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How Testosterone and Serotonin Drive the Shift in Global Power Dynamics, and Geopolitics of Social Conflict in the Clash of Civilizations

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Abstract

The recent atrocious war starting in 2022 between Russia and Ukraine has highlighted the underlying fundamental tensions between the two polar sides of the Eurasian grand supercontinent, connecting Western Europe (and also the United States across the Atlantic Ocean, further west) on one polar side, versus the Far East of Asia where China is centered on the other polar side, and Russia, as a land bridge between them then absorbing influences from both sides through its history over the last millennium. This great geophysical divide has been an important point in history of human conflict, in periods of war such as the great invasion of the Mongol hoards beginning in the thirteenth century, leading to the unification of today's Russia, China, and Iran (ancient Persia) under the Mongol Empire. The Rise of the Islamic Empire in the seventh century also led to great conquest stretching from the east in China to Spain (Andalusia) in the West. Today, in the twenty-first century, we are experiencing similar challenges with rise of Islamic jihad for global caliphate and global social conflict in the East-West paradigm. In this article we shall examine this fundamental global social divide from the holistic view of Sociophysics, seeking to understand the dynamic behavior of human crowds in terms of complex system moved by physical, biological and social forces. This work further develops the theory presented in the 2019 article, "Solar Cycles, Light, Sex Hormones and The Life Cycles of Civilization: Toward Integrated Chronobiology", which suggests sex and growth hormones, driven by seasonal solar patterns (chronobiology) are the driving force of human social dynamics. According to this view, solar energy levels reaching us as daylight determine human sex hormones levels, regulating our biological and sexual behavior, by driving human social mood trends and collective action, manifesting itself in the rhythm of human history from fall of civilization to a Dark Age of plagues pandemics and wars, to rebirth into a Renaissance leading to an age of Enlightenment.

Key Words: sex hormones, chronosociobiology, geopolitics, social conflict, evolutionary psychology

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Introduction

The Russia-Ukraine border conflict is at the center the Eurasian supercontinent, representing not only a topographical divide, but a much greater civilizational divide between cultures and political and economic systems. This divide demarcates the West from the Eastern sociopolitical system. Since the Enlightenment, the West has been associated more with liberty, independence, individual rights, and capitalism, favoring independent nation states, with rule of law, equal rights, and limited government authority. The East, on the other hand, is more authoritarian, centralized, collectivist, and socialistic, and tends toward a globalist empire.

The focus of this article is to study this geopolitical conflict from an interdisciplinary scientific point of view termed *sociophysics*. The founder of sociology, Auguste Comte, defined "social physics" in the following manner:

> [T]hat science which occupies itself with social phenomena, considered in the same light as astronomical, physical, chemical, and physiological phenomena, that is to say as being subject to natural and invariable laws, the discovery of which is the special object of its researches (Iggers, 1959).

Sociophysics seeks to understand the dynamic behavior of human crowds in terms of complex systems moved by physical, biological, and social forces. This work further develops the theory presented in the article "The Testosterone Paradox: How Sex Hormones Shape the Academic Mind" (Barzilai, 2019b), which suggests sex and growth hormones, driven by seasonal solar patterns (chronobiology) are the driving force of human social dynamics. According to this view, solar energy levels, reaching us as daylight, determine human sex hormone levels, regulating our biological and sexual behavior and driving human social mood trends and collective action. These behaviors in aggregate manifest in the rhythm of human history, from the fall of civilization into a Dark Age of plagues, pandemics, and wars, to rebirth into a Renaissance, leading to an age of Enlightenment.

In addition to Comte, another French father of sociology, Émile Durkheim, determined that human society is unified by a collective force that is manifested in its moral and religious sentiments that hold it together and direct its course, circling around its common values, similar to an electromagnet that brings the electric components to circle around its center of power. Contemporary moral psychologist Jonathan Haidt echoes Durkheim when describing the magnetic power of shared social values in a given society. He writes:

> Sacred values act like a powerful electromagnet, generating moral flux lines. Everyone and everything must fall into place along those lines. Within a moral force field, deviance is deeply

disturbing. Apostates and heretics must be banished or executed (Haidt, 2011; Coleman and Leo, 2017).

The current trend of rising global polarization between the two sides of our global civilization can certainly be described in terms of complex systems such as the current in an electromagnetic system that drives electric current from one polar side to the other (plus versus minus) until reaching a new energy equilibrium. Another apt metaphor describing the chaotic global tension is a massive earthquake caused by the violent motion of tectonic plates that shake the current order in the system to a chaotic state of flux that will finally settle into a new equilibrium.

Moreover, sociocultural differences seen across the East–West divide on our globe are evident in our very genetics. According to recent research in neuroscience, a theory called "culture–gene coevolutionary theory" maintains that these sociocultural differences originate in human biological genetic inheritance—they have evolved and adapted "and influence the social and physical environments under which genetic selection operates" (Chiao *et al.,* 2009). Research that looked at the serotonin transporter gene (5-HTTLPR) and cultural propensity toward individualism or collectivism indicated that these different mindsets correlate with the prevalence of the S allele of the serotonin transporter gene: In collectivist societies (N = 29), "significantly" more individuals had the S allele than in more individualist cultures. Interestingly, the more people carrying the S allele in a nation, the less evidence of anxiety and mood disorders. Culture–gene coevolution has been found in much other research as well. In a 2015 meta-analysis, the author presents evidence that physiological differences are notable between Asian males and African or European males (Hertler, 2015). Steven C. Hertler reports that Asian males display "less sexual dimorphism, muscularity, and less marked secondary sexual characteristics… showing less sexual drive and activity as well as smaller testicles and lower sperm counts." Moreover, Hertler asserts that these physiological differences in Asians indicate "a more peaceably monogamous mating history" and "are directly associated with the collectivist ethos that has been historically, anthropologically, and sociologically observed among the Asian people.

Hence, we can use the emerging scientific discipline of Sociophysics to analyze current trends of the fall of civilization toward global social conflict and war as being powered by physical, biological, and psychological forces as single social phenomenon.

The geopolitics of unipolar versus bipolar worlds

This emerging bipolar world with the rise of China and Russia in recent decades represents a paradigm shift, shaking the old order that was established since 1987 with the breakup of the Soviet Union in

Eastern Europe. At that time, the United States emerged as the only superpower, a unipolar force maintaining the global order under Western, American leadership. In the subsequent decades, however, the East has grown in power and prosperity. China has become the second greatest global economy and superpower, and Russia has developed as a global export leader in the energy and commodities markets. Both of these countries also boast great military might. The convergence of these factors has created a global competitive environment that in recent years has transitioned from one of healthy, global cooperation, free trade, and division of labor that benefits the world economy into one of growing distrust, more trade sanctions that lead to the fall of global trade, and wars. In fact, the current global scenario looks like the path to a world war, a similar path that led from the Great Depression of the 1930s to World War II.

Sociobiology versus the individual man

Prominent Harvard biologist E. O. Wilson has suggested throughout his work on social insects, primarily ants, that human beings are a similar ultra-social species, called *eusocial*. Such social species tend to form groups, as ants do in their colony, with a social division of labor and a sharing of common goals to protect and further itself. Wilson contended that humans, like ants, evolve at a group level. Eusocial creatures comprise a superorganism: a group of organisms in the same species that interact in synergy to create a social unit. The collective acts in concert to produce the emergent phenomenon of a greater whole than the sum of its parts. Darwin determined that the unit of evolutionary selection in a eusocial group is the group as a whole, not each individual creature.

This evolutionary, biological view of the collectivist nature of human as a social animal is in obvious contrast to the Enlightenment vision of the independent and rational man who created the modern Western world. This article suggests that this social trend of decline in Western's man autonomy of will and culture of reason is actually itself an evolved psychological adaptation. This adaptation is generated by a gradual, prolonged decline in sex and growth hormones, primarily testosterone and serotonin, since their peak during the Enlightenment, in which the West rose in dominance and prominence in the global pecking order of the nations. Indeed, it was during the Enlightenment period that the Russian Empire under the Reign of Peter the Great identified itself with Western European culture, emulating its institutions, such as art, science, and industrial civilization.

This remarkable Western influence on the Russia Eurasian Empire, that connects East to West, was best identified with the establishment of the great eighteenth-century city of Saint Petersburg in the western part of Russia, by Peter the Great. However, today, as

solar and sexual energies are in global decline, we see Russia being influenced and attracted again to the East, forging an alliance with China and Iran, against the West. This is a similar pattern to the period of the thirteenth and fourteenth centuries with rise of the Mongol Empire under Genghis Khan that united Russia, China, and Persia under its imperial rule.

The Bioenergetics of social dynamics

This repeating historical pattern suggests that sex hormones, regulated and synchronized as a chrono-sociobiological mechanism according to solar cycles, shape the sociocultural evolution of the Eurasian supercontinent. In a period of rising solar activity, similar to the summer mating season, the modern Western world, energized by high fertility rates, a view of the rational man, and dominance over nature, rose to create the great wealthy industrial civilization, reaching its peak in the twentieth century. However, declining solar activity and sex hormone levels led to a more pessimistic worldview. The German historian Oswald Spengler published his book *Decline of the West* (1918), during the period of WWI and the Spanish Flu Pandemic that led to the rise of communism and fascism in Europe and Asia. Spengler recognized the changes in history as evolutionary and organic, as described in the *Wikipedia* article about the book:

> Spengler introduces his book as a "Copernican overturn"—a specific metaphor of societal collapse—involving the rejection of the Eurocentric view of history, especially the division of history into the linear "ancient-medieval-modern" rubric. According to Spengler, the meaningful units for history are not epochs but whole cultures which evolve as organisms. He recognizes at least eight high cultures: Babylonian, Egyptian, Chinese, Indian, Mesoamerican (Mayan/Aztec), Classical (Greek /Roman, "Apollonian"), Arabian ("Magian"), and Western or European ("Faustian"). Cultures have a lifespan of about a thousand years of flourishing, and a thousand years of decline. The final stage of each culture is, in his word use, a "civilization."
>
> According to Spengler, the Western world is ending, and we are witnessing the final season, the "winter" of Faustian Civilization. In Spengler's depiction, Western Man is a proud but tragic figure because, while he strives and creates, he secretly knows the actual goal will never be reached (Spengler, 1918).

Bioenergetics: How cultural evolution shapes modern science

With the hope of resisting the fall of the rational, productive West and thwarting Spengler's prediction, the influence of bioenergetics on human development should be further studied in a more holistic context as shaping the evolution of the human social mind, including

our produced ideas, body of science, and how they form our cultural view of universe. Pioneering geneticist Douglas C. Wallace explains the energetic impetus of bioenergetics that is the driver of biological complexity:

> Complex structures are generated and maintained through energy flux. Structures embody information, and biological information is stored in nucleic acids. The progressive increase in biological complexity over geologic time is thus the consequence of the information-generating power of energy flow plus the information-accumulating capacity of DNA, winnowed by natural election. Consequently, the most important component of the biological environment is energy flow: the availability of calories and their use for growth, survival, and reproduction… and the ascent of man has been the product of 3.5 billion years of information generation by energy flow, accumulated and preserved in DNA and edited by natural selection (Wallace, 2010).

This evolutionary process can be observed in the rise of modern science during the period of Enlightenment philosophy engendered by the father of modern physics, Isaac Newton, who based his scientific worldview on the "God of order" (Harrison, 2019). This manifests in his physics of the laws of gravitation in a clock-work universe, in which natural objects are ordered according to the creation of God the Father who dominates nature and extols masculine order.

However, this view of orderly universe was diminished in the period the counter-Enlightenment, transforming our view of nature to a more chaotic flux of energy and matter. This was evident in the rise of the theory of electromagnetism during the nineteenth century by Michael Faraday and James Clerk Maxwell, leading to Einstein's radical paradigm shift with relativistic time and space. Rather than Newtonian absolute time and space, Einstein postulated relativism, culminating finally with Heisenberg's "uncertainty principle" and quantum mechanics, whose Copenhagen Interpretation completely invalidates the existence of objective reality. Heisenberg's uncertainty principle claimed to disprove the laws of logic, including the laws of identity and causality. In his 1927 paper he states:

> In the sharp formulation of the law of causality -"if we know the present exactly, we can calculate the future"- it is not the conclusion that is wrong but the premise.
>
> I believe that the existence of the classical "path" can be pregnantly formulated as follows: The "path" comes into existence only when we observe it (Heisenberg, 1927).

What Heisenberg cast doubt upon was the very *meaning* inherent in the activity of the physical world. The idea wave-particle duality in quantum mechanics emerges as a conflict whether the physical universe is made of collective undivided continuous waves of energy,

or discrete individual particles of light photons. This view pertains also to human social organization with the contrast between individualism and collectivist ideologies that focus on society as a whole, as a single wave rather than composed of independent elements, or societal and cultural waves rather than individual particles. This manifestation of collective action and wave dynamics in human social behavior is manifested in The Third Wave, an experimental social movement created by California high school history teacher Ron Jones in 1967 to explain how the German population could have accepted the actions of the Nazi regime during the rise of the Third Reich and the Second World War (Jones, 1967). This experiment was also done during the period of the wave of Cultural Revolution under communist Mao in China (1966-1976).

We see here a pattern of decline solar energy causing diminishing levels of sex and growth hormones, primarily testosterone, causing our evolved minds to change our very perception of the universe from an orderly one to a state of chaotic flux. During the period from peak solar activity in 1776 to its low in 1933 we also see a paradigm shift from the idea of liberty and national independence of the Founding Fathers of the United States, who rebelled against the mighty British Empire, to a shift back toward collectivist ideologies of Empire, beginning with Napoleonic wars for a French Empire in the early nineteenth century. This shift was further realized during the twentieth-century World Wars, in which the Soviet communist Empire fought against the German Nazi Empire—as well as the war in the East between Imperial Japan and communist China.

During this period in biology also emerged a new Darwinian evolutionary paradigm, which contradicts the Newtonian, religious Enlightenment view of God as creator of the entire animal and plant world. This began with Thomas Malthus in the early nineteenth century, who became concerned that overpopulation would demographic and economic collapse. This inspired Charles Darwin to later develop the theory of evolution through natural selection, and led directly to Nazi Eugenics theory that sought to develop a master race by eliminating and enslaving the lower races, in a biological race war for natural dominance in environment of limited resources. This counter-Enlightenment period of falling solar activity leads to a phenomenon of negative social mood in a Dark Winter of plagues, pandemics, lower fertility rates, and sex wars for social dominance (Barzilai, 2019a; 2020a).

Dark winter environmental conditions and stress response

The stress hormone cortisol is associated with the fight or flight stress response in humans when conditions threaten survival or stress to the organism. In order to save resources to fight disease, cold, and enemy threats, allocation of resources for growth and fertility are reduced.

Hence, we see increased social conflict for limited resources. Furthermore, in cold winter periods, low agricultural yields lead to bodily adaptations that are similar to a bear in winter hibernation. Hence, we observe in periods of low solar activity, causing colder winters and pandemics, such as the Spanish Flu pandemic of 1918 or the COVID-19 Pandemic of 2020 (Barzilai, 2020b), that the human social organism adapts to this stressful environment as a super organism, by reducing fertility rates and increasing social cohesion to fight foreign enemies. This ecological view of immune response is expressed in the article "Stress, Energy, and Immunity":

> A common perspective on stress-related changes in the human immune system is that such changes are potentially harmful, especially those occurring during chronic stress. In contrast, an ecological perspective views the immune system as an energetically costly system that may or may not have priority over other uses of that energy. From this perspective, the immune system may have energy made available for it via reduction of other activities, may change in energetically conservative ways when the protection it confers needs to be balanced with the energetic demands of other activities such as fight or flight, or may be suppressed when other activities are more important than immunity for total well-being. This last type of change can explain why aspects of psychosocial health such as optimism relate to worse immunity under some circumstances and suggests that both benefits and costs of immunosuppression during stress should be considered in research on human stress and immunity (Segerstrom, 2007).

Testosterone, the power hormone, and energy dominance and independence

The low testosterone, low power, and low energy environment that we are experiencing today in the West also shapes our global sociopolitical systems in regards to our economic utilization of energy to power modern industrial societies. The rise and fall of complex societies with great metropolitan centers that produce vast economic prosperity is dependent on the production and consumption of huge energy resources to fuel economic growth. However, the current trend of the green environmental mentality exhibits a primordial fear of Mother Nature punishing mankind for its use of energy and resources in order "to be fruitful and multiply and have dominion over nature." Such fear will not only bring the collapse of modern civilization, but also we observe its immediate results in the current conflict between Russia and Ukraine, as much of western and central Europe, in particular Germany, has shut down coal and nuclear energy due to climate alarmism and has found itself dependent on Russian energy dominance for oil and gas deliveries.

In 1971, pro-individual and capitalist American philosopher, Ayn Rand, warned of these ominous trends in her article "The New Left: The Anti-Industrial Revolution." Peter Schwartz published a similar article in 1999 under the title "Return of the Primitive: The Anti-Industrial Revolution." This was in the context of widespread fear and panic, in the period of the "Mad Max" world of the 1979 film and Paul Ehrlich's famous book, *The Population Bomb* (1968) in a demographic and nuclear winter period. Ehrlich warned about a lack of resources for an exploding population, causing a Malthusian trap, as early editions of *The Population Bomb* began with the statement:

> The battle to feed all of humanity is over. In the 1970s hundreds of millions of people will starve to death in spite of any crash programs embarked upon now. At this late date nothing can prevent a substantial increase in the world death rate… (Ehrlich, 1968).

Furthermore, we should remember that both Napoleon's and Hitler's wars and invasions of Russia failed due to very cold winters. In addition, it has been suggested that Hitler's invasion of the Soviet Union was to get control of oil resources in the east and grains for food in Ukraine because Churchill's British embargo blocked oil and food shipment to Germany from the West, causing a severe oil and energy shortage. A similar collapse of the Western economy today is probable as Russia exerts its energy and resource dominance over the West during the cold winter.

A Twenty-first century view of the historically recurring life-cycle of civilization

If we look backward from our current historical perspective, we can observe a seven-century cycle of civilization:

19th century BCE – Fall of Sumerian civilization

Rise of Ancient Egypt

13th century BCE – 10 Plagues on Egypt, The Bronze Age Collapse – Mediterranean Apocalypse

Rise of Ancient Israel

6th century BCE – Fall of First Temple in Jerusalem

Rise of Classical Greece and Roman Republic, Persian Empire

1st century CE – Fall of Second Temple

Rise of Roman Empire

7th century CE – Plagues, global Islamic Jihad, fall to Dark Ages

Rise of Golden Age of Islam

14th century – Black Plague, as Mongol Empire conquers China, Russia and Islamic world

Rise of Renaissance of European Civilization

21th century – Pandemics, sex wars for global empire

This cyclical view of civilization based on solar cycles has been backed by a recently published new article on solar cycles, which predicts we are heading into a period of reduced solar activity over the next few decades. According to the article on millennial solar cycles published in Nature journal in 2015, *Heartbeat of the Sun from Principal Component Analysis and prediction of solar activity on a millennium timescale,* there is a 350 years repeating solar cycle which is half of the seven-century cycle suggested here:

Extrapolation of the PCs backward for 800 years reveals the two 350-year grand cycles superimposed on 22 year-cycles with the features showing a remarkable resemblance to sunspot activity reported in the past including the Maunder and Dalton minimum. The summary curve calculated for the next millennium predicts further three grand cycles with the closest grand minimum occurring in the forthcoming cycles 26–27 with the two magnetic field waves separating into the opposite hemispheres leading to strongly reduced solar activity (Zharkova, 2015).

Conclusion

This historical research suggests that we are reaching the ending of a seven-century grand super cycle in civilization starting from a collapse in Black Plague in the fourteenth century to a peak in the Enlightenment in the eighteenth century, leading to a decline and collapse into the twenty-first century, due to rise and fall in solar activity cycles. Hence, now society is falling into a low energy, low testosterone state of asexual behavior, low fertility rates, transgenderism, social conflict, sex wars, pandemics, and wars for empire.

If we study our natural world and biosphere from a holistic perspective, we can seek the conception of chemist James Lovelock who proposed the Gaia Hypothesis in the 1970s, co-developed by the microbiologist Lynn Margulis:

> The Gaia hypothesis proposes that all organisms and their inorganic surrounding on Earth are closely integrated to form a single and self-regulating complex system maintaining the conditions for life on the planet. The scientific investigation of the Gaia hypothesis focuses on observing how the biosphere and the evolution of life forms contribute to the stability of global temperature, ocean salinity, oxygen in the atmosphere and other factors of habitability in a preferred homeostasis.

Furthermore, if we study human civilization as an integral part of our biosphere, which means our complex social systems adapt as a

holistic body of civilization to environmental change through self-regulation, similar to a homeostatic bodily mechanisms that self-regulate our bodily systems in response to environmental change, then we may better understand the forces of our bio cultural evolution.

Epigenetics is an emerging field of science that investigates how genes can be activated by self-regulating processes as adaptation to environmental change. The article "Epigenomics and Gene Regulation in Mammalian Social Systems, suggests a new view of gene regulation as affecting sociobiological systems:

> Social epigenomics is a new field of research that studies how the social environment shapes the epigenome and how in turn the epigenome modulates behavior. We focus on describing known gene–environment interactions (GEIs) and epigenetic mechanisms in different mammalian social systems. To illustrate how epigenetic mechanisms integrate GEIs, we highlight examples where epigenetic mechanisms are associated with social behaviors and with their maintenance through neuroendocrine, locomotor, and metabolic responses.

In conclusion, I would suggest that we seek to understand our current negative trend in social mood that is manifested in the 2020 Coronavirus pandemic hysteria, fear of climate change, rising social and political conflict, and the threat of global world wars, from a broader biosocial perspective. This perspective includes the chronobiological effects of solar activity and light on our earthly environment, hormone regulation, stress response, and evolved psychological immune response in such conditions.

To understand how hormones, provide the impetus for human activity, we can study the rise of Western science and technology since the age of Enlightenment that led to the invention of nuclear energy in the twentieth century to power the economic growth of modern civilization. However, technology usage can be a double-edged sword, as the counter-Enlightenment trend has demonstrated—including the twentieth-century nuclear weapons of mass destruction using this immense energy source that were employed against Japan in 1945 during WWII. Today, we have superpowers with thermonuclear weapons that can be bring the abrupt destruction of civilization. As our hormones drive social trends for either creating and building civilization or its decline and final destruction, we have to beware of this double-edged sword.

Furthermore, we know that thermonuclear weapon technology, as in the hydrogen bomb, uses thermonuclear reactions, as in the sun, which employ transformations in the nuclei of atoms of low atomic weight (such as hydrogen) that require a very high temperatures for their fusion into heavier elements that causes the release of immense nuclear energy. This complex sociophysical system, of atoms fusing into greater wholes, works on energy levels, similarly to a view our

civilization as composed of individual people who organize into unit of greater groups, energized by solar energy trends.

This raises the question whether this a deterministic environmental system in which complex societies doomed to collapse back to Dark Ages, due to the intense stress reaction to the adverse environmental earthly conditions caused by low solar energy? Or can the rational man of modern science and technology, inspired by an Enlightenment worldview of dominance over Mother Nature, rise up to these great challenges by utilizing our energy resources to further the life and prosperity of mankind?

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