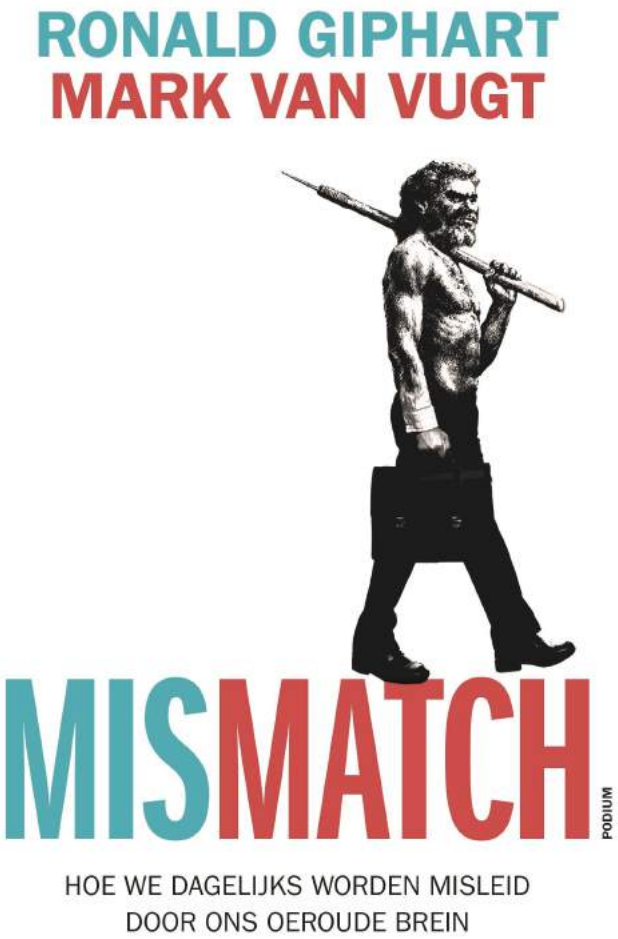
Ronald Giphart & Mark van Vugt

MISMATCH

HOW OUR STONE AGE BRAIN DECEIVES US EVERY DAY



A best-selling novelist and a Professor of Evolutionary Psychology team up in this highly enjoyable exploration of how the Stone Age brain (mal)functions in the Modern World.

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INTRODUCTION

A best-selling novelist and a Professor of Evolutionary Psychology team up in this highly enjoyable exploration of how the Stone Age brain (mal)functions in the Modern World. Based on the academic research and knowledge of an absolute expert in the field of Evolutionary Psychology (Van Vugt) and written by a novelist in clear and elegant prose, *Mismatch* offers a playful look at human beings and the strange ways our species behaves. There's no doubt that this will appeal to many readers of the popular scientific genre.

Mismatches occur when our primitive brains put us on the wrong foot by responding to stimuli that - in prehistoric times - would have prompted behaviour that was beneficial. But in the modern environment, various stimuli cause us to make the wrong choices, ones that harm our well-being.

Examining mismatch in the fields of healthcare, love, sex, leadership, religion, environment and media, the scope of *Mismatch* is bigger than any other book on the Evolutionary Psychology concept of mismatch has ever been. These topics have been written about by other authors, for example in Van Vugt's own internationally successful book *Leadership.* In *Political Animals* (Basic Books), Rick Shenkman zooms in how the Stone Age brain gets in the way of politics. Other books that come to mind are Yuval Noah Harari's *Sapiens* and *The Origin of our Species* by Chris Stringer. But the books mentioned cover a piece of the mismatch-story in depth, whereas Giphart & Van Vugt discuss mismatch and its consequences in a wide variety of fields. There are no comparable books in which the idea of mismatch is central and its consequences to the above mentioned fields are so clearly outlined. Furthermore, there are no other books that show in a practical sense how mismatch can influence your life and how you can do something about it, either on a personal or a professional level.

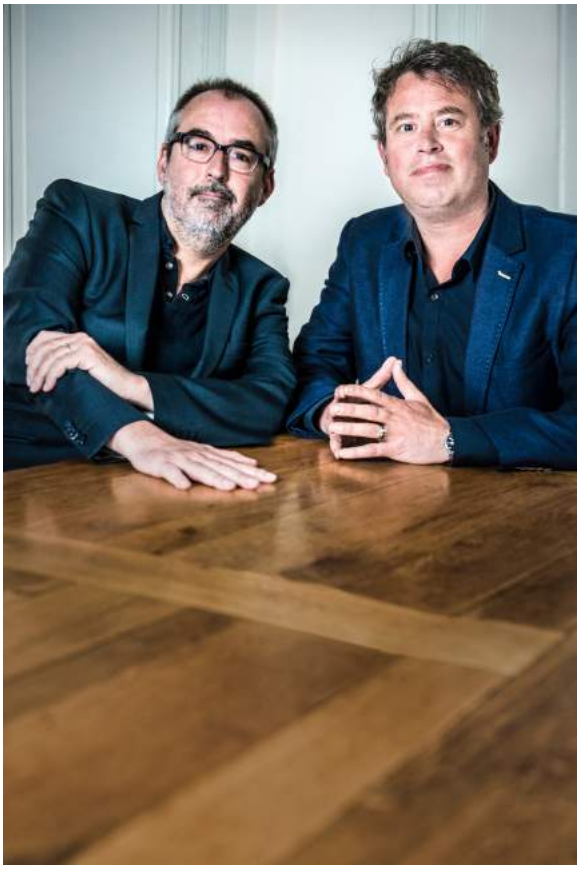
Giphart's captivating storytelling makes the most of Van Vugt's almost infinite knowledge of the subject of *mismatch*. Together they have written a unique popular science book, that helps you to turn *mismatch* into *match.* Because ultimately, the better we match ourselves, the bigger our chances get of living a happy and healthy life.

ABOUT THE AUTHORS

Ronald Giphart is an award-winning and best-selling novelist with a strong interest in psychology and human behavior. He met Professor Mark van Vugt when he worked as a creative writing teacher at the VU University Amsterdam.

Mark van Vugt is Professor of Evolutionary, Work and Organizational Psychology at VU University, and research associate at Oxford University. He is the author of the international success *Leadership* (2011), and a regular contributor to national and international media channels such as the BBC, Channel Four, ABC, CNN, *Nature*, *New Scientist*, *The Times* and *The Daily Telegraph*. Van Vugt is also consulting editor of various psychology journals.

Professor Van Vugt has worked with a number of government and business organizations in the Netherlands, the UK and US, including the UK Charity Commission, the US Office for Naval Research, Southampton Football Club and the Dutch Parliament. He was also a member of the team that won the prestigious €1.5 million British Academy grant "From Lucy to Language: The Archaeology of the Social Brain".



Professor Mark van Vugt has already been published internationally. His book on *Leadership* (2011) was sold into the following territories:

UK (Profile), **US** (HarperCollins), **Canada** (Random House), **Indonesian** (KPG), **Japanese** (Hayakawa), **Korean** (Wooongjin Think Big Co.), **Portuguese in Brazil** (Pensamento), **Russian** (Kariera Press), **Turkish** (Everest Yayinlari)

SAMPLE TRANSLATION

Chapter 4: This isn't working

The self-employed caveman (p. 132-134)

A sketch from the television series The Armstrong and Miller Show features a caveman sitting opposite three members of another tribe in a job interview.
'What do you do?' asks one of the tribe members.
The job applicant replies: 'Me hunter…'
'We have many hunters,' interjects the female tribe member.
'Me also gather!'
Third tribe member: 'You hunter gatherer?'
The job applicant replies proudly: 'These days man need many skills!'
In the prehistoric era, 'work' wasn't a concept. Just as chimpanzees don't have jobs or worry about their salary slips, early humans had no notion of employment. Everyone in the tribe foraged for food and helped prepare it, everyone was responsible for keeping the fire burning, everyone helped fight off enemies and everyone looked after the children, both their own and those of other tribe members. Once our ancestors had satisfied their basic needs they would spend their time in social activities: telling stories, engaging in politics, singing, dancing and other group-bonding rituals. There was no distinction between 'work' and 'private life'. There were no bosses, jobs, contracts, salaries or pensions. In short, early humans were self-employed.

It was long thought that hunter gatherers were always on the brink of starvation, spending most of their time in a harsh struggle for survival. In the 1960s this picture was radically revised by the anthropologists Marshall Sahlins and Richard B. Lee. They proposed the theory of the original affluent society, one in which hunter gatherers didn't suffer at all, but led a life in which their needs could easily be met. On average, prehistoric people needed to put in far fewer 'working hours' to stay alive than humans in the modern era, after the agricultural and industrial revolutions. According to Sahlins and Lee, our ancestors had a 'marvellously varied diet' and lived in a world of 'affluence without abundance'. Once they had enough, it was sufficient. An earthly paradise, in other words.

Studies of contemporary hunter gatherer peoples like the !Kung and the Hadza show that they only spend 15 to 20 hours a week on what we would classify as work. The rest of the time they occupy themselves with 'social behaviour'. They laze around together, contact their ancestors using ancient rites, discuss and celebrate the world. They aren't worried about 'later', because later is a meaningless concept.

Early homo sapiens was literally homo universalis (or self-employed all-rounder) and that still applies to today's hunter gatherers. There was of course some specialisation: in general it was the men that hunted and defended the group, and the women who collected nuts and fruits and looked after the children, but these tasks certainly overlapped. People mainly did what they were good at, especially if it benefited themselves and the group. But they also often performed tasks they weren't skilled at, simply because these things needed to be done in order to stay alive. The group needed to eat, needed to pack up and move, needed to find a place to sleep. A bit like a modern camping trip, where the members of a family have to do all kinds of things themselves, instead of relying on supermarkets, landlords or plumbers.

In prehistoric times, even the most influential and prestigious person in the tribe, the leader of the group, spent the day doing what was necessary to meet his basic needs. But in his ‘spare time’ he would be occupied with group politics, a bit like the chairman of an amateur football club or head of a motorcycle club today.

Our ancestors ‘worked’ in the vicinity of the place where they would sleep that night. They didn’t have to commute or face traffic jams. When the men of the tribe hunted they were sometimes away for a few days, especially if their prey was some distance away, but they didn’t travel far on a daily basis. Friends, relatives, co-workers and fellow tribe members: all these categories merged. Everyone was part of a greater whole. There was no clear distinction – either physically or psychologically – between private life and work. CVs, professional training and career planning had yet to be invented. Youngsters learnt skills by copying adults. You could compare it to the hit television series The Apprentice, in which Donald Trump offered talented young people the chance to learn on the job. If you wanted to become a hunter, you would just tag along with the best hunters and learn the tricks of the trade. Developing talents in certain valued fields gave you more prestige, and ultimately more sex and progeny.

Mismatch and work (p. 144-145)

Mismatches occur when our primitive brains put us on the wrong foot by responding to stimuli that – in prehistoric times – would have prompted behaviour that was beneficial. But in the modern work environment, various stimuli cause us to make the wrong choices, ones that harm our well-being.

To start with, we find it hard to deal with the fact that we work for a superior. In other words, we can’t stand our bosses. As a result, we’re not motivated to do our best. Most employees arrive at work promptly at nine in the morning, and leave on the dot of five. If we wake up with a hangover or a headache we seize the chance to call in sick. This behaviour is prompted by dissatisfaction with our ‘work-life balance’. That’s not how it was in prehistoric times: back then we were self-employed.

Organisational climate surveys show that people are most stressed by interaction with their direct boss, their line manager. In the savannah, there weren’t any managers. Decisions were taken by the group, on the basis of consensus, not hierarchy. Modern organisations have become excessively formalised and institutionalised, which goes against our instincts. Studies show that employees want a lot of autonomy – a primeval craving for self-employment. People want to be left alone; they don’t want some process manager looking over their shoulders. The same studies reveal that employees rate autonomy and social contacts more highly than pay. That, too, is a primeval preference. Our desires haven’t changed, only the circumstances in which we live.

Stress (p. 147-149)

The dividing line between work and leisure was an issue as far back as the mid-nineteenth century. Happiness was defined as having ‘as little separation as possible between your work and your play’. The term ‘work-life balance’ is comparatively new, dating back to the late 1970s in the UK and only to 1986 in the US. Studies show that this balance is often out of kilter. It tips too much towards

work, to the great dissatisfaction of many employees. We want more time off, which shows where our priorities lie.

Our brains struggle to cope at various levels with the way in which private life and work intermingle. A mismatch arises because we confuse an intense work relationship with intimacy and love. Since we often see more of our colleagues than our husband or wife, our relationship with our partner is continually threatened. That's why some organisations ban romantic relationships between employees. In the event that two co-workers do become an item, one of them loses their job. The workplace is often a hierarchical setting, which also makes intimacy risky. Some American universities fire professors if they start a relationship with a student.

Our primitive brains cannot distinguish between work and private life. That's why a lot of insomnia is work-related – we toss and turn because we can't banish work from our minds. Recent studies show that insomnia is unknown among hunter gatherers. In general, work can take a huge toll on family or marriage. People experiencing tension in their relationship tend to ascribe much of this to their work situation. A survey found that 75% of those questioned came home late from work, 72% felt tired because of work pressure and 48% felt they spent too little time at home. We have separated the domestic and work domains even though, from an evolutionary point of view, they are inextricably interwoven.

This has a connection with how we experience stress in the workplace. In prehistoric times, the threats we had to deal with were typically brief: a snake rustling under the leaves, a striking predator, an attacking enemy. In these situations our stress systems would be activated, flooding our bodies with cortisol, readying us for a fight, flight or freeze response. This reaction was vital; without it early humans would not have survived. Such stress lasted only briefly, and when the threat had been warded off, our systems would recover their balance. The workplace causes stress of a completely different kind, as neurobiologist Robert M. Sapolsky of Stanford University explains in his book Why Zebras Don't Get Ulcers (1994). Work-related stress causes our stress systems to be continually activated. The fact that our bodies are constantly awash with cortisol causes all kinds of health problems, problems that don't affect zebras (or hunter gatherers). Much of the tension we experience is directly or indirectly related to work, and it is long term. Our bodies aren't equipped to handle a continual supply of cortisol, and we end up suffering from burnouts, ulcers and heart disease.

In the most extreme cases stress makes workplaces literally life-threatening. According to statistics from the US Department of Labor, over 500 employees were killed annually at work between 2006 and 2010, mostly as a result of shootings. Violent robberies were the main cause, but there were also cases in which employees shot their co-workers. Managers are more at risk, as emerged in October 2015 when angry Air France staff physically attacked some of their bosses in protest at the loss of thousands of jobs.

Chapter 8: Waiting for the Ice to Melt

A not-so-green brain (p. 246-250)

The main theme of this book is that our primitive brains are not well adapted to modern life, causing a mismatch. The environment is a prime example. The fact that we as a species inflict such far-reaching ecological damage can be explained by five ancestral brain features combining to

catastrophic effect. Formerly, these five features enabled us to survive and flourish in the savannah, but in the modern environment they create mismatches. Our resultant behaviour has led to a host of ever greater environmental problems – problems that we have no idea how to solve.

The first of these ancestral features is a focus on our own welfare and that of our families. From an evolutionary perspective, humans are basically egocentric and egotistical. That is the starting point of the selfish gene theory proposed by Richard Dawkins. Our own welfare and that of close relatives is more important than that of genetic strangers. This can be measured in various ways. For instance, how much money can we spare for someone we don't know? Many studies have looked at how people behave when asked to distribute a sum of money. One way of measuring generosity is the 'dictator game', whereby a participant is given money to divide between themselves and others (typically an unknown participant, but there are many variations of the game). On average, people give away only 28% of the money they receive. Women and old people give away more, and people who are considered deserving are given the most.

But the majority of people keep most of the money for themselves, giving away only a small proportion to a stranger, even if the latter needs it more. Studies also show that people's generosity increases when the recipients are not strangers, but family members and friends. We are prepared to give more to co-workers than to strangers, more to friends than to co-workers, and more to relatives than friends. In Palaeolithic times we weren't interested in tribes on the other side of the savannah, simply because we had no dealings with them. The far side of our camp was where our world ended. Why should we care about the world outside the camp?

The consequence of this primeval egocentricity is demonstrated by a dilemma known as the 'tragedy of the commons'. The term was coined by the mathematician William Forster Lloyd in 1833, but it was brought to wider public notice in the 1960s by ecologist Garrett Hardin. (The word 'commons' refers to common land on which herders could collectively graze their cows or sheep.) Each parcel of common land has a set size and a finite amount of grass. If a herder adds an extra animal to his flock, he benefits (another cow or sheep means that he will get more milk or wool), but the other herders are disadvantaged (because less grass remains for their animals). If all seek to benefit by increasing their flocks, overgrazing results and the common land is destroyed. So what benefits an individual herder ultimately has tragic consequences for all herders. We see this tragedy of the commons today in polluted habitats and oceans that have been fished dry. We have too many children (genetic self-interest) and as a result the world population is increasing at a rate that threatens the planet. It is in everyone's genetic interests to have more children, but the environmental costs have to be borne by the whole of society, including people who have no children.

The second ancestral brain feature is a focus on the here and now, rather than the future. We want instant gratification. That childish urge has been demonstrated in many scientific studies, including the famous marshmallow test devised by psychologist Walter Mischel in 1972. Small children were given the choice between one reward they could eat immediately (a marshmallow) and a larger reward (two marshmallows) for which they would have to wait 15 minutes. Many responded impulsively, immediately gobbling the marshmallow. But others were able to defer gratification by waiting. Follow-up studies showed that these children generally fared better in later life. It seems likely that people with a high degree of self-control are better at coping with mismatches. Studies show that measuring self-control early in life tells you a lot about how an individual will perform academically, cope with stress, and function socially. It's also a good predictor of whether or not

they will smoke, have a healthy BMI, enjoy a happy love life, make sound financial decisions and plan their pensions.

The third ancestral feature is our focus on status. We are wired to covet status, because in Palaeolithic times it was associated with all kinds of evolutionary advantages. Who came home with the tastiest gnu steak? Who was the best hunter? Who found the juiciest fruit? Who told the best stories about how the world began? Who was the most popular in the group? It was these individuals who obtained the highest status, and with it more sex and a greater share of scarce food resources. This innate craving for status means that people always want more, and to be better off than those around them, which in today's economy leads to huge extravagance and waste. To measure the importance attached to status, the American economist Robert Frank gave people a choice of two worlds. In World 1 they earned $50,000 a year, working for an organisation where the average annual wage was $60,000. In World 2 they earned $40,000 a year, at an organisation where the average annual wage was $30,000. Which world would they prefer? The most logical choice would be World 1, because they would earn more. Yet most people opted for World 2. The conclusion is that people are wired to want to do better than those around them. Even if that means wanting things they don't need, or doing things that conflict with the general interest.
The fourth feature of our primitive brain is to copy the behaviour of those around us. The idea being that the majority is always right. And in ancient times that was of course a good strategy. If, when the tribe was roaming the savannah, Johnny went in a different direction to the rest of the group, he might not survive. Following the group provides protection. It's called the herd instinct. If ten people on the street are looking up at the sky, it makes sense for you to cast a glance upwards too. Who knows, a plane might be crashing right on top of you.

But this copying behaviour also means that if we see people around us throwing litter on the street or not cleaning up after their dogs, we are inclined to follow their example. A set of classic conformity experiments by the American social psychologist Solomon Asch shows how people tend to conform to the group even when they know the group is wrong. In one such experiment, test subjects had to look at lines of different lengths. They were asked to say which was the longest. What the test subjects didn't know was that their fellow 'participants' were actually part of the experiment. If most of them answered that a certain line was longer, the real test subjects would give the same answer, even if they knew it was wrong. Logic apparently weighs less with us than peer pressure.

The fifth ancestral feature makes us focus primarily on direct sensory experiences. That tendency impacts on how we perceive nature. Our ancestors were for instance wary of bad smells. Their noses would tell them to avoid a spot where another member of the tribe had pooped, or a food source that smelt tainted. We've inherited this adaptive behaviour. But that means we ignore input we can't directly see, hear or smell. When we read about melting ice caps, decimated rainforests and bone-dry water reservoirs in the paper, it all seems very unreal. Our back garden looks terrific, flowers are blooming everywhere, and there's clean drinking water coming out of our taps. 'What's everyone getting so worked up about?' we think.

In short, our brains affect our interaction with nature and the planet. Characteristics that enabled our ancestors to survive on the savannah, when there were few people and lots of space, are now working very much to our disadvantage.

Changing nature (p. 252-256)

How did our planet change after the agricultural revolution and later, after the industrial revolution? And how did our primitive brains handle that change? What was the impact of a different human lifestyle? Did sustainability suddenly become an issue? A traditionally nomadic lifestyle made way for life in settlements. In a relatively short space of time the Earth's population increased greatly. Prior to the agricultural revolution, small groups would roam from place to place in search of food, without worrying about how they left their surroundings behind. The human brain was adapted to life in an environment where there was in principle enough food for all. After the switch to life in settlements, the question suddenly arose of how to meet the needs of large communities.
The first farmers cleared plots of land on which to grow crops. Woods and natural vegetation made way for small fields. After a while, people tried to domesticate wild animal species (buffaloes, pigs, goats) and keep them near their crops, so that they didn't have to hunt them. Very soon, agriculture became more intensive. Fields were irrigated, rivers channelled, forests cleared and burnt. The human impact on the natural environment became ever greater as the world's population grew exponentially.

Whereas the small groups of nomads had had little if any impact on nature and the environment, in the case of farmers and city dwellers it was a very different story. They moulded the natural environment and adapted it to meet their evolutionary craving for status, self-interest and extravagance. The consequences of this mass impact on nature have been particularly apparent in recent centuries: pollution, depletion of resources and agricultural land, overfishing, mass extinction of species, a shortage of fresh water for irrigation and consumption, plastic soup in the oceans and a worrying decline in air quality in many regions. The many tiny contributions by many individuals have collectively resulted in an irreversible problem – a textbook example of 'the tragedy of the commons'.

Take our egotistical consumption of huge amounts of energy and water. Or the way our short-term thinking leads to impulsive purchasing behaviour: we buy all kinds of things that we really don't need – things that quickly end up at the rubbish dump. Our craving for status – a positive quality in a small group of hunter gatherers – now prompts us to try and keep up with the Joneses. We proudly show off our trophies: the latest car, fancy kitchen gadgets, fashionable bathroom fixtures, several new outfits a year. We are the most extravagant creatures on the planet and we copy each other's behaviour when it comes to waste disposal. If one person tosses litter on the street, for instance, others follow suit.

Many disasters are now bearing down on us that no one had predicted, and that threaten life on Earth: global warming, the rising sea level, plastic soup in the oceans, soil pollution and the extinction of species. Our primitive brains aren't equipped to deal adequately with issues of this scale. Our ancestors only faced environmental problems that they could perceive with their own senses, and that affected their immediate surroundings. These days, issues are too big for us to perceive personally, so we don't know how to respond – and we certainly can't come up with a solution.

Take climate change, on which 99.9% of all scientists now agree. There are still American politicians who take an isolated cold snap in the US as their cue to deny global warming, and who claim that the money spent on climate change mitigation would be better spent on arms, or on bailing out banks or the automobile industry. Our primitive brains – wired to view life on a day-to-

day basis and to respond to direct experiences (like an extremely cold winter) – make it hard for us to grasp what's going to happen in the more distant future. Data collected around the world over many generations shows that climate change is indeed happening. We face a new evolutionary challenge, one that we are mentally ill equipped to deal with. We 'know' about the problem, but we don't 'feel' it.

A natural mismatch

A mismatch has arisen. We are gradually destroying the planet, and thus the future of our children and grandchildren, because we're wired to think we're still nomads living on the savannah. We don't perceive global environmental issues as our problem. Sadly, the message that the ecosystem is threatening to fall apart, with terrible consequences for life on the planet, isn't being taken in by our primitive brains.
How did the current environmental problems arise? Let's look at today's world, while bearing in mind the five predominant ancestral features of our brains:

1 egocentricity
2 short-term focus
3 wanting to be better off than others
4 copying those around us
5 reacting to direct sensory stimuli.

We don't perceive environmental issues as urgent, because our senses are misleading us. Take the problem of climate change. It seems clear that the current temperature fluctuations around the globe are largely the result of human impact. Take the food, oil and coal industries, pumping out greenhouse gas emissions. But we can't perceive those emissions directly in our own surroundings, so see little need for action. The sky looks clear, our water is perfectly drinkable and so what if there's a brief heatwave? It'll rain again soon. In fact, an overwhelming body of scientific evidence has now been amassed to show that everything is not okay. Since the industrial revolution, the concentration of the greenhouse gas CO2 has increased sharply and the average temperature on the planet has also risen. So, too, has the temperature of the oceans and the sea level. According to findings published in 2008, the concentration of greenhouse gases in the atmosphere is the highest in 800,000 years. The resultant rise in temperature has led to climate change, which is evident from a whole range of factors.

Extreme weather is on the increase. On average there are more excessively hot days and fewer excessively cold days. The number of heatwaves is increasing globally, along with heavy precipitation, tornadoes and hurricanes. Glaciers are melting, as is the sea ice at the North Pole. The tree line is moving, and spring is starting earlier in the year. And those are just a few examples… The use of fossil fuels (particularly for energy-guzzling products like cement and steel) is one of the main causes of climate change. But intensive farming (particularly the ever expanding livestock sector) and deforestation are also helping to turn up the thermostat.

Some think the future lies in nuclear energy, a solution prompted by our Stone Age short-term desire for instant luxury and comfort. The answer to our massive use of fossil fuels, it's said, is to build reactors, producing cheap energy with zero carbon emissions. But no one has seriously thought through the consequences of this technology, especially the processing of nuclear waste. The problem of radioactive waste is being parked for the next generations to solve. And it would

only take one big nuclear disaster (like in Chernobyl or Fukushima) for all the perceived advantages to melt away like snow zapped by gamma rays.

Competing for status

We don't perceive a shortage of natural resources because from our vantage point everything seems inexhaustible. Our brains are telling us to consume, and so that's exactly what we do. To keep up in the competition for status, we copy the extravagant behaviour of others around us, instead of just buying what we really need (creating a great deal of waste and depleting natural resources in the process). Evolution has wired us to compete for status, leading to a mismatch in the modern era, when this tendency leads us to act in ways that harm the planet. We don't get enough stimuli from our surroundings to show that resources are running out. We read about it in the papers, and see items about it on television, but we don't really feel that it directly affects us. We act as if the resources we use to produce and consume were inexhaustible.

But this mass consumption is leading to acid rain and deforestation. It's making farmland arid and impoverishing habitats. Take the excessive use of fertilisers. It results in nitrates and phosphates leaching into surface water, causing a loss of biodiversity, in a process called eutrophication. Basically, the flood of nutrients allows certain plants (typically algae) to flourish at the expense of other species, disrupting the normal functioning of the ecosystem.

Anyone looking down at the Earth from space sees a planet that appears to have plenty of land for the world's population. But that's only at first glance. Land isn't equally distributed around the globe: at the poles and very high latitudes it cannot support a wide range of flora and fauna, while at the equator there are large regions of desert. Soil degradation – meaning that land becomes temporarily or permanent infertile – is something that has always happened, even when humans still roamed Africa in small groups. But it's now occurring on a much wider scale, propelled by the spectacular increase in the world's population and mass consumption.

We are producing too much, too quickly, and pumping up too much water, causing the groundwater level in many areas to sink and the land to dry out. The supply of fertile land is shrinking, and coveted by ever more countries and peoples. Developing countries are – quite rightly – beginning to claim their share of the cake, which means that the available land is being used even more intensively.

Bringing the future closer (p. 264-265)

In our efforts to reverse this downward spiral we should consider the characteristics that helped us survive on the savannah for two million years. Our ancestors, we must remember, were focused on the here and now. They looked out mainly for themselves and their families, competed for status in the tribe, copied others and were led by direct sensory perceptions.

We must not allow ourselves to be overwhelmed by the enormous impact of global environmental problems, but look for small-scale, personal solutions. Living in the here and now, we need to bring the consequences of the current environmental and climate issues much closer. Al Gore opened many people's eyes to the issue of global warming in his film An Inconvenient Truth (2006). It featured a chart showing the rise in temperature and the concentration of CO2 in the atmosphere. At one memorable point, Gore got onto a hydraulic lift to demonstrate the dramatic rise in the level of

harmful greenhouse gases since the beginning of the industrial revolution, showing that if this continued unchecked, the hydraulic lift would have to go up several metres to reach the new emissions highpoint in fifty years' time.

Data visualisation of this kind is very useful. It's already used in public health campaigns. Computer-generated images showing what you will look like in twenty years' time if you go on smoking or drinking are a good example. Films, computer animations and 3-D programmes would help bring home to people what the world will look like if half the animal and plant species die out, or if much of the fresh water resources are polluted – and what the impact will be on us. An image of a dried up water reservoir near our house is much more effective than a hundred images of dried up rivers in China or Africa.

How could we deploy our self-interest as a means of preventing mismatch? Evolutionary theory teaches that humans are motivated by genetic self-interest. Concerned about the welfare of relatives and offspring, in other words. So if you want to get people to put solar panels on their roofs you should point out the benefits for their children and grandchildren, in the form of a better world for them to live in. Research shows that this works. If people were asked to do something that benefited the environment, they were more likely to comply if emphasis was placed on the benefits for their children, rather than humankind as a whole.

Using role models that resemble your target group is also effective. People are more prepared to do something for somebody who resembles them, because that is a sign of kinship. Could computers link up people with avatars that resembled them, to ask them to do something for the environment? It sounds like science fiction, but increasingly anything is possible thanks to the latest technological gadgets – like the virtual reality head-mounted display Oculus Rift, due to hit the markets in 2016. Closer to home, you can get local residents to raise funds for environmental causes. Studies show that if someone with a collecting tin shows up at your door you're much more likely to give generously if you know them, or at least recognise them.

We could also exploit the reciprocity principle – the idea that one good turn deserves another. It ties into self-interest and is already being applied with some success in the recycling of towels in hotels. If hotel guests are asked to reuse towels in the interests of the environment, only a minority does so. But if they're told that the hotel donates a certain amount to charity (e.g. the WWF) for every reused towel, far more people comply. And the response is even greater if people are told that most guests choose to reuse towels.

Chapter 9: The Realm of the Imagination

Media (p. 274-275)

The term media can be defined in many ways. As 'the main means of mass communication', for instance, or 'tools used to store information or data'. This can be further broken down according to the technique used (print, digital) and the sensory form of the information (auditory, visual). Not to mention the myriad different forms of communication, ranging from smoke signals, spoken language, cave art, clay tablets, legislation, stories and books to photography, film, television, internet and mobile telephones.

In the course of evolution, communication about direct experiences (‘Did you see that big lion near our camp yesterday?’) has been largely replaced by communication about virtual experiences (‘Did you see the nature documentary yesterday about that big lion?’). There is a real world, one in which we burn our fingers if we stand too close to the fire and bang our heads against low branches – but there is also a virtual world, where imagination rules and things happen that aren’t real. The world in which we live is becoming more and more virtual. We constantly read, hear and see things that have little if any connection with our daily lives. We watch films about made-up events, read books about fictitious characters and see news items about things that happen in faraway places. And we interact on social media, rather than seeing each other face to face as our ancestors did.

Living in a virtual environment creates all kinds of mismatches, and is potentially harmful to our physical and spiritual health. The strength of our imagination constantly misleads our primitive brains, and vice versa. The influence of new media like radio, TV and internet is sometimes so great that it takes a toll on mental and physical health, and can even shorten lifespan. The challenge is to eliminate this mismatch. Indeed, can we go one further and harness the power of the media to increase our well-being and solve real problems, like climate change? That’s what this chapter is about.

Digital detox (p. 306-309)

These days, people increasingly live in a virtual world thanks to the power of media like books, radio, television and internet – phenomena that are all new from an evolutionary perspective. The digital revolution is in full swing, and as a result our brains increasingly respond to stimuli that are not real, while failing to respond to stimuli that are real. The fate of characters in soap operas concerns us as much as if they were our real friends. We unconsciously copy the behaviour of celebrities, even when that isn’t very good for us. And our brains confuse porn with real sex. Sometimes we forget there is a real world out there – a world of good conversations, real friendships and satisfying romantic relationships. We’re as stressed by the dangers we perceive through television and internet as if we were personally involved. An attack on a faraway city has as much impact as if we had witnessed it ourselves.

Humans have so filled their environment with modern media that, as Marshall McLuhan noted, there is no escape from it. How do we create a match between us and modern media? How can we go a step further, even, and use the media and the fact that we live in an increasingly virtual world to tackle the problems facing us? How do we prevent the physical world being taken over by a virtual world – a world in which people no longer need to leave their homes, can no longer form normal relationships and can only find sexual satisfaction via the internet (already an issue in Japan)? If humans were to stop reproducing altogether, all the other life forms on the planet would probably rejoice, but we believe there are still other options left. After all, there are still enough people who don’t watch television, aren’t addicted to Facebook and can tune out the omnipresence of the media.

Can we cut ourselves off from social media for a while and start living a real life again? Last year Simone Engelen, a young Utrecht-based photographer, invited writers and other artists to take control of her life for a day. Simone asked them to provide scripts for a brief, alternative existence, a new life that she would capture in photos. One assignment involved going out for a meal with a mirror, another being the centre of attention at an exuberant gay party. One author asked if she would spend the day travelling around with his elderly mother, while someone else came up with

the idea of Simone spending 24 hours alone in a white, windowless room without any books, newspapers, art, photographs, Wi-Fi, computers, telephones or any other forms of human expression. She was so affected by the experiment that she signed up that same night for a 10-day meditation course which involved abstaining from any form of communication. Her aim was complete digital detox.

The human desire to retreat and find rest reflects an ancient need. Our ancestors would retreat into the woods, retiring from daily life for a while. A digital detox could be the modern variant. One of the authors of this book had a British colleague who was so computer addicted that on Friday afternoons he would remove the plug from his computer and post it to himself. That way he couldn't resume his virtual life until the plug landed on his doormat the following Monday. (This was before the days of Wi-Fi.)

The Screen-Free Week (following on from TV Turnoff Week and Digital Detox Week) is an annual event that encourages people to turn their electronic apparatus off 'and their lives on'. In fact there are all kinds of initiatives that promote unplugging, either temporarily or permanently. It's beginning to dawn on many businesses that staff shouldn't be expected to be in email contact outside office hours, and certainly not at weekends. There are also apps for smart phones that show how much time someone has spent on social media.

The power of the imagination

Modern media also have great potential to transform our lifestyles, to turn mismatch into match. Medical professionals all over the world use media to promote healthy behaviour. Mention has already been made of computer-generated images showing what someone will look like in twenty years' time if they go on smoking or drinking. But people are also being encouraged to jump about playing tennis or baseball on the Nintendo Wii, or share the number of kilometres they have jogged on Facebook. Media can also be deployed to open people's eyes to the harmful effects of environmental pollution (like Al Gore's film An Inconvenient Truth, mentioned in the previous chapter, which alerted many to global warming).

Research all over the world has shown that reading fiction has a universally positive effect. Prisoners who read books, for instance, develop a greater capacity for empathy and are less likely to reoffend.

The authorities in the Italian region of Calabria recently introduced a rule that prisoners could reduce their time in prison by reading books. Each book they read would bring forward their release date by three days, up to a maximum of 48 days a year. Prison reading groups have been set up in the UK, and a pilot project is underway in Flanders involving reading clubs made up partly of detainees, partly of ordinary members of the public. These mixed groups meet to talk about novels, facilitating the prisoners' return to society. That's why it's so distressing that the current Dutch government has decided to cut costs by abolishing prison libraries. Perhaps literature can even provide the key to world peace. Canadian and American research shows that reading novels and poetry makes it easier for people to put themselves in someone else's shoes. That's because the reader sees the world from the protagonist's viewpoint, which increases their ability to empathise. If it were up to the authors of this work, hooligans, soldiers, terrorists and gang members would be given free books and reading courses. We could even drop novels over conflict zones. Not bombs but books!