determine transmission cease or become less intense.

Along the Amazon River, the lot of the indigenous communities was severely altered by the arrival of the colonizers. In the more remote villages, sheltered from the impact of the invader, infirmities were restricted to complications during childbirth, accident-related injuries and infections proper to the natural ecosystems. As interaction with other peoples increased and their presence transformed the natural environs, new diseases began to spread, weakening the Indian organism with infections it was not used to fighting.

Unpredictable and unplanned migrations accentuated the declining sanitary panorama. Chaotic situations, such as the construction of the Balbina Hydroelectric Plant, which invaded the Waimiri-Atroari reserve, were perpetuated. This particular undertaking was heavily criticised as being a money-spinner for large construction companies at irreversible ecological and human cost. This plant and the opening of the BR-174 roadway sparked violent outbreaks of malaria that wiped out a large portion of the community.

Malaria was even more aggressive at goldwashing sites, where the deplorable living and working conditions exposed the workers to permanent risk, not

exclusively to malaria, but also to leishmaniasis, leprosy and STDs. Further, as panning is a nomadic activity, when there was nothing left to prospect, the panners shifted camp, leaving environmental degradation behind them and taking with them all their acquired infirmities. In other words, they were agents of disease spread who left the marks of their hardships wherever they went.

Staying awhile with the spirit of greed that craves the demarcation and subjugation of territory at whatever cost, we have the pathetic outcome of the Madeira-Mamoré railroad recounted in such detail in Francisco Foot Hardman's *Trem-fantasma: a Ferrovia Madeira-Mamoré e a modernidade na selva* (Ghost Train: the Madeira-Mamoré Railroad and modernity in the jungle) (2005). This endeavour sacrificed the lives of thousands of labourers for profits that never came. Speaking about the diseases that "devoured" men and turned them into zombies, Hardman says:

> And what can one say, then, of the sick, the forever moribund, who wandered between deliriums and fevers, through doses of quinine, along the corridors of death? The Candelária Hospital was both sanctuary and tomb, a monument to scientific progress and an ante-room to darkness. It was from there, armed with their ultra-modern installations and equipment, that doctors and sanitary staff directed their war upon tropical diseases.

The main ailments that set back work on the railroad were pneumonia, measles, hookworm, beriberi, dysentery, hemoglobinuria, yellow fever and, worst of all, malaria. Oswaldo Cruz, summoned to the jungle with the emergency mission of combating these diseases, wrote:

> The region is so rife with infection that the population has lost all notion of what it is to be in good health, as the condition of "being sick" has become normality. The children – the few there are -, when asked about their state of health, respond simply: "I've no sickness, just spleen". That's how they characterize the enormous splenomegaly they have, caused by exposure to repeated bouts of malaria.[c]

As we have seen, various other projects in the Amazon (prospecting, mining, hydroelectric plants, railroads, saw mills…) caused natural devastation and destabilized local populations, plunging them into poverty, disease and lowering life-expectancy. These "advances" of modernity dragged the locals along with them to far-flung outposts without the slightest conditions for supporting human life.

The effects of environmental devastation are alarming and expose the region to a series of risks. On one hand you have the threats posed by the traditional economic activities, while, on the other, there is biopiracy and the poaching of traditional community knowledge.

The advancing agricultural and cattle-ranching frontier triggers a chain reaction: large swathes of forest are felled to make way for grain plantations or pastureland. This degrades and erodes the soil, which, along with the adoption

of new agricultural technologies, leads to lay-offs among farm labourers, who are consigned to abject poverty. With no prospects for livelihood or survival, they are forced to migrate to large cities and towns, where they are further trampled by the ills of progress – prostitution, illness and violence. They may also see a gleam of hope in panning, seduced by the get-rich-quick allure of gold. But this is just the same fate under another guise: more prostitution, more disease, more violence.

Deforestation, loss of biodiversity and water contamination are other serious problems the Amazon must face. Clearing forests has a significant impact on carbon gas emissions, causing climate change and substantially affecting the lives of the local population, especially with regard to the occurrence of diseases transmitted by mosquitoes and other vectors (malaria and yellow fever), periods of drought, tropical storms, desertification and flooding. Water pollution increases the chances of contamination by water-borne diseases, while improper occupation of the riverbanks triggers erosion processes that alter the water cycle and create marshland areas that further aggravate the socio-environmental conditions.

The immediatist and utilitarian concept of development applied wholesale throughout the region without due attention to the complex reality of the Amazonian ecosystems has not only resulted in the loss of natural resources, but in social injustice and poverty among the local populations as well, sparking land-related conflicts and high incidences of diseases, including some long since eradicated in the first world – such as tuberculosis and leprosy - , but which now ravage the region's poverty-stricken populations. On top of these various scourges there is also drug trafficking to contend with, and all the violence that goes with it. In other words, the destruction of nature spills over from the environment into all other sectors: health, the economy, defence, justice, education, and others.

As a native of Amazonas and a doctor with a special interest in tropical diseases, I have witnessed the increasing aggression toward the Amazon in a somewhat sharper focus. I have seen first-hand the results of almost all of the large projects now bearing down upon the Amazon and I have reached the conclusion that the illnesses I fight against each day result from man's relationship with the environment. Besides the malaria among goldwashers, I have also received some 15 thousand cases of tegumentary leishmaniasis, a disease that is one of the most telling paradigms of nature's direct backlash against its aggressor. What happens is that the infected sandflies - the catuquim - hide on the trunks and in the tree boughs. As soon as the lumberjack's saw bites into the bark, the mosquitoes descend and feed, causing him to fall ill.

With time, I realized that diseases to which humans had always been prone were being exacerbated to such a degree by environmental devastation and the unmanaged occupation of areas of the Amazon that all attempts to control them with medication and preventive measures were hopeless compared to the aggressive potential of the large undertakings. During the construction of the Transamazonian highway, for example, people were "planted", "discarded" all along its length. Penetrating that ecosystem was a traumatic experience, as the road

tore its way from Paraíba to Benjamin Constant. Samuel Pessoa, a parasitologist from the University of São Paulo, described the truckloads of people left there in the middle of nowhere as "sad human herds". Not only were they savaged by physical illness, but the number of psychiatric complaints trebled, causing the Amazonian hospitals to overflow. After all, it was a one-way trip.

However, new discoveries bring some glad tidings: recent research, such as a Fiocruz study on General Vulnerability Ratings (GVR), sponsored by the Ministry of Science and Technology, indicate a step forward in diagnosing climatic influences associated with the diseases that affect these populations. The researchers from Fiocruz arrived at the GVR by measuring and analyzing three basic items of information: the occurrence of diseases (Epidemiological Vulnerability Rating); the living conditions of the population (Socio-economic Vulnerability Rating); and climate change (Climatological Vulnerability Rating). With this general index it will be possible to identify the susceptibilities of each region and identify the populations and areas most at risk. Another study, conducted by the Brazilian Genome Network and financed by the CNPq (National Counsel of Technological and Scientific Development) and the MCT (Ministry of Science and Technology), has been established to map the DNA of malaria transmitters with a view to creating a genetically modified anopheline that could be cross-bred with the naturally occurring species to engender a line of insects genetically-modified to no longer transmit the protist that causes malaria. This would represent an expressive boost in life quality for the population, especially in the Amazon.

While there are possibilities that offer a glimmer of hope for the health area, the fundamental question remains to be answered: can intervention in nature ever be harmless? Is sustainable development really viable – marrying economic progress and environmental preservation? For Ignacy Sachs (1995), the application of the concept of sustainable development should begin with the identification of possibilities for integrated production systems for food, energy and other assets, promoting the sustainable management and agricultural use of forests, the valorisation of aquatic and forest resources, the production of bioenergy and a vast array of biomass-related industrial products and services. I believe that this is indeed the way forward for the Amazon and Brazil in general, as the nation now faces the challenge of developing a two-pronged course of action: fine-tuning environmental legislation and monitoring, inspecting and fining enterprises guilty of infringements while encouraging the switch to a technological platform that favours the implementation of sustainable practices and aggregates economic value to natural resources.

The development paradigm thus rests upon four pillars: i) sustainability, through the creation of jobs and decentralization of the distribution of wealth via social inclusion and sustainable projects involving the local populations, such as extractivist reserves; ii) transversal presence of environmental issues at all levels of public policy, with the integration of the environmental sector in decision-making on national development projects for other sectors and articulation with the various

Foto Alberto César Araujo/Folha Imagem - 18/03/1998

Queue for blood tests at the Tropical Medicine Institute in Manaus, Amazonas.

organs responsible for sector-based policymaking underway in the Amazon; iii) social control as a means towards sharing responsibilities with society and therefore heightening social awareness of the problems the region is facing; iv) strengthening the National System for the Environment, with emphasis on licensing, inspection and monitoring, the expansion of protected areas and the management of genetic resources.

By way of conclusion, let me share with the reader a poetic image that expressed in a handful of words the approach man ought to take toward nature. Last March, during a meeting at the United Nations Conference on Biological Diversity (COP 8), the Congolese representative, when asked to define the concept of sustainable development, likened it to the relationship between a snake and a tree. When the snake climbs the tree, it moulds itself to it, assuming its shape, sliding over and between its branches and adjusting itself to its trunk. That is how man should relate to nature: adjustment, not invasion, usurpation and destruction. We have more than enough examples confirming the desolate future in store for us unless we revise our predatory stance toward the environment in which we live. From diseases to ecological disasters, nature is, in its own way, trying to warn us. How much longer will we refuse to listen?

Notes

1 Passage available at: <http://www.comciencia.br/entrevistas/2005/06/entrevista1.htm>

2 Passage available at: <http://www.pucsp.br/publique/media/edicao250_PUC_pg8.pdf>

3 Passage available at: <http://www.geocities.yahoo.com.br/megasoft_informatica/madeira_mamore.htm>

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ABSTRACT - THIS ARTICLE depicts discrete ways of understanding the Tropics and the relationship between tropical climate and people's health. By rejecting the biased notion that diseases derive solely from climatic conditions, the author proposes analyses more concerned with the underlying socioeconomic reality, more humanitarian and less fatalist, and conceives sustainable development as the way to achieve a balance between human life and nature.

KEYWORDS - Tropics, Tropical diseases, Climate Change, Sanitation, Sustainability.

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