Dynamics among Nations explores the relationship between concepts of emergence and complexity that became an important focus of Hayek's thought in his later work.[1] In the most mature phase of his thinking, Hayek came to identify a society of free individuals with processes of self-organization and complex social emergence. Though he did not use its language, this thinking places him close to the core concerns of contemporary research in complexity science (Hayek 1952; Hayek 1967).[2] His vision of economic and political liberty is closely connected to his belief that social order emerges through processes of self-organization out of the interactions of dispersed, heterogeneous agents. His radically distributed and decentralized view of human agency is encompassed in the idea that "if left free, men will often achieve more than individual human reason could design or foresee" (Hayek 1948, 11).

Dynamics among Nations draws upon the science of complex adaptive systems to pursue questions of knowledge diffusion, emergence, systems theory, cognition, evolution, and agent behavior. Hayek asked similar questions, and *Dynamics*' approach to contemporary issues develops his epistemology within innovative studies of nation-state, international, and global phenomena. The book shares a number of themes with Hayek's later work:

(1) Both argue that conventional social science research methods that address problems of economic policy and moral philosophy are inadequate, based as they are on models of linear transition, where change is additive, or the sum of all inputs. Complexity sciences teach us that the constant interactions and adaptive reactions among agents are what generate changes in the larger system.

(2) Both address "bounded agent rationality." In complex systems, knowledge is distributed among interacting agents, but it is not distributed equally throughout the system. This "bounded," knowledge is a constant in Hayek's thinking: human cognition "cannot be guided … by full knowledge and evaluation of all the consequences" (1948, 19). Similarly, *Dynamics* explores the social transmission of information and argues that local culture, community, acquired beliefs, and institutions are the filters through which people frame essential issues.

[3) Thus both Hayek and *Dynamics* go against the grain of the economics profession and its embrace of equilibrium-based methodologies. Both examine the idea of behavioral economics in the context of evolution. Because agents are (a) continually coevolving and adapting (b) in a decentralized space and (c) with distributed knowledge, they produce *an economy without equilibrium*, comprising many interacting parts that change over time.

(4) Both address how social order emerges without a local "controller." *Dynamics* explores the implications for global policy of a world without equilibrium or global optimum and "no captain at the helm" (Root 2013, 217-235).

(5) Both Hayek and *Dynamics* recognize that early cultural adaptations or mutations can place a population on paths that differ from the unique circumstances that paved the way

for Western development. Both accept that in any ecology multiple adaptive peaks are possible. In *Dynamics* populations are more likely to reach the highest adaptability along a local trajectory, than to switch from one adaptive peak to another.

(6) Both Hayek and *Dynamics* argue that laws that belong to "lower," more fundamental levels of a system cannot be used to reconstruct the universe in which they form only one part. Institutions rarely survive if "transplanted" elsewhere. In *Dynamics,* the idea that "states are not built but grow" fulfills Hayek's notion of public policy that seeks "to cultivate growth by providing the appropriate environment, in the manner in which the gardener does this for his plants" (1974).

(7) When Hayek refers to the "impersonal and anonymous social processes by which individuals help to create things greater than they know," and when he describes outcomes that are not products of individual reason nor "consciously designed… or… fully intelligible to it," he is describing what modern evolutionary science calls *emergence*. For him and for *Dynamics*, emergence is the most dramatic process in the course of human interactions, often resulting in outcomes that lie outside of the range of human intention and beyond the precognition of the agents.

(8) Hayek was skeptical of social engineering, based on his understanding that perception and cognition are bottom-up processes. Yet he also saw a dynamic relationship between top-down and bottom-up *causality*, e.g., in his writing about how the creation of money altered the behavior of agents and organizations. In *Dynamics*, the theme of downward causation is reflected throughout history in such instances as when states win wars and are positioned to decide the legitimate order for other states.

(9) The later Hayek expressed ideas about cultural evolution that are often misconstrued and criticized, incorrectly, on the grounds that he presumes evolution to be a process that produces optimal fitness. In fact, he repeatedly tried to distance himself from the view that something is efficient because it exists.[3] Cultural evolution in *Dynamics* and in the later Hayek share with evolutionary biology a common understanding that suboptimal or maladapted traits, or the populations in which they reside, can persist for long periods of time.

A tangled web: What's new in *Dynamics* and where does it take the Hayekian epistemology?

Hayek understood implicitly that tangled networks foster heterogeneity and in so doing create new opportunities for novelty, innovation, and entrepreneurship. But in his work, the properties of crosscutting hierarchical organization and tangled webs of relationships found in complex global ecologies are unexplored. *Dynamics* applies advances in evolutionary biology that occurred after Hayek had completed most of his life's work to explore tangled ecologies and their properties.

Hayek's *The Road to Serfdom*, for example, is a study of contemporary politics written when enemies of liberty were heterogeneous but self-declared. The threats to individual

liberty could be readily identified during the long war between liberalism, socialism, and fascism that ended when the Soviet Union collapsed. Today, however, when many capitalist societies are mixed regimes and former socialist regimes are free traders, differences between central planning and free markets are not so easily identified. In the tangled order of today, many layers of connections exist between liberal and illiberal polities. China, for example, embraces classical liberalism's ideal of complex economic interdependence, yet its internal policies are at variance with the social norms and rules that underpin a free economy.

Milton Freedom writes in the introduction to *The Road to Serfdom* that "the free market is the only mechanism that has ever been discovered for achieving participatory democracy." But the powerhouse economies of China and Singapore suggest that the connection between economic and political liberty is far more complex, and that the existence of one form of liberalism cannot be predicted from the observation of the other. *Dynamics* explores how the different strategies and networks that are possible in a highly interconnected world may have system level effects that alter the shared global environment.

The clinical difference between the world of *Dynamics* and the work of Hayek resides in an effort to uncover *how* the degree of interrelatedness affects a system's evolution. Highly interconnected systems raise two questions that Hayek did not have to address: whether change will be intermittent or gradual, and whether temporal variation will increase over time. To answer these question *Dynamics* focuses on who is interacting with whom and how strongly they are linked. *Dynamics* explores where Hayek's insights on the role of evolution of social institutions might have gone had he had access to recent work in evolutionary biology. In a tangled and highly interconnected global ecology, the selective forces that drive the process of cultural evolution among the agents are such that even the most powerful cannot assume that their preferences are likely to be realized.

In Hayek's writing resides the wellspring of many of the questions concerning the relationships among spontaneous order and emergence that *Dynamics among Nations* addresses. *Dynamics* advances Hayek's research into complex emergence in human societies by applying insights from foundational science, enabling scholars and the public to rediscover and strengthen the broad liberal philosophical tradition from which Hayek's drew his inspiration and that in turn has made his work so enduring.

[1] This is amply documented in Bruce Caldwell's 2004 book.

[2] Hayek writes “The ‘emergence’ of ‘new’ patterns as a result of the increase in the number of elements between which simple relations exist, means that this larger structure as a whole will possess certain general or abstract features which will recur independently of the particular values of the individual data, so long as the general structure e.g. by an algebraic equation is preserved” (1967, 26).

[3] Whitman, Douglas Glen. 1998. “Hayek contra Pangloss on Evolutionary Systems.” *Constitutional Political Economy* 9: 45–66.