

A guided tour through a labyrinth of biological and behavioural information- A Review of *Behave* by Robert Sapolsky (Vintage, London, 2017)

Behave by Prof. Sapolsky is a thick volume with full of interesting information not only on the biology of aggression and violence in humans but also on the subjects like genetics, anthropology and ethology. The author extensively discusses neurophysiology and the relevant ideas in evolutionary biology that contribute to who we are. Unfortunately, most of the footnotes, irrespective of the fact that however interesting they had been, were too small and I had to oftentimes skip to avoid eyestrain. What I understand as the essence of his book is that we humans are complex beings and our behaviours are expressions conditioned by our biology that controls our brain and hormones, the environment that hosts our behaviours and our upbringing that shapes our childhood. Prof. Sapolsky concludes that both our worst and best behaviours are rooted in our biology. In this review, my intention is not to write about what Prof. Sapolsky extensively covered but to highlight some implications of two ideas discussed in the book.

Violence: The Role of Democracy

While reading Prof. Sapolsky's huge work, my main interest was around the reasons for war or mass murder and the controls over it. Although the book by Prof. Sapolsky is a tour de force on the physiology related to human nature than the psychology, it only says that our behaviours are products of our biology but does not explain how to keep our behaviours in check. Perhaps, in this regard, Prof. Sapolsky does not agree with the measures suggested by some writers who took on the same subject.

Dr. Erich Fromm says as long as one believes that the evil man wears horns, one will not discover an evil man¹. To avoid future human destructiveness, we need to make fundamental changes to our economic and political structures as well as our values, our concept of man's aims and our personal conduct. We should not listen to the demagogues or to the leaders with hardened hearts without the love of life². Prof. Richard Wrangham and Dale Peterson in their book *Demonic Males* state that "out of four thousand mammals.....a system of intense, male initiated aggression....is known only among chimpanzees and humans³." Linking the violence to the biological evolution between the closest relatives was stopped by the practices observed in Bonobo, the 'gentle ape', the name used in *Demonic Males*. Prof. Sapolsky, in third person, while disagreeing with their picking chimpanzees and ignoring gorillas also says "Wrangham pretty much ignores bonobos.⁴" In my view this is an unfair criticism as "*Demonic males*" devotes a full chapter to bonobos and hypothesises that in bonobos "males lost their demonism...Or possibly male coalitionary skills..⁵"

¹ P574. Fromm, E *the Anatomy of Human Destructiveness*, Pimlico,1997; The evil man here implies people with destructive tendencies like Hitler.

² P579. Fromm. Love of life is likely to mean the love of humanity.

³ P24. Wrangham, R and Peterson, D *Demonic Males* Bloomsbury, 1996

⁴ P317. Sapolsky, R

⁵ P219. Wrangham, R and Peterson, D

Prof. Sapolsky also says that the history of violence is a mixture of Hobbes's and Rousseau's views. World, he accepts, did not have wars in its modern sense until the nomadic hunter gatherers became sedentary agriculturalists. Like Hobbes's belief of man as a wolf to his fellow men, the ethologist, Prof. Konrad Lorenz also believed in savage hunter gatherers. People like Professors. Wrangham, Steven Pinker and Lawrence Keely continue in some sense to believe in the innate violence in man. As some of the writers quoted in Prof. Sapolsky's book wanted us to believe, the prehistoric people placed in mass graves with arrowheads closer to skeletons or the skeletons with projectiles embedded in bones indicate warfare. This as evidence reminds someone of a quote in *The Anatomy of Human Destructiveness* by Dr. Erich Fromm. Future archaeologists studying present day bushmen will look at the cracking stones found with nearby arrowheads might conclude that these stones were used to crack bones even though the stones were actually used by women to crack open the nuts providing 80% of bushmen economy⁶. As Dr. Fromm points out the war is mostly caused by the 'aggression of military and political elite'. He quotes a Ukrainian saying found in Prof. Konrad Lorenz's book *On Aggression* "When the banner is unfurled, all reason is in the trumpet."⁷ People who go to war against humanity are directed by the reasoning of the elite, the trumpeters like Caesars, Hitler, Pol Pot, Stalin, Mao, Bin Laden. Unfortunately, sometimes the trumpet, in the case of war against Iraq was played by the democratically elected leaders like President Bush.

But on the other hand, we live in the best of the times in the history of world as Prof. Pinker quoted in *Behave* says 'the worst horrors of inhumanity and violence declined over the last 500 years due to the forces of civilisation'⁸. As Dr. Quincy Wright tabulated the number of battles engaged in by the principal European powers increased from 9 between 1480-1499 to 892 between 1900-1940. Even though the above quoted numbers do not help the assurance about a decreasing violence, inhuman acts such as slavery, racial vilification, colonisation, violence against women and LGBTQ people declined over the recent spans of time. *Behave* too ignores the possibility that the diminishing violence has been due to the rise of one impactful ideology with all its flaws: Representative Democracy.

This reminds of a profound statement in *Demonic Males*. The political power, that depends on physical power in traditional societies is personalised. Whenever the political power is personalised, the physical power arising from the violence of demonic males becomes unrestrained. The great revolutions at the end of the eighteenth century placed the political power in the hands of institutions rather than a person or families or alliances. Of many styles of political institutions, the most depersonalised ones are the most democratic⁹.

Even though the world's first age of revolution began in Greece around 650 BC¹⁰ through the breaking of the monopoly of aristocratic groups to empower the law givers, the democracy as a widely accepted system of governance did not arise until late. The start of

⁶ P144. Fromm

⁷ P52. Fromm

⁸ We only need to have a look at the statistics quoted by the late Prof. Hans Rosling in his book "*Factfulness*". Unlike in the past, the majority of the world population live in middle-income countries and expect to live longer than ever before.

⁹ P243-247. Wrangham, R and Peterson, D

¹⁰ P58. Fox, R. L *the Classical World*, Penguin, 2006

the modern democracies should be considered as the period when the women were allowed to fully participate in the electoral process. Thus, the world's democracies in modern form only started to appear around the turn of the 20th century¹¹. As Prof. Niall Ferguson points out in the introduction to his book *Empire* (Penguin,2008) the British Empire which controlled the quarter of the world disseminated, among other things, common law, representative assemblies and the idea of liberty to its colonies. As the British left many of their colonies in the 20th century, these ideas found support among their former subjects. The experts of the field proclaim that the democracy thrived with the globalisation of economies. But that was not always the case as one of the largest democracies in the world, India, had been closed to the world economically for a long time. Thus, it is very likely that the world we see today with restrained violent impulses on the level of individuals or as a nation is mainly due to the ideas of lawfulness, liberty and representative democracy. In a democracy, going to war is not very often one person's decision but a collective decision. There will be likely repercussions to be had at the ballot box for the wrong decisions. The individuals breaking the law by being violent towards others have to face the legal system. At least in theory, all citizens are equal under Law in a law-abiding democracy. One of the greatest ideals we may see as a cause of progress we made as humans is the Democratic Institutions. Thus, a strong democracy is where constitutionality, voter participation, equality under Law and transparency in government are upheld and preserved.

But it may be true that democracies as Rousseau believed are not the natural state of affairs even though those are the ones with restrained personal power as the authors of *Demonic Male* show us. A citadel of democracy adored as a shining light for the rest of the world tested the strength of its institutions on the 6th of January 2021. Even though it was unlikely that the American Republic would have collapsed, it clearly showed how fragile the system was. Modern form of democracy is so delicate that it completely relies on the good faith of the elected and other officials and the people's belief in the democracy as a whole. Even the American system of democracy that has stood the test of time for more than a good century and revolves around the supremacy of the constitution may not be all that strong as arguably the greatest logician the world has seen in the modern times, Prof. Kurt Gödel realised. He tried to explain why to Prof. Albert Einstein, Prof. Oskar Morgenstern and the judge who was examining him for the US Citizenship. Long after the finest logician of our times was troubled by some inconsistency in the Constitution that would give rise to a dictatorship, in the fateful month of January, the possibility of weak links in the US Constitution came so close to a conceivable scenario for a realization. It was rather surprising to find out how little people care about the value of democracy in one of the greatest democracies in the world. This episode again reminds of some remarks in *Demonic Male*. The authors noted the fear of the right-wing militias in the US, particularly referring to the Michigan Militia in 1990s, about their freedoms in a world led by the United Nations¹². Fear of a shrinking world and the humanity encroaching traditionally held spaces can be easily dignified as diminishing freedom and exploited by demagoguery or even closet bigotry. The United Nations may represent to some a new order with crumbling traditional boundaries dismantling the old-world order. The idea lacking in Prof. Sapolsky's book is

¹¹ As per <https://ourworldindata.org/democracy>, in 1900, there were only 1 democracy among 112 autocracies. As of 2018, there are 99 democracies and 80 autocracies. Retrieved on 20/02/2021

¹² P248. Wrangham, R and Peterson, D

about a mechanism to control the demons residing in human souls. At least according to the authors of *Demonic male*, the control over any possible violence is moral sanctions or the law and order imposed by the institutionalised political power, *a democracy*. We need to acknowledge all democracies in the world are not same and some are only a semblance. Anyhow, we all owe a responsibility to participate in the democratic processes that uphold the belief in democracy that protects people¹³ from violence.

A greater challenge the democracy today faces is misinformation and the lies to get elected as the majority of Fourth Estate now mainly resides online with the freedom to publish anything, fact or fiction. Voter ignorance is still blamed as a cause for the failure of democracy as an ideal. But this is a sad argument when the literacy today is as high as it perhaps could be. As the allegory goes, a doctor prescribing harsh remedies for the good of the people would be outdone by a person selling sweets to get elected by popular vote. The perceptions matter in politics as well as in any other realm of human activity. The increased literacy combined with transparency, accountability and factual information is essential to a good democracy. Now we have the literacy but are losing the battle for facts with the overarching intervention of the world wide web. The tech giants, unwittingly, are at war with democracies by feeding the masses with streamlined news and catalysing a process that creates unscrupulous individuals with bullhorns to promote harmful ideologies and falsehood. The selective news feeds in a world almost everyone having access to a phone with the internet is likely to be an invisible danger to an individual living in a healthy democracy. Perhaps, the moral philosophers and legal theorists have their work cut out in the future to stop the flow of misinformation in modern societies where morality and decency such as truthfulness, honesty and personal integrity induced by a moral code like ten commandments, five precepts or greater sins no longer exists. What we need to keep in mind about democracy as an ideal is that the ideals set are the ideals followed; the ideals upheld are the ideals preserved.

Evolution, its mechanisms and new paradigm

Prof. Sapolsky devotes chapters eight and ten to genetics and evolution. The discussions are very thorough and very illuminating to a lay reader. Prof. Sapolsky rejects the idea that the violence is solely determined by a gene such as a variant of the gene encoding the enzyme monoamine oxidase, MAO but caused by many genes and influenced by the gene and environment interaction; Nature and Nurture. The discussion on the adaptations, spandrels, gradual and punctuated equilibrium is entertaining (even involving the manner Prof X put down a more statistically oriented Prof Z by saying “Prof Z has a slide rule rather than a penis”) and very informative. Especially, the way the above ideologies accepted by various socio-biologists can colour the schools of thought are pointed out. However, at the end of the day the heated debates on those matters, Prof. Sapolsky writes, are now only a thing of the past and both of the opposing arguments are accepted as plausible explanations.

¹³ Australia is a great example of a sound democratic system even with its flaws like branch-stacking. If the people of a country do not fully participate in the democracy, it is unlikely to be a fully developed democracy. Thus, Australians, virtually any citizen above the age of 18 years incur a fee if they fail to vote at elections reminding them that the democracy is not to be taken for granted.

The above paragraph segues into the topic we want to focus here. Lamarckian ideas were one of the most controversial topics in Evolution until very recent times. Even Prof. Sapolsky mention Lamarck about epigenetically mediated inheritance and makes sure to follow up with the caveat that Lamarckian inheritance is “right in this narrow sense”¹⁴. The academic restraint is a good thing especially when it comes to controversial viewpoints that are based on blatantly weak premises. However, it can be very detrimental when people reject them like Dr. X mentioned by Prof. Sapolsky on a whim without a profound reason. Especially in the case of Lamarckian inheritance, the professional “Us-Them dichotomy” that perhaps drove Prof. William Bateson of the UK to undermine the work of another fellow scientist without a thorough analysis and further experimentation, led to the tragic death of Dr. Paul Kammerer. The author Arthur Koestler in his book *the case of the midwife toad* beautifully explains the callousness that might have driven the scientist over the edge¹⁵. It is true that political manoeuvring by Dr Lysenko or the allegation of fraud on Dr Kammerer’s experimental outcomes did not help the cause of Lamarckism in the West. Another Lamarckian, this time from Australia, who had to reportedly fight the British biological establishment¹⁶ was Dr. Edward Steele who pioneered the idea of crossing Weismann’s barrier via the action of a retrovirus. However, now there is more acceptance for Lamarckian ideas as the experimental data accumulates and neo-Lamarckism is being popularised by the geneticists like Prof. Eva Jablonka and Dr. Marion Lamb and in the likes of the comic book *Epigenetics: A Graphic Guide* (Icon Books Ltd, 2017). Coming back to Prof. Sapolsky’s book it is sad to see mix-messaging on Epigenetic inheritance. Talking about the inheritance of mothering style in rats, he emphatically discusses the possibility of epigenetic inheritance but is reluctant to accept its impact on neo-Lamarckism by saying epigenetic inheritance “resembles the long-discredited idea about acquired inheritance”¹⁷.

Dr. Steeles’ mechanism for somatic hypermutation, even though disputed, was something that can be depicted as follows:

External factors → Genomic variation in somatic cells → Retrovirus involvement →
Genomic variation in Germline → Darwinian selection

This process combines Darwinian evolution with a Lamarckian pathway. Another hypothetical pathway combining these two schools of thought is given below in Figure 1. This is not a scientific idea as it is speculative and coming from a trespasser into the field. But it is a possibility for a feedback mechanism that provides a complete framework for

¹⁴ P230 Sapolsky

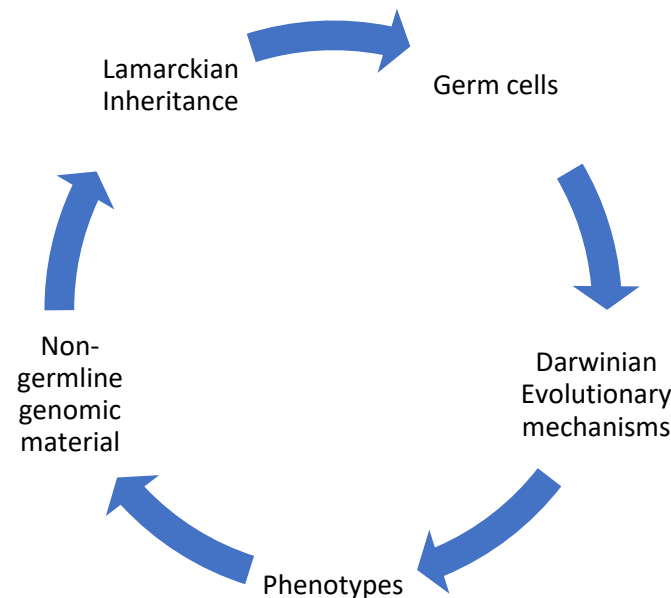
¹⁵ In a recent paper (2016) titled ‘An Epigenetic Perspective on the Midwife Toad Experiments of Paul Kammerer (1880–1926)’, JEZ-B, Vol 328; <https://doi.org/10.1002/jez.b.22708> argued that the parent of origin effects (i.e., superficially speaking, inheritance of a trait from one of the parents), the parental sex on dominance described by Dr Kammerer can be explained now via current understanding of epigenetics. Thus, after all he may not be a fraud.

¹⁶ To be fair, this is a broad statement. Writing in 1990s in his book *Evolutionary Genetics* (Chapter 1), Prof. John Maynard-Smith, a high priest of Darwinism, accepts the existence of inheritance outside of germline. Then in mid-1070s the British biologists Robin Holliday and John Pugh pioneered the trend towards modern epigenetics.

¹⁷ P220-221 Sapolsky. The inheritance in such cases may not be stable but it could not be explained as Darwinian. Why then cannot a case of acquired inheritance be accepted? Although Lamarck’s original explanation is flawed, over the years Darwin’s original views have also been modified.

evolutionary models. As some biologists assume, Prof. Fred Hoyle might not be so naïve to misunderstand the process of natural selection and compare its perceived effect on evolution to a hurricane blowing through a junkyard assembling a Boeing 747¹⁸. Even though he was not a biologist and the analogy flawed, he had been an intellectual giant who is believed to have missed the Nobel Prize for his breakthrough ideas in Astronomy, due to his unorthodox views. Teleological arguments aside, Boeing 747 is a designed specimen of human ingenuity that came into fruition through years of development by many engineers and technicians, a process of evolution¹⁹. However, in the landscape of the often-written about history of flight, it all started with an ingenious idea of two brothers in the US. That is, in my opinion, an act of punctuated equilibrium followed by a progression of feedback loops. Here the feedback comes from the humans; an autocatalytic process of ‘behavioural and symbolic inheritance’, two of the four processes suggested in *Evolution in Four Dimensions*²⁰ In the cycle in Figure 1 we have Epigenetic inheritance labelled Lamarckian Inheritance as the only known mechanism for passing on environmental and other external influences via somatic cell genomic material. Phenotype can also be a holobiont phenotype.

Figure 1. Hypothetical Feedback Mechanism for a Lamarckian Darwinian Evolution



¹⁸ P234. Dawkins, R. *The Blind Watchmaker*, Penguin, 1988

¹⁹ Possibly for billions of years, there have been seven major tectonic plates, counting Indo-Australian plate as one. These plates were in different climates and have rocks exposed to various weathers and forms of erosion. But no one has reported, at least to find its way into the internet, a recognisable human shape or a Moai head, sculptured by those millions or billions of waves lapping rocks, gusts of wind sweeping landscapes almost all day or occurrences of rain and sunshine that constantly impact the rock formations. All are gradual processes that continuously occur over a very, very long time. The point is that time and random actions do not always create what makes sense to us but what Nature happens to shape. The creation here comes from the Nature ‘looking for’ the most energy efficient way to flow. In the Darwinian framework, a germline via natural variation will bring forth phenotypic expressions that would be culled by the environment. The selfless gene lets the selfish environment select the phenotype it favours. In case of Lamarckian inheritance, a genome effects the changes making the phenotype suitable for the environment. This, in theory, is an energy efficient process that does not require the intermediate forms to exist.

²⁰ Jablonka, E and Lamb, M *Evolution in Four Dimensions*, MIT Press, 2005.

The above diagram is surely an affront to the scientific purists who would not entertain any idea that is different to what prevails. I am comfortable being an offender here even though I am neither a biologist nor a geneticist and have no right to criticize prevailing scientific authority. When Weismann proved the fallacy of Lamarckism by cutting off tails of mice to emulate the use and disuse, we applaud it as scientific²¹. But we do not have a proof of Weismann barrier like a proof in mathematics, that there is no way that the barrier can be broken. Yet we accept it as if it were a mathematical proof. The same can be said about the natural selection as the sole mechanism for Evolution. Almost everyone in scientific community believes in Evolution but many are not convinced about the tyranny of natural selection promoted by the scholars like Professors. R. A. Fisher, W.D. Hamilton, Ernst Mayr and Richard Dawkins as a complete mechanism. The emergence of ideas like Hologenome theory of Evolution that encompasses all microbes symbiotic to an organism as responsible for the evolutionary process, proves that there is some unease about the completeness of Darwinian mechanism of Evolution even among the elite biologists. Not surprisingly this recent idea includes Lamarckian mechanisms. In my humble opinion, Hologenome theory, with its warts and all, is a ray of sunshine into the now stale ideas around the modern - synthesis-based view of Evolution. This theory is likely to be in symbiosis with the framework in Figure 1. As an afterthought, it is not untimely to keep in mind what Prof. S. J. Gould said in the prologue to his book *The Panda's Thumb* (1980) about the evolutionary theory- "fruitfully undeveloped enough to provide a treasure trove of mysteries". I wish Prof. Sapolsky had written about an Evolutionary landscape inclusive of Lamarckian inheritance.

Conclusion

Even though Prof. Sapolsky does not provide new solutions to deal with human aggression, he tells us about its biological roots and makes us look at the aggressors with a broader understanding. He also draws attention to the information on how our modern society creates problem individuals with our parenting choices. *Behave* also teaches us our behaviours cannot be easily explained as a presence of one factor or an absence of another but as a process conditioned by one or more factors. It also tells us to take responsibility for our actions even though there are biological factors at play. This book is a great read with a wealth of information for a person with some patience.

Reviewed by Darshi Arachige

²¹ In a hallucination one can visualise a holobiont phenotype that includes some form of virome interacting with consciousness – mind virus. If the mind is just biology as physicalists want us to believe why shouldn't someone throw the possibility into the mix to explain the difference between chopping off and the use-disuse?