

***Future human evolution:
Can we change human nature?***

by

S M Sigerson

copyright S M Sigerson 2015, 2022
all rights reserved

Licensed under
Creative Commons copyright
CC BY-NC-ND 4.0

This work may be freely shared and excerpted
on a strictly non-profit basis,
with appropriate citation.

Not for commercial use

Future human evolution: Can we change human nature?

Humanity's age-old dilemmas are often set down to what we call human nature. Even the most philosophical shake their heads in despair at this, as an impassible boundary to progress. Though some have denied its existence, studies indicate that we do indeed have a nature, instincts, and patterns of behavior which are endemic to our species. Even so... Could we change?

In what does our nature consist? Is it hopelessly etched in stone? Or only written on our DNA? If our instincts and behavior have evolved beyond that of earlier primates and hominid ancestors, is it possible for us to improve them? If so, why haven't we done so, noticeably, lately?

How did we get this way?

Modern humans comprise the triumph and pinnacle of mammalian evolution; (that is, at least, in our own view.) Yet *Homo sapiens sapiens* have remained remarkably static, for an extraordinarily long time. The basic model seems to have shown little significant evolutionary changes since it first emerged, many millenia ago. ⁱ

Back then, our species evolved rather suddenly, in a relatively short time (as hominid evolutions go): toward the end of the last ice age, when global climate was swinging continuously between millennia of warming temperatures, followed by millennia of deep freeze conditions, and back again. This leads one to surmise that we literally re-invented ourselves in response to this particular crisis, in order to overcome certain challenges.

Why evolutionary decisions?

Evolutionary decisions may generally be characterized as driven by one agenda: survival. As an inter-generational agenda, bent toward a goal which cannot be achieved within the span of any one lifetime, that means not individual survival, but species survival. In this it is a kind of altruistic instinct: something directed toward a greater good, "*which will not touch the life of the individual at any point.*" ⁱⁱ

Scientists now tell us that evolution need not always be so abstruse, mysterious, or even so imperceptibly gradual as was once supposed. Evolutionary decisions are being made, so to speak, every day. Species as unsophisticated as, for instance, tiny guppies, can adapt to changes in their environment by modifying their average size, age at maturity, reproductive patterns, etc., in only a few generations. ⁱⁱⁱ

Human nature & social problems: how are we different?

This poses interesting questions when placed beside chronic human dilemmas. Our own vicious cycles of social problems, and the disasters which they spawn, have been both unique among earth's fauna and amazingly consistent, throughout recent millennia.

Whether described by ancient Greeks, the Bible, cuneiform tablets, Inca chronicles, or the earliest Asian scribes, how many passages, without knowledge of their source, could be mistaken for the latest comment on world events today? Evidence indicates that the social disasters which so equally occupied the Hittites, ancient Chinese, and Assyrians, were old news long before those great civilizations rose and fell. In fact, we'd

already had several millennia to work these things out, before writing was ever invented.

Our genocidal conflicts and cruel, institutionalized injustice are behaviors unique to us alone, among all the world's living organisms. While not always occurring everywhere to the same extent, they are part of a compulsive repetitive cycle, reproducing itself under conditions which we ourselves continuously re-create, independently, in different times and places, around the globe, throughout history and pre-history.

The oft-repeated pattern can be roughly summarized: somewhere, eventually, hunter-gatherers become so successful, that they over-populate, beyond the capacity of the land to support them by this means. (Hunting/gathering requiring a considerable range of open territory per capita.) This leads to the invention of agriculture and food storage. The subsequent success of these more advanced food production systems ultimately fosters even greater over-population, placing pressure on the supply of premium farmland. This leads to the introduction of land ownership, and conflicts over land which inevitably ensue. ^{iv}

These combined developments are both the cause and result of increased social organization. And it is new levels of group cooperation as a survival strategy, which anthropologists have come to suspect as the root motivation for the emergence of *Homo sapiens sapiens*, with its unprecedented, new types of intelligence. ^v

If so, this need for higher social organization, the catalyst driving our development as modern humans, has become also the source of our worst chronic problems as a species; ironically threatening not only our own survival, but that of our environment, and of all other life forms on this planet.

Increased social organization plus conflict equals war. Continually over-successful reproduction (among us) begets insatiable need to acquire more land. It fosters ever more complex societies, more divided into more classes, to produce, store, distribute ever more food, and to engage in spiralling defensive and offensive military operations, within and without. All revolving round that problematic phenomenon:

The ruling class

Ruling classes thus thrust and thrusting themselves into positions of power have had a way of losing sight of the common good, in the pursuit of private advantage. In this process, inter-tribal struggles, pushing each other back and forth over a few acres, have been replaced by sophisticated military culture, with a profit motive.

Such conflicts motivate drives for larger population, which offer military advantages; the greatest supply of "cannon fodder" not the least of these. (That is, young males ripe for sacrifice to cults of martial "glory".) ^{vi} Thus over-population, the long-term problem, begat more drive to over-populate, as a short-term solution. Until we reach the eras of advanced militarist patriarchies, characterized by slavery, mass torture, and imprisonment. Dependent on sophisticated surveillance, dedicated to strangling ideas, persons, movements which might threaten to slow their career toward self-annihilation. Setting the stage for the worst possible scenario: genocide.

Patriarchy

Such militarist societies have often involved the expulsion of half the population (women) from all professions, and their confinement to a class of child-bearing servants; at incalculable cost to social, political, and cultural development. ^{vii}

This cycle has become a dominant human paradigm, now menacing us with self-extinction. Enlightenment, civil rights movements, democracy, global cooperation and dialogue, seem struggling nobly but hopelessly to catch up with the tsunami of inertia, driving us down this hamartic tragedy of self-doom.

Why don't we?

With the aid of literacy, with the benefit of all our vast reservoir of written history and great thinkers to instruct us, why haven't we learned? Why haven't we changed? The guppies don't have all that; yet manage to sort out their evolutionary difficulties with comparative ease. All we've managed are a few minor adjustments, (increasing our capacity to digest cow's milk, acquiring blue eyes, etc,) which seem trivial indeed compared with the problems we've failed to solve.

In this there appears some fundamental difference between the functional capacities of the lofty, "crown of creation" two-legged, and the lowly, simple guppy; one in which we are not the winners.

Guppies, finches, and any number of other creatures make marvellous, spontaneous self-modifications of their species, ingeniously responding with appropriate, effective solutions to new challenges in their environments. Yet it seems safe to presume that these evolutionary choices are not the result of a conscious, deliberate intellectual process. All the finches don't call a meeting, discuss the long draught conditions and settle among them on changing the size and shape of their beaks. They don't make a circle, chanting "smaller beaks, smaller beaks." At least, no scientist has ever caught them at it! ^{viii}

Certainly, our hominid ancestors were not above making dramatically ingenious evolutionary decisions. That's how we got here. If they had the capacity to make such choices, when did we stop? Why did we stop? How did we get off that path? Does this mean we've lost the capacity to change? Or is it within our power, in our present condition, to get back in the evolutionary game? ^{ix}

Why don't people in the arctic grow fur? In communities where homelessness has been continuous over generations, why don't people develop a metabolism which enables them to live without shelter, in cold, wet conditions, as happily as ducks or cattle?

While social controversies furiously rage over birth control and abortion, why do women go on ovulating in such a manner as to be continually plagued by unwanted pregnancies?

When did we decide to join the very few species who are "continuous breeders": with potential to become pregnant 365 days a year? Was this in connection with the emergence of more sophisticated group organization, as our favored survival strategy? Was it because more people equalled increased chances our species would survive? ^x Or was it the bigger brains that came with that, which required longer childhoods, and a whole village to raise just one child?

However that may have been, our remarkable reproductive strategy has long since so outlived its usefulness as to prove a blight to humanity and to our planet, defeating its own purpose.

What does the scientific community propose?

Predictably, scientists by and large concur that the solution to our evolutionary predicament is more science. Just as chemists suggest drugs, surgeons favour surgery, and the hangman can be trusted to recommend more hangings.

The prospect of our making new evolutionary decisions is rather a neglected field of study. What has been written on it, even in scholarly quarters, seems inspired more by science fiction, than by science. It is peppered with musings about "bionic" frankensteins, reducing human life to artificial intelligence within a mechanical body; colonization of

some other habitable but unoccupied planet (if we ever find one); and/or improving ourselves through carefully selected breeding (presumably to be overseen by smiling scientists.) Exuding great confidence, some professors outline a future of totalitarian autocracy, which will tame our unruly sexual drives into perfectly regimented docility. It's shocking how academics with a forest of letters after their names can overlook that this is a failed mideaval paradigm, looking back to the Dark Ages, and not forward into the unknown.

A rare exception is R Powell, who has had the temerity to point out that our long abstention from evolutionary change, is in itself a "selection" on our part. In his "The Future of Human Evolution" Powell carefully dismantles several popular scientific explanations as to why *homo sapiens* have remained evolutionarily static for so long. He concludes that we have remained the same because we chose to; and that without that "selection" operating, the universal tendency to evolutionary drift would naturally take over. (Interestingly enough, Powell is from neither the biology nor the anthropology department, but on the faculty of philosophy.)

The Neanderthal evidence: biological evolution vs technological invention

Perhaps a clue to how we diverged in our development might be found in recent discussion of the Neanderthal mystery: Why did these intelligent, robust *Homo neanderthalensis* become extinct, while the related *Homo sapiens sapiens* prospered?

It has been found that, in response to the ice age, Neanderthals developed more cold-resistant bodies. The modern humans next door, so to speak, did not: instead, they invented complex clothing.^{xi}

Complex clothing is now suspected to have been the technological leap forward which set modern humans on the path to world domination. That is, not just an animal skin that's wrapped around the shoulders, but sleeves. Boots. In a word, tailoring.

If this is true, it would mean that the Neanderthals hit a dead end because, in the crises of the last ice age, they relied on the well-established processes of gradual biological evolution. And transversely, modern humans thrived because they turned away from evolution, toward *invented technological remedies*.

Is this how we got off the evolutionary train?

In some antediluvian survival crisis, was our developmental attention somehow shifted away from evolution, and riveted on technology? If our new "prime directive" as a species somehow became "*When in doubt, invent*"... that would certainly account for a lot of our singularity among the earth's creatures. Did we as a species, for particular reasons, at a particular juncture, turn our backs on biological evolution, and congenitally embrace technology as the end-all, be-all solution to every problem?

Could this be how our biological evolution activators got permanently disconnected?

Evolutionary mistakes?

So we invented agriculture. We invented land ownership. We invented government, monarchies, priesthoods, fanaticism. We invented war, genocide. We even invented movements for social justice.

Now we respond to the mess we've created, not by changing ourselves, but with more inventions. Our failure to evolve out of a pattern of continual over-population and destruction of environment, has spawned ever-swelling hoards of destitute, homeless brethren, who have been failed by society's economic arrangements; including tens of millions of refugees, recognized and otherwise, viciously driven from communities devastated by war and genocide.

So we invent social services: white-collar jobs herding, sorting, tagging, feeding, housing, and/or refusing to feed or house. For those missed by this very loose safety net, we invent tactical forces: imprisoning, driving away from every shelter, mercilessly hounding from place to place until death by exhaustion; above all, preventing them, heaven forefend, from providing for themselves by hunting, gathering, or building simple shelters. In worst case scenarios, such forces may resort to massacre and genocide of those "unwanted" by the powers that be. Whether through racial conflict, colonialism, famine, or fanatical pogrom, the bottom line motivation for all such atrocities ultimately remains competition for land and resources. ^{xii xiii}

But there is no military / enforcement solution to the global refugee crisis, nor for its twin crises of "internally displaced persons" and other forms of homeless destitution.

INSANITY

In all our brilliant inventions of science, medicine, healing arts, throughout innumerable millennia, the very last topic to win western science' attention has been psychology. The study of the human mind, its mental health, or lack thereof, is a late modern development, still in its infancy.

How extraordinary, in view of mental health issues seeming vastly more prevalent among humans than in any other species. Animal behavior, by comparison, is observed to be consistently predictable, reasonable, and hardly violent, except for food or other survival concerns.

In stark contrast, the staggering scale of irrational, pointlessly destructive human behaviours defies enumeration: wantonly abusive cruelty, often against women, children, intimate family; torture, murderous sexual violence, mass femicide, genocide; all of the above horrifically multiplied and compounded when in the context of war (another thing no other species does); not to mention war crimes.

Constructs & Extraordinary Popular Delusions

Our capacity to create complex social and intellectual constructs, so vital to large-scale, organized paradigms like agriculture, land ownership, religion, academia... has been seen to be the very function which can go most disastrously wrong, in the form of fanatical mass delusions.

Yet a glance at the pages of history might suggest that society's greatest mental health challenge may not be pathology in the general population, so much as its frequency in leadership: or rather our demonstrable willingness to *follow madmen*.

History's worst catastrophes indeed tragically illustrate, how Hitlerian leaders of this kind can hypnotize armies of followers, as well as seducing other leaders and heads of state into their fold. Multitudes may be lured over a precipice of international disaster, dragging their own nation and others down with them. Not unlike Captain Ahab leading his crew to a watery grave. ^{xiv}

Even as we speak, a younger generation's collective outrage on climate change now begs the question, whether world leadership is driving us over the cliff of climate disaster, like so many mindless lemmings.

Why can't we stop it?

Enlightenment and democracies

For centuries, popular revolts were frequent enough, but could only dead end, except through an allied regime change in the ruling echelons. At the end of the day, the only real choice was which prince to serve.

Since the 18th century, popular movements have progressed beyond their role as

mere cheering sections for one lord or another. Revolutions, in the name of large-scale, centralized, republican democracy, have depended on wide dissemination of basic social principles, like freedom, cooperation, and human rights. This mass consciousness-raising has ultimately changed the face of government around the world.

In the process, we've had the happiness to find that democracies are far less likely than autocracies to go to war.^{xv} The greater voice in decision-making exercised by the general public, who do the actual fighting and suffering, the safer the world is from such orgies of destruction.

Demonstrating that the sanity of the general public can save society from the madness of autocrats.

On the right track

This shows that our instincts are not far wrong. It suggests that they may not need radical transformation, but only fine-tuning. With perhaps only small improvements, could we prevent genocidal autocracies from ever dominating society at all?

Why don't ants need political leaders?

If the spread of new ideas can change things . . . why must we depend on decades of education, endless debate, communication media, and still fumble most inefficiently toward only the clumsiest, most problematic consensus necessary to struggle on; often with one step back for each two forward?

Science is now penetrating mysteries of how animals, such as ants, bees, or migrating birds, achieve complex social cooperation, without any of the tools or practices which we require for comparable projects.^{xvi}

Could we evolve more efficient means of self-enlightenment? Could we develop entirely new paradigms for processing, testing, and disseminating ideas? Means which may seem inconceivable to us now; such as streamlined access to vast group mind of unlimited knowledge and prespective: an internet of the psychesphere.

How do we begin?

Research has shown that mutations are the first step in evolutionary change; and that a successful mutation, which strikes a chord in a given survival dilemma, can spread species-wide in a remarkably short time.^{xvii}

The possibility of manipulating DNA formulae in the laboratory is already predicated. However, by now, experience should warn us away from the addiction for ever more technological remedies.

Evolutionary anthropology has already abundantly demonstrated that we don't need test tubes to manipulate our DNA.^{xviii} We need instead to look at the way evolution occurs in nature; and to recover our innate capacity to make evolutionary decisions as our ancestors did, spontaneously, with instinctively accurate response to survival challenges.

Hypothesis: it's in our hands

The reasonable hypothesis is that our power to change ourselves has only been mislaid, and not irretrievably lost; is not dead, but only sleeping. Waiting, so to speak, for the "kiss" required to re-awaken it. That it far pre-dates and outstrips the comparatively infantine cleverness of all the scientific establishment's laboratories. Completely in the hands of all people, individually, collectively, intrinsically; it's not a pricey toy for tech companies to sell to the monied classes.

Consciousness-raising time

Certainly, in the natural world, every evolutionary change begins with consciousness: on some level, a given species recognizes that it is faced with a survival dilemma, which cannot be solved by usual means.

Humanity has this capacity. We have recognized that we are faced with such dilemmas. The *consciousness* of each individual around the globe, of their own survival struggle, of their loved ones' struggles, their community's, their nation's, constitutes, in itself, a species-wide consciousness of our evolutionary challenges.

Therefore there exists in virtually everyone the congenital drive to pursue evolutionary change; some seed of the same consciousness which somehow works so well for other creatures, and also worked for us, in the distant past.

One first step possible now is raising general consciousness, in more and more people everywhere, of the nature of these issues, and of the potential latent in each one of us, to participate in changing humanity itself through evolution.

At the same time, although guppies don't do it by calling a meeting of the minds (as far as we know,) we need to use all the tools at our disposal. In our species' race against time, we cannot afford to omit implementing all the capacities we have, in order to recover those we seem to have lost the use of.

Experiments in unified group thought have yielded substantial evidence that mental focus alone, of a large group of people, fixed on a particular event, can impact that event. Results in such experiments have shown a decrease in random outcomes, and a shift to order or synchronization, achieved solely by unity of thought. ^{xix}

One of our most useful recent inventions, the internet, has now brought together the global family of humanity in an exciting discussion of ideas, with intimate immediacy, undreamed of by previous generations. This great tool can be used to raise consciousness and focus attention on a worldwide conference of evolutionary possibilities, including virtually everyone on the planet.

Please feel free to join a discussion here:

www.holywellwordsmiths.wixsite.com/future-human-evoluti

OR START YOUR OWN wherever!

Where should we begin?

If you, dear reader, could change one thing about the human species, to solve the chronic problems discussed above, what would it be?

Let's suppose that we've discovered the means to re-activate human evolution: re-awakened our capacity to evolve in response to survival problems. In this light, let's take a few key problems from the above-described repeating patterns: over-population, destructively self-serving leadership, homelessness, genocide, human-generated climate disaster. If we could fix these things, by waving the magic wand of evolution, what would we change?

Some suggestions:

- Reduce population to a sustainable level:
- This means changing our physical reproductive strategy: from the more-is-better paradigm settled on in some past evolutionary epoch
 - ◆ Do the math: develop strategies to assimilate gradual population reduction, without economic disaster
- Develop more climate-adaptable metabolisms: vastly reducing the need for artificial heat, fabricated environments (i.e. complex housing,) and related consumption of resources.
- Develop new kinds of intelligence to change chronic, problematic paradigms, such as:
 - ◆ domination of society by the worst elements;
 - ◆ appetites for gratuitous cruelty;
 - ◆ insanity / personality disorders / abuse
 - ◆ genocidal drives;
 - ◆ femicide / gender violence ;
 - ◆ child abuse
 - ◆ the drive to silence / strangle:
 - debate;
 - new solutions;
 - successful innovation;
 - the best & brightest;
- Enable the widest possible range of creative survival strategies to flourish, side-by-side, in a context of cooperation rather than competitive domination, including:
 - ◆ permaculture & other more sustainable, non-destructive farming;
 - ◆ hunting-gathering;
 - ◆ nomadic herding;
 - ◆ other itinerant lifestyles.

What we don't need:

Much scientific writing on future humans focuses on super-science commodities for sale to high-end consumers; (predictably enough, in the context of institutionalized research as we know it.) Substantial research interest and support have been devoted to projects aimed at increasing human intelligence; even with the idea of inventing a "super-race" of higher IQ's.

This is not any kind of legitimate biological evolution which addresses humanity's pressing survival crises with real solutions.

We don't need to be smarter. It's our intelligence which has made us a menace to the planet and to ourselves. It's the *way we use* intelligence which needs to change. It's not the quantity but the *quality* of our intelligence which could improve our condition & arrest/reverse our destruction of environment.

"No one can set a boundary to the progress of a nation."

Nor to the progress of a species. History supports Parnell's admonition: clearly this is not out of our reach. It's precisely the kind of change we made, slowly and also suddenly and dramatically, in the evolutionary decisions which made us what we are today.

Bibliography / Endnotes

Alesina, Alberto & Spolaore, Enrico "War, peace, and the size of countries", Science Direct; 2004; www.sciencedirect.com/science/article/abs/pii/S0047272704001513

Buhl, J.; Sumpter, D.J.T.; Couzin, D.; Hale, J.J.; Despland, E.; Miller, E.R.; Simpson, S.J.; et al. (2006). "From disorder to order in marching locusts" (PDF). *Science*. 312 (5778): 1402–1406. Bibcode:2006Sci...312.1402B. doi:10.1126/science.1125142. PMID 16741126. S2CID 359329

Carroll, Sean B, Gompel, Nicolas, Prudhomme, Benjamin "Regulating Evolution" - Scientific American; 1 May 2008 www.scientificamerican.com/article/regulating-evolution/

Chesler, Phyllis *Women and Madness* St Martin's Griffin 1972

Darwin, Charles *Narrative of the surveying voyages of His Majesty's Ships Adventure and Beagle between the years 1826 and 1836, describing their examination of the southern shores of South America and the Beagle's circumnavigation of the globe; Journal and remarks, 1823-1836 vol II*, London, Henry Coburn

Democratic Digest "Why liberal democracies avoid war, reduce civil conflict" publication of the National Endowment for Democracy www.ned.org, Washington DC, September 21, 2017 <https://www.demdigest.org/liberal-democracies-avoid-war-reduce-civil-conflict/>

Diamond, Jared *The Third Chimpanzee / The Rise and Fall of the Third Chimpanzee* Radius Book Group 1991

Fagan, Brian M. University of California, Santa Barbara; *Peoples of the Earth; World Prehistory*, Fifth Edition; Little Brown & Co 1986

Forell, Catherine A and Matthews, Donna M *A Law of Her Own: The Reasonable Woman as a Measure of Man* New York University Press, New York 2001

Grant, Peter & Rosemary, Princeton University "Neanderthal extinction and modern human behavior: the role of climate change and clothing" by Ian Gilligan *World Archaeology* Volume 39, Number 4, December 2007; Routledge Journals, Oxon, UK

Harari, Y. N. *Sapiens: A brief history of humankind* iDvir Publishing House Ltd, Israel 2011 (in Hebrew); Random House Harper, New York 2015

Johanson, Donald *Lucy: The Beginnings of Humankind* Touchstone Simon and Schuster 1990

Lovejoy, G "The Role of Indoctrination in Gender Violence" Center For the Study of Women in Society, Gender and Violence Research Interest Group 2004 University of Oregon

MacKay, Charles *Extraordinary Popular Delusions and the Madness of Crowds*
Richard Bentley, London 1841

Potts, Dr Rick "Climate Effects on Human Evolution"; Smithsonian Institute, Human Origins Program <https://humanorigins.si.edu/research/climate-and-human-evolution/climate-effects-human-evolution>

Powell, Russell, Powell, Rachell "The Future of Human Evolution" Oxford University Press / British Society for the Philosophy of Science 2011

Woolley, Sir Charles Leonard, *The Sumerians* 1929; Oxford, Clarendon Press

Reiter, Dan "Is Democracy a Cause of Peace?" *Oxford Research Encyclopedias*
Published online: 25 January 2017
<https://oxfordre.com/politics/view/10.1093/acrefore/9780190228637.001.0001/acrefore-9780190228637-e-287>

Reznick, David; University of California, Riverside; College of Natural & Agricultural Sciences; *The Guppy Project* Ongoing work 1977 - present documented at:
www.theguppyproject.weebly.com/publications

Shirer, William *The Rise and Fall of the Third Reich* Simon and Schuster, New York 1960

Snyder, Professor Timothy, Yale University, History Department; permanent fellow Institute for Human Sciences, Vienna; member Council on Foreign Relations "The Next Genocide" 13 September 2015
www.nytimes.com/2015/09/13/opinion/sunday/the-next-genocide.html ;
www.beyondintractability.org/moos/links/resource-competition-and-genocide

Stone, Merlin, *When God Was a Woman* 1976; Barnes & Noble

Toner, J.; Tu, Y.; Ramaswamy, S. "Hydrodynamics and phases of flocks" *Annals of Physics*. 318 (1): 170–244. Bibcode:2005AnPhy.318..170T.
doi:10.1016/j.aop.2005.04.011 2005

University of California, Museum of Paleontology, Understanding Evolution
<https://evolution.berkeley.edu/evolution-101/mechanisms-the-processes-of-evolution/>

Van Der Kolk, Bessel *The Body Keeps the Score* Viking Penguin, New York 2014

- i Potts, Dr Rick Smithsonian Institute, Human Origins Program
- ii Shaw, George Bernard, "Evolutionary Appetite" from *Prefaces to the Plays*
- iii Reznick, David The Guppy Project
- iv Fagan, Brian M.
- v Harari, Y. N.
- vi Alesinaa, Spolaore
- vii Stone,M, Wooley, C L, Lovejoy, G
- viii **Darwin, Charles**
- ix Carroll, Sean B, Gompel, Nicolas, Prudhomme, Benjamin
- x Johanson, Donald
- xi Grant, Peter & Rosemary
- xii Timothy Snyder
- xiii Diamond, Jared
- xiv Shirer, William
- xv Reiter, Dan; and Democratic Digest; "...observed correlation between democracy and peace" referred to as 'the democratic peace'...Essentially all scholars agree that ...violent conflict, especially wars ...significantly lower." Reiter expands documentation of the democratic peace and also discovers bidirectional correlations, such as that peace also causes democracy.
- xvi Buhl, J.; Sumpter, D.J.T.; Couzin, D, et al; and Toner, J.; Tu, Y.; Ramaswamy, S.
- xvii University of California, Museum of Paleontology
- xviii Carroll, Sean B, Gompel, Nicolas, Prudhomme, Benjamin
- xix Krippner, S C