



First Principles First

GOVERNANCE & IDEAS

Moving Beyond the Left-Right Divide: Governance by First Principles and Natural Intelligences

*Current democratic institutions are inherently limited by their Enlightenment origins.
A computational science of intelligences offers a principled alternative.*

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February 2024

“I have seen Americans making great and sincere sacrifices for the key common good and a hundred times I have noticed that, when needs be, they almost always gave each other faithful support.” — Alexis de Tocqueville, Democracy in America (1840)

Introduction and Overview

This essay is a provocation and challenge. It makes the claim that there is a computational science of intelligences and that there is no essential difference between natural and artificial intelligences. It further argues that well established fundamental principles in physics, such as the Free Energy Principle and Quantum Information theory, and Bayesian prediction offer a cogent, testable, and scale and domain free framework for explaining and designing a variety of intelligences. Such frameworks are themselves computational models, and hence, imminently testable, and practical for biological as well as digital phenomena.

The essay postulates that the principles that shape and govern intelligences are proximate if not identical to those that perform the same functions in creating and sustaining life. In other words, to exhibit intelligence is to stay alive and to stay alive is to be intelligent. Biological processes are manifestations of evolved intelligences not just at the scale of the brain but at the cell as well. Living things are the result of sensing, sampling, and shaping nature, and then making and sharing predictions about both nature and self that ensure survival.

The fact that such sensing and predicting can be shared with others through messaging, rituals, images, norms, and languages demonstrates that intelligences exist outside the skull as forms of sharable collective beliefs. When these collective beliefs become codified prescriptions on how to perceive and act in the world, they become ideologies.

This essay is the first of series of essays. This first essay begins by arguing how the findings of computational physics and neuroscience will fundamentally upend current Enlightenment and Newtonian based conceptions of governmental, social, and economic institutions. It examines the weakness of American democratic institutions, markets, and policies predicated on Enlightenment and Cartesian principles. It critiques core American Constitutional principles that assert that protection of personal freedoms and rights can be secured through current electoral, legislative, and judicial processes. It also challenges the efficacy of the separation of powers doctrine and the claim that sovereignty and personal freedoms can be achieved through the doctrine of subsidiarization and decentralization.

It then provides historical examples to illustrate how from its inception, the growth and governance of the American Republic was driven by policies of land acquisition and speculation as facilitated by the powers of

the Federal Government through the Commerce Clause of the Constitution. This historical assessment posits that the judicial doctrine of textual originalism is inherently unscientific and unsustainable.

The essay then argues for reimagining democratic institutions and principles as intelligent, adaptive, and self-correcting political and economic entities designed to embody and augment core democratic values of equity and agency.

A key finding of both Quantum Information theory and the “Predictive Brain” thesis as applied to social groups and democratic institutions is that there is no “objective” reality outside the shared observations, actions, and predictions of collections of “sentient agents”.

Furthermore, it is posited that the intelligences of such agents, be they people, synthetic agents, or societies, are tied to their capacity to stay alive by adhering to the First Principle of Free Energy Minimization, or in other terms, the Hamiltonian Least Action Principle of Physics. In other words, for both life forms and societies to survive, they need to recognize and abide by this First Principle. One therefore, can regard recent advances in “natural based intelligences” as developing the multiscale and multi-domain intelligences for institutions, corporations, and democracies to recognize and abide by these First Principles.

The second essay is an exploration of the underlying science of Quantum Information Theory, computational biology, Active Inference and Predictive Brain theory to test the claim that collective beliefs or ideologies can be studied with the same rigor and predictability as biological and genomic processes. If that claim proves true, it is argued that it will become possible to have a principled basis for evaluating and addressing the health or pathologies of different kinds of social, political and economic ideologies.

Needless to say, this perspective is a major break with the postulates of Cartesian dualism: the separation of mind and body, information and matter, and the objective and the subjective. It also challenges the validity of many reflexively held Enlightenment ideals, such as, the rational actor, the objective observer, and the hallowed democratic doctrine of free speech, free markets, and the electoral process.

From Enlightenment to Entanglement

For the last six hundred years the success of the West can be attributed to its embrace of science and the principles of the Enlightenment Rationality, in particular, Cartesian dualism, and its application to industry and government and military organization. Through the separation of the mind from the body, the objective condition of Nature could be understood and mastered. Nature could be understood and engineered in its own material terms without any need for “meta-physical” or clerical justifications or limitations. Applied to commerce, there was no need for market oversight, as the “invisible hand” of price and supply and demand could replace the dictates of the state and monarch to fairly and efficiently allocate value. Likewise, there was

no need for a legacy of a “Divine Right” to confer legitimacy, as the “demos”, the People, are invested with the secular authority and capacity to express and realize their own will through representative processes.

This vision of democratic freedom and individual rights, however, had a counter narrative roughly starting at the same time. This narrative grew from the recognition that the unrestrained exercise of freedoms leads to new form of accumulated privileges and powers that concentrates power resulting in cruel disparities of wealth and opportunity. Variously deemed Levelers, Socialists, Marxists, and Progressives, advocates for this new narrative fundamentally challenged Mercantilism and Capitalism at their core. They offered a new vision of social well-being and justice that sought to correct the “systemic forces” that concentrated wealth and power through egalitarian measures of governmental oversight and wealth redistribution.

In fact, both groups are wrong; each is stuck in the same 17th century mindset. They are simply arguing opposite sides of the same Cartesian coin. The “Right” identifies liberty with freedom of choice and autonomy, and the “Left” with freedom from want and abuse.

For “free rights maximalists” granting any such powers to any governmental body violated a core democratic principle, that of individual freedoms and self-determination. To this group value is created by individual effort and risk taking, and therefore, the unbounded accumulation of value and privilege is a just reward. In contrast, the “social justice maximalist” see socio-economic and systemic factors as determinative, where privilege and success are not so much the result of individual merit, but the result of the accumulated contribution of others and random good fortune.

In the more extreme versions of their ideological selves, the “free rights maximalist” espouses a reality defying minimalist version of government, paradoxically enabled by blind obedience to authoritarian rule. On the other extreme, the “social justice maximalists”, construe any hardship, offense, or aggression as a deliberate systemic injustice and moral failure, thereby legitimating its own version of intolerance and imposition of moralistic correctness. The former emphasizes the importance of duty while the latter the importance of rights and entitlements.

Moreover, when such absolutist positions are taken, ideological integrity is equated with immutability, thereby rendering the prospect of democratic “compromise” or consensus impossible. Under such conditions, the “People’s representatives” cease being advocates for their constituents but advocates for those for whom ideological purity serves their particular interest.

The Ideology of Free Speech and Press

Especially difficult for any democratic society is the treatment or regulation of “speech” or the press, which in current terms, also applies to the treatment of content, information, and social media. As offspring of the

Enlightenment, democratic societies were founded as secular institutions that politically manifested the mind-body ideology through the separation of church and state, which delegated the control of secular affairs to the state, and matters of the mind to meta-physical, non-state institutions such as, the media, arts, education, and the church.

This left the Press and media in a particular kind of limbo. As the “Fourth Estate,” the “Press” was essential to the functioning of democratic processes but was beyond the reach of effective oversight. Since newly formed democratic societies were eager to defend their newly asserted freedoms, they distanced themselves from any semblance of “content” censorship and market oversight. As a result, democratic societies intrinsically lack principled policies on the oversight of speech, content, or media.

This idealized notion of unconstrained natural forces achieving a “fair” equilibrium has been repeatedly shown not to work for market goods and information “goods”. In contrast to the Enlightenment era, our 21st century understanding of information, content, computation, mental adaptation, and prediction has advanced enormously. We have a deep and principled scientific understanding of the physics of information, cognition, and life, which form the technological and economic underpinnings of our era. Yet we persist to govern and think of ourselves in highly simplistic and antiquated terms.

Lacking a principled and effective means for distinguishing “free speech” from “hate speech”, “disinforming from informing speech”, and fact from fiction, democracies are incapable of establishing causal links between the types of speech acts and content and their material and cognitive consequences.

This notion of freedom as “constraint free” action is not just problematic but detrimental to any highly functional, inclusive, and complex society. It is a legacy of Enlightenment thinking trying to wean itself from the theological categories of the constraints of the church and monarchy.

It is this transition from an inanimate, indeed, dead and reductionist view of Nature to an animate one that is generative, abundant, and expansive that is being contested today in science, politics, and culture. It marks not only a new era in science and technology, but a new era in how we see and govern ourselves by being grounded in an ever-evolving science of evidence-based beliefs.

From Politics to Free Energy Principles for Evidence Based Governance

A seemingly recurrent and inevitable point of failure democracies and republics comes when the question, “Who guards the guards” (*Quis custodiet ipsos custodes?*) becomes both foremost and unanswerable. Yet this question is preceded by another even more difficult to answer. By what rule do rulers rule? (*Principe per*

quam regulam regunt?) This question about the origin of legitimacy applies to authoritarians as well to democracies and republics.

In non-secular societies there is a kind of infinite regress to some opaque and distant notion of “divine right or mandate” that is granted to a ruler which invests him or her with unassailable legitimacy. In secular democratic societies and republics there is a nod to a notion of a deistic “Primal Mover”, as in the United States creeds, “In God We Trust” and “One Nation Under God”. But the actual and defining operating principle of legitimate rule is derived from a similarly opaque but secular construct, “The People”.

Another problematic founding principle taken from the American Declaration of Independence is the assertion that “all men are created equal”. This hallowed claim rings hollow in that it states “men” and by that it means only white propertied men, and not women nor the poor nor other races, are equal before the law. It does not address the obvious point that different persons, individually and collectively, have different and systemically skewed starting points, and that equality of opportunity like equality of market access are points of competition, contention, even concentration.

Formal and Informal Rule Making

Another flawed foundational democratic principle is the formal process of legislation whereby representatives convene and deliberate to draft rules and statutes to protect and implement the principles of freedom and equality. In practice, however, the legislative process is often as much governed by “animal spirits”, influence peddling, settling scores, and identity signaling, as it is by evidence-based deliberation.

As the imminent Civil War veteran and Supreme Court Justice, Oliver Wendell Holmes noted in his famous treatise on Common Law, common laws and statutes evolve from norms and customs and have a mind and purpose of their own: “the rule adapts itself to the new reasons which have been found for it and enters into a new career.” Holmes seems to imply that the formation and acceptance of formal laws are not a rigorous rational process but a natural extension of an informal and emergent social process of social norm formation and invention.

Another hypothesis of current democracies and republics is that a separation of powers and the process of representative voting are a fair, representative, restorative, and self-corrective process. But this presumption is itself grounded in the same failed “laissez faire” premise of market “self-regulation;” for, as in the case of markets, initial conditions and genuine optionality are shaped by those who can capture and benefit from the process.

The Core Principle of Effective Democracies: Common Good

This brings us back to the primal question: By what rule do rulers rule? Is there a principle of rulemaking that is both legitimate and resistant to capture that can effectively and fairly govern a complex democracy or republic?

The historian Mike Duncan noted a recurrent pattern throughout the failure of republics in general but collapse of the Roman Republic in particular. In the course of a healthy republic's lifetime even major differences between parties were resolved through deference to a tacit code called *mos maiorum*. This unwritten code was in effect a "custom" of placing the preservation of the republic above the interests of individual parties. In effect, this informal code of deference to the "common good" was the underlying "meta-principle" that underscored effective democratic processes.

Perhaps the "rule by which rulers can rule" is not so much a rule as a founding principle whereby individual self-interest is subordinated to a "common good" as a personal duty and a predicate for sustaining their personal and collective well-being.

It is notable that in the Roman case, effective governance consisted in a set of long held norms such as, *fides*, *pietas*, *gravitas*, *dignitas*, and *virtu*. All such beliefs require limitations on individual freedoms in deference to others combined with a recognition of the need for self-discipline to attain a higher standard of personal conduct. Such values cannot be legislated but only realized socially by individuals internalizing, honoring, and adhering to such principles.

When the "entropy" of self-interests become too high, the fabric of democratic union dissolves and the institutions of democracy fail. This condition devolves into what Duncan terms the entropy of revolutionary forces when the polity fails to fashion a new political consensus for governance. Failing to achieve an accepted functioning consensus, they devolve into authoritarian rule as the simplest means to achieve order and a confined predictability.

Democratic Processes as Symbiosis

A possible key to preserving democracy may not lie in protecting individual freedoms per se, but something more fundamental, and from which the very notion of individual freedoms is derived. Paradoxically, this may lie in having constitutional rights tied to mutual constraints and duties, as well as to individual freedoms.

Yet in the case of the "game of democracy" those who are ruled are also those who make the rules and enforce the rules. This creates a foundational conflict of interests. Without counter measures and durable enforceable means of sufficient and persistent magnitude to counter the usurping forces, the entropy of concentrated self-interests will eventually prevail. Hence, it is not so much the structure of the game per se, but the capacity to independently enforce the rules that becomes determinative of fairness.

The American Conflation of Freedom with Decentralization

This flaw of lacking independent referees with enforcement powers has played out throughout the history of the American Republic as a contest between a centralized government, Federalism, and localized decentralized State institutions, Jeffersonian Democracy. The early presumption in the drafting of the U.S. Constitution was to accrue powers to a central or Federal government only as a last resort.

Into this mix of radically different cultures and economies was born a definition of freedom that is singularly American. Freedom was defined as absence of governmental control and was cultivated in fact and in myth in the expanding American Frontier. The smaller, the more decentralized, the government the freer the people.

Through the Northwest Indian War of 1784, Louisiana Purchase of 1803, the Transatlantic Treaty of 1821, and The Mexican American War of 1846, the young Federal government essentially brought, negotiated, invaded, and annexed virtually all bordering territories from the native populations, the Spanish, French, and the Mexicans. By doing so it built a huge land inventory and treasury by which it could finance its road, canal, postal infrastructures, military, and social policies of land grant payments and the forced resettlements of indigenous peoples.

The “liberation” of the Republic of Texas from Mexico by the Texas Revolution of 1835 and its annexation as a State in 1845 exemplifies the interplay of Federal land policies with the dubious claims of State self-sovereignty and local freedoms. By contemporary standards, the “liberation” of Texas was a step backward into a slave-based plantation economy, favoring Anglo American residents, and the diminishment of women’s rights to hold property and act for themselves.

This is not to say that Federal infrastructure investments were neither unnecessary nor not beneficial, nor that centralization is inherently bad. Rather the failure to “referee and enforce” the interfaces and boundaries of multi-scale and cross domain value exchanges, inevitably results in the capture and concentration of value. The mere act of asserting subsidiarity or decentralization does not resolve the governance issue to preserves freedoms.

Intelligent Generative Interfaces Between Contending Beliefs

True to the argument that complexity and growth comes through the interaction of different agents or parties, the likely vehicle for the growth of the Federal government and attendant special interest groups came through the Commerce Clause of the U.S. Constitution.

From the perspective being advocated here, the definition of Powers in the Elastic Clause Article equates to the Free Energy Principle as used in the Active Inference definition of intelligence as models of increased prediction, hence, reduced uncertainty. Hence, the reduction of uncertainty is a principle to provide order,

which in essence, is the goal of government and law.

Free Energy is generated at the interface of two disparate populations, and in the case of living agents follows the Principle of Free Energy Minimization to generate a synthesis to achieve a new “homeostasis” that combines the interest of disparate agents into a new set of combined beliefs or models.

Not So Fair Laissez-Faire

The doctrines of laissez-faire and decentralization are popular, but flawed understandings of how complex living systems self-assemble to form new kinds of organizations for mutual benefit. To achieve a homeostasis of mutual value, each agent cannot blindly optimize their own self-interest, but rather must identify and signal shared predictions and synchronously adjust their own actions to jointly achieve a higher mutual benefit.

Democratic Self-Assembly as a Natural Principle

The process for achieving complexity and stability is fundamental to the formation of all complex, symbiotic, multicellular forms of life; it entails a form of complementary segmentation to reduce entropy or “Free Energy” whereby the joint benefits outweigh the benefits of the individual agents acting on their own.

The question of how self-assembly works at the multi-cellular level or multi-agent to achieve stable complexity is not just a story of how more complex biological forms are created, but also how more complex forms of intelligences are created to predictively anticipate and shape the world around them. This is not an individual process but one of group selection as the Nobel Laureate Gerald Edelman argued in his book, *Neural Darwinism: Neuronal Group Selection* (1985). The discoverer of eukaryotic symbiotic evolution, Lynn Margulis, demonstrated the importance of cooperation in achieving stable complexity.

At the socio-economic level, the importance of symbiotic mutualism is demonstrated by the long history of American agricultural cooperatives, credit unions, and insurance risk pools as exemplars of the symbiotic process where individuals with very different preferences come together under a common preference, the reduction of risk or the pooling of resources, to organize themselves under new rules of self-regulation.

Scale-Free and Domain Free Self-Assembly

This is a very well researched process in information physics and computational biology, and it shows that at each level of self-assembling processes a new kind of boundary condition and intentionality emerges. It has been demonstrated that each level or scale of self-assembly acts by the same principles as those levels both

above and below it. One level does not reduce to the other, but “what is true as below is true as above” is a universal principle of nested organization.

In technical terms, each agent is a Markov blanket which becomes a “blanketed” or enclosed independent, self-assembling whole that achieves relative autonomy in its niche by reliably predicting the state of that niche and its own internal states and its actions on that niche.

Given that ideologies and policies can be modeled, tested, and predicted, creative change does not necessarily entail “destruction” and hence, organizations, firms, and sectors can adapt without having to be destroyed. This is indeed what separates living and sentient beings from blind mechanisms acting as though their futures are to be determined not by planning and prediction, but by a presumption of “random variation”.

Conclusion

This is the first in a series of essays. This initial essay begins with the provocation that current democratic institutions, principles, and practices are inherently flawed and limited by their Enlightenment origins and adherence to Cartesian Dualism. These limitations make many of the guiding principles of American Democracy incapable of addressing the fundamental challenges of an exponentially growing, technology driven, and complex digital and computational society.

The essay challenges such hallowed doctrines as separation of powers, textual originalism, subsidiarity and decentralization, free markets, and free speech. As modern societies become more digital, interdependent, virtual, and networked, it is argued that new forms of distributed self-governance become possible grounded in scientific principles and informed by the new informational physics and biology of natural intelligences.

The application of such sciences to deploy autonomous forms of adaptive intelligences that embody the same principles of error prediction minimization that the brain does to enable growth and stability at multiple scales and across many different areas of application. This initial essay lays the groundwork of a major “upgrade” in current democratic institutions. The second essay examines the application of such approaches in greater depth to create healthy and stable ideologies and institutions grounded in First Principles of a science-based governance.

¹ The heading “From Enlightenment to Entanglement” owes its inspiration to Danny Hillis’ essay, “The Enlightenment is Dead; Long Live the Entanglement,” *Journal of Design and Science*, 2016.

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