

The Jungle Book updated

Bogdan MIELNIK

*Departamento de Física, CINVESTAV
A.P. 14-740, 07000 México DF, Mexico
E-mail: bogdan@fis.cinvestav.mx*

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Abstract

Data from many sources indicate that the Earth ecological crisis might not wait till distant future. To avert it, some difficult truth must be accepted and adequate steps taken. One of them is the strict protection of the world forests, even at the cost of the short term economic growth.

These remarks are inspired by the place of our conference. The woods of Białowieża are the last remnant of a huge forest, that once covered the northern Europe. In pre-Christian times the trees of this forest were considered sacred. I admit, I did not share this belief - not until the summer of 1998 in Mexico City.

The rainy season in this year did not arrive in June as usual: instead of violent, refreshing rains there was not a drop of water. The air in the city was almost static; the forests around were burning. The veil of smoke extended as far as Texas causing respiratory difficulties. During the same summer fires devastated the jungles in Sumatra, forests in Florida, Greece, even in Siberia. (It is hard to imagine tropical jungles burning: we think they are so wet!)

I suddenly realized that the Earth ecological problem might exceed the rise in the sea level. When we hear about the “greenhouse effect” we usually imagine a warm, green environment with evaporating drops of water... This might be a misunderstanding. Though the sea level will indeed rise [1, 2], the principal danger may consist in peaks of drought and high temperatures, with vegetation fires converting the lands into arid deserts (so, farewell to the tropical forests. Once the jungle is burn, the floods can't help). The parallel process of melting the polar ice hides as remarkable dangers [1, 3, 4]. Due to the complicated climate dynamics, there is no 100% proof that the alterations are caused by the human activity but the probability of such diagnosis is significant. Indeed, the recent climate oscillations start to resemble the behavior of certain nonlinear systems when the stability threshold is crossed [5, 6]. Perhaps we are like a fool sitting on a barrel of explosives, calculating calmly that the average barrel temperature will rise about 0.5° C during the next 50 years - but ignoring the existence of an ignition point! The forest fires might precisely mean that the ignition has already started.

When discussing this subject in public, I was perplexed by the defensive rhetorics. Whenever quoting an increasing number of places where the temperature rises to 50° C,

I was answered that this probably occurred before. Forest fires? Intentional. Climate changes? Indeed, but the problem is for future generations. . . “Don’t jump to conclusions”, I was told. “The changes of the average world temperature are nothing new in Earth history, they occurred already in Oligocene, then in Pleistocene, etc. . .” (I almost felt that the most important activity of a scientist is to abstain from conclusions!). . . All this resembles 1995-97, when the first timid warnings about the “discernible human influence” on the world climate published by the Intergovernmental Panel on Climate Change [7, 8] were under attack of skeptical scientists [9, 10] gathered in the Global Climate Coalition (incidentally, including energy companies). Thus e.g., S.F. Singer writes sarcastically: *Most scientists would not object strongly to the IPCC phrase about “discernible human influence”. We have known for some years that the stratosphere is cooling, the diurnal temperature range has been decreasing, the frequency of hurricanes has been diminishing and so forth - quite possibly as the result of some human influence* [10] (so much, to illustrate that the scientific arguments are not necessarily superior to the pedestrian observations). Today it is difficult to deny the climate anomalies, including the extremes of temperature [11, 12, 13]. The signs that we have to do with a certain global process are multiplying [14, 15, 16]¹ - but the public is still bombarded by persistent voices and press articles trying to dismiss the problem. I specially remember one, published in 2001 by prestigious authors (“nomenclature figures” of their governments) complaining that public opinion reacts hysterically to some marginal problems: one is the toxic effect of the depleted uranium, the other is the slight climate change (I skip the reference!). Even if the authors were not institutionally inspired, their article has a characteristic taste of an ‘political opportunism’: *never make alarm, always calm down the public. . .*

The same limited vision, unfortunately, is shared by governments, trapped by wrong priorities (political conflicts, economic recession, etc.) The world penal law is hypnotized by the secondary problems like the drug dealing or sexual harassment. . . While the glaciers were already shrinking in Sierra Nevada and the fires were consuming the jungles, the public almost suspended respiration to follow the Monica Levinsky case! . . . While the industrial pollution expands (millions of involuntary consumers [17]), the trained teams of special forces fight hard to destroy acres of plants, since they cause addiction. The entire story starts to resemble the well known movie “Titanic” with Leonardo di Caprio. The movie is easy to criticize as a Hollywood product, but it contains a gem of dramaturgy. An Italian emigrant (Leonardo) is trapped by his powerful enemies on a supposed act of (fabricated) robbery. Suddenly two officers sent by the captain appear. Leonardo’s predators don’t miss opportunity to tell them about the crucial event of the journey: a dangerous criminal was just captured and he must be immediately arrested! “But gentlemen”, respond the captain’s envoys, “What are you doing? Within one hour we are going to be at the bottom! . . .” It seems this story reflects well the present day world situation.

I now come to the main problem. Since we are in the forest reserve of Białowieża

¹The increase of the average world temperature is discussed in [3, 1, 11, 14, 15, 16]. The localized temperature peaks, unfortunately, were not systematically measured in the past, but they form a rather disquieting pattern. The predicted episodes of cold [4] caused by the melting ice seem to materialize. The parallelity of the temperature and CO_2 -plots is reported in [12]. The discussion as to *which one is the cause?* looks as a slim chance to exclude the human influence (for good or for bad?). Yet, the mechanism of how CO_2 can produce the warming is elementary, while there are no good inverse models (see also the failure of the sun forcing hypothesis [13]).

let me pass the warning that the Amazon jungle – one of the treasures of this planet – is in danger of extinction due to the irresponsible industrial projects. I am referring to the Brazilian program which predicts cutting Amazonia by railways and highways [18] - facilitating access of legal and illegal industries to the heart of the jungle. According to pessimistic calculations, if the project will prosper, then in 2020 about 95% of the jungle will be polluted, 30% completely lost, the rest quickly vanishing in the next decades. The optimistic variant is not much better (the detailed analysis see W.F. Laurance et al. [19, 20, 21, 22], Ph.M. Fearnside [23, 24]). Since the forests are one of the last stability factors for the Earth's climate and since the Amazon represents about 40% of the world tropical jungles, it is not difficult to guess that its disappearance would be a dramatic turning point for the Earth's ecology [25, 18]. (Some recent proposals of how to control the problem seem purely cosmetic [26]). What's specially shocking are the childish arguments: "If Europeans could destroy their forests, Brazilians can take revenge by doing the same!" Another controversial idea is that a part of the jungle must be sacrificed, to increase the income of about 17 millions inhabitants who earn less than USD 100 per month - an economical doctrine apparently endorsed by D. Nepstad et al. [27, 28]. Yet, while the threat of destruction is real [21, 22, 26], the belief that the 17 millions will cash the profits might be extremely naive (see also the recent polemics [29, 30, 24]). Moreover, let's remember the splendid forests of India (cf. Rudyard Kipling) destroyed almost completely ² [31]. Now millions of inhabitants live under a vast cloud of organic pollution (the *brown cloud* [32, 33]), still earning less than USD 100 per month and with no jungle to cut in order to improve their incomes (see e.g. the *Deccan Herald* [34]).

As it seems, the mangrove forests in Latin America face the similar threat in spite of their long term profits [35, 36] (note the pressures to destroy the mangroves in order to develop the shrimp farms [37, 38]). The Brazilian project pretends to avoid the same scenario, e.g. by improving the jungle surveillance [28, 30, 39], but one can wonder whether the authors are aware of the economic realities. *The greed of profit has no limits!* So, when a section of the jungle will be sacrificed for some particular reasons, this (most probably) won't be the end of the story. The next step will be to "develop" some new regions, still covered by unnecessary trees (cf. [19, 23, 24, 40]). Similarly as a cancerous process, this must be stopped at the beginning, by sharp and efficient laws. The opposite attempts to relax the Brazilian forest code (*codigo florestal* [41]) by reducing the obligatory forest reserve from 80% to 50% are a bad sign; no better is the idea of ceding the exploitation/profits to the local administrations (see [28]). All this, if added together, must lead to the repetition of Indian scenario. At the very end, the impoverished population will live in a landscape of gasoline stations, slums of concrete and car cemeteries. . . The jungle which was growing millennia, will disappear in few decades (cf. [42]), contributing to a global ecological disaster (perhaps, slightly delayed by the fact that there is still some polar ice to melt [4, 3], but see the risks involved [43, 44, 45]).

March 2003: Meanwhile, the ecologic deterioration is updated by new extremes of temperature, above 40° C in Athens, 46° C in Cairo (summer 2002), the drought in many areas (the subsequent floods won't help!); then by the uncontrollable forest fires in the northern hemisphere. About 100 thousand acres burned in Oregon, above 460 th. ha in Arizona (posing a threat to the giant sequoias), around 1 million ha burned in Russia [46]. In

²I owe this remark to Vishwanath Ramakrishna, Math. Dept., Dallas, Texas, June 2002.

Aug-Sep 2002 the persistent drought and vegetation fires around Moscow made the air in the city hardly respirable, reducing the visibility to about 100 m. Since 1996 the climatologists predict also that the ice melting [4] caused by the global warming might trigger some countereffects of cold, which could help the vegetation, though at the cost of new dangers (including the violent climate jumps³). As it seems, the disaster won't wait until next generations; even if still reversible, it is a grim reality. . . The school of "wishful thinking" is updated as well. In his polemic letter in *Sci. Am.* Bjorn Lomborg says that: "At the end of this century the U.N. expects we will have *more* forests, simply because even inhabitants in the developing countries will be much richer than we are now. Thus, the species loss caused by the real reduction in tropical forest (. . .) will probably not continue beyond 2100" [47]. While the first sentence sounds as a *science/fiction*, the second one might even be true. If the present trend will continue, then in 2100 the forest reduction might indeed stop since there will be little left to reduce (see also [48, 49]). An explicit admission of this prospect was the statement of US Interior Secretary G.A. Norton reporting that an intense drought has converted the California forests into a 'tinderbox', with around 190 millions acres in an immediate danger [50]. Another dramatic admission are the recent proposals to cut the forests before they catch fire (George Bush, August 2002 [50]). Wouldn't it be good to cut rather the emission rates? However, the economy planners do not seem to share the idea. Curiously, the subject is avoided even in the recent *Sci. Am.* report on the California fires [51] where the attention of the reader is focused on a number of secondary reasons which cause the disaster, but the fundamental one (i.e. the climate change) is hardly mentioned. . . Meanwhile, in March 2002 and Jan - Feb 2003 the northern hemisphere suffered already the predicted countereffects of cold [4] - whereas on the south, the end of 2002 was marked by intense forest fires in Australia; recently also in Pantanal, Brazil (the causes are the drought + temperatures $\approx 40^\circ$ C [52]). The informations are rather fragmented; e.g. the authors reporting on California fires believe that the phenomenon was caused by the former overprotection of the forest (too much bush and deadwood accumulated), but they forget about the simultaneous fires in Siberia (no overprotection there!). In the last century the destruction of tropical forests seems to accelerate: less than 20% left in India, almost nothing in Pakistan, less than 2% in Haiti; the rest in danger of extinction almost everywhere [18]. . . It thus seems not a good moment to exercise our capacity to abstain from conclusions. Since the Earth's deterioration might be relatively fast, it may give us no margin to solve first all economical and political problems. . . So, it might be our time to jump to conclusions - for if we don't jump now, then very soon there may be nobody to jump! Note also that in this case there will be no captain envoys to ask: "But gentlemen, what are you doing?..." Under the circumstances, we are the envoys - and so, we must announce the will of the ancient trees. The message is very simple: *Just stop deceiving yourselves or you shall perish!* . . .

³Some models predict that until the polar ice still exists, the Earth climate may show some elastic defense, the warming just intensifying the natural circulation: the more ice is melting and water evaporating, the more snow should be also falling [1]. However, according to a more pessimistic hypothesis, the masses of the cold water from disappearing glaciers might cause violent 'climate flips' [43, 44, 45] including the 'little ice age'. Should such a catastrophe occur within few decades, when the oil/gas reserves will be exhausted and the forests extinct, one can wonder, how the humanity will survive?

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