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# *Aposematic Model vs. Sexual Selection Model of Human Evolution*

The principle of sexual selection as a model for the evolution of most of the human morphological and behavioural features was suggested by an authority no less than Charles Darwin. So we can say that the principles of sexual selection received heightened attention from the very beginning of the scholarly study of human evolution, also because it was proposed by arguably the biggest scientific authority the world has ever seen.

The aposematic model of human evolution, proposed in this book, is a completely new suggestion and, to check its viability as the central principle of human evolution, there is no better way than to compare it to the model of sexual selection.

Unlike his first groundbreaking book, 'Origin of Species' (1859), Darwin's second groundbreaking book, 'The Descent of Man' (1871) was perceived more controversially even among the staunch supporters of the idea of evolution. Even Alfred Wallace, co-discoverer of the principles of evolution, was trying to convince Darwin that his attention towards the importance of sexual selection was exaggerated.

Of course, if you look at the Darwin's 1871 book from the perspectives of our contemporary 21st century, you have to admit that at least in some instances Darwin was exaggerating the importance of principles of sexual selection, particularly the famed principle of 'female choice'. According to Darwin's model, for example, human skin colors, tiger stripes, the rattling sounds of a rattlesnake, and brilliant colors of many insects were formed exclusively under the power of sexual selection (mostly through the female choice). Darwin was rejecting virtually all other explanations (which sometimes were already in place) that environmental factors could play a role in developing these features. Today most scholars would find the claim of such importance on sexual selection in these instances difficult to agree with.

So, while writing his 1871 book, Darwin was routinely explaining all the visually explicit morphological features of different animals (from insects to humans) as the result of sexual selection, mostly as a result of female choice. If the morphological features were different among the male and female representatives of the species, it was particularly easy for him to attribute them to sexual selection, although in some cases even the similar morphological features in both sexes did not stop Darwin from explaining these features on the basis of sexual selection.

Of course, as a brilliant observer and analytical genius, Darwin wrote about cases when animals were intimidating enemies with their voices (Darwin, 2004:589-90). In another place he noted that one of the possible reasons of the tradition of body painting in humans before going to the battle was to scare enemies with their fierce look (Darwin, 2004:643), but such examples were in a huge minority in comparison with the avalanche of examples of the power of sexual selection.

As there was no clear criterion why females should like or dislike certain colors, morphological features or behaviours of their male counterparts, theoretically it was possible to explain virtually any morphological feature and any behaviour by the power of 'female choice'. By its very nature Darwin's model of 'sexual selection' was almost as potent means for the explanations of morphological and behavioural changes as the earlier creationist model that it replaced.

And suddenly Darwin hit a brick wall, when he tried to explain the brilliant colors of the caterpillar larvae. Brilliant colors usually were easily attributed to sexual selection, but in this case Darwin had a larvae which was not sexually active, so brilliant colors could not be explained by the principles of sexual selection. Finding himself in such a dilemma, Darwin wrote to Wallace and asked him if he had any explanation. As we have already mentioned this earlier, Wallace suggested that the brilliant colors of a caterpillar was a warning signal to predators, advertising that the larvae was not good food for the predators. Darwin was famously very happy with Wallace's explanation, but despite this, unfortunately, Wallace's suggestion did not affect Darwin's overenthusiastic attitude towards the power of sexual selection.

It is not surprising that in the scholarly publications dealing with the defence mechanisms in animals, Wallace's name is cited much more often than Darwin's name. For example, in a recent monograph on this subject, 'Avoiding Attack' (Ruxton at al., 2004) Wallace is mentioned about dozen times as one of the founders of this important sphere, while Darwin is cited only couple of times, mostly because of his enthusiastic responses to the ideas of Alfred Wallace and Henry Bates.

For any scholar who works on any aspect of evolution, to criticize Charles Darwin is something that can not be done easily. Of course, the self-critical attitude of the great scholar and ability to listen to different arguments made it possible to

argue with him openly on any aspect of evolution, but it is still not easy for many reasons (see the box: 'Charles Darwin: My Personal Hero').[1]

Potentially, both sexual selection and aposematism can work hand in hand. Bright colors, sounds, smells or behaviours can be potentially explained by sexual selection (as trying to impress the other sex with your beauty, energy and healthy genes), or by aposematism (trying to warn enemies and competitors with bigger size, bright colors, sounds, and unusual behaviours).

We must remember, that sexual selection has two very different strategies: (1) female choice, and (2) male to male competition (usually known as a 'male to male combat'). Apart from this well-known division I suggest that we must also differentiate between two related but very different strategies of male to male competition: (1) intimidation, and (2) combat. Nature prefers intimidation in order to avoid direct violence and unnecessary injuries, so I suggest that ***intimidation plays a leading role in male to male (or 'intra-sexual') competition***. I believe that different 'unnecessary' ornaments, that adorn the bodies of the males of many species, are chiefly designed to intimidate a rival male, not to impress the opposite sex.

It is easy to notice, that the same morphological features that can be used for male to male competition in animals in order to intimidate a rival (increasing body size, showing colors and unusual behaviours), can be used as the defence from the aggressors again through the intimidation/warning. I suggest that ***intimidation as a defence strategy*** has a tremendous and mostly unacknowledged importance in the life of animal species. Males across many species from insects to lions are trying to compete with each other primarily using only the ritualized forms of display.

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[1] **Charles Darwin: My Personal Hero**

As for many scholars who are fascinated by the evolutionary past of the life on our planet, Darwin has been my role model and hero for all my life. On my first visit to Cambridge University in 1994, I walked there with the sacred feeling that Darwin was walking the same places before. You can imagine how excited I was when I found out, still in my teenage years, that I had the same birthday as Charles Darwin! And one more, possibly a bit unusual token of my deepest reverence towards the great scholar and his personal influence on me: reading Darwin's works made me... a more religious person. This might sound strange, but for such a non-religious person with a strictly scientific mind as myself (and plus raised in an atheistic Soviet Union), reading in Darwin's works that he was not considering himself an atheist was truly a revelation. If this sounds unthinkable for some of the readers of this book, I can remind them a few of Darwin's own words from his writings: "I have… never been an Atheist in the sense of denying the existence of a God.' 'I may say that the impossibility of conceiving that this grand and wondrous universe, with our conscious selves, arose through chance, seems to me the chief argument for the existence of God…' In 1876 he even declared 'I deserve to be called a Theist.' According to Darwin's words, a person 'can be an ardent Theist and an evolutionist.' I hope we can all agree, that religious beliefs are as private as happiness – you can not decide for other person if this person is happy or unhappy, or religious or non-religious. So although for many of my much more religious friends I might still be a non-believer who does not go to church every week (again very much like Darwin), I do not consider myself a non-believer. Well, I am not sure how many people are out there whom reading Darwin's works made a more religious person, but that's exactly what happened to me. And at the very end, possibly as a justification for my critical remarks towards Darwin's model of human origins, I can say that my model, which is strictly based on the principles of natural selection through the struggle for survival, seems to me 'more Darwinian' than Charles Darwin's own model of human origins, based on sexual selection.

Contrary to the popular belief that in the animal kingdom the only way of life is an all-out fight, animals actually try to avoid unnecessary fights whenever it is possible, because any serious physical confrontation is dangerous for both sides. To avoid direct physical fight, natural selection came up with ingenious strategies. Avoidance of direct violence is mostly achieved through the ritualized display of morphologically exaggerated features, sounds, smells, behaviours. Even the first seconds of the fight are still a part of the ritualized display, and the fight as a rule does not go into a serious fight, aimed to kill the rival. Instead, a smaller and weaker animal usually retreats quickly after the first physical touch. Watching the filmed confrontation between male lions, for example, it might seem that they are fighting to destroy each other, but in fact lions are extremely rarely fighting seriously, and the fight itself is very seldom longer than few seconds. During the confrontation both sides are trying to intimidate each other first by displaying their own size and the size of their teeth, and then they have few seconds of 'showing off fight'. The fight itself is heavily aided by intimidating roaring sounds. As a rule, after few seconds of fighting one of sides retreats and both lions are content that the fight is over. Have you seen a filmed fight between male lions where one of the lions was heavily injured or even killed? Such things may happen, but they are so rare that the chance to film such an event is extremely slim.

In his evolutionary model, based chiefly on sexual selection, Darwin virtually neglected the importance of intimidation. He was sometimes puzzled why some species of birds that were powerful fighters, and could kill the opponent, had the exaggerated and useless morphological features (Darwin, 2004:454). These morphological features were in fact detrimental for their fighting ability. I propose that even those birds that can kill the rival, may receive serious injuries during the all-out fight. Therefore, it is in the interests of both sides to avoid any intense physical combat. Ritualized display of body size, colors and behaviours has the important function of settling the argument without fight. In this context I prefer to use the notion 'male to male competition' instead of the usually used notion 'male to male combat.' Real all-out combat is not the preferred evolutionary strategy of survival.

As a non-native English speaker, I am not good at word-play, but the term AVOID asks for such interpretation, as I am proposing, that the phenomenon of **AVOID** (Audio-Visual-Olfactory Intimidating Display) was primarily designed by the forces of Natural Selection to literary **avoid** unnecessary physical combat.

We should remember that non-aposematic species can also use aposematic warning signals for their defence. For example, when a hunter is entering a grassy patch where a wounded lion is prepared to defend its life, if a lion growls menacingly, this is an aposematic warning signal to the hunter, signal declaring that a lion wants to be left alone, but it will attack if hunter goes closer. If a lion definitely wants to attack someone, or if it is actually hunting a prey, it will be waiting without making any sounds. Let us remember: a growling predator wants to be left alone. A silent predator is more dangerous.

So, non-aposematic species also can use aposematic warning signals, but this does not make all these species aposematic. We can only call a species aposematic, if aposematic display is used as a core principle of its defence system. Skunk, striped polecat, colorful spiders and snakes use aposematic display as a central means of their defence. So did our hominid ancestors. They were using the whole set of aposematic displays to warn all potential aggressors that they were very unprofitable prey. They were dong so with their clearly visible upright posture, the big bush of hair on top of their heads, longer legs, slow walking, strong smell, loud singing and drumming, use of body painting and animal skins. For the millions of years of their life in the African savannah, our ancestors taught tough and costly lessons to predators; that in case of an attack they had to deal with the whole group, a group of religiously dedicated warriors who would fight any predator in order to get back the body of their killed fellow member. This long and bloody history of fanatic dedication to each other and to the group interests for the millions of the years must have taught predators to leave our ancestors alone. This must be the reason why most wild animals (including lions and tigers) do not usually hunt humans. Of course, the contemporary hunter with a gun greatly contributed to the fear of humans among all animals, no question about that, but even in those regions and cultures where humans did not have guns, attacks on humans were still relatively rare.

Therefore, I suggest that Aposematism could better explain many cases of the colorful plumage and colorations of the insects, or the habit of singing, than such an unstable factor as 'female choice'. We can also remember here Wallace's famous remark that sexual selection is very unlikely to be working in the case of such low class creatures as insects, where the presence of aesthetic feelings or the conscious 'female choice' was very unlikely to be present.

Proponents of sexual selection thrive on cases when the morphological features or the behavioural traits can not be explained through the principles of natural selection. The viability of sexual selection is particularly evident, when morphological or behavioural characteristics are seemingly detrimental to the survival of the bearer. A peacock's colorful tail (known as the 'train') is the most famous case of such a morphological feature, and we are going to discuss it next.