

**The Global Political System
A Dynamical System within the Chaotic Phase**

**Bennett Stark
Visiting Scholar**

**Agnes Scott College
Decatur, GA**

ABSTRACT

The article is an examination of the global political system. I apply the dynamical systems framework employed by Kauffman and explain why self-adaptation does not explain the global political system. Additionally, I postulate what conditions must be met if it did. I focus on the structural properties of the strong nation system and argue that anarchic conditions within the global political system foster a maladaptive strong nation system that is an extension of human self-maximizing behavior unconstrained by law or culture. I focus, as well, upon complexity-- the increasing interconnectivity arising from the widespread expansion of global society within the biosphere and the increasing interconnectivity emerging within and between societies. I argue that complexity has its own imperative: global governance for global problems whose defining decision-rule is: when a conflict exists between the interests of national security and global security, the latter takes precedence.

The global political system is analyzed as a dynamical system using the framework of Stuart Kauffman in his study of biological and ecological systems. (Kauffman, 1993, 1995, 2000) I explain why it is that the global political system is not characterized by self-adaptation and present the concept of global governance for global problems as a necessary condition for achieving a system property approaching *self-organized criticality*. Political and ecological sustainability—the equivalent of *self-organized criticality*-- are the evolutionary challenge before our civilization. The ability of humanity to live with itself and within the biosphere with reasonable harmony I define as political and ecological sustainability.

A Random Grammar Model of the Global Political System

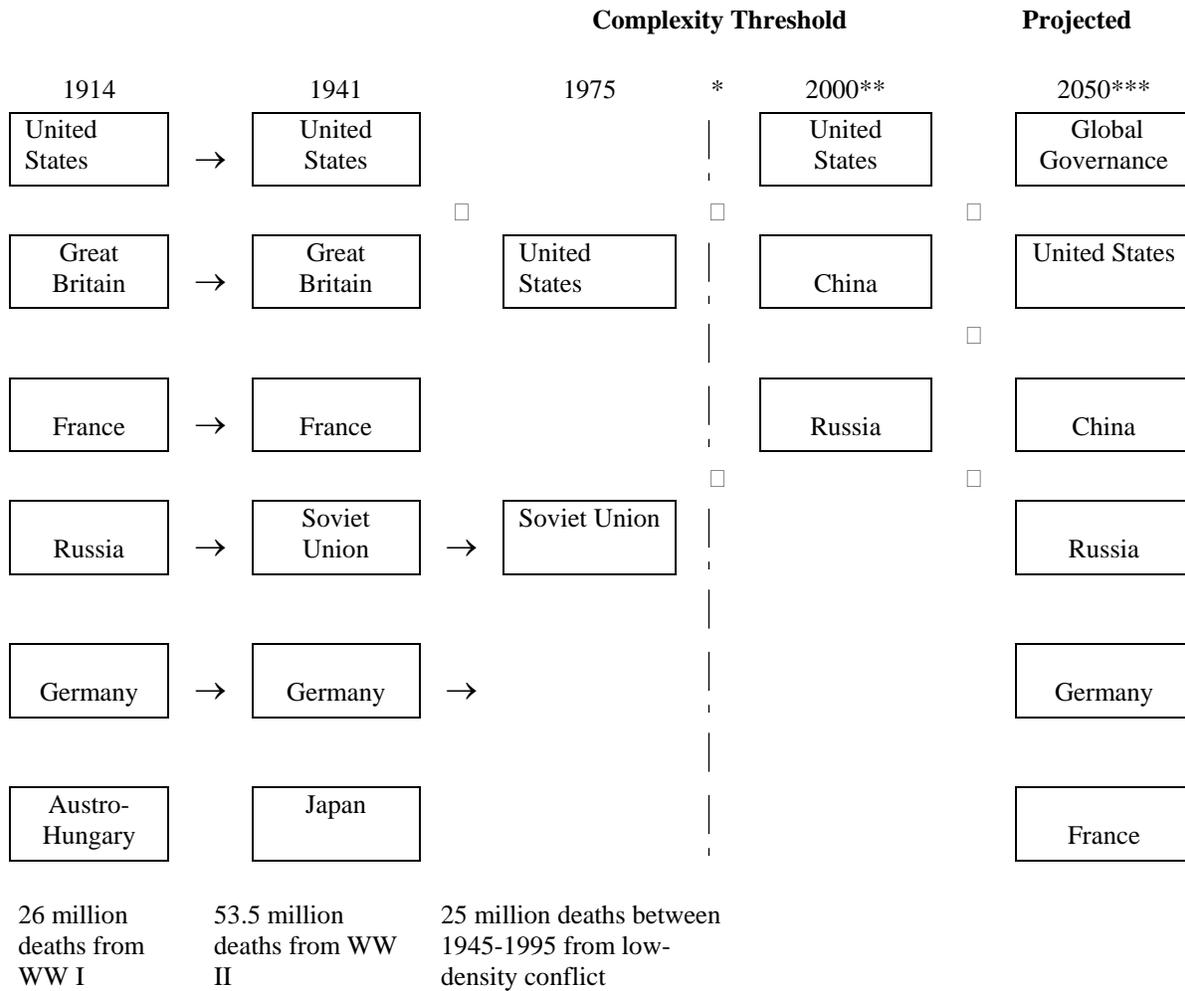
On page 4, we have a global political system model for the year 1914, 1940, 1975, 2000 and for the year 2050. In place of *chemostats*, we have strong nations that are the key actors in our model. *Strings* are the key constituents of strong nation power and are represented by an arrow between time-periods of a given nation. The constituents of power include: 1) GNP: An indicator of economic power; 2) Population; 3) Military manpower; 4) War technology and during the nuclear age, the number of nuclear weapons; and 5) Environmental degradation and deterioration of governance capacity.

The singular logic or grammar of the strong nation system is its arrested or truncated development marked by significant governance and ecological deficits and the absence of movement toward *self-organized criticality*. Accordingly, the strong nation system is not characterized by self-organization and self-maintenance. The strong nation system replicates itself after both WW I and WW II, and after the dissolution of the Soviet Union. A transition from the maladaptive, strong nation system to multi-tiered global governance with global governance for global problems marks the projected year 2050. The transition, if it is realized, represents a fundamental shift in priorities within and among strong nations. A necessary condition for the transition is acceptance by strong nations of the gravity of potential change arising from both ecological degradation and decline of governance capacity.

The strong nation system is one in which no external governance exists to impose an international rule of law. In the absence of a rule of law, nations that can engage in aggressive self-maximizing behavior often do. Nonetheless, the pursuit of power does not exist within a vacuum. Thus, religious, ideological, economic and geographical factors come into play and affect whether a nation regards another nation a potential adversary, an ally or neither.

The strong nation system is a violent, dysfunctional world. Germany was defeated in 1917 and in 1945. In the space of about fifty years, France was defeated in 1871, in 1917 and in 1940. Imperial Russia underwent a violent revolution in 1917 and the Soviet Union into which it was transformed dissolved in 1991. Hapsburg Austria was defeated in 1866 by Germany and in 1917 by the Allied powers and was annexed by Germany in 1938. In large part because of the military challenges posed by the English Channel, Britain was spared conquest in both world wars. WW II ravaged France and Germany and weakened Great Britain, such that their empires de-colonized and each fell from the ranks of strong nations.

Grammar Model of the Strong Nation System



The onset of complexity I assign to the mid-1980s when the evidence of depletion of the ozone layer was first recognized. ** The United States is the lone superpower and China and Russia are regional strong nations. ***The configuration of political entities for the year 2050 includes global governance followed by a list of potentially strong nations. Global governance has as its cornerstone global governance for global problems. Space constraints have not permitted inclusion of Japan. It is nonetheless a potential strong nation.

The complexity threshold marks the onset of dense, causal connectedness between burgeoning population, the proliferation of greenhouse gases, habitat destruction and their feedback effects on our ecosystems which include- global warming, biodiversity loss, pollution and the depletion of the ozone layer. The emergence of potentially, critical ecological problems and, if realized, a complementary, equally serious, array of political, social and economic problems are the consequence of having passed into the complexity realm.

Technological changes in communication and transportation and the globalization of trade also serve to increase global connectedness. The level of difficulty of effective governance is increased at all levels of

governance in the complexity era. Moreover, the presence of a maladaptive strong nation system renders an already fragile global political system unstable.

The Quest for Self-Organized Criticality

Based upon his computer simulations, Kauffman maintains that a species possesses maximum mean fitness at the phase transition between the *ordered* and *chaotic phases*. This is the point of *self-organized criticality*. Is humanity poised at *self-organized criticality* or close to it? Has civilization attained political and ecological sustainability? No, the global political system at our juncture in history has significant deficits. These deficits can be examined within Kauffman's concept of a *fitness landscape*, which is essentially the mean fitness level within a genetic network or an ecosystem. A current *global fitness landscape* would describe our environmental and governance deficits. An optimal *global fitness landscape* characterized by maximum mean fitness is an abstraction that is very unlikely to be realized. Its value is heuristic, indicating the direction the global political system should be headed in order to avert catastrophic scenarios.

We are in the *Red Queen regime* within the *chaotic phase* described earlier. John Maynard Smith's model of a very simplified, *evolutionary stable system*, also discussed earlier, has little or no applicability to the global political system. It describes what we are not. *Red Queen behavior*, to the contrary, describes humanity's unsatisfactory efforts to deal with the consequences of its actions. Species never stop coevolving and never reach an *evolutionary stable system* in the chronic *Red Queen system*. At best, they remain in place. At worst, species fall further and further behind. We are mired in a *Red Queen system*, seemingly unable to disengage from a maladaptive *strong nation system* and unable to take adequate steps to deal with environmental problems. The political and ecological problems do not stand still. Timing is crucial. The longer we take to correct matters, the greater will be their magnitude and the greater will be the number of problems to overcome and thus, the more difficult it will be to take corrective steps. Moreover, our global political system is subject to the *butterfly effect*, a characteristic of a *chaotic* dynamical complex system. Circumstances not particularly alarming, taken in isolation, may lead to catastrophic trajectories.

In their 1991 article, biologists, Paul Ehrlich and E. O. Wilson (Ehrlich and Wilson, 758-763, 761) stated we are 45 years late in coming to terms with biodiversity loss and other anthropogenic harm inflicted on the biosphere, and that adjustments would require a level of effort by the U.S. at least comparable to that expended during the Cold War. During the ensuing fifteen years since their article was written, loss of biodiversity, habitat destruction, carbon dioxide emissions and global warming have proceeded unabated. If

Ehrlich and Wilson are correct, we are now almost sixty years late and the biosphere is now in a more compromised state.

The maladaptive properties of the *strong nation system* contribute significantly to the political deficit. The perception of unfairness in representation in global economic institutions and trade policy on the part of the United States and other G-8 nations is widespread among third world nations. As Nobel Prize laureate in economics, former chair of the Council of the Economic Advisors and former chief economist of the World Bank, Joseph Stiglitz has written, the perception is largely correct:

The critics of globalization accuse Western countries of hypocrisy and the critics are right. The Western countries have pushed poor countries to eliminate barriers but kept up their own barriers, preventing developing countries from exporting their agricultural products, and so depriving them of desperately needed export income. The U.S. was...one of the prime culprits....
...[E]ven when not guilty of hypocrisy, the West [G8 nations] has driven the globalization agenda ensuring that it garners a disproportionate share of the benefits at the expense of developing world. (Stiglitz, 2000)

The hypocrisy of the G8 nations as indicated by Stiglitz must change, giving undeveloped nations an equal chance to benefit from trade. This is reinforced by the disenfranchisement of the third world (China excepted) as a result of the veto-power of the Permanent Members of the United Nations Security Council. Much of the third world and the second world distrust the U.S. and other G-8 nations. *Strong nation behavior* of the United States in quest of a 'new order' and global supremacy and the unilateralism of current U.S. policies exacerbate the matter. The distrust and hostility ultimately must be displaced by policy changes and must be matched by cooperative policies of other nations and sub-national groups as a precondition to achieving effective global governance.

Zbigniew Brzezinski, National Security Advisor to President Carter, states that the United States should adopt a leadership role among nations moving in the direction of building a "global community of shared interest" and "...weav[ing] together [with the European Union and other nations] a broader fabric of binding and institutionalized international cooperation."(Brzezinski, 2000). The cost of taking the wrong path is "an accelerating plunge into global chaos."(Brzezinski, 2000).

Not only are we *not* at, or near an optimal position to deal with global problems, we appear to be on a *Red Queen* trajectory which, in a matter of decades or at the end of the century, could bring our extinction and that of most species. At our current rate of biodiversity loss, E. O. Wilson has predicted twenty percent of species will become extinct by 2130 and fifty percent by 2100. (Wilson, 2000)Can humanity as we know it

survive with thirty percent of species extinct or fifty percent extinct? Is there a threshold, in which if current trends continue in this century with little or no effective counter-measures, the level of ecosystem harm would be so great that the viability of future generations would be destroyed? Our life scientists have not given us an answer.

Over time, the characteristics of the global political system could change for the better. If they do, a critical variable may be the degree to which a series of interconnected global problems undermine our ecological and political sustainability that impel a dramatic corrective transformation. These widespread problems might be: changing temperatures, a rise in sea levels, dramatic change in weather patterns, famines, mass refugees, political turmoil, intra and international wars and massive governance failures. The basic question for strong nation decision-makers under such circumstances is: would the benefits of global governance as perceived by strong nations warrant the perceived costs of altering the narrow self-maximizing nature of the strong nation system and ceding some significant measure of their autonomy? The answer would be that the costs of doing little or nothing are sufficiently greater than the costs of making reasonable adaptations to optimize our chance to preserve civilization. The defining decision-rule of global governance is: when a conflict emerges between the interests of national security and global security, the latter takes precedence.

If global governance arises, we would expect the emergence of both revitalized, if not new, constituencies and vocal interests groups sympathetic to the goals of ecological and political sustainability and to the shared commitment to an ethos that extends beyond the narrow self-interest of the *strong nation system*. A growing awareness on the part of global citizenry accompanied by a rapid increase in the density of trisectoral networks in the political sphere (comprised of international governance institutions, international and domestic organizations (NGOs), and in the private sector, transnational corporations (TNCs) that reflect this awareness, would be prerequisites. Under such circumstances, it is possible that legitimacy and support for the traditional policies of the strong nation system within strong nations would weaken, and outside of strong nations, legitimacy and support for global governance on behalf of political and ecological sustainability would strengthen. Insofar as global decision-making is concerned, such a major transformation in societal attitudes and governance, should it occur, would illustrate the simplification or convergence-- akin to that which Stuart Kauffman observed in the genetic regulatory network some forty years ago which he stated was a result of self-adaptation at the phase transition between the ordered and chaotic phases.

It is instructive to consider possible catastrophic scenarios. Such could occur, in the absence of significant correction of our current course. The worst-case scenario would be a mass extinction in which, borrowing

from E.O. Wilson's scenario, as many as 50 percent of all species, including our own, will perish. Each of the previous, five mass extinctions have taken on average ten million years for the biosphere to recover its prior level of biological diversity. Restoration of pre-extinction levels of biological diversity if the sixth mass extinction were to occur, might take a comparable length of time. It is not clear whether *Homo sapiens* or a similar species would, in time, evolve. Whether this species would be able to reconstruct the details of our species' ill-fated misadventure and whether this memory would purposefully inform their efforts at building governance structures, I have no basis for a conclusion.

A second scenario would be a massive ecological collapse accompanied by a commensurate disintegration of governance capacity both of which on a planetary or near-planetary scale. In this scenario, the capacity to govern on the national or regional level or over a large geographical area would not exist. The energy, communication, transportation infrastructures that we associate with modern society would be destroyed. So too the research, medical and educational infrastructures would not exist. The rule of law protecting personal safety and property would also not exist. In large measure, civil society and governance would have to start anew on the local level. Subsequent scenarios would be defined by severe, if not massive ecological collapse(s) and loss of governance capacity, but which are spatially limited in their consequences.

The achievement of *self-organized criticality* within a system, and with it, an optimal global governance decision-making together with an optimal *fitness landscape* is currently nowhere on the political horizon for the human enterprise.

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