

“The biological Human Being – individuals and societies in light of evolution”

A COMPLETE PICTURE

“...everything is connected to everything else”

Norway’s former prime minister, leader of the Brundtland commission, Gro Harlem Brundtland

In a moment of clarity, Gro became famous for this overstatement, which is nevertheless true in its essence. Through human battles over truth, artificial walls are built between nature, culture and individuals. A holistic view of knowledge is now becoming an essential requisite for finding global solutions to the many threats humanity faces in the coming decades. The ecosystems upon which we are dependent have real limits, which they are approaching, or have already passed in many areas. No personal or public opinions can change these facts. All technologies have to operate within the laws of nature. One of these laws is that humanity needs functional ecosystems to exist. Geoengineering, consisting of attempts to save global-sized ecosystems with large construction projects, is presently science fiction and will remain so in the near future. Life must reproduce and replenish resources to meet our basic needs, i.e., food, shelter, air, water, fibre and soil. Every human is a part of ecosystem cycles, and every part of the human body is a result of evolution. We have known this for quite a long time now. Thus, why are we still headed towards collapses? Why are we living as if we were the last persons to be alive? What is the reason for not handing over a safe, sustainable and well-organised Earth to the next generation? Answers to these questions are now emerging from within our own psyche.

Global crises result from human behaviours, which evolved in Africa long ago and are still present in our minds. Our ancestors focused on small scales: family, friends and the nearest environment. No feeling or emotion for an understanding of issues at a global scale was necessary to carry the human lineage onwards. In the wake of evolution in this environment, the human brain was formed and is now scanned for emotions. Knowledge of evolved tendencies and feelings is crucial if we are to find ways to avoid the race towards collapses. First, making “the man in the mirror”

prudent has not worked and is not a solution. We now know why. Saving future generations calls for collective action, along lines such as “OK, I will do it if we all do it together, but I’ll not be the first one to cut down on consumption”. This sentence is central and implies a form of complete democracy that must include everyone. Industry and production must be a part of this democracy. We close the book with suggestions regarding how this can be accomplished, given the human mind and its possibilities and limitations science now has revealed.

((... Omitted for now: Further elaborations on the fact that it is not the earth that needs saving, it is the humanity itself: Earth recover over geological time, regardless of collapses))

We begin with a brief summary of the concept of evolution, which is so simple that it strangely enough took some time before it was accepted. How could so much variance and so many colours and shapes have arisen from such simple mechanisms? Darwin addressed the human species in only a few sentences in his 1859 “Origin of Species”. One of Darwin’s most famous critics was Bishop Wilberforce, and the story goes that the Bishop’s wife, faced with the notion that she was descended from animals, said “I hope it’s not true, but if it is, I hope no-one will ever know”. Alas, she is still partly right.

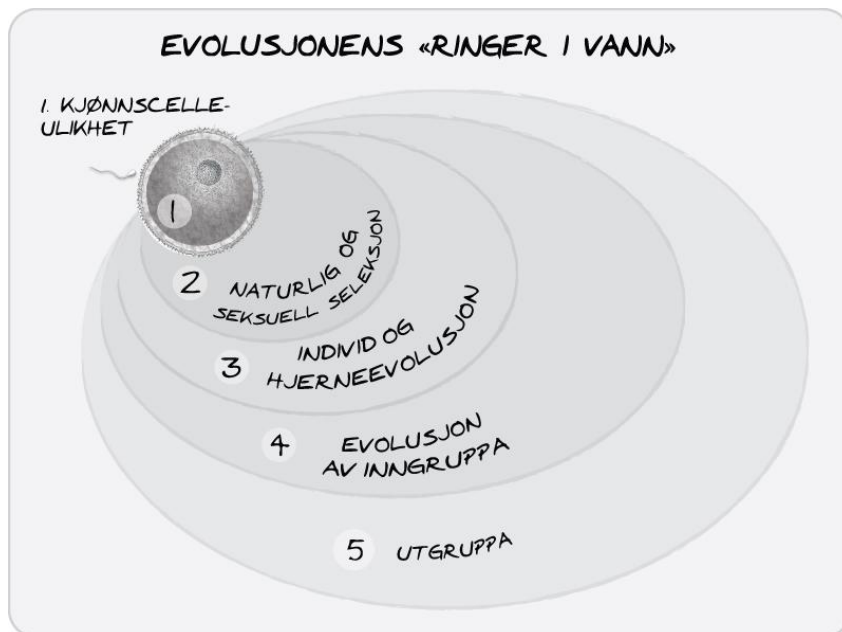
“It has happened. We have finally figured out where we came from, why we’re here, and who we are”

Laura Betzig [1].

Knowledge of evolution and its consequences should now be a part of everyone’s education. There is a connection between the Big Bang, the origin of life and evolution, extending up to financial crises, environmental collapses and the common quest for quality of life and satisfaction that characterise human cultures. The evolved biological connections can be illustrated, as shown in figure 1.

Fig 1: Evolutionary waves: the connection between evolution and humans in time and space. 1. Size differences between the sex cells. 2. Natural and sexual selection. 3 Individual and brain evolution. 4. Ingroup evolution. 5 Outgroup evolution. There are

many, fluid, overarching connections between each wave are that influence each other.



The ultimate driver over evolutionary time is the difference in the sex cells, which is discussed in Chapter 2. Mate choice is the primary driver of sexual selection and the ultimate mechanism that formed our brain. The dominating human strategies of wastefulness and squandering are a direct response to the showy type of selection characterising humans, which is observed cross-culturally, throughout all known history, including in today's cultures [2]. The urge to have more and to consume and the resulting problems, such as settling down and be content, are emotions, inclinations and drivers inherited from the most generous consumers among prehistoric man. They became our ancestors, and the connection between these drivers and wave 5, the outgroups of larger communities, is destroying the Earth's life support abilities. The same mechanisms are crucial for brain evolution (wave 3) and are found in the arsenal of similar dispositions, feelings and tendencies with which each of us is now equipped. We introduce a definition of human drivers derived from evolutionary science:

"The emotions, inclinations and tendencies felt by an individual are inherited rewards or punishments that have helped them to act in an evolutionarily fruitful way in the past"

Consciousness is, itself, a trait that shows every sign of being sexually selected. Even an earthworm finds its food and mate without a brain. The only need for a feeling of being oneself is the self-assertion that “I am important. I am something. Look at me; I am self-aware and attractive”. In Chapter 2, we address the paradox of “the half-second delay”, i.e., that our consciousness is found to be alerted half a second after decisions and actions are made [3, 4]. Consciousness occupies only approximately a millionth of the brain’s activity, and this fact conflicts with the purpose of the whole concept that “I have full control through my consciousness”. The results of verifiable experiments confirmed that the last decades are therefore problematic to accept.

Chapter 2 deals further with the individual, emotions and what we are evolved to strive for. The limit of consciousness and the surprisingly minimal control it exerts represents a literally unbelievable challenge. To confer the illusion of control, self-deception is an important characteristics of humans. Is it possible to see ourselves from outside and expose our own ego using insight and knowledge? The chapter concludes by describing emotions as evolved means to survive and make individuals attractive. In this context, “evolved” is a better word than “developed”. Evolution is not "development", meaning "improvement." Evolution only consists of value-neutral changes.

Chapter 3 addresses the wide range of strategies that form individuals and cultures. The decisions we make are always related to what others are doing. Mate choice and differences in attractiveness are core factors that have shaped human behaviour. Feelings that have evolved through mate choice are therefore the reasons for most of the misery and joy in life. This chapter address why people behave differently. "People are different" is a comforting, soothing and inaccurate simplification. Differences between people arise from the actions and strategies triggered by each specific situation. "Relate to what the others around you are doing" is the catchphrase. Attempting to be like others or daring to be different are two main ways of changing behaviour and creating strategies. Furthermore, Chapter 3 discusses deviations from the norm and why a majority always deviates from the arithmetic mean. Human behaviour illustrates evolutionary mediocrity. Fig. 2 illustrates evolution’s “good enough” principle.



Fig 2. Two polar bear researchers are on their way to Svalbard, and one of them bring spikes... his companion points out that it is not possible to outrun a polar bear... The other remarks "I only have to outrun you"...

Physical performance has been less important for the development of human behaviour. It was mostly brain "spikes" that selected ancestors. Those who had slightly blunter spikes were left on the evolutionary scrap heap. Our ancestors were only slightly better than their contemporaries. It is not necessary to be a genius when one is surrounded by mediocre contestants. Evolution is about being only slightly better, and consequently, nobody is perfect. The competition to win access to resources and mates has always been fought against those who are closest. Even the most attractive and talented have, throughout time, only performed barely better than their competitors. Therefore, all individuals of all species generally exhibit both large and small irregularities, variations, halfway solutions, failures and shortcomings, both physically and mentally. Let the history of the Svalbard researchers follow you throughout the book. It describes a principle that forms variation. Furthermore,

adaptations fit the past, corresponding to the environment in which they were originally selected.

It should be noted that exaggerations may also act as a "good enough" solution: to feel more worried and suspicious than necessary may constitute advantages for the prescient. Too much food is a smaller problem than no food, and to always be on the alert for strangers is better than to have a careless attitude [5]. Humans therefore exhibit many smoke detectors that are triggered before they are needed.

Exaggerations are inherited from our worried ancestors. The carefree were eaten by evolution's polar bears. The saying goes "It may soon be raining...".

In Chapter 4, we examine how the "good enough" principle has led to many mental disorders. An entirely new view regarding how to address psychiatric patients may arise from the science of human behavioural ecology.

Understanding human behaviour is necessary to understand human societies. It seems self evident, but in Chapter 4, we integrate human evolution with culture. This approach constitutes the foundation for a comprehensive social analysis that has not yet been discovered by the mainstream social scientist. Evolution is the only factor that can be identified as part of every detail of human behaviour. Cultural expressions are limited by the evolved human arsenal of emotional behaviour. There are many cultures that we know will never be discovered. However, when we know why certain sought after cultural expressions are in conflict with human behaviour, it might be possible to override ourselves through common action.

In Chapter 5 we address how human cultures have generally attended to resources and how subsequent environmental problems lie in the wake of humanity. History shows that man has never been prudent [2]. When opportunities have arisen and technologies have been invented, the most extravagant have ended up as our ancestors, in line with the evolutionary logic of the past. Global environmental problems, capitalism, war and religious struggles have originated from the four inner rings in Figure 1. Congenital feelings and urges govern the strategic choices appearing in both small and large groups. A central problem is egoism, which leads to "the tragedy of the unregulated commons". Egoism is only one of many innate

traits influencing culture. We are closest to ourselves and the inner group of our family, as well as people who we know and are personally connected to. These human emotions are present cross-culturally, and we find them manifested throughout history. Suspicion against "outsiders", or outgroups, is one of the most problematic factors today because the world has become a large community in a very short period of time.

Human mate choice constantly progresses, associated with evaluations of status, appearance and intelligence. Outwardly, this triggers reactions: it is uncomfortable to admit that you look for and evaluate differences. The human scenario consists of a cacophony of patience, kindness, showing off, generosity and trampling on competitors, and we discuss this quagmire thoroughly. Every stone must be turned. We cannot close our eyes in the quest for answers.

In Chapter 6, we elaborate on the basis of current knowledge about human behaviour. Understanding how communities work is the first step towards achieving ecologically sustainable use of resources. What is possible within the evolved human individual and group behaviour? What is the significance of human behaviour for social organisation? Insight into how some aspects like egoism and lack of prudence can be controlled, and others like cooperation, generosity and solidarity can be encouraged, may lay the foundation for a sustainable and safe future. Is it possible to design a stable, democratic platform so that the problematic parts of human behaviour are inhibited, while the cooperating and generous parts dominate? We suggest a model in which evolved ingroup feelings may thrive. Solidarity, generosity and responsible feelings dominate transparent ingroups, where everyone knows everyone. Corruption and selfishness are kept under control when actions are visible. We believe that the emotions obtained the human past in small groups and tribes can be transferred to large societies via organising representative democracies.

The book concludes with a chapter we have entitled "The battle over truth". This battle permeates all parts of human life and is an echo of the quest for status; i.e., the individual who has the last word increases his or her status. The battle over truth is one of the greatest obstacles to a safe future because the purpose of a discussion seldom approaches truth. Rather, it is usually about winning the argument itself.

Evidence of such unwanted effects of human behaviour is uncomfortable to accept and leads to battles between the natural and social sciences.

"Of all the things in the universe, human behaviour is the only thing we really don't want to understand too well"

Richard Alexander [6]

The effect of the innate "I want to win the discussion" emotion is fights for the truth in every aspect of life, from religions and politics to how children should be brought up. These drivers lead to difficulties in introducing new ideas, which are also perceived as a challenge to achieve status. Consequently, someone attempting to come up with something new is usually opposed. The battle over truth is one of the main reasons why it is difficult to organise large human communities. Might it be possible to unmask ourselves and, thus, reveal the purpose of the fight, thereby allowing reason to decide our actions? Do knowledge and insight increase free will?

By now, you will perhaps see our biggest problem as authors: in which sequence should this be presented? Inasmuch as everything is connected, it seems to be impossible to find a logical path. Our advice is therefore to read the book twice. Science is, in its essence, without morals. It is dishonest to choose the pleasant and sought after results and leave the unpleasant facts aside. The latter type of knowledge must be included to organise a sustainable society. The biological term for the type of science addressed in this book is Human Behavioural Ecology. This is a cumbersome name, and its origin is explained in greater detail by Mysterud [7].

Why is it so crucial to find answers?

The scientific description of the world forms a four-dimensional whole. In addition to space, the fourth dimension is long, evolutionary time. Emotions and drivers that evolved in ingroups in Africa are now facing enormous social and global distances. Human history involves strategies designed to dominate in a complicated Machiavelli and Münchhausen's game of attractiveness. The winners defined the truth and were rewarded through descendants who inherited their manoeuvring capabilities. The difference between a bluff and the truth was less important in an era when there was

no paper or pencils. Over time, answers that were once “right” and represented discussion-winning arguments disappeared. Why humans have evolved this way is related to an incredibly interesting history. This history should not be considered as a guide for behaviour, but to provide insight and aid in regulation, management and avoidance of unwanted consequences.

Human life has rarely been lived on a bed of roses. Disease, hunger, war and other disasters characterise human history. The crises now facing humanity are, however, on a global scale. The most productive parts of the world are close to collapses of varying degrees, and some places have been irreparably damaged, which may persist for thousands of years. There are no further shelters to flee to. No additional oceans, forests or waterways can be exploited without large negative consequences. Man has reached the limits of the world. This is a completely new situation. Human emotions are not adapted to global limits. We live our lives like our ancestors, as if we were to be the last people on Earth. To understand why this is the case is the first step towards shaping the future.

Each of us follows an evolved urge to provide for the individuals closest to us. In addition, the tendency to never be satisfied evolved in an infinite world where the modest produced fewer descendants. The cautious were weeded out. The generous, dominant and celebratory became our attractive human ancestors. To obtain valuable, attractive or beautiful things triggers innate rewards rooted in mate choice. There has never been any need for emotions that warn of global limits. Today's economy fits like a hand in a glove with these extravagant feelings. Next time you buy something you want, stop for a while and “taste” the feeling inside you. Because of these urges, moral pressure and personal inclinations to halt consumption is not a feasible solution for large societies. Free riders not following the moral imperative will always be in a majority. We discuss this problem in Chapter 4 by introducing the hawk and dove dichotomy. Another aspect of this “solution” is that if it were to produce results, the economy would break down because it is founded on ever increasing consumption. The total consumption has exceeded the sustainability of most areas, demonstrating the political need to address the function of the global capitalist economy. The resource requirements of the current human population would require the resources of five planets if everyone were to exhibit the same

consumption as in the richest parts of the world. Holistic long-term thinking, management and planning are now required. The world economy has no built-in solutions to global problems, quite the opposite. The global free market economy is dependent on increasing overproduction and overconsumption. Stock exchange breakdowns, multi-billion dollar losses and job closures are essentially beneficial to the environment, paradoxically producing a safer future through decreasing consumption and emissions. When the economy crashes, however, government efforts are concentrated on getting the game back on track.

Every nation seeks to increase the competitiveness of its own industries. At the same time, environmentalists, socialists and politicians of all types urge increasing the production of so-called environmentally friendly energy. In today's economy, however, all energy will contribute to over-consumption.

What exactly is money? Why do we believe that the symbol of money will retain its value in a future lacking natural resources to produce food and clothing? The notion of money as a valuable symbol arises from a selected emotion inherited from those who felt desire for objects that were sought after and represented attractiveness or exchange value. In our modern society, we mix the sense of monetary value with the feeling of having saved food, clothing or wood. However, money, gold, stocks and art cannot be eaten. Our children's needs must be met in the future. Hard drives with monetary data are not food¹. The battle over the truth needs to be launched now.

What is truth, and what is a "good enough answer"?

The librarian Erasthenes (276-196 BC) from Alexandria compared the length of the shadow of a pole in northern and southern Egypt on the same day. From this, he could calculate that the Earth had a circumference of 39,375 kilometres. You do not always need to know every detail to comprehend large contexts. Circumnavigation is not necessary to observe that the Earth is round. Only a minimum of knowledge is

¹ The Norwegian oil fund is at present exceeding 300 billion Euros. On October 6th 2010, the chair of the finance committee at the Norwegian Parliament, stated: "We can subsist on this fund forever".

necessary to recognise that man's future is linked with taking care of the Earth's ecosystems. Information presented both in school and to the public through the media should communicate that mankind is dependent on self-propelled, species-diverse ecosystems. The knowledge that life is unsafe associated with new and unknown chemicals should be compulsory.

The Norwegian government has established an educational committee referred to as the Bostad Committee. They note that it is necessary for democracy that public education is improved. They have presented the following statement"

"Enlightened conversation and informed debate are fundamental elements of democracy. In a world where environmental protection and global scientific knowledge is becoming more and more important, it should be emphasised again and again how crucial it is to have a population that understands - or at least knows something about - science and scientific thinking. "

Achieving an enlightened democracy is the first step towards solutions that will prevent suffering and injustice. Free will is an illusion without knowledge, and increasing knowledge increases free will. Knowledge provides more possibilities for change, both for individuals and societies. Understanding is the first step towards sustainability.

A biologist is often thought of as an enthusiastic weirdo, telling insignificant anecdotes accompanied by funny or mystical music in special TV productions². He dares to handle small animals that grown-ups scream and run from. Biology is considered a natural science subject in school but does not appear to apply to our daily work or life on the Internet. We play music, fall in love, buy burgers, watch TV, cry, drink, have sex, read comic books and go shopping without being aware that the drivers and feelings behind all these activities are inherited and are part of the biological science of life [8-15]. Evolution does not shut down above our necks. Every time you feel or act, the brain and body apply the results of three billion years of evolutionary history. Humanity needs to know how this came about, including why

² Exceptions are David Attenborough and Richard Dawkins

human behaviour is so difficult to address to make well thought out choices regarding what the future should be like.

In this book, we have attempted to avoid or explain technical terms. Researchers now specialise to achieve status, which is measured in terms of articles written in unreadable language for non-experts. Mankind's knowledge is often obtained by a few brilliant giants who stand on the shoulders of a large number of unknown puzzle piece contributors. Like most other scientists, the authors of this work have contributed modestly to the world's knowledge. We have attempted to recommend popularised books in various fields in the references. Books usually explain results more understandably, without employing formulas and field-specific terminology. These books, in turn, refer to more detailed scientific investigations for those who want to go further. The chosen references are limited by the fact that it is not possible to present a complete overview of all of the published works in each field of science. In popular science books, it is therefore considered good manners to apologise to specialists about leaving out references. We hereby do so.

Knowledge, truth, status and justice

The battle of truth causes combatants to use concepts and words as they please. To be the one who is right evokes rewarding feelings – such ancestors became attractive. The human menagerie consists of a jungle of bluffing, opinions, hair-splitting and quibbling in every setting. The best “talker” wins on TV debates, like a faint echo from boastful campfire discourses in our African past. Science will therefore not thrive without rules addressing how to communicate. For example, if two debaters present opposite answers, at least one of them must be wrong; e.g., humanity cannot both have evolved in Africa and, at the same time, have been created 6000 years ago. These ongoing and logical settlements of accounts cause science to progress. Although science has sometimes undergone revolutions that have turned world views upside down, not all knowledge must necessarily go through this type of change. Cautiously used, this process will strengthen the web of science so that it does not have to start with explaining the Big Bang every time an experiment is to be carried out. The total amount of data and knowledge is gigantic, and this process makes it possible to accumulate increasing amounts of scientific

knowledge. Alas, the human battle for status is needlessly complicating this process by turning it into playgrounds for peacocks. Some social scientists claim that no truth exists and, consequently, can never be approached, much less found. Some claim that every statement may be true or false, a view that lightens conflicts between those who uphold the same view (see Chapter 7). To prevent others from winning the argument, every trick is legal.

Is it possible to agree on a minimum standard of truth? Consider the comparison below:

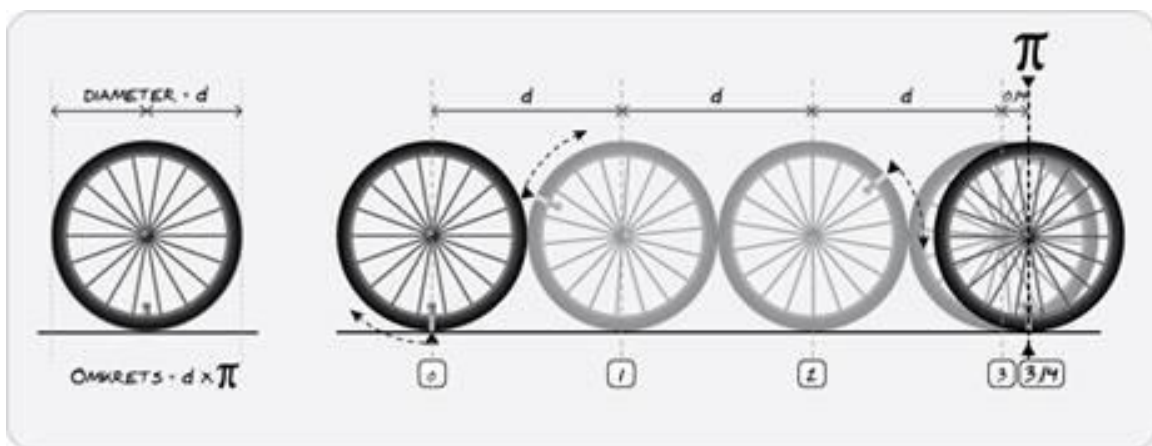


Fig. 3. How to calculate Pi.

Circumference divided by diameter is the same for every circle. This calculation has no exact answer. We simply designate the answer with the Greek letter Pi (π), acknowledging that the number will never be found. Nevertheless, we can be sure of one thing: the answer is in the vicinity of 3,14. It will never be 3,15, or 3,13, or any other number. This small example has a major impact on the science of knowledge itself and how we approach the truth by calculating increasing numbers of Pi decimals within each branch of science.

True statements may not be possible to find, but that does not mean that everything is equally wrong.

One example is the law of gravitation, which was first formulated by Isaac Newton in the 17th century. His calculations addressing how movements and forces interact are

still useful. Newton found that the accelerating speed towards the centre of the Earth is approximately $9,81 \text{ m/s}^2$. In the context of our Pi example, Newton found gravity's own 3,14. Since that time, Newton's formulas have been improved several times, including corrections for air resistance, friction and height above sea level.

Approximately two centuries after Newton, Einstein introduced relativity, and another set of Pi decimals were calculated for the Newton formula.

However, Newton was not all that wrong, and for everyday life, his Pi has more than enough decimals to build houses and receive an A in high school, even though he might not have produced a sufficient number of decimals for calculations related to space travel. We know something else for certain:

Newton, Darwin and Erasthenes will forever be approximately right. We evolved in Africa and descended from Africans [16]³. We are the sole surviving species of a number of humanoid species from the last millions of years. This will, regardless of what the future brings, forever be approximately right.

The Pi example illustrates a “good enough knowledge” principle that challenges or possibly silences (...) the fruitless battles over truth. Science knows with Pi certainty that this fight is an inherited trait that evolved for the purpose of achieving status.

We elaborate on this in Chapter 7. We only needed you to be familiar with the Pi example; human knowledge is more comprehensive than is usually described. The saying that “we know so little, and the more we know, the more we need to find out” is not as true as it once was. There are many Pi models available, which form a framework including most of the world. Cross-cultural references to “the old truths” are best seen as the results of evolved feelings to cement and support our own cultures and ingroups. “This is the way we have always done it” is a saying that is found everywhere, throughout all times. Now, a reasonably bright high school pupil knows more of science and how the world is constructed than the total knowledge of mankind prior to approximately 1700. The science of human behavioural ecology, which this book addresses, is only four decades old.

³ <https://genographic.nationalgeographic.com/genographic/journey.html>

The thrilling story of science starts a fraction of a second after the Big Bang, 13,9 billion years ago. Humans have not evolved abilities to comprehend such vast length of time, we only need to understand what will happen within a decade or so. The Earth was formed approximately 10 billion years later. The physical conditions during the next 1000 million years laid the foundations for life. Life is not a miracle, it is a physical necessity, driven by a set of favourable conditions that are most likely present throughout the universe.

We need to practice how to comprehend large-scale perspectives to act globally. Time is an example we can use as an exercise. Imagine that one centimetre equals one year. On this scale, the Earth's age is approximately the same as the length of its circumference: 4 000 000 000 centimetres, or 40 000 kilometres. The authors of this book have lived for approximately half a meter on this scale. It is slightly over one meter back to the invention of the car. Our "incredibly long" written cultural history only extends for a few meters. One of the many saviours of humanity lived his 33 centimetres twenty meters away. Think about it the next time you pick up the mail. One hundred meters away, the first farmer appeared in the Middle East. At 500 meters, the ancestors of all humans outside Africa emigrated from their evolutionary cradle in the Rift Valley. At that point, there were no Europeans or Asians. Every human was an African.

A small Sunday walk of approximately three kilometres brings us back to our common ancestor with *Homo neanderthalensis*, a closely related species that Europeans met and mated with [17, 18]⁴. Where we separated from chimps is 50 kilometres away, and down the line, we find the point where we separate from mammals, birds, dinosaurs and arthropods, all the way down to one-celled algae and bacteria. At that point, we still have 10,000 kilometres remaining in our journey around the Earth. Science passed our evolved limits for understanding numbers, sizes and distances long ago. Humans are evolved to see inside a three-dimensional

⁴ People outside Africa share 1-4 % genes with neanderthals:
http://www.sciencemag.org/cgi/content/abstract/328/5979/710?ijkey=e4c83a2e5347606b8e6ca8583c0a5e451b9f611e&keytype2=tf_ips_ecsha>

room. Here on Earth, this has been the basis of our environment for all time. For a human being, the changes over time and space are not possible to comprehend, even though calculations and science prove them to be true. None of these perspectives has had any influence on the numbers of descendants produced. However, the urge to answer questions, seek knowledge and understand systems has, in itself, been a selected trait. Through mate choice and sexual selection, these attractive qualities have shaped a brain that is capable of imagining a world outside of the senses. The senses are surprisingly poor. We have inherited the abilities to see only a microscopic subset of the electromagnetic waves that flow around the universe, which we call light. This set is, however, the most useful if our purpose is to move around on Earth. The other waves, from shortwave cosmic rays, to radio and telephone waves, to the echo of Big Bang were not essential to become our ancestors.

We usually dislike being reminded of our insignificance. Our emotional evolution has given us a high self esteem. The bashful part of us is not the most prominent.

There are, of course, an unknown number of Pi decimals to be revealed in every corner of science. Details about which we now do not have the faintest clue will be found [19-21]. Some claim that group selection may be a human strategy, i.e., that groups with some individuals who sacrifice themselves for the good of the group will thrive more than others. The evidence for this idea is weak at most [22]. Research on altruism suggests that self-sacrifice for the benefit of the group is most likely the result of sexual selection and The Handicap Principle, therefore representing pure egoism at its most cunning, though it may result in some larger group effect under certain circumstances. Generosity and showing off generate one of the most evolutionary valuable assets: status. These mechanisms constitute the basis for organising stable societies. The key is to separate visible behaviour from the evolutionary advantages conferred by the generous and seemingly altruistic behaviour. It is possible to use our knowledge of ourselves to allow the best in us to be dominant over the worst.

People have produced scientific explanations based on religions and stories throughout our history. This wide-ranging story telling is the product of a mate choice-driven, evolved need to understand the world. We are the descendants of the persuaders, the talkers and the discussion winners. These people seasoned their statements and thoughts with a flow of words. Because of this, our scientific and philosophical past and present history is full of strange opinions and descriptions, often far from reality. Knowing the limits to thinking itself provides important insight for broadening the mind. One such limit is the concept of statistics. We are evolved to consider the experiences we have in our daily lives. Maybe a healer has treated one of your friends with apparently good results. This will colour your opinion, regardless of the hard evidence based on statistical investigations showing no effects apart from placebo effects and pure coincidence. We now have a clue as to why it is so popular to be an “alternative” healer: they obtain status.

We need to separate two concepts: chance and stochasticity. No one has yet shown that anything happens by chance. The newest statement from physicist Stephen Hawking is more categorical than ever: “Because there is a law such as gravity, the Universe can and will create itself from nothing. Spontaneous creation is the reason there is something rather than nothing, why the Universe exists, why we exist”, he states [23]. Most events are, nevertheless, impossible to foresee because their causes are almost infinite in number, and most of them are microscopic. Consider a ball bouncing away. Its direction is decided by the small irregularities on the spots it hits and the specific small-scale air resistance conditions. Even microscopic differences in gravity based on height play a role. These causes are impossible to monitor. The only thing we know is that they are there, somewhere. Nothing happens by chance; i.e., no rocks fall upwards, and people do not become younger over the years.

Stochasticity has been referred to as the butterfly effect, a popular expression from Chaos theory: like a bouncing ball, a stroke of a butterfly’s wing may set in motion a series of microscopic meteorological events that may change the path of hurricanes on the other side of the planet. Impossible to calculate or observe, but the world is run by such details [24]. The brain and its activities are analogous to an immensely difficult map. It should be noted that even if the world is constructed in this way, it

does not need to have any purpose. Through mate choice, the human mind is selected to search for patterns, purposes and meanings in everything. We produce these if necessary, together with evaluations of attractiveness and economic value. Evolution in itself has no value, it is our evolved minds that place values on whatever comes our way. The evaluators became our ancestors.

Because of this, the world is by no means boring. We cannot even predict where a bouncing ball will end. However, apparently paradoxically, we can say more about the possible variation in human cultures.

Throughout the book, we frequently address the characteristic evolved behaviours of manipulation, self-assertion and duping of others found in human behaviour. The concept of ruling others has given birth to a large number of techniques. Some of these methods are, in themselves, evolved feelings that can silence an opponent. Used in a discussion, it is difficult to decide whether many concepts are manipulations or misunderstandings. Three of these are as follows:

1. The naturalistic fallacy: Nature is always right. (That is, if something is natural, it should be that way. Ever since Edward O. Wilson brought humans into behavioural biology [25], sociobiologists have faced this manipulative misunderstanding. In our book, we show that it is much more logical to go the opposite way; i.e., if we know why nature is difficult to change, it will be easier to make changes.
2. The moralistic fallacy: What is good is found in nature. It lies behind the romantic belief that humans cannot harbor desires to kill, rape, lie, or steal because that would be too depressing or reactionary. It is unpleasant to face the fact that humans are different because we unavoidably evaluate differences, and we dislike to admit that we do. For example, sex, ethnic groups and individuals are characterised by differences. It is therefore convenient to claim that no differences exist and that we are all equal. This is a mixture of a moral standpoint (which the authors support) and a scientific view that has tormented knowledge seekers for decades.
3. The culturalistic fallacy, i.e., the notion that all cultures are equally valuable.

Such fallacies are used as weapons in arguing. In this book, we want to take you on a showdown tour, and hopefully make you see both personal and societal shortcomings and the possibilities this opens up to build a brighter future. We have to go down that road together.

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