

Times to Fight: Music and War

There is a strange neglect of one of the crucial areas of early human evolution, namely how human ancestors were defending themselves from predators. Starting with Charles Darwin, who had only a passing mention of this crucial issue in his 1871 classic book on human evolution, no scholar dedicated any decent attention to this problem. We must mention here 1980 article of Adriaan Kortlandt, where he suggested that our hominid ancestors were using the prickly branches against lions, and 2008 book by Hart and Sussman, where according to authors our hominid ancestors had virtually no strong defense against prehistoric predators and in the case of attack their best chance was to seek a shelter on the tree branches. As a result, even today this remains possibly one of the most understudied topics of early human evolution. Let us now dedicate several pages to this subject, as I believe that this question is closely related to the function of singing in the early stages of human evolution.

Animal species use several typical strategies to avoid predators: hiding and keeping silent, fleeing the scene as quickly as possible, fighting back, using their physical strength, teeth, horns, spikes, venom etc.

Humans are, in most of these faculties, hopelessly bad in comparison with other animal species, and even more puzzlingly, they gradually became worse during the millions of years after they descended to the ground. Let us have a quick look at how our ancestors used the most popular ways of defence from predators.

Crypsis. This term stands for 'hiding'. Hiding is possibly the most common initial strategy for many animals to avoid predators. Actually, not only the prey species, but predators also prefer to stay out of sight for obvious reasons. Human ancestors upright posture was not the best option if they really wanted to hide from predators. Some authors suggested that the upright posture was to help our ancestors to see the approaching predators. It is certainly true that you can see better when you rise on two legs, but it is also true that this posture helps others to see you better. Many animal species found the best solution: they use upright posture to scan the environment, but they do it for several seconds only, and after scanning their surroundings they return to their usual four-legged posture. I hope we can all agree that this option is much safer than to remain permanently on two legs and be

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easily seen by predators. Therefore, human ancestors did not try to hide, and in the case that they did, they were not very good at it. Another element of crypsis is to remain silent. We already discussed that humans are the only ground living animal that sings, so I will not repeat here the obvious fact: our ancestors definitely did not try to be unnoticeable and silent.

Running. Running is the most popular way of escaping predators, particularly on the open grasslands of the African savannah. Are humans good at running? Although we are in awe watching best human athletes competing at the Olympic games, we have to confess that we are amongst the worst runners of nature, particularly if compared to the animals of the African Savannah, a place where our ancestors lived for the millions of years. Even the best human athlete, the legendary Jamaican sprinter Usain Bolt, three time Olympic gold medalist and recognized as the fastest man on the planet, would not be able to save his life with his fast legs from an attacking lion, or to catch a running antelope for his dinner. Both lion and antelope can run with the average speed of about 50-55 kilometers per hour, and the speed of Usain bolt on his record-breaking 100 metre run in 2008 was about 38 kilometers per hour. Very fast for a human, but still too slow to escape predators or to catch prey in the African savannah. Another amazing fact about human running is that bipedalism, the first and probably the most important behavioural change that lead our ancestors to the road towards humanity, instead of making humans run faster, actually slowed our ancestors down. The reader might not believe this, but chimpanzees can easily outrun the best human sprinters with their awkward four-limb running style. To conclude, we can say that even if Berndt Heinrich was correct in suggesting that our ancestors could run down antelopes with endurance running, human running was not fast enough for what running is primarily used for in many animal species: to escape from a predator (see also a box: 'Is Running Good for Your Health?')¹

¹ Is Running Good for Your Health?

Of course, generally speaking, running is good for your health like any other physical activity. But we need to take into account that running has some negative side effects. Running is effectively a series of jumps, and every jump and every landing causes stress to our ligaments and muscles. Professional runners often suffer from leg injuries. If you look at the anatomy of human leg, and compare it to the anatomy of the legs of some of the best running animals like antelopes, horses, wolves and cheetahs, you will notice that the lower part of the leg, the ankle, is much more bulkier in humans than in the best running animals. Leg morphology in these running animals has been refined by millions of the years of struggle for survival, that's why they have very lean ankles. As the ankle is the part of the leg that moves most vigorously during running and absorbs repeating stress of series of jumps, a lean ankle is a great advantage for a runner, as it helps to avoid injuries. The bulky human ankle anatomy compared to animal lean ankle anatomy is another fact suggesting that running was not among human natural abilities that were refined in the course of evolution in the African savannah. Another very interesting fact came from Roy Palmer, a British sports writer and author, a former competitive runner himself. According to Palmer, humans are not naturally good at running, and even among professional runners there are some who do not run correctly. So, if you keep you physical form

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Physical strength. No one will argue against the fact that an animal's physical strength is directly connected to its ability to defend itself. The best human athletes' bodies are prodigious to watch at work and their musculature does not leave a shred of doubt that these bodies are full of physical strength. The question is though, how strong are humans when compared to animals? Apparently, humans are very weak compared not only to animals of a similar size, but even much smaller animals. For example, if you put together photos of a common chimpanzee and the legendary Arnold Schwarzenegger, it will be quite difficult to believe the fact that the much smaller chimpanzee is several times stronger than this powerfully built sportsman. Humans look much bigger and stronger than chimpanzees, no questions about that, but when it comes to actual physical strength, chimpanzees and even smaller baboons are much stronger than humans. Therefore, we need to remember that during the course of evolution humans became bigger, but they lost big part of their physical strength.

Teeth. I have already mentioned, that unlike birds, who have no teeth, many ground living animals use their teeth as their primary defence tool from predators. As a defence and attacking tool, canines are of the primary importance. If we compare canines of those primates who live on the trees and those who live on the ground, we can easily see that the ground living primates have predictably bigger canines. Charles Darwin noticed and mentioned in his 1871 book, that ground living baboons, for example, have dog-like jaws and a huge canines. Canines of Chacma Baboons are even bigger than lion canines. Humans, on the other hand, present us with mysterious dynamics of their teeth evolution: since they descended from the relatively safe trees to the predator-infested ground, human canines started disappearing. 'Because the small human canine has a disproportionately long root, it is clear that our ancestors had a larger tooth more typical of apes. Furthermore, the human canine bears a pointed tip when it erupts, although it quickly wears to a more spatulate shape' wrote Langdon in 2005. We will later discuss the possible evolutionary reasons as to why our ancestors canines started to disappear after they descended to the dangerous ground, but at the moment let us just remember that human ancestors could not use canines as well when they were confronted with predators.

Strong and tough hide. Most animals species, both predators and prey, have a strong and tough hide. Even though an antelope's hide may look

with weekly running, it might be a good idea to first check with professionals if your running technique is correct, and then to take it easy and not run very fast and very long distances to avoid injuries. And at the end, let me suggest something very unusual, but something that I believe might be better suited for your human morphology and health. A much less stressful way of keeping yourself in good physical shape is dancing. Dancing under your favourite rhythmic music, even for hours, is much more natural and injury-free for humans than running. If you wonder how can dancing be more natural to humans, than running, please keep reading this book.

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very fragile to us, they are so strong that even lions need some time to cut through the hide and reach the nourishing parts of the body. The benefits of having a strong hide for animals, whose lives depend on the outcomes of violent physical confrontations with other animals with sharp fangs and claws, are obvious. A primate's hide is as tough as other animals, but what about humans? We are faced once again with a puzzling evolutionary transformation: after our ancestors came down from the safer trees to the dangerous ground, their tough skin became gentler and softer. So even our skin is not suited for physical confrontations with predators.

We come to the end of our short survey of the most popular animal defence strategies. When discussing human evolution, there is not much sense in discussing such defence strategies as venom, horns or electric charges, as evolution only works with elements that are already available in ancestral forms. So, after this survey we have to conclude that our distant ancestors were not using any of the usual defence strategies: hiding from predators, remaining silent, fleeing from the danger, using their physical strength, using canines, or using strong and tough hides.

Despite these shortcomings, our ancestors managed to build a ingenious defence system that enabled them to gradually become the dominating species of the African savannah, and I suggest that singing played a critically important role in their defence system. How could that happen? █

Can Singing Save Your Life?

We just finished a review of defence strategies and found that our ancestors were not using any of the usual defence strategies that countless species of animals use in their everyday struggles for survival. Later in the book we will discuss one more defence strategy that was deliberately omitted here – aposematism (this is a defence system based on giving audio, visual and olfactory warning signals to predators). But before we start discussing the principles of aposematic defence, I want to concentrate on the possible role of singing among our ancestors during the millions of years they spent in the open grasslands of the African Savannah.

Let us follow the blessed principle of Occam's Razor, and try to look for the easiest answer to the question of hominid singing. The most direct strategy would be to find out why other animal species use loud group vocalizations. Some social animals use loud vocalizations when their group meets another group, or most importantly for us, when group members are facing their deadly enemies, predators.

Plenty of animals, when cornered by a predator or a bigger competitor, try to look as big as possible and make as loud warning sounds as possible. Most readers would have seen, at least once, a frightened cat arch its back, fluff up its hair and make hissing sounds. The arched back and erected hair helps the cat to look bigger to the aggressor, and with the hissing sound while displaying sharp teeth, the cat also warns the opposition that it is going to defend itself. The aim of this audio-visual display is to look and sound as intimidating as possible.

Let us pay attention to this temporary transformation of appearance: most animals that are commonly prey try to avoid their predators by keeping themselves as silent and unseen as possible, however if they are detected and confronted by a predator and clearly have no option to flee, they instantly change their defence strategy and try to appear as big and as loud as possible.

Could our ancestors also have used loud vocalizations to protect themselves from the predators? They certainly could. It is widely known, for example, that our closest living relatives, chimpanzees and gorillas, when they are confronted by predators (like the leopard) or competitors, start shouting loudly, stomp on the ground, drum on trees and other objects and basically try to make as much sound as possible. Even today if we suddenly encounter a big stray dog or some other potentially dangerous animal, and if we want to scare them away, we instinctively shout at them, stomp on the ground and make a hand gesture like we are throwing an object at it.

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Therefore it is highly plausible that the common ancestors we share with African apes were also using loud vocalizations and drumming to defend themselves from predators.

Despite these parallels, there is a big difference between how African apes and human ancestors used loud sounds to protect themselves from predators. Loud displays among apes are used rarely, and most of the time apes remain, to use Tecumseh Fitch's words, 'surprisingly silent'. Humans, on the contrary, are noisy most of the time, or we can at least say that humans do not try to be silent. I suggest that human ancestors used a different strategy – they did not try to conceal their presence, on the contrary, they tried to intimidate every possible predator with their confident look, behaviour and noise.

My suggestion is that our ancestors turned loud singing into a central element of their defence system against predators. They started using loud, rhythmic singing and shouting accompanied by vigorous, threatening body movements and object throwing to defend themselves from predators. The power of the loud vocalization of a group of humans is widely known from well-documented cases where a group of unarmed shouting humans have scared away even a hungry man-eating tiger from its prey, or when a shouting human group can drive large and dangerous animals towards an intended location.

Tomas Geissmann, an expert on gibbon singing, suggested in his 2000 article that human singing could have originated as a means to scare away aggressors and competitors. Noted American ethnomusicologist Bruno Nettl also supported this possibility. My model gives full support to this idea.

As mentioned above, human musical behaviour includes another element, unique among all other singing species – precise rhythm. As Estreicher noted in 1964, Africans have an 'in-built metronome' that gives them an extremely precise sense of rhythm. I think many would agree with me that this is a characteristic feature not only of Africans, but of humans generally. The appearance of such a unique feature must have had strong evolutionary reasons. Rhythmic unity brought a few new important features into human defensive singing and made it much more efficient: (1) singing/shouting is physically louder if it is precisely organized rhythmically; (2) rhythmically well-organized group vocalizations send a strong message to the predator about the unity and determination of the group; and (3) doing repetitive rhythmic physical actions in a big group (working, marching) is an extremely effective way to create a strong bond between the members of a human group. But most importantly, I suggest that loud rhythmic chanting-singing-shouting, apart from the external function (scaring away predators)

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had a crucially important internal, psychological function as well. We are now going to discuss this factor.

Rhythm, Battle Trance and Collective Identity

August of 1839 saw possibly the fiercest fight that the war-torn Caucasian Mountains have ever seen. The military forces of the mighty Russian Empire were finishing off the prolonged resistance of the legendary Dagestani military and religious leader Imam Shamil. Shamil was leading armed resistance against Russian forces for many years. After the epic 80-day-long siege at their mountain stronghold Akhoulgo, and after about 7000 were killed from both sides, a small group of Shamil supporters were surrounded by overwhelming number of Russian troops. Neither side took prisoners in this battle. The death of all Shamil fighters, including Shamil himself, was imminent. In this most critical situation Shamil suddenly started singing and dancing a traditional dance, gradually involving all his fighters in the dance. The speed of the dance was becoming faster and faster. Russian soldiers were in amazement hearing sounds of singing and dancing from their encircled and doomed enemies. When the tempo and the vigor of the dance was raised to boiling point, Shamil suddenly stormed out with his sword in the hand and with a fierce war cry attacked shocked Russian soldiers. All his fighters followed, and despite the overwhelming number of Russian troops, a few of the fighters including Shamil himself and his family escaped and continued to fight for many more years.

If you think that this kind of history can only happen with the members of conservative traditional societies, you are not correct. Even now, as you are reading this book, it is very likely that a group of American soldiers, positioned somewhere in Iraq or Afghanistan (or any other dangerous zone), are together singing and dancing to the loud sound of heavy rock song. Why are they doing this? Because in a few minutes they will be going in combat zones where they can be ambushed and killed, so they are preparing for their dangerous mission by singing and dancing to a loud rock song. It is not easy to prepare yourself for such a hard task. According to recent research by Jonathan Pieslak, many American soldiers confess that it would have been impossible for them to get into the required combat spirit if they did not listen to heavy and rhythmic rock music. I hope we all can agree that, when a combat unit goes out for a combat mission, it is of paramount importance that they all are feeling the strength of their unity and an utmost trust towards each other. This feel comes from being in a state of *collective identity*, in a state of *battle trance*, and rhythmic music and dance are the best means to put soldiers in the state.

I propose that *the central function of the rhythmic loud singing was to put our distant ancestors into a very specific altered state of consciousness*

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which I call the 'Battle Trance.' This is a very specific state of mind designed by evolution for the most critical moments of life, when the total commitment of every member of the group was needed for a life-or-death fight. This state has several characteristics:

(1) Humans in a state of battle trance do not feel pain. This state is known as 'analgesia';

(2) In this state humans also do not feel fear. This state can be called as 'aphobia';

(3) In this state humans may totally neglect their individual survival instincts as they are fighting for something bigger and more important than their own life;

(4) In this state humans sometimes demonstrate supernatural strength; lifting cars and doing other things that are beyond their usual physical capabilities;

(5) In this state humans lose their individual identity and acquire a different, collective identity, and as a result every member is acting in the best interests of the group, even neglecting the powerful instincts of self-survival.

(6) Going into the battle trance may happen instantly, fully instinctively, or can be induced by special ritual-like activities.

The classic example of the instant appearance of the battle trance is when a child is suddenly attacked in the presence of a parent. In such a critical situation parents often instinctively start an all-out fight against the aggressor, despite the fact that the aggressor might be much stronger and can easily kill both the parent and the child. In such critical situations a momentary switch happens in the mind, and a human turns from a logical, thinking being, which it usually is, into a furious bundle of nails and fists without any fear or feeling of pain.

This kind of self-sacrificial dedication and neglect of self-survival interests must have had its origins in the mother-child relationship of the mammalian species. When a survival of an offspring became totally dependant on the mother, evolution re-designed the hierarchy of instincts, and in many species the instinct of saving an offspring became a higher priority than the concern for its own safety. Hunters often remark that the most dangerous animal to encounter during a hunt is not a huge male, but a mother with a cub.

Among humans this motherly instinct of utmost dedication towards the offspring turned into something different: the total dedication of all members of the group to the interests of the Group they belong to. Like in a well-established combat unit, where in the heat of the battle one can sacrifice

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his own life to save friend's life, human ancestors developed the feel of **group identity**. The feel of group identity is based on the total trust and dedication of each member of the group to the common interest. Group identity kicks in when there is a critical situation, a mortal danger for survival of the group or any of its members. In such moments the noble principle of 'One for all, all for one' rules any individual self-preserving instinct, fear and pain. Such human sentiments, like patriotism or religious belonging, are primarily based on this ancient instinct, and the feelings of group identity are becoming particularly strong in the moments of big national or religious upheavals, wars, natural disasters.

Going into the battle trance and acquiring group identity can be viewed as a classic example of altruistic behaviour, although I want to maintain that humans go into group identity not because of their feeling of duty towards others, but mostly because the powerful forces of evolution designed this mechanism as a better survival strategy for a group and every member of the group. Evolution supplied powerful neurological mechanisms to make this feeling a positive experience. Going into group identity brings the most exhilarating feelings to every member of the group. Every member of the group feels bigger, feels stronger, and virtually feels immortal. You can only become truly immortal if you do not fear death. Group members in such an altered state of mind, when they share total trust with each other, emotionally believe that the group cannot be defeated (see also the box: "The Battle Trance and the Origins of Religion")². This unique altered state of mind is supported (and most likely caused) by the powerful neurological substances such as endorphins and oxytocin, which are momentarily released in the brain when a critical survival situation arises. As the neurological substances are released into the brain, feelings of pain and fear are blocked, and total trust and exhilaration of being a part of a supernaturally strong unit becomes overwhelming.

² **The Battle Trance, Altruism, and the Origins of Religion**

In the state of battle trance, with oxytocin released in the brain, humans have an exalting, spiritual feeling, a feeling of being a part of something much bigger and much more important than their own life. The concept of battle trance, when individuals virtually lose their ego and acquire a new collective identity, provides a potent evolutionary model for the emergence of human altruistic morality and religion. Feeling yourself as a part of a bigger unity, placing the interests of the society over individual interests, and caring about other members of the society is in the very core of every human religion and every social moral codex. Even when a prayer is alone, the aim of the pray is to feel yourself a part of something bigger, part of the cosmic being, the God. The battle trance model of the origins of religion supports Emile Durkheim's idea of totem and totemism being the earliest human religion where the group, society itself, was the initial symbol of supernatural deity. A highly ritualized process of going into battle trance that our ancestors were undertaking every time when total commitment of the group members was required, involving rhythmic singing, dancing, and other forms of the ancient expressive arts, must have laid a solid fundament for the religious rituals on one hand, and for the development of human arts and artistic transformation on the other hand.

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I am proposing that the mechanism of the battle trance has been designed by the forces of evolution as the highest ranking instinct in the entire hierarchy of human instincts, the instinct that rules our behaviour in the most critical situations of life.

'Wait a minute', a reader might ask here, 'this all sounds very exciting, but what is singing doing here? When a predator attacks a child with the mother present, she does not start singing, she instantly goes into the battle trance and starts fighting against the aggressor without feel of fear and pain. What has singing to do with the phenomenon of the battle trance in such situations?'

This is absolutely correct. When the aggressor attacks our loved ones, we do not start singing or rhythmic chanting. There is simply not enough time for this. Besides, there is no need for this, as our instincts can do all the required work instantly, switching our brain from the usual everyday relaxed mood into an intense self-sacrificing state of mind where we do not care for our life for the sake of a more important goal.

However, apart from the instant fight against attacking predators, there were other very important moments in the life of our ancestors when there was time and the need to prepare a whole group for a decisive battle, and when the mental state of the group was crucially important, as it still is today for the members of a combat unit before they go into battle.

Hunters or Scavengers?

One of the crucially important moments in the everyday lives of our distant ancestors was obtaining food. There are heated debates on how our ancestors were obtaining their much needed protein after they started their new life on the ground. The early traditional view that human ancestors were hunters from a very early age is not considered today as strong and convincing as it was before. Instead the new idea that human ancestors were mostly scavengers, is finding increasing support from the archaeological records. Louis Binford was probably the central figure in this debate and in changing the attitudes towards the role of scavenging and hunting in human prehistory.

Scavenging in the ecosystem of Africa is not as easy as it might seem to the reader, sitting in a safe and comfortable house somewhere in New York, Tokyo or Melbourne. If a species relies on scavenging as one of the main sources of food, this species must be ready to fight for it, or to be engaged, as Blumenschine suggested, in 'confrontational scavenging.' The difficult part of scavenging is that in order to get to the coveted carcass, you must confront many other competitors. No carnivore animal, including the lion, refuses a chance to scavenge somebody else's kill. Often the kill becomes dinner not for the original predator who made the kill, but to the strongest competitor who is in the vicinity of the kill. The cheetah, for example, is probably the most successful hunter on the African savannah because of its superior speed (seven kills out of ten hunts against the three kills out of ten hunts among lions), but because of its fragile complexion which is built for speed, not for power, the cheetah often loses its kills to lions, leopards, and hyenas.

I want to suggest that our ancestors became very skillful competitors at scavenging opportunities. They were very slow and bad hunters, and they lacked natural weapons to kill a prey, but they became excellent at scaring away all other competitors, including the strongest of the African predators, the lion.

So I am suggesting that *aggressive or confrontational scavenging was the central means of obtaining food for early hominids*. I propose that our distant ancestors were targeting lions and waiting for them to make a kill. As the kill was made, after some special preparation (we will talk about the nature of this 'special preparation' very shortly), hominids would approach the feasting pride and would start scaring them away from the kill with the display of loud rhythmic group sound, stomping on the ground, drumming, clapping, threatening body movements, and stone throwing.

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There can be no doubts that lions would be very unfriendly towards uninvited guests, and would try to scare them away with either fake or real attacks, just as they do today when hyenas are harassing them.

Trying to scare away a lion from its kill is a formidable endeavor that only the bravest or craziest (and definitely the hungriest) can undertake. If you remember that the competitors of the lions in this case were not some other huge and well armed predators, but primates with nothing more than stones in their hands, then the whole idea of such an attack seems even crazier. You would expect that such a group of primates would instantly clear the scene at the very first fake attack of any of the mighty lions, but here we must remember that our distant ancestors, in such a critical confrontation, would definitely be in a state of battle trance, where they did not feel any fear or pain, and were totally dedicated to the common aim to obtain the much needed food, even if this would require the self-sacrifice of a few members of the group.

To succeed in such a dangerous endeavor, and to become a worthy competitor for the strongest apex predator of the African savannah, our ancestors went through many behavioural and morphological changes during several millions of years of evolution. All these changes were aimed towards the same aim: to make our distant ancestors better intimidators with more powerful audio and visual displays. The result of this long and painful process with millions of trials and countless victims was the powerful system of Audio-Visual Intimidating Display', or AVID, which we are going to discuss in the next several pages.

Audio-Visual Intimidating Display: Behavioural and Morphological Changes

The model of Audio-Visual Intimidating Display gives us an opportunity to have a look at several well-known elements of human behaviour and morphology in a new evolutionary light. Let us remember that the sole aim of all morphological changes was the same: **to make our distant ancestors look taller, bigger, and to sound louder**. Here are some of the key behavioural and morphological changes that appeared during the evolution of *Homo sapiens* and which I suggest were related to the development of the system of Audio-Visual Intimidating Display.

Bipedalism. There are about a dozen distinct hypotheses as to how and why bipedalism (walking upright on two legs) started in human evolution. The different hypotheses are not necessarily mutually exclusive. The idea that the origins of human bipedalism might be connected to the desire to intimidate opponents was proposed by Fred Livingstone in the 1960s, and was supported by Nina Jablonski and George Chaplin in the 1990s. Plenty of animal species use bipedal threat displays to look taller in order to avoid an undesirable fight or to intimidate antagonists during a confrontation. I suggest that, unlike other animal species that use bipedalism only when they are confronted by a predator or a competitor, our human ancestors used bipedalism most of the time, eventually shifting to habitual bipedal locomotion. The reason for this, as I have suggested, is that our ancestors did not try to become another silent dweller of the ground. On the contrary, they chose a policy to assert their presence wherever they went, and to intimidate all possible predators with their taller body, confident appearance and noisy behaviour.

Long Legs. Compared to our closest relatives, African apes, humans have unusually long legs. The first explanation that comes to mind when you think of the evolutionary reason of our long legs, is that humans needed longer legs to run faster. This argument fails if we take into account two facts: (1) humans are one of the slowest runners in the animal world, and certainly the slowest among the animals living in the savannah, where they had to demonstrate their running ability; and (2) chimpanzees, with their short legs and embarrassingly awkward running style, can in fact run faster than the best human athletes. So if long human legs did not develop in order to run faster what other purpose could they serve in human evolution? I suggest that the powerful evolutionary forces of natural selection developed longer legs in our distant ancestors for the same reason as bipedalism: to

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make the human body taller and more intimidating for predators and competitors.

Head hair. Human head hair is one of the unique elements of human morphology, although it has not been granted as much scholarly attention in the studies of human evolution as bipedalism has. Nina Jablonski suggested that it was evolutionarily advantageous for hominids to retain the hair on their heads in order to protect the skin there as they walked, upright, under the intense African sun. Desmond Morris suggested that the overgrown head hair was used as a species-specific morphological sign for the hominids, visible from afar. To understand the evolutionary function of human head hair, we need to remember that humans most likely had huge 'afro' style hair on their heads. I am specially stressing this because, in most scholarly reconstructions, our hominid ancestors look as if they just have walked out from a hairdresser. In reality our ancestors had a huge ball of hair on top of their heads. I suggest that the unusually long Hominid hair had the same purposes as that of the bipedal posture and the longer legs: to look taller. Untrimmed head hair can grow about one and a half meters long, so the size of the untrimmed 'Afro' hairstyle is several times as big as the diameter of a human head. Therefore, the huge ball of black hair must have been a significant addition to the hominids' body height. Here we can recall tall military helmets, which, apart from the function of defence of the head from different weapons, also served the similar purpose - to make the wearer look taller and more intimidating for the opponent. Adding horns and other objects to helmets had the same intimidating function. Sometimes even a hairstyle itself could be shaped to make a person look much taller: the well known 'Mohawk' hair style, popular among some contemporary Punk and Goth group members, originated from American Indian tribal warriors, and has the advantage of greatly increasing the height of the wearer.

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Body painting. Hardly any known human tribe or society exists or existed without some form of body painting. Painting bodies and faces before battle or hunting is universal in many parts of the world. I suggest that our ancestors also started using body painting for practical reasons. Body painting used for confrontation with predators had two functions: external and internal. As an 'external' factor, the effect of 'unknown appearance' would confuse and threaten predators, because animals are instinctively weary of other animals and objects which have an unusual and colorful appearance. As an internal, psychological factor, change of appearance (body and face painting) could have helped our ancestors to obtain a different, collective personality and to go into a battle trance. The popularity of masked rituals from different cultures and religions are of particular interest in this regard. What substances could our ancestors use to paint themselves? Although the first material evidence comes from over 230 000 years ago, it is very likely that before the use of such elaborate substances as ochre or manganese dioxide, our ancestors were using simpler and more easily available substances like blood or different berries for quite a long time.

Clothes. The traditional approach to the origins of clothes is that they give protection from cold weather. I propose that initial use of clothes (more precisely - animal hides covering parts of human body) served the function of intimidation, based again on the factors of unusual appearance on one hand, and psychological transformation into the state of battle trance on the other hand. I suggest that those groups of hominids, who were covering themselves with animal hides during scavenging confrontations would have been more successful in intimidating predators and competitors with their unusual appearance than other, naked groups. My suggestion does not conflict with the traditional idea, as clothes could easily serve both of these functions in human prehistory. At the same time there is an important difference between these two functions of the clothes. Clothes as a defence from the cold weather would have become important only after our ancestors moved to other geographical areas with colder climate. On the other hand, clothes as a part of the intimidating system could have originated when our ancestors were still living under the hot African sun, as an aid to make human defence and attacking ability against predators and competitors more effective. Therefore, our distant ancestors could have started using clothes primarily for the defence purposes, and much later, when they moved from sunny Africa to other geographical conditions, clothes were found to be a life-saving protection against the cold weather.

Male Voice Range. The big difference that exists between human male and female voice ranges is very rare among primates. The difference in range is an octave. None of the other apes and most of the

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primates, despite a much bigger difference in their body sizes (for example, between male and female gorillas) have such a big gap in voice range. In explaining the evolutionary reasons for the emergence of the unusually deep male voice, I totally agree with the suggestion of Desmond Morris that a low male voice could have been very useful to 'intimidate human rivals, to drive prey or to scare off predators'.

Singing in harmony. Choir directors would agree with me: the sound of a choir increases when its members sing in harmony. When the overtones of different pitches clash with each other in one simultaneous harmonic sound, the result is a more robust sound with seemingly greater number of participants (this phenomenon is known as "Beau Geste effect"). Therefore, it seems natural for me to propose that the initial impetus to sing in different parts was the result of a long evolutionary process of seeking more impressive sounds for survival and safety. The same search for a more impressive sound, that brought rhythm into human singing, created another uniquely human musical element - singing in harmony. I suggest that hominids were not only singing together, but they were also singing in harmony (in different parts). Some readers might view my suggestion of the direct links between the cultural phenomenon of choral singing and the singing of prehistoric hominids as a bit of an insult, but for me there is something very deep and very poetic in making evolutionary connections between Bach's chorales and the final chorus of Beethoven's 9th symphony on one hand, and the trance-inducing loud singing in the harmonies of our distant ancestors in order to stand their ground against the mighty lions a few million years ago on the other hand.

Singing in dissonances. We have just discussed that singing in harmony makes the overall sound more robust, creating an impression of a larger and more imposing group. Another question is what kind of harmony could have been employed by our hominid ancestors? Professional musicians know that there are several different ways of singing in harmony. You can sing in parallel thirds, or parallel fourths or other intervals, use a drone with other parts, sing in very wide or very close intervals, you can also sing in two, three, four, or more parts, and also you can sing in consonant or dissonant intervals and chords. All these different types of singing in harmony create a very different overall sound. According to my long experience as a choir leader and a university lecturer in different styles of polyphonic singing and various styles of harmony, singing in dissonant intervals and chords creates the most startling, the most robust, and the most impressive overall sound. These characteristics make singing in dissonant harmonies the best possible

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option for the intimidation of opponents (see the box 'Can The Earliest Polyphonic Style of Humanity Still Be Around?').³

Hairless Body. In total contrast to the huge bush of hair on top of the human head, the human body is almost naked, and there must be a good evolutionary reason for this unusual feature of human morphology.

An authority no less than Charles Darwin suggested that human ancestors lost bodily hair because a hairless body was considered to be more attractive for a mate. Taking into account humans' unusually active sexuality,

³ **Can the Earliest Polyphonic Style of Humanity Still Be Around?**

If migrating humans took the common polyphonic singing style from the African 'cradle' to the different regions of the world, it is theoretically possible that some remnants of this primordial polyphonic singing style might still be surviving in the most isolated regions of the world. If we want to search for such survivals we need to look for a polyphonic style with a loud and piercing sound and with very sharp dissonances, and this style must be found in geographically isolated places, ideally on different continents.

If we look at the stratification of singing styles discussed in the first chapter of this book, a very specific polyphonic style stands out. This is a piercing and loud singing style, based on acoustically maximally dissonant intervals (this is a very specific interval between the major and minor seconds, 14-16 hertz, known by the German term 'Schwebungsdiaphonie'). This singing style is found in such geographically isolated regions as the Himalayas, mountain ranges of Hindu-Kush, Caucasian and Balkan mountains, North Vietnamese and Taiwanese mountains, South-West China's forest-covered mountains, some islands of Indonesia and Melanesia, swampy forests of East European Polesie, the fringes of Europe in the Baltic region. I call this polyphonic style Drone-Dissonant style (D/D Style), according to the two most important elements of this style. Some remnants of D/D style are also found in isolated regions of Africa, in North Japan among Ainus, and in the Andes among the Q'eros of South America. The amazing similarity between the polyphonic styles of such isolated regions and cultures strongly suggests that these all are the remnants of the earliest common singing tradition. The striking resemblance between Balkan and Indonesian polyphonies which left Jaap Kunst astonished, is only one example survived from this pre-historic mega-unity. When in the 1980s Florian Messner played a recording from Bulgaria to Indonesian villagers, Indonesians were sure that this was a recording made in a neighbouring village, and the reaction of Bulgarian villagers was exactly the same on hearing the recording of the Indonesian polyphony. I can also say that although I had been studying these polyphonic styles for years, I still cannot distinguish them from each other.

The only serious argument against the possibility that these polyphonic styles are survivals of pre-historic and even pre-modern human times is the immense stretch of time, literally millions of years, that is supposed to pass without much changes in these singing traditions. Otherwise the amazing closeness of singing traditions on one hand, and the distribution of this style in many extremely isolated regions on the other hand represents the classic case of 'remnants of the ancient common practice'. Victor Grauer famously declared that Bushmen/Pygmy polyphony (based on yodeling) can be a survival of the earliest singing style of humanity, stretching for the last 100 000 years. Grauer relies on the 'Recent African' or 'Total Replacement' model. My research and polyphonic data supports, as we will see later, the 'Multiregional model', also known as 'network model', where the count for the age of humanity goes on for millions of years. If we believe that such a long survival of a singing style is impossible, then we are facing the even more difficult task to explain the presence of amazingly similar and very specific dissonant singing traditions in very specific intervals in such wildly different places of the world. Therefore, I suggest that we should not discount the simplest possibility, that these are all remnants of the oldest human singing style, the style that helped our ancestors get into the trance and obtain collective identity in order to fight together, as a unit, for their common survival.

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this idea seems highly plausible. At the same time we should remember that the human skin is not only hairless, but also much more fragile and sensitive than an animal's hide. Most of us would agree that a naked hairless body with gentle smooth and sensitive skin is sensually more attractive, but such skin is also a very vulnerable in violent confrontations with predators, and that's why gentle and soft skin is so rare among animals. What about human ancestors? I suggest that *Hominids did not actually need to be engaged in contact combat with predators*. The new defence strategy, Audio-Visual Intimidating Display (AVID), based on loud and rhythmically united singing, stomping, rhythmical stone hitting, stone-throwing, coupled with bipedal posture, longer legs, huge bushy hair, and body painting, allowed our ancestors to defend themselves against predators and to obtain food (via aggressive scavenging) virtually without any physical contact.

As soon as the need for violent physical contact disappeared, the primate strong and hairy hide lost most of its survival function. The principle of evolution is simple and strict: 'use it or lose it'. As soon as AVID provided a potent non-contact defence system against predators, a green light was given to the sexual preferences for mates with gentler, more sensual skin and a hairless body. I hope we can all agree that if the interests of physical survival and sexual pleasure are in conflict with each other, sexual pleasure takes a back seat. However, as soon as the problem of the defence from predators was solved in our prehistory without the need for violent physical contact, Darwin's suggestion of sexual preference for the hairless bodies became a powerful driving force for the further evolution and refinement of the human body. Another possible reason for the gradual disappearance of bodily hair could be to get rid of the parasites that were (and still are) dwelling in long primate fur.

Teeth. We have already discussed the strange dynamic of the disappearance of human canines since our ancestors descended from the trees to the ground, where most animals try to grow bigger canines. Here I want to discuss briefly the reason for this transformation.

Darwin was probably the first to point out that the decrease of canines in human evolution must have been connected to the adoption of tools as weapons, relieving teeth of the function of physical defence. A century later Ralph Holloway suggested that the reduction of canines followed changes in the social organization of our ancestors and was a selection against aggressiveness. Richard Wrangham and Peter Lucas recently suggested that it was the invention of cooking, not tools, that played the key role in the decrease in the size and number of hominid teeth.

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I propose that the answer to this 'dental paradox' can be found in the intimidation strategy of our hominid ancestors. With the development of successful non-contact means of confrontation, the need for sharp canines as the primary weapon for defence and attack was over (very much like the tough and fur-covered hide).

Interestingly, the teeth of *Sahelanthropus tchadensis*, who lived some 6-7 million years ago, already show reduced canines. There are two possibilities to explain this fact: (1) *Sahelanthropus tchadensis* is an ancestor in the line leading to hominids, or (2) this was a common ancestor of human and Chimpanzee lines, still arboreal, with smaller teeth, and that chimpanzees gradually developed bigger canines after they moved to the ground (while human ancestors chose another strategy and further decreased their canine size). I think the latter suggestion is closer to the historical reality. This suggestion is not very far from the suggestion of Charles Darwin, and the suggestion of Ralph Holloway should not be discounted either (they are not mutually exclusive). On the other hand, the suggestion that cooking was the driving force behind the decrease of canines does not fit the early timelines of the decrease of canines, as the earliest possible date for the use of fire among our ancestors is about two million years ago, while teeth started declining at least five million years ago.

At the end let me also mention, that the decrease in the size of teeth had profound long-term consequences for the development of subtler forms of vocal communication, leading ultimately to the emergence of spoken language a few million years later.

Body Size and Physical Strength. A bigger and heavier body is a liability if you live on the tree branches and try to escape a leopard on the top of the tree, but if you live on the ground and try to intimidate lions with your sounds and looks, a bigger sized body is a blessing. It would be natural to propose that during the millions of years of confrontation with lions, hominids with bigger body size would be naturally selected by evolution.

As I have already mentioned, human body size increased during evolution, but the human's body strength actually decreased. This fact is another indication that for our ancestors size was much more important than the actual strength.

The decrease of the hominid body's physical strength could have been a selective trait towards the decrease of aggressiveness and fatalities during inter-group conflicts in a larger group of hominids, as Holloway suggested in relation to the decrease of size in hominid teeth.

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The Origins of Paleolithic Industry. The origin of the stone tool industry is one of the crucial moments of human evolution. A few scholars who tried to accomplish the task of making a stone tool with their bare hands found that making even the most basic stone tool is an arduously difficult task. Even the talented bonobo, Kanzi, despite his impressive achievements in acquiring the basics of human language, still failed to manufacture stone tools.

In this connection there is an often neglected question hovering over the origins of Paleolithic industry: why and how did our ancestors start making stone tools? What was the initial drive behind this difficult task?

I suggest that the audio-visual intimidating strategy can provide the answer to this question. One of the important elements of intimidation strategy was the use of stones. Stones were used for two important purposes: (1) to make rhythmic sounds by hitting two stones against each other as loud as possible, and (2) to throw them at predators if the audio and visual factors were not effective and if the attack was imminent. Here we have an excellent situation to have plenty of shattered stones: we have a group of hominids in the heat of a life-and-death confrontation. They are using two stones as the simplest rhythmic devices, so they are hitting stones against each other with all the power they have, trying to make sound as loud as possible. The force they were hitting the stones with would have been also augmented by them being in a state of battle trance, much like modern-day soldiers during combat.

As a result, every such confrontation would provide our ancestors with a few shattered stones. A few minutes after the battle, during their feasting on a carcass, the presence of pieces of shattered stones with sharp edges would provide hominids with an excellent opportunity to get an idea of the effectiveness of the sharp-edged pieces of stone. In this scenario, before making stone tools, our ancestors used boulders for a much longer time. These boulders had two functions: (1) function of rhythmic/sound device and (2) function of a missile. I propose that stone tools, which appeared later, were initially an accidental by-product of vigorous 'drumming sessions'.

We should also consider the possibility that hominids were using stone tools with sharp edges not only for working on carcass, but as more effective missiles which could do more damage to a predator's body and head. The presence of unnaturally big and heavy stone tools made by early humans, too big for work on a carcass, but perfect for close combat with its crushing power, also supports this possibility (See also the box 'Is it Possible to Kill a Lion with a Stone?').⁴

⁴ Is it Possible to Kill a Lion with a Stone?

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Musical Emotions: For Sex or for Survival?

While discussing the survival value of the musical faculty in human evolution, scholars often expressed their surprise about the extreme emotional power of music on one hand and the absence of any practical function of music on the other hand. Arguably the best known hypothesis of the adaptive function of music today is still connected to the Charles Darwin's idea of the attraction of the opposite sex, although now in a form of 'demonstrating one's fitness to mate' (Geoffrey Miller). Followers for the 'music for sex' suggestion should somehow explain two important facts which are conflicting with this suggestion: In those species where males sing in order to compete for female attention, understandably only males sing, and also, singers prefer to sing solo romances. In humans both sexes are ardent singers, and also humans prefer to make music in big groups.

To demonstrate the viability of his suggestion, Miller rightfully remarked in 2000: 'No one ever proposed a reasonable survival benefit to individuals taking the time and energy to produce music, which has no utility of finding food, avoiding predators, or overcoming parasites'. Well, I certainly do not claim that music has the power to overcome parasites, but I do claim that music played a crucial role in two other crucial needs of life: avoiding predators and finding food. Even more, I tried to demonstrate that music

The classic answer would be 'it depends how big the stone is and how fast it is flying towards the lion, and where it hits the lion'. OK, what about a hand thrown stone? Well, who would consider doing such a crazy thing?

Throwing objects has been one of the well researched topics in human prehistory. William Calvin's idea of throwing objects as the earliest means of hunting is deservedly popular among a wide range of scholars. I want to suggest a small correction to this theory. In my opinion throwing was primarily used by our ancestors not for hunting, but for defence and confrontational scavenging situations. If we compare these two types of throwing we will find out that defence throwing has several important advantages over hunting throwing: (1) It is much easier to aim at an object when it is running towards you rather than running away from you, (2) the distance for the throw is much shorter in defence throwing, (3) as the distance is much shorter, a thrower can use much heavier rocks, and can even use both hands for throwing one bigger rock, (4) if you are throwing a stone at an animal that is running away from you, most likely you will hit the rear quarters of the animal, but in defence throwing, where a target is running towards you, the most likely place where the stone hits is the head, and (5) if you are throwing a rock at an attacking animal, the speed of the attacking predator is augmenting the speed of the flying rock. So in defence throwing there are several factors that make it more fruitful: we have much better aiming, much shorter distance, much heavier rocks, and the rock hits the head of the attacking animal at a higher speed. The result is much more deadly power from the hit, possibly even able to damage the skull of an attacking animal. The huge, over 30 centimeter, stone tools found in Africa with the sharp edges, were most likely used as a deadly weapon for such close combat rather than a scavenging tool. If you add here that African apes are also widely known to use defence throwing (but not hunting throwing), then the case 'hunting throwing vs. defence throwing' seems to be a case when the defence team clearly wins the case.

Considering that male shoulder morphology is built as a perfect throwing machine (unlike a female arm), it would be logical to propose that the crucial part of confronting attacking lions with heavy rocks during the millions of the years was predominantly a male task.

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actively participated in the development of several important elements of human morphology and behaviour.

After a long period of neglect music, like in the African savannah a few million years ago, goes into a brave and noisy attack to claim the deserved and much belated acknowledgment for the crucial role it played in the evolutionary history of our species.

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Music and War: Million Years BC and Today

So we came to the conclusion that the evolutionary function of music was directly connected to the physical survival of our species. It was loud rhythmic music that was preparing humans for confrontations with powerful African predators, instilling boundless bravery into virtually unarmed hominids with only rocks in their hands, turning separate individuals into a unit of dedicated and self-sacrificing warriors, and giving predators a strong message that behind our ancestor's rhythmic war cry there was a fanatic unity and an absolute dedication from every fighter towards a common goal. As this fanaticism was also supported by the heavy rocks thrown at the closest possible range, no wonder that after countless bloody confrontations on the African savannah, lions started avoiding these kamikaze-style warriors. Lions did not need hominids, as it was too much trouble for them to hunt hominids or to eat them if they managed to kill some of them (about this see later). On the other hand, humans needed lions as 'professional killers' and hunters of the big game, who could kill a decent meal for the whole group (see the box 'Humans and Lions: Parallel Evolution?').⁵

⁵ Humans and Lions: Parallel Evolution?

The evolution of humans and lions has several strikingly similar features, and I want to suggest that these two species, as competitors and arch enemies for the last five million years, had a profound reciprocal influence on the morphological and behavioural evolution of each other. This was an evolutionary 'arms race,' where the development of one morphological and behavioural feature by one species was triggering the response from the other species. Here is the list of the evolutionary similarities between these two species: (1) both humans and lions evolved in the open grasslands of savannah in Africa, within similar timelines: first ancestral forms of both species appeared about 5 million years ago, and more contemporary forms of both species were formed during the last 2-1 million years; (2) both humans and lions are social animals (this feature is not unique among primates, but is unique among cats); (3) both humans and lions have a very unusual and effective intimidating morphological feature in common: long hair on their heads (1.5metre long hair on hominid head, and a mane on a male lion's neck and head), which is unique among both primates and cats; (4) both humans and lions have low and very loud voices which they effectively use for the intimidation of their opponents. Humans obtained the upper hand in this component after developing rhythmically coordinated loud group singing and drumming; (5) both humans and lions went out of Africa and went to different regions of the World in the same historical period, about 2 million years ago; (6) humans and lions were the two most widespread large terrestrial mammals during the Late Pleistocene (100,000-10,000 years ago); (7) the geography of their distribution also coincided, comprising Africa, most of Eurasia, and North America. Even contemporary theories on the evolution of humans and lions have amazing similarities: very much like the two most popular theories of the origins of *Homo sapiens* (multiregional evolutionary model and the single origin replacement model), scholars studying the evolution of lions are also grouped behind two models. One group of scholars maintains that regional varieties of the lions had a successful uninterrupted transformation into the modern groups (multiregional model), and the other group of scholars claims that a single population of lions from Africa later replaced all the local populations in Africa and southwestern Europe (single origin replacement model).

Contrary to the traditional view, according to which migrating humans followed the migrations of herbivores, I suggest that humans were actually following not herbivores (as killing them would be a problem), but the lions, professional killers, who followed and hunted herbivores. For

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Millions of years of using music in combat situations did not go away. It is still with us, in our blood and brain. Humans still use rhythmic music to help soldiers and special forces in their developing the feel of the unity and dedication, and for the psychological preparation for the combat situations. Doing long and rhythmic army drills together gives new recruits the feel of a collective identity, the feel of a bigger entity they belong to. The effectiveness of army drills and rhythmic music is very well known from history. From the 16th century, when the rhythmic army drill became a routine part for preparing armies, soldiers who practiced drills were routinely defeating bigger opposition who had not been trained in army drills. American scholar William McNeill dedicated a fascinating book to this subject.

Music still rules our emotions, and in the most critical moments for survival, humans still use it. Of course, most of us are lucky and we do not need to listen to a heavy rock music in order to prepare ourselves for combat missions where we might be killed, or be required to kill other humans, but many soldiers who have to do this know that music can prepare them for such missions. Millions of years later, music is still a powerful force in war.

It is no wonder that, as neurological research results pointed out, listening to music, singing and drumming activates the deepest structures of our brain, structures that are only activated when survival is on the line. The phenomenon of the battle trance, developed as a result of the millions of years of evolutionary history of the use of singing and drumming for the physical survival of our ancestors, gives this fact full explanation.

millions of years the main strategy used for obtaining food by our ancestors was to chase away lions and scavenge their kills. That's why so many important elements such as social lifestyle, intimidating strategies, and the range of distribution of humans and lions coincide. In this context the origin of the biggest cat, the tiger, can also be seen in a new light as a result of ancestral forms of lions escaping human 'company' by going into the environment usually avoided by humans - tropical jungles. In the environment of tropical jungles, the ancestral lions were transformed into a new cat species with a different look and behaviour- the tiger. Realizing the vastness of this subject, and taking into account my deepest love and reverence for the tigers and generally for the big cats (I guess the result of our evolutionary past), I started writing a new book about the evolutionary duel between big cats and humans even before I finished writing the text of this book.

Defence Strategies in Darkness

One of the serious issues that our distant ancestors faced after becoming terrestrial was the problem of night time security. Even if hominids could stand their ground against the biggest predators during the day, sleeping in the open savannah for the badly armed hominids must have been a very serious challenge. Some insightful ideas were expressed. Adriaan Kortlandt made a brilliant suggestion that one of the ways to secure night time sleep was to organize a loud evening 'concert' to scare away potential predators. Kortlandt cites the behaviour of groups of Chimpanzees, who sometimes organize loud 'concerts' before they sleep, and cites also the behaviour of African tribes living in the forests, who organize the same kind of loud evening displays.

I would like to suggest that there were at least four more factors to make night time less dangerous for the hominids: (1) reclaiming the dead bodies, (2) cannibalism, (2) the use of eyespots, and (4) smell of the human body.

Reclaiming Dead Bodies

When a predator kills its prey, it intends to eat the kill. Prey animals, even after defending their family members with ferocity, usually stop fighting if the attacked member of their group is already dead. Therefore, as soon as the kill is made, there is no more confrontation – the predator got what it wanted, the fight is over and now the predator can enjoy the meal. It was totally different with hominids and humans: being superb masters of intimidation as a group, if their member was killed and taken by a predator, they would follow the predator and reclaim the dead body from the predators.

What is the aim of such crazy bravery? Of course, you can not bring to life the dead member of your group, but with this behaviour you can give a strong message to the predator: every time it attacks your group and kills someone, you are not going to give them a chance to eat the dead body in peace. This behaviour, repeated generation after generation, would teach predators the lesson that preying on humans was unprofitable. Of course, individual humans are among the worst armed animals, so tracking and killing a human for a leopard, tiger or a lion is much easier than killing an antelope or zebra, but it is a totally different story when it comes to eating the

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kill. Antelope or zebra family members do not start a massive attack on the predator after the kill is made, much unlike humans. Therefore, from a predator's point of view, humans are easy to kill but very hard to eat.

So in light of the ongoing argument it is clear that there was a very good evolutionary reason for hominids to attack the deadly predator and reclaim the body of their fellow hominid. In this way they would prevent more attacks from predators, or as scholars call this, would "educate" the predators. Another question is what hominids would do with the dead body after they reclaimed it from the fangs of the predator. This is the topic of the next discussion.

Prehistoric Cannibalism as the Survival Strategy of Human Ancestors

There are several options of how to deal with the remains of the dead human bodies: to bury them, to burn them, to put them on a boat and let it go sailing, to feed them to vultures, etc. There is also another option – to eat the dead bodies. Of course, this last option is the least acceptable for us, but unfortunately, our early ancestors had only two options on how to deal with the dead bodies: (1) to eat them, or (2) not to eat them. All the other options came much later with the development of technology.

These two options had different, short-run and long-run consequences. In short run, if you do not eat the dead body, then predators will eat it. You might think this does not matter as the person was already dead, but it did matter in the long run, because if predators can easily obtain and eat human/hominid corpses, there is a good chance that they will become habitual man-eaters. Arguably the biggest expert in man-eating tigers and leopards, Jim Corbett, noted that after the terrible bout of infectious disease that spread in India in the beginning of the 20th century, some of the worst man-eater leopards started their activity, apparently attracted by the readily available human corpses left unburied during the disease (Corbett, 2003:xiii). For this very reason, it was important for our ancestors to make sure that no human corpses were readily available for scavenging predators to eat.

So, I suggest that those groups of our ancestors who would eat the bodies of their dead fellow members, would have the advantage of forcing lions in their neighborhood to stop hunting humans as non-profitable strategy.

Besides, not eating the dead body of your fellow group member is a waste of high quality food. So despite the well-understood repulsive reaction of the readers of this book to my idea, I have to suggest that cannibalism was an important evolutionary strategy of predator control among our ancestors.

There have been wide ranging disputes over this emotionally charged behaviour in human history and prehistory. According to Tim White, cannibalism was very common in human societies prior to the beginning of the Upper Paleolithic period. This theory is based on the large amount of 'butchered human' bones found in Neanderthal and other Lower/Middle Paleolithic sites. Food shortages are usually considered as the main reason for cannibalism. Taylor also suggested that Cannibalism was a usual practice in all continents in different times in human history. William Arens denied the existing evidence that humans were practicing cannibalism in all of the

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human societies but, according to White, the accumulating body of evidence for the past cannibalism is too strong to refute.

It is important to remember that I am not suggesting that hominids were killing and eating fellow hominids. Instead, I am proposing that hominid groups were co-operatively and self-sacrificially fighting against predators, and in the case of a fatal attack from a predators they were collectively attacking predators, reclaiming the bodies of their killed group members, and cannibalising them. To fight against predators for the body of your killed groups member, and then cannibalise the body in a ritualized way, has totally different evolutionary and even moral overtones. Our distant ancestors are getting undeserved bad publicity for their habit of cannibalism. I maintain that this was an important survival strategy that paid dividends in the attitude of predators towards our ancestors. Most big and powerful predators, who can easily kill humans, do not usually include humans in their diet unless they are incapacitated by wounds and prompted by circumstances. This is, in my opinion, the lasting result of millions of years of 'predator education' by our ancestors.

Apart from the attitudes of predators, cannibalism was an important factor for the emergence of ritualistic behaviour and religious feeling. We can be quite sure that eating the body of a fellow member, killed by a predator, must have been a highly ritualized act. A recent finding of the skull of a young hominid, reported in the July 2010 issue of *National Geographic* with Tim White's comments, also confirms this. We also know that cannibalism in many human societies was connected to the belief that the physical and moral strength of the dead person would go to the person who eats the flesh, so the origins of this belief may also have extremely deep roots. In many cultures (for example, my own Georgian culture) verbally expressing a desire to eat someone or something is the highest expression of love (like 'the puppy is so cute you want to eat it!' similar sayings are used about children, or about attractive members of the opposite sex). Carl Vogt famously suggested in the 19th century that the Communion Rite of Roman Catholic mass comes from the ancient ritualized cannibalism.

Apart from archaeological evidence, there is also genetic proof of the past practice of cannibalism in our ancestors. Many humans have a special gene which protects us against brain diseases (known as prion diseases) that can be contracted by eating contaminated flesh. 'The discovery of this genetic resistance, which shows signs of having spread as a result of natural selection, supports the physical evidence for cannibalism' wrote John Roach in 2003.

As time went on, our ancestors obtained tools that made ground digging possible, and as their food supply improved, burying and burning

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the bodies became the better option, and eventually the only accepted option to deal with dead bodies.

Let us conclude this section on cannibalism. There are three main reasons of cannibalism, currently generally accepted among scholars: (1) cultural norm, (2) necessity in extreme situations of famine, and (3) insanity or social deviancy. None of them acknowledges the possible evolutionary significance of cannibalism. I suggest to add the fourth, the central reason for prehistoric cannibalism: (4) it was a mechanism of predator control among early hominids.

'I Can See You!' Eyespots in Humans

Eyespots are clearly visible marks on the body of an animal. These spots resemble an eye to deceive a predator. Plenty of butterflies, some reptiles, birds and most importantly for us – a few members of the big cat family also have eyespots. Eyespots on the back of the big cats' ears are to fool a predator or competitor into believing that the cat is alert to their presence. Eyespots are effective against predation and attacks because most potential predators seek a certain moment for their attack, when the prey is not looking at them. That's why the eyespots on the back of the head are so widespread among cats – to deter an attack from behind. That's why the cheap plastic masks worn on the back of the head became so effective in deterring the man-eating tigers of the Sundarbans national park from attacking humans.

With many eyes present during daytime and their powerful audio-visual intimidation, human groups hardly need such a defence, but at night when everyone was sleeping, such a defence would have been very welcome. Hominids could not use plastic masks, but I suggest that evolution provided them with such a defence for the night time in the form of eyespots.

Although this has never been suggested before, I propose we have eyespots, but we fail to notice them because of two reasons: (1) humans are generally not good at noticing eyespots, and also, (2) because we only have them when we sleep.

If the reader asks friends or family members to close eyes and looks at their 'sleeping' faces, they may notice, that the eyebrows, arched upwards, and eyelashes, arched downwards, form quite visible oval eyespots on a 'sleeping' human face. Of course, it is not easy for humans to notice the resemblance of human eyebrows and eyelashes to the eye, but this is because we are not generally good at noticing eyespots. For example, we find it difficult to see the resemblance of the marks on the back of a leopard or a lion ears with eyes even after we are told about this. Let us remember that eyespots on our face were not designed by the forces of natural selection for humans to notice, they were designed by evolution to be noticed by big African predators, particularly predators from the cat family, and the cats seem to be particularly good at recognizing eyespots.

According to the generally accepted view, the main function of the human eyebrow is to prevent moisture, mostly salty sweat and rain, from flowing into the eye. Desmond Morris, discussing the possible function of the eyebrow in human evolution, criticized this suggestion as non-effective and suggested that the primary function of the eyebrows is to signal the changing

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moods of their owners. There is no doubt that eyebrows are excellent communicators of our moods, but I suggest that their primary function in human evolution was an anti-predatory defence, to ensure the safety of the night sleep of our ancestors during the thousands of generations of their life in the open savannah.

Body Odour as Defence Strategy

Human sweating is a well-known feature in human anatomy. It is generally believed that humans started sweating more profusely after they started walking upright and lost the body hair. So sweating was cooling down their overheated bodies. Another often neglected peculiarity that comes with sweating is the strong body odour it creates. In fact, the sweat itself is odourless, instead some bacteria who thrive on human sweat, particularly in the hair covered parts of the body (like armpits and genitals), produce the strong smell. In order to cool down a body, sweating does not have to produce odour, so if the sweating comes with a strong odour, it is very likely that there is some evolutionary reason for it. Here is my suggestion.

Our ancestors used a whole set of visual and audio signals during the day to make sure that all predators could easily recognize them and remember that these noisy, bipedal and conspicuous looking creatures were unprofitable prey for them because of their tenacity, fanatic dedication to each other and persistence and overwhelming bravery in fighting for the dead bodies of their slain group members. Apart from daytime security, there were some defence strategies for the nighttime. For example, the use of the eyespots on a sleeping human face, discussed above, had no value in daytime. I suggest that the body odour coming from a group of our ancestors was another strong signal aimed for predators. Predators always approach potential prey against the wind, so that they can smell the prey, but more importantly so that the prey can not smell the approaching predator. In this situation it was inevitable that predators would sense our ancestor's body odour from some distance. With the renowned power of all human secretive glands, and without a shower literally for millions of years, this must have been quite a powerful olfactory sign to all prowling carnivores with even the faintest sense of smell. This strong odour was the first line of defence for our sleeping ancestors. With this suggestion comes another preposition that the initial function of armpit and genital hair possibly was to produce the most effective body odour.

Some readers might ask, if body odour could already give a strong clue about the identity of the sleeping prey, why would our ancestors need eyespots as well, would not body odour be enough to turn them away? Well, as scholars say, the determination of a predator depends on how hungry the predator is. If predator is too hungry, it will still continue hunt, so one more warning signal, another line of defence would never hurt. Sometimes no warning signal can save a prey from an attack. For example, even though any living being tries to avoid the skunk for its legendarily strong odour,

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sometimes skunks still get attacked, killed and eaten by predators. In such cases the predator was too hungry to take into account the disgusting smell of the food item. It is very much the same when starving humans start eating items that they would not consider in normal circumstances (like rats, cats, leather boots, or other humans). So despite at least two defence lines (odour and eyespots) I am sure that cases of nighttime attacks were still occurring. In such case the whole group would be momentarily up, and if the predator was able to take a body in amidst of the loudly shouting and fighting group members, soon the party of dedicated warriors would be ready to follow the trail and teach a predator a very costly (for both sides) lesson to leave them alone in the future.

Reconstructing the primordial polyphony

My arguments for the role of music in the history of human conflicts throughout human history is mostly completed. Before we start discussing the role of music in non-conflict situations, I would like to discuss the hypothetical 'primordial polyphony' that our distant ancestors took from their African cradle.

Any reconstruction of a 'primordial language' or a 'primordial culture' is a highly speculative business. Reconstruction of 'primordial' polyphony is not much different. To reconstruct a phenomenon that, according to my model, existed many hundreds of thousands or even millions of years ago among our hominid ancestors, we need hard evidence which is unlikely to ever enter our knowledge. The only possibility for such a deep historical reconstruction is to find some common features that characterize a big part of the live vocal polyphonic traditions from different parts of the world.

When we look for common features we need to remember that vocal polyphony, once a much-needed phenomenon, lost its 'survival value' after the development of articulated speech and started to decline (the reasons will be discussed in the next chapter).

Here is a list of the possible characteristic features that could have been present in the singing of our distant ancestors. This list was compiled after a comparative study of vocal polyphonic traditions from different regions of the world.

- 1) The choral singing of our distant ancestors was most likely based on the antiphonal and responsorial alternation of two groups, or of a soloist and a responding group. This is a truly universal feature for both polyphonic and even monophonic cultures, and there is hardly a human musical culture on our planet without any elements of the deep-rooted tradition of responsorial singing.
- 2) Choral singing must have included everyone, every layer of a hominid group. This feature is very characteristic for traditional polyphonic cultures, where everyone is expected to participate at some level and there are no formal listeners at all. Strict gender division in singing, or the division of society on performers and listeners seems to be a relatively late phenomenon (unless the situation itself requires the presence of only one gender, like for example, males confronting lions in order to drive them away from a kill).

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- 3) The rhythm of choral singing must have been very precise and vigorous. Precise rhythm absolutely dominates in sub-Saharan singing traditions, and in many European and Polynesian polyphonic traditions.
- 4) The choral singing of our ancestors most certainly was accompanied by a dance, clapping and by bodily rhythmic movements involving all participants. This kind of syncretic unity of singing and dancing is conspicuous in all more or less archaic musical traditions. Even today when we hear rhythmic music, we instinctively want to follow it with tapping, stomping or bodily movements.
- 5) The use of body percussion is also highly probable for the ancient communal singing of our ancestors. The possibility of group stomping in order to create a steady basis for the singing rhythm is even higher. When we hear rhythmic music we have an urge to follow it, and stomping is one of the instinctive and most usual means to do this.
- 6) The singing style of our ancestors was most likely loud and straight. Most archaic polyphonic singing traditions are still extremely loud. With every member of the society participating in singing that involves dance and clapping you will hardly ever hear any quiet and gentle choral music.
- 7) The meter of music was most likely based on duple rhythms (2/4, 4/4). This simplest and most common meter is arguably the most widespread in different cultures of the world (both polyphonic and monophonic), and even in classical music notation it is known as 'Common Meter' (expressed by letter 'C' in notation). Related meter 12/8, where each beat is divided into three sub-beats is another good nominee for the earliest human meter. 12/8 is widespread among Central African Pygmies, and is known to many as 'swing'.
- 8) The tempo most likely became faster during the performance and the pitch was gradually rising. These features are a usual part of archaic dance-songs. They start at a relatively slow or medium tempo and the tempo gets faster and the pitch rises during the performance in growing excitement. Most music teachers are well aware of the general tendency of music students to play faster and faster as the piece approaches the end.
- 9) The drone is the best nominee for the claim of the primordial universality. Drone is not popular in sub-Saharan Africa, although there are certain African cultures where drone is strongly present

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(e.g., among Maasai in East Africa, or Kpelle in West Africa, and even Pygmies). Also, drone polyphony with secondal dissonances (D/D style), is scattered so widely in spectacularly geographically isolated regions of the world that we already discussed the possibility of D/D polyphony being one of the oldest types of group singing among humans.

- 10) Ostinato is possibly the most universal type of vocal polyphony. There are hardly any polyphonic traditions that do not employ the ostinato principle (based on multiple repetition of the same short phrase) to some extent. Drone and ostinato principles are not mutually exclusive, on the contrary, they often coexist.
- 11) I have to suggest that there was no separate function of a bass in the ancient primordial polyphony of our ancestors. Sub-Saharan African polyphonic singing does not seem to be using a bass as a functionally separate part. Even African ostinatos are not necessarily in a lower register, and the drone in traditional music is often in the middle of the polyphonic texture.
- 12) The yodel also has a claim for inclusion among the characteristics of ancient polyphony. It is by no means distributed in a lot of cultures, but nevertheless different forms of yodel are present in isolated pockets of European, sub-African and Pacific polyphonic cultures.
- 13) Verbal text must have been absent or kept to a bare minimum in this primordial polyphony (as it is in the polyphony of the Pygmies). Interjections and nonsense syllables must have been prevalent at this stage. Besides, we are talking about such an archaic period of time when the presence of articulated speech was very unlikely. Repetitive, mantra-like verbal formulas are the most likely candidates for the earliest 'song lyrics.' Repetitive and rhythmic mantra's ability to put humans into an altered state of mind is well known (we will discuss this topic in the last part of the book).
- 14) There is a good chance that the scale basis for the most ancient form of primordial polyphony was an anhemitonic pentatonic.
- 15) The performance was naturally leading participants to the state of trance. To transform individual members of the group into fanatically dedicated members of a unit - this was actually the core function of the whole action (see also the box 'Dancing Through the Night').⁶

⁶ **Dancing Through the Night**

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To summarize, we have the following description of the ancient 'primordial', or 'proto-polyphony':

This was loud, responsorial singing of a large mixed group, rhythmically very precisely organized (most likely in a duple rhythm), accompanied by rhythmic movements, stomping, body percussions, and stone hitting. The choral sound was polyphonic, based on sharp dissonances, the tempo rose during the singing/dancing, as well as the pitch, together with the general dynamics. Polyphony was based on ostinato and drone principles, there was little or no text (mostly interjections or mantra-like repeated verbal formulas), and the function of a bass part was not yet separated. Participants of this primordial session were going into the state of battle trance, where feelings of fear and pain would disappear. Putting participants into this altered state of consciousness was the central function of the primordial singing and dancing sessions.

Dancing is a very energy consuming physical activity, and it is quite amazing how humans can dance for many hours. I am not talking about the exhaustive dance competitions which would go on in order to find out the most resilient dancing pair. By its nature dance is not a competitive activity, much like singing. Dancing and singing are both cooperative activities, designed to unite participants into a unique mental state when they feel a strong bond with each other, a bond that in critical situations can lead to sacrificing their own lives for others and for the group interests. At the same time it is crucially important to remember that the aim of virtually every cooperation is competition, although this competition is aimed at external forces (predators, other human groups).

Group dancing was a great practical help in some critical situations. For example, if a group of our ancestors was in a very dangerous situation at night they could start a loud rhythmic dance, which would help them to keep up their spirit and scare away the predators. Loud dancing at night was like a bonfire which would help to keep predators away from humans. Since the aim of the dance was to achieve the physical safety of the group, it is very likely that males would create a circle, trying to keep children and women inside the circle (as is the case in several animal species). Interestingly, in many cultures the circle created during the round dance is considered a sacred and safe place from evil forces. This kind of round dance, performed during millions of years, must be the predecessor of the contemporary ritual round dance. In the state of trance our ancestors could dance for hours, even dance the whole night. These kind of long dancing sessions are still a part of some religious rituals (for example, Candomble night sessions in Brazil). That's why I suggested earlier that dancing as a physical activity is very natural to humans, and it is possibly evolutionarily more natural for our bodies than running. Humans are not natural runners, but they are natural dancers. Proponents of the 'born to run' model suggest that humans on long distances could outrun all other animals, including horses and wolves. Apart from the natural suspicion to the reality of such claim, even if human ancestors were able to run after an antelope for many hours, and kill the exhausted prey at the end, this long run would take so much energy (plus carrying the food back to others for many more hours) that it is questionable whether such an exhausting and energetically costly way of gaining food was a sustainable strategy. █

Times to Relax: Singing and Peace

Apart from the adrenalin, oxytocin and endorphin-fuelled loud, relentlessly rhythmic and trance-inducing singing-drumming-dancing display, there was another, completely different side of hominid musicality – soft and relaxing.

As we all know, humans can hum. This vocal behaviour is so ubiquitous and so natural, that as is often the case, we mostly fail to notice it. At least, according to the results of my preliminary search, there are no scholarly publications discussing humming.

So, let me ask a few questions – Why do humans hum? When do humans hum? And most importantly for us: could humming have (or had) any adaptive value in human or hominid life?

It would be quite safe to say that most humans hum at least occasionally, and there are a few who hum almost constantly. My late father was from this category. He was humming when reading a newspaper, walking, thinking, playing chess, eating. As Bernadette S., a 14 year old student from Mercy College in Melbourne, told me, she hums almost at every activity. 'But of course, I can not hum at school during my classes,' she told me with regret, 'as it would be embarrassing... So when I am attending classes, I only hum in my head'. Jeff Titon, a prominent American ethnomusicologist, answering my question if he ever hums, told me that he does, although he only sings in his head. Sometimes humans can not control their urge to sing, and as another of my students from the same Mercy College, Stephanie E. told me, she sometimes gets into trouble because she unconsciously starts humming during school classes and even tests.

Another prominent American ethnomusicologist, Timothy Rice, also belongs to the category of people who hum most of the time. 'When he is at home, he is usually humming, whatever he is doing,' his wife Ann told me. 'One day he came back from the University and I noticed right away he was not humming. I immediately guessed something was wrong. I asked him and he said they had had a very unpleasant meeting at the faculty. After about an hour I heard him humming again, and I guessed with relief that he was over it and was feeling fine again'.

An informal survey on humming, conducted by London Zoo in 2008, found out that most people hum when they feel very good. People hum along when listening to music, driving a car, walking, even hum while eating, and some even while having sex. Well, the uniting feature for all these activities is that all these are usually pleasant activities. Although humming can induce

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negative feelings (particularly if humming is out of tune), generally the positive meaning of 'humming' cross-culturally is overwhelming. There is another very interesting and neglected universal human behaviour that often is used instead of humming - whistling, but we will discuss this phenomenon some other time.

Let us now search for the possible evolutionary roots and the possible adaptive function of human humming.

Why Do Humans Hum?

Some social animals are known to have an almost constant indistinct background sound when they are going about their everyday business. These sounds are known as 'contact calls' and include plenty of different sounds, like chicken clucks, baboon grunts, even the sounds of eating, etc. These seemingly unimportant background sounds, a kind of an 'audio byproduct' of everyday activity, in fact have two important functions: (1) it lets every member of the group know that everything is all right, they are only among their kin, there is no sign of a predator, and they all can relax; and (2) it alerts group members if there are any signs of potential danger. In this latter case the first animal who notices the signs of danger (suspicious sounds, or shadows in the forest), stops producing indistinct sounds and stands absolutely still, listening and scanning the environment. Soon other animals around also stop, and in a few seconds the whole group is silent and motionless, watching carefully the environment for the signs of danger. If the alert was false, after some time everyone starts moving again and the indistinct background sound resumes. So the group members can relax again. So let us remember: *for social species, silence is a sign of danger*. To my knowledge, Charles Darwin was the first who noticed this phenomenon on the example of wild horses and cattle and wrote about this in his 1871 book on human origins: "Wild horse and cattle do not, I believe, make any danger-signal; but the attitude of any one of them who first discovers an enemy, warns the others" (Darwin, 2004:123).

Taking into account the intensely social nature of human life and their noisy behaviour, it seems natural to suppose that the universal human habit of humming was routinely accompanying most of the everyday group activities of our distant ancestors. I suggest that humming is the ancient hominid 'contact call'. The fact that humming today is a universal expression for our positive feelings suggests that the positive message implicit in humming is not a late cultural development, but has a very deep, innate basis. A soft humming sound tells us that everything is fine, we are among kin, and we can relax. This simple message is very important for everyone, particularly for our ancestors, who lived under a constant threat to their lives.

It is interesting that although the loud, intimidating audio-visual display has long since lost its initial function in everyday life (only surviving in military forces), humming and soft music still plays an important role in everyday human life both in pre-literate and technologically advanced societies. The lullaby is one of the live examples of the calming power of humming and soft singing. The use of gentle music as a therapy is widely

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known in very different cultures, from the tropical forest dwelling tribes to the most technologically advanced western societies.

The universality of humming as an expression of positive feelings on one hand, and the total silence as an expression of a potential danger on the other hand, suggests that the human brain must be pre-programmed to perceive these emotions from hearing audio background. The fact that prolonged total silence is negatively affecting our emotion is quite well known. Silence can be perceived as an ancient sign of approaching danger, or as Timothy Rice suggested in a conversation with me, 'one suddenly feels as if he is alone'. These emotional responses might be wired in our physiology and psychology through the millions of the years of our evolutionary prehistory. Although we often are seeking a calm atmosphere, we internally feel more comfortable when we hear sounds, particularly human sounds. You may have seen that in some houses the TV or Radio are turned on, although no one is watching or listening. The same effect is achieved when people (usually when they are alone) talk to themselves. As a species, we hate silence.

This ancient desire to avoid silence must be the reason why there is so much music everywhere we go - in shopping malls, elevators, cars, trains, sporting events, political rallies, parties, funerals. Some complain that hearing music in such places, where people do not really listen to the music, is a sign of decline in musical taste. I believe that this kind of highbrow attitude towards music is not historically justified. Listening to music for the pleasure (particularly at concerts) is a much later, I would say, 'Pikerian' phenomenon. For millions of the years the function of music has been to help humans to live more secure, more harmonious and better life. In this context the infamous 'background music' is the evolutionary continuation of the ancient human habit of humming, and it has the worthwhile purpose of helping humans to feel better, to have a more positive attitude, or to fight the fear of small spaces in the elevators. Unlike a few other life pleasures, like eating, drinking or sex, we can not harm ourselves with too much music. I suggest that this extremely high tolerance towards a musical environment and our generally positive reaction towards musical sounds is the consequence of our evolutionary past, where musical sounds were accompanying virtually every moment of the lives of our ancestors, giving them a feeling of security and well-being.

Conclusion: Thank You for the Music

It is time for a general conclusion to this chapter. It is widely accepted that music, unlike language which can communicate precise arbitrary meanings, evokes emotions. In the next chapter we will be shortly discussing the possibilities of transmitting quite precise messages which can be sent by means of musical sounds, but even without that possibility, if we only acknowledge the emotional power of music, there is no need to dismiss the practical importance of music in human life and evolutionary history as a pleasure-inducing audio technology only.

Virtually all the needs of early hominid evolution, from defending themselves from predators, obtaining food via aggressive scavenging, watching out for predators and enemies and relaxing in the heat of the African savannah, were governed by musical sounds. We survived the long and unusual evolutionary path of the primates who descended from the trees to the ground with the help of music. We refused to become silent and throughout our evolutionary history music has been our great practical aid, both in times of life-and-death struggle and in times of relaxation. We can truly say 'thank you for the music'!