



Will Barnes

Capital climes

Today, an Indian child consumes one ninetieth of the energy of her American counterpart. Such comparisons discredit the overwhelming consensus that it is the mass activity of "man" which is responsible for global warming, writes Will Barnes. Instead, the real problem is forms of consumption and the type of development that underpins it.

Capitalist criminality

With invaluable assistance from modern science and technology, capital is perpetrating a crime for which there is no name, the enormity of which has hitherto been and, apart from the literary holocausts of anti-utopian science fiction, largely remains unimagined.

Capitalist development, whether expanding or contracting and crisis-ridden, merely intensifies and exacerbates ecological degradation. The mindless and extraordinarily destructive disregard for the ecological consequences of the profitable pursuit of exploitable "natural resources" has led, for example, to the consumption of hydrocarbon-based fossil fuels that are producing a warming of the earth that is melting the ice caps and raising sea levels, thus threatening the vast seaboard populations of the world. It has produced specifically the denuding of tropical forests, which, in the end, will deprive humanity of incalculable medicinal wealth. This pursuit has produced the strip mining and clear cutting of vast tracts of land — which have, in turn, created desertification rendering potentially agriculturally productive lands depleted. It has created a biotechnology centred on genetic engineering that has introduced transgenes transmitted through natural interspecies crosses which, in turn, have allowed emergence of resistant superweeds and superpests; these, in their turn, demand the application of further chemical poisons, in other words, herbicides and pesticides, that end up in groundwater, waterways and oceans and poison the food chain. The profitable pursuit of exploitable "resources" of nature has further led to industrialisation of poultry and livestock production that, in the interests of a greatly enlarged worldwide markets for meat consumption (chicken, beef, pork), has generated life threatening strains of antibiotic resistant bacteria (E coli, Campylobacter, etc.) and highly pathogenic, potentially pandemic viruses. It has led to the massive and criminal termination of animal species and micro-biotic life forms, an extraordinary contraction in the very basis of life itself. More precisely, the pursuit of exploitable "natural resources" for capitalist production on a world-scale has created a geological and biological regression reversing thousands and millions of years of natural evolution.

Species — new ones — come into being and they disappear: human beings, abrupt climatic changes, and even the occasional (by geological standards) natural calamity originating from beyond the earth in the solar system bring

about extinctions, even the rare mass extinction. Yet, if the Arctic polar bear dies out (as a consequence of its inability to gain access to food sources as global warming melts the ice fields it uses to traverse distances and as a result of the early death of its young as PCBs, the product of industrial emissions that fall in their greatest concentration to earth in the Arctic, lodge in milk of lactating mother bears), it is an unnecessary loss of a majestic creature, one that is final. Extinct species do not make evolutionary reappearances.

Nonetheless this loss, unintended and undesired, is not of the same order or magnitude as that at which bourgeois civilisation unknowingly takes aim. The problem is that specifically capitalist social transformations are borne along by an objective logic whose outcome is necessarily the very destruction of the natural world in its autonomy, cohesion, and otherness, that is, in its abiotic coherence, as living, and as a presupposition of specifically human life: it is the natural world as the totality of earthly nature (earthly nature as a totality and in its totality) that capitalist social transformation takes as its object.

The grand sweep of capital's movement at the beginning of the 21st century can only portend a future in which nature, because for capital nature is raw material for commodity production, at the very least undergoes continuous and ever greater homogenisation. Homogenisation means in the most minimalistic sense the ongoing destruction of ecological diversity, of species-specific ecological niches and, accordingly, species destruction. It entails, first, the loss of nature as an aesthetically beautiful setting and context in which human and other life forms live. Second, homogenisation of nature is characterised by the emergence and proliferation of a limited number of dominant species (e.g. coyotes, rats, starlings, cockroaches) that, highly adaptable to disrupted habitats, will be increasingly unsettling to life practices of other species. Third, it means the gradual disappearance of real, organic foundations of human (and generally animal) health and medicine as centres of biodiversity (such as the Amazon forests) disappear or collapse. Fourth, produced in and through the movement of capital, homogenisation of the earth will tend toward the creation of nature existing at two poles, uglified raw material basins (denuded forests, open mines, desertified grasslands, etc.) at the start of a cycle of commodity production, and toxic wastelands and garbage cesspools (wetlands turned into landfills, decaying urban centres, vast stretches of ocean densely littered with plastic refuse, etc.) at the end of that cycle, i.e. with commodity consumption. Human beings acting and interacting in nature in this form will tend over several generations to become organically, physiologically, and perhaps even anatomically and morphologically a degenerating species.

The presupposition of homoeostatic, biospheric nature (i.e., nature as a self-regulating totality capable of internally modifying and adjusting its moments to maintain stability and equilibrium in the face of external changes, e.g., increases in ultraviolet radiation) is sufficient internal diversity. This diversity includes, among other things and relations, a variety of different climatic regimes and zones, a multitude of regional landscapes, and, centrally, a huge assortment of different life forms. Thus, it is precisely this internal diversity that the movement of capital is destroying and destroying independently of climate change, and, accordingly, it is the self-regulating character of nature, and life as it has developed over tens of thousands of millennia, that is disappearing.

Climate change

What is important to recognise here is that the criminality of capital goes beyond the vast and potentially catastrophic problems that climate change has

introduced. Even if societies of capital at the level of the world come to grips with ongoing climate change in a manner that allows them to maintain the "achievements" of capitalism (densely populated reserve industrial armies and objective substance, i.e. built environment, means of production and the mass of circulating commodities) on capitalist terms, generalised ecological collapse as described above is encompassed by capitalist development itself, that is, by the practical reduction of surrounding nature to raw materials for capitalist production.

Let us, here and now though, consider climate change. The earth as we immediately apprehend it, what we call the biosphere, is a unitary phenomenon, its various partial systems (weather, oceans, atmosphere, abiogenic matter, organic life including "man") are fully integrated and mutually dependent. It is a self-regulating "system" whose internal diversity (precisely that which capital without regard to climate change is destroying) provides its own coherence and guarantees the preservation of life on earth. As the "external envelope" of earth, it orders the constant energy inflow from space (solar energy) on which it is dependent. The constitution of earth's biosphere has qualitatively changed over geological time, meaning its composition, hence its structure (or the "laws" governing its "behaviour") has also changed. For any evolving, real totality such would have to be the case. What is basic for the earth as self-regularity is comprehended physically: the earth, from this perspective, is grasped as an energy system that makes "self" adjustments to maintain an energy equilibrium (inflow of solar heat equals its outflow over time). Climate change is the mechanism of this adjustment, and climate is the immediate expression of this constitution of earth's biosphere.

To understand climate, and climate change, we must consider reconstructions of the earth's geography on a geological time scale. While the earth, at some 3.8 billion years of age, is estimated to be nearly as old as the solar system, geological dating begins in earnest 570 million years ago with the emergence of truly complex, highly developed life forms (fish, insects, reptiles). For the entirety of this vast sweep of geological time down to the present, we can designate "cool" and "warm" climate modes on earth. A simple determination of a climate mode is offered, namely, the presence of ice — ranging from periods of intense glaciation (emanating from the poles covered with permanent ice caps) to phases in which the high altitudes have been seasonally cold. Tectonic activity, because it is capable of shifting continental-sized landmasses, has played the largest role in making possible intense cold, especially glaciation. For the latter only occurs when there are landmasses very near or over the poles. It should be obvious that over this simply enormous stretch of geological time, there were periods when landmasses were near or at the poles, and periods when they were not.

Antarctica split off from the ancient, gigantic continent known as Gondwana (encompassing present day Australia, Antarctica, South America, Africa and Asia Minor and Arabia) and arrived at its current locale over thirty million years ago. But by the time it reached what we identify as the southern pole it had already begun to glaciare (in response to tectonic changes, to plate uplifting and volcanism). The formation of the Southern Ocean, as an open waterway (with accompanying winds) sweeping round the earth, isolated Antarctica creating an atmospheric barrier against weather systems beyond this continent. Until recently, Antarctica has largely made its own climate, one very cold and dry, which, in turn, has helped cool an earth that hitherto (prior to its separation and drift) was warm and wet, Gondwana largely a temperate rainforest. Some twenty million years ago, tectonic activity entered a period,

still ongoing, of considerable diminution (after the continents as we know them today formed), lessening, for the geological time being, its determination in the formation of climate. (Continental drift has brought large landmasses near to the poles thus allowing the earth's orbital eccentricity to cyclically create ice ages.) These cooler, drier conditions were particularly noticeable in Africa. And, under these newly forming climatic conditions, species, especially some of the truly large species (ancestors to many of today's large mammals who to them stand only as dwarf instances), died off and new ones appeared. Among the latter group were hominid lines, including the larger brained hominids who appear to be *our* ancestors.

Beginning about two and half million years ago, the dynamic climatic structure ("laws") characterising the most recent geological epoch stabilised. So what does our geologically "contemporary" climatic structure look like?

For an answer to this question we must consider physical theory aimed at solving the problems of recurrent ice ages (glaciation). Today, our understanding of glaciation in the geological time frame we live in (it more or less slowly began fifteen million years ago) has largely been resolved into three great cycles that drive the earth's climatic variability. The earth's orbit around the sun is elliptical completing a cycle every 100 000 years. At its greatest as opposed to its smallest distance from the sun, a determination of the earth's eccentricity, there is a 20–30 percent reduction in the amount of radiation (heat) that reaches the earth. At that eccentricity, it is this relation (of sun to earth) that has produced ice ages at regular intervals over the past two thousand millennia. The second cycle concerns the tilt of the earth on its axis, its obliquity. Tilt determines where the most radiation from the sun will fall on the earth. A full cycle occurs every 42 000 years. As the earth revolves around the sun, tilt produces seasons. The last, shortest cycling, periods of 19 000 and 23 000 years, turns, so to speak, on the earth's wobble (called precession). Created by the magnetic mass distributed unevenly and off-centre between the earth's inner core and mesosphere, wobble creates a shift on average every 21 700 years in its "true (celestial) north" (north determined along its axis in contradistinction from the Geographical North Pole) from Polaris to Vega. This shift affects seasonal intensity (e.g., hot summers, frigidly cold winters). In the case of all orbital cycles, the changes in radiation that reach the Earth are amplified by the amount present (more or less) of those gases, especially carbon dioxide, that trap solar radiation in the atmosphere.

We note that once the current warming synonymous with the last interglacial (the end of the last ice age ended roughly 11 600 years ago) was under way, "archaic", stateless communities first began to form. Early on during this interglacial (effectively extended by the greenhouse gas emissions warming of the last century and a half) the rudiments of agricultural, sedentary social life, the state and civilisation emerged for the first time.

Relative to over two million years of "contemporary" geological time, historically constituted patterns of weather, such as the regularity of seasons each with its own predictable structure, are today disappearing. Instead, weather patterns that have existed over millennia are vanishing, and based on these vanishing patterns "the weather" itself is losing its predictability. Similarly, climatic "regimes" characteristic of specific geographical regions (e.g. a temperate region with mild summers and cold winters) are losing their defining features as these regimes become much more "elastic". Destabilised, under conditions of global warming-induced climate change, the occurrence of weather at its extremes becomes more and more frequent (increased intensity

of hurricanes in the Gulf and El Niño effects) because warming radically increases the moisture content in the atmosphere and thus produces extreme weather. (The unpredictability and extremism of global warming is perfectly consistent with instances of "normality" by historical standards, e.g. frigid cold such as in Moscow last winter. It should be added that those extremes are not fixed. What is an extreme today may be "normal" five years from now, and what is extreme then might very well hardly be conceivable today. In an abstract way, the only requirement for such warming is that over time the average annual temperature rapidly rises for the planet as a whole.)

Consequences -- a "new nature"?

Climate change and in particular warming, as we now understand it, can be abrupt, occurring over years or decades and not over millennia (or hundreds or maybe thousands of millennia). Abrupt climate change has certain "tipping points" that "force" change. Under geologically current conditions, there are three components of the self-regulatory system of the earth that are crucial for the constitution, if you will, of a "new nature", that is, a different regime of climate, seasonality and weather. They are a shut down of thermohaline circulation in the North Atlantic (the Gulf Stream as it warms Europe, a shut down of which would be disastrous for Britain and northern Europe), the destruction of the Amazon rain forests, and the release of gas hydrates (clathrates, ice crystal trapped methane, a carbon-based gas) from the ocean floors. All three are threatened by warming as it is generated by capitalist activity on the scale of the world. For example, sufficient warming (say, by no later than 2080) would melt enough of the Greenland ice sheet to shut down the Gulf Stream in the North Atlantic (melting of which pushes fresh water into the Stream's current — a vast conveyor of hot water from the Gulf, diluting the heavier because saline Gulf water, thus, preventing it from dropping toward the ocean floor in the area of Iceland, further preventing it from pulling more warm water in behind it, i.e. effectively shutting it down). The shut down would induce cooling which, in turn, would bring a halt to ice sheet melting that, in turn, would eventually restart the current and start a re-warming, all of which could go on for centuries until the ice reserve had reached a reduced threshold at which point it could no longer add enough fresh water to stop the circulation. Climatic see-sawing of this sort is one possible, under current conditions likely, outcome of warming. Climatic see-sawing is not, however, a lawful creation of a "new nature", for example, a "warm" or "cold" mode, or better, as long as see-sawing continued, a new mode would not be firmly established, as climate at least in some parts of the world alternated between the two. (On the other hand, a massive release of clathrates premised on sufficient warming of the oceans, leading to species extinctions on the order of the Permo-Triassic extinction event, is another, this time abrupt, shift that could usher in a new climatic regime in just decades.)

Suspending consideration of the shape of a "new nature", let us briefly reflect on the some of the features of warming as it is now occurring. These include, among others, increasing frequency and intensity of extreme weather (ice storms, hurricanes or cyclones, tornadoes spun from hurricanes, etc.), rising sea levels, and, possibly, the cooling of northern Europe (not to mention elsewhere the shift northward of subtropical seasonality and temperature into temperate zones).

To even the casual observer here in the United States, the incidence of extreme weather has qualitatively been on the upswing since the 1980s. For example, in 2005 the North-West experienced a severe winter drought; western states had

a record heat wave in July; in the South–West, a marked increase in winter storms included record rain and snow; the central states had a major drought worsen throughout the summer; the South and South–East experienced a record number of hurricanes — fourteen, seven of which were major; and, the North–East had flooding in April and record precipitation in October... In two decades, rising sea levels will flood as much as a quarter of the land mass of Bangladesh; Dhaka, now on average 137 miles (221 kilometres) from the sea, will front the Bay of Bengal at 60 miles (97 kilometres); and, thirty million people will be displaced, countless others dead. Today, the freshwater wells immediately south of Dhaka have become increasingly saline, the water nearly undrinkable. Or, again, in two decades parts of Sydney, Australia, beginning with its harbour, will be underwater... As we write (28 February 2007), the temperature in London (latitude 51.52 N) reached 47F (8 C); in the region of Moosonee (latitude 51.31 N) in eastern Ontario at the southern tip of James Bay, temperatures ranged from 9 to 14 F (–13 to –10 C). Both are roughly seasonal averages. And while London may generate 10F/6C degrees of its temperature as a consequence of its concentration of built environment, Moosonee is London's fate under conditions of a shut down of the thermohaline circulation in the North Atlantic.

"Man-made" climate change?

The overwhelming consensus among scientists and spokespeople of capitalist states in the world today (and even in the US, Australia and Bangladesh among the most recalcitrant of states, there is grudging acceptance) that, in terms of causation, "man" is responsible for warming induced climate change.

While the evidence is straightforward, the attribution both of culpability *and* the liable agent are effectively ideological, masking real agency and responsibility. Consider, first, the evidence.

From the outset of the current interglacial some 11 600 years ago, down close to the end of the 18th century, average global surface temperatures have risen slowly, very slowly, but steadily. This increase, it should be noted, is relative. Plot the average from the peak of the last ice age (last glacial maximum) 22 000 years ago, and that incremental increase (circa 9600 BC to 1760 CE) is not noticeable. But plot average global surface temperature from 1760 to 1870 and the line of temperate approaches a positive 15 angle of incline. Plot it from there to the present and the angle of incline rises to roughly 45. Back up and plot it from 8000 BC to the present, and those last 235 years present a nearly straight vertical rise.

Note the dates: As suggested earlier, circa 8000 BC is the point at which we mark the beginnings of sedentary agriculture, social division and the rise of the state. And 1760 marks that point at which we can date the commencement of the mechanisation of industry in the West (i.e. in capitalist England). In the former case, initial sedentary life and, with it, rising population began to generate a human input, methane (CH₄) and carbon dioxide (CO₂), into the atmosphere, nothing that before 1760 might delay a glaciation, but incrementally in the short view, noticeable. The development of capitalist industrial production after 1760, however, has indeed transformed the chemical make-up of the atmosphere. How?

On a geological time scale, atmospheric CO₂ has ranged from lows of 200 parts per million (ppm) during major glaciations to highs of 280–300 ppm during warm interglacials. Today, atmospheric CO₂ concentration stands at

marginally more than 380 ppm, and is rising in geological terms at an extraordinary and unprecedented rate with, at this moment, no end in sight. Best estimates put a tipping point (qualitatively hastening ice cap melting) as low as 480 ppm, reachable with even modern emissions reductions before 2080. This, then, is the major piece of evidence for anthropocentric based warming.

Second, consider the attribution of agency and, accordingly, responsibility for climate change. The Intergovernmental Panel on Climate Change tells us "man", "his" activity, is altering climate. In one sense, a very crude argument can and has been made (though not explicitly by the IPCC) that sheer human numbers, a global population of six billion, and the outputs that result from the volume of activity of so many people, bear direct responsibility. While the quality of human (animal and plant) life may well be grounds for limiting population growth, global warming does not result merely from the activity of masses of humans at any level of development: Today, an Indian child (the Indian subcontinent being one of the most densely populated regions on earth, India having the second largest population in the world) consumes 1/90th of the annual energy that her American counterpart does. The problem is forms of consumption, energy inefficient consumption, not to mention profligate consumption, and the type of development that underpins that consumption.

If we have raised ourselves to the level of an understanding at which it is intuitively obvious that human population, either in the contemporary sense or the historical sense (going back some 10 000 years) or both, is neither the agent nor, accordingly, responsible for climate change, we have dissolved one mystification. "Man" (here, human population generally) as such is a merely formal concept without a determinately real referent. Perhaps, then, the "industrial system" is at issue. Or, perhaps, it is a question of "man" in the "industrial system". In either case, we are dealing with empty abstractions. The issue is the historically specific configuration of groups of living men and women working within that "industrial system", i.e., capitalist production. More precisely, the issue is the group which dominates that production. We refer, here, to those personifications of economic categories, capitalists (as well as the bloc of classes they have in tow). Capitalists (and states that unify otherwise disparate or competing capitals) make decisions concerning the allocation of monies and capital, concerning what and the manner in which "natural resources" are exploited and utilised, and concerning the technologies on the basis of which those activities are carried out. Still, it is not just those decisions, but the entire system of social relations, that is at issue in climate change. In this sense, it is the subject of society (a part of nature, yet confronting it as raw material for the production of commodities) that is the agent responsible for climate change. It is not "man" that is remaking, as it were, the biosphere; that remaking is a product of "his" own objectified and alienated power. This power is capital: Capital is the real subject of human society under conditions of capitalist production (real domination).

At the "price" of cataclysmic human and social costs, abrupt climate change could transform the geography and sociology of social life: over the period of decades, a qualitative increase in regimentation and repression of domestic populations to insure compliance with draconian restrictions on energy consumption; drought and starvation, massive, unnecessary death; depopulation of coastal areas around the world, forced dislocation, creation of huge frontier zones and camps of displaced persons along national borders, refugees in the tens of millions living in squalor without hope, resource wars between states, ethnic cleansing and genocides as a regular feature of daily life.

Nonetheless, while capital *cannot* stem the ecological collapse which its very movement is engendering and within which climate change is situated, it can and, in our view, will meet the warming-induced, climate crisis. Whatever else, the social relations of capitalist production will neither disintegrate nor disappear in the maelstrom of climate change.¹ The real question is whether capital, at unimaginable human cost, will set the terms on which this change is confronted, or whether we shall.

¹ In the imperialist centre of global capitalism, governed by that most backward, obstinate of regimes, capital has begun to weigh in. As we write, TXU Corp., a Texas-based energy conglomerate is being sold to a group of finance capital-based private investors in the largest ever private equity deal. The new investment group promises not to build eight out of eleven proposed coal-fired power plants, and to double its investments in wind power and the creation of internal efficiencies qualitatively reducing emissions; at the same time, independently of the American State at the national level, five western state governments including California have signed an agreement to reduce greenhouse gas emissions.

Published 2007-07-16
Original in English
Contribution by Mute
First published in Mute vol. 2 no. 5 (2007)
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