

The Battle for Compassion: Ethics in an Apathetic Universe

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Chapter 6. Determinism: The Universe's Marionette Show

The Free Will Paradox

We have seen how, over large spans of time, processes resulting from matter and energy obeying the laws of physics eventually led to the evolution of intelligent, conscious beings. This chapter is about the incredible paradox that this situation entails and some of its implications.

An age-old problem in philosophy is the question of free will—essentially, whether human beings can *really* act freely in an apparently deterministic world of cause and effect where the past dictates the future. As with all philosophical debates, the arguments and conclusions hinge crucially on what one actually means by the terms in question. Often, this problem is framed in terms of choice, and the answer is meant to depend on whether a person “could have” carried out a different action than the one performed. This vague terminology opens the door to endless hours of philosophical ruminations and explorations of various scenarios. But if by free will we mean something more fundamental that we feel instinctively to be true—that, as individuals, we are the ultimate sources of our thoughts, desires and actions— then the conclusion that refuses to go away, like an unwanted guest one has to accommodate, is that free will is a subjectively experienced, though highly effective, illusion. Period.

Strangely, perhaps, something so profoundly important about our existence is rarely addressed directly outside the academic sphere, and even then often only timidly. Renowned philosophers intimately familiar with the literature on free will, neuroscientists studying the mechanisms associated with human consciousness and thought, and physicists penetrating the mysteries of deep reality try to persuade us, though often with muted enthusiasm, that we have at least some form of free will. It seems that many scientists and philosophers feel guilty about confronting the truth and revealing it too loudly, perhaps unsure about how their readers will react or concerned about expressing ideas that are too at odds with conventional wisdom. What should be obvious is pushed farther back into the future, in anticipation perhaps of new scientific findings or reflections that might shine further light on the issue and offer a convenient way out. It is almost as if they feel a responsibility to reassure, telling how fantastic scientific truth, technology and human resolve are, without helping their readers to come to terms with some of the deepest truths themselves. For example, towards the end of *Freedom Evolves*, a book that comprehensively explores the issue of free will and determinism, Daniel Dennett, one of the world's foremost and most respected thinkers about human consciousness and other major philosophical themes, optimistically argues that human freedom is an objective phenomenon. Reality is a little darker than many philosophers will readily admit. Including the concrete reality of millions of people suffering because we cling too tightly to the notion of free will, failing to show compassion to those to whom the laws of the universe have dealt bad cards, and

neglecting to recognize the large-scale consequences of our collective, supposedly free behavior.

The free will issue has never quietly disappeared because, whether we like it or not, it concerns an essential, fundamental truth that cannot be discreetly swept under the rug. However unintuitive it may be and unlikely to be widely grasped and accepted, determinism and all its implications are where the search for the truth ultimately leads. And it needs to be confronted honestly, because it matters more than most people realize: it is central to our understanding of who we really are and where we are headed. In fact, it should really be seen as part of a larger issue, which is how deeply we are prepared to understand the human condition and admit the contradictions between how we generally perceive things—our most intuitive sense of what it is like to be a responsible, autonomous human being—and how things really are in a broader, objective sense. This is one of our biggest taboos.

Reflecting on determinism is far from being an intellectual diversion that contributes nothing practical to the search for solutions. You cannot address the big questions about what matters and what we should do about it if you ignore the fundamentals of how the world works and humans' place within the whole framework. Without accepting the implications of determinism, philosophical reflections and even editorial commentaries on politics and world events are fatally incomplete, as they fail to face an essential—perhaps *the* essential—aspect of the human condition. Until you grapple with the free will issue and understand human minds as integral parts of a system, you can never really grasp the essence of our existence and our predicament as a species in a fully meaningful way. Failing to more fully acknowledge the deterministic chain of causation *itself* has downstream consequences. I believe we desperately need to use this knowledge, gleaned from observing the system “from the outside”, in order to have a positive effect on the workings on the inside. Dismissing the free will issue as irrelevant is actually mistaken and dangerous if it hinders us from adopting a perspective we might need in order to take more ambitious steps towards averting an unfortunate fate.

Now, I need to admit that I am using the concept of a deterministic world a little loosely. At its most basic level, at the subatomic scale where quantum physics dominates, the world is random, and the probability functions of subatomic particles, rather than causal determinism, best describe how things work. This randomness can even potentially have gigantic effects at the macroscopic level. Just to evoke one unlikely but entirely plausible scenario, imagine a deranged dictator who decides she will launch a nuclear strike if and only if an experiment that depends on a random, quantum event—such as the timing of the radioactive decay of an atom—yields one particular outcome. The existence of human brains can thus allow a minor quantum hiccup to have phenomenally significant consequences. This implies that even an omniscient being would not be able to predict the future. Even putting aside quantum randomness, chaos theory—which deals with the ability of very small changes in starting conditions to have huge macroscopic effects at later time points—means that, for all practical purposes, the future is unknowable in any degree of detail.

But what matters is not so much whether the state of the world at any point in the future is, in theory, entirely and precisely determined by its state in the past or present. What is far more relevant to the free will issue is the fact that we are an inherent part of a physical world with all its associated properties and trends, a giant network of interacting particles. The molecules bumping around in our bodies and everywhere else in the world follow the laws of physics. Everything that happens on a larger scale is determined by all these particles and molecules interacting.

Furthermore, much of the quantum randomness that occurs at the subatomic level still averages out at more macroscopic scales. As time moves forward, one thing still leads to

another in a consistent and often predictable way as matter and energy collide—even if we cannot foresee all the consequences. The processes going on in our brains are no exception. Our thoughts and behaviors depend on everything else. Our whole functioning is like clockwork, like cogs in a giant machine generating thoughts, feelings and emotions, even though the meaning associated with these thoughts is absolutely real.

These facts should be entirely uncontroversial for anyone who accepts a rational, scientific understanding of the world, and yet consistently accepting all the implications is extremely difficult. Really, *really* understanding what determinism means and what it says about the human condition can produce a profound, even frightening epiphany, as if one is staring into the face of God. Even some who defend the truth at all costs probably don't realize just how difficult this particular truth is to make sense of. From our vantage point as complex, sophisticated, cocktail-sipping beings, we lose sight of the fact that the underlying physical world is still there, going about its business according to the same laws as ever, and that the happenings at that scale are still translated into events at a macroscopic level, including human thought and interaction. This means that everything is, in some sense, destined, even if this destiny properly resides in randomness and statistical probabilities, and that whatever we want or end up doing was determined by the rigid laws of particle physics and the higher-level patterns they exhibit with greater degrees of complexity. Our thoughts and actions really are the consequences of fate. And can we change fate? Not from an *outside* perspective.

The concept of determinism exists in a kind of “yin and yang” relationship of apparent opposites with that of consciousness. When you consider how counterintuitive (to conscious beings like ourselves) the phenomenon of consciousness itself actually is—that physical matter organized in a certain way yields subjective experience—, it is, perhaps, no more surprising that this consciousness ends up thinking of itself as being in charge, at the center of it all and dictating everything else. This point is rather subtle but so fundamentally important. If you think about it, its true significance can pop into focus in an “aha” kind of moment. There is an analogy here to how, if you stare long enough at a picture containing repeat patterns known as a stereogram, a 3-D image suddenly appears.²⁴ Seeing the hidden 3-D image requires you to relax the focus of your eyes on the 2-D picture, and in a similar way, understanding the significance of our identity with the physical world requires us to relax our intuitive but constrained perspective.

If it is impossible to fully fathom how matter produces consciousness, it is also difficult, in the reverse sense, to grasp that conscious creatures are still wholly physical ones. As conscious beings, we live under the continuous illusion that the decisions that determine our actions and shape our lives and immediate environment ultimately originate in our minds, when in fact, our thoughts, desires and actions are just part and parcel of the whole system and chain of events.

Does an animal have free will? We hardly expect an animal to behave independently of the physical universe, for there to be some aspect of its brain that operates according to non-physical laws. There is nothing about animal behavior that cannot theoretically be explained in terms of various levels of causes. But aside from the heavy use of abstract thought and the development of complex societies and culture, which add a whole new dimension of calculation to his behavior, a human being is not really that different from a bonobo or chimpanzee, our closest animal relatives. Yet as soon as we ask the question about free will with respect to ourselves in the first person, it suddenly becomes very difficult to be objective.

Our nature as physically determined beings—which, in the end, we cannot possibly be anything else but—is becoming less of a theoretical abstraction as the details at various

levels of analysis are gradually being worked out, filling in the moat that separates our recalcitrant view of ourselves as unique, autonomous creatures from our view of the rest of the universe. At one level, for example, genetics is increasingly revealing to us details of the physiological basis of our behavior. Given that our genetic makeup has been solidly shown to contribute to a very large extent to our character, in a not-too-distant future it will be possible to make fairly good predictions about individuals' behavioral tendencies based on a simple analysis of their relevant genes. Of course, this raises a host of fundamental, extremely important and difficult practical questions regarding privacy, civil liberties and legal responsibility. But once the moat is filled in, maintaining a drawbridge is to live in denial.

As just one example of the paradox of invoking free will, it has been demonstrated that people with low serotonin levels in their brain are much more likely to behave aggressively. In fact, much of our decision-making will, as science progresses, ultimately be linked to molecular neurobiology and such variables as, for example, how tightly a particular neurotransmitter binds to its receptor.

Tendency does not mean certainty—there are so many different factors acting at different levels that determine our thoughts, emotions and behaviors, from strong synaptic connections created by momentous life experiences to random molecular noise. But when you add up all these different factors, there isn't anything else left. The combination of all the factors determines how the person actually behaves. So, for example, you might find that very low serotonin + x other brain chemical levels + y other genetic factors + z environmental factors all add up to near certainty of committing violent crime (with further chance events serving as the final trigger). The sense of freedom is entirely subjectively felt, if at all—and it is unlikely that a person with all these factors weighing against him would feel very free to act peacefully, despite attempts to constrain his impulses.

The roles of other, non-genetic factors in people's behavior are also continuously being revealed by psychologists, sociologists and economists, and the number of potential examples is endless. There are the broad determinants, including the usual suspects such as parental upbringing, education, encouragement and success as a child, relative wealth, social class, peer pressure, etc. And there are all the innumerable happenings and encounters in our daily lives, some of them insignificant in the long term, others life-changing. Everything that happens to us affects our behavior in some way. Scientific studies can help evaluate the average relative weight of different kinds of factors in different situations.

One anecdotal example I find mildly amusing of how one organism can directly affect the behavior of another is the evidence that infection with the toxoplasma parasite makes mice more likely to loiter in the presence of cat odor—an adaptation that makes the parasite more likely to end up in its preferred host, the cat. There is some evidence that toxoplasma infection may also make humans more likely to take risks.²⁵ Of course, an affected human would ascribe his risk-seeking behavior to something else—undoubtedly some intrinsic urge.

Indeed, numerous psychology experiments have revealed that humans are notoriously bad at knowing the underlying reasons for their decisions and actions, often inventing explanations that make sense to them after the fact. And neurological research has shown that humans are only consciously aware of decisions they make fractions of a second or even longer after the decision has already been made within the brain, as measurable by typical electrical signals.²⁶ Science, by digging away at the truth about things—at least at a mechanistic level—is continually pulling away the curtain that hides the “operator” behind the scenes, to use a reference from the classic American film “The Wizard of Oz”.

So our sense of freedom is entirely an internally felt phenomenon. Viewed objectively, our thoughts, our emotions, our desires and our actions are all the result of our state-of-being at any instant—the momentary architecture of our brain—and the environment we encounter, and these in turn determine our future state-of-being. Any thinking process that results in conclusions, decisions and actions is always initiated by a previous set of causes—like billiard balls colliding, to use a frequent but useful metaphor. Even the positions we hold, arguments we make and actions we defend ultimately stem from a network of causes existing at various levels, rather than from some unassailable, absolute truth. From a broad, big-picture perspective, it also means that the universe is to blame for everything that happens.

The relevance to our everyday lives of understanding free will as an illusion depends on the circumstances. If a person who, as a result of a combination of intrinsically strong character, an encouraging environment and favorable circumstances, knows what he wants—for example, to become a highly paid investment banker—and ends up succeeding, most people would not think to deprive him of his pride and sense of personal accomplishment by reducing his fate to the consequence of various specific determining factors, even if strictly speaking this is the case. If the aid of others played a role—perhaps a friend or uncle who pulled some strings—some jealous detractors might be tempted to make some snide comments, whereas the self-made man or woman tends invariably to be universally admired. But the question of free will would probably not appear relevant to most observers.

However, there are times when the future seems so open-ended and we don't know which future to choose. We may find ourselves unable to make a decision because, on reflection, we realize we don't actually know what we really want, or we may have a strong sense of what we want but not know the best way of achieving it. Our subjective feeling of autonomy can even come to a standstill. For someone who finds themselves in the clutches of depression or simply unhappy with how their life is going, and with no idea what to do next, the free will issue no longer seems so obscure. When a person's thought patterns don't result in the right behavior to achieve their goals, or where they cannot even manage to make a decision, blaming them for not picking themselves up and getting on with things is mostly an instinctive expression of frustration. People who find themselves in a rut need an event, often an external stimulus, to change their way of thinking or provide them with a new opportunity, and they may find themselves waiting to be hit by the right billiard ball—in the form of a useful or motivating discussion with a friend or stranger, an inspiring book, the determined roll of a die²⁷, a life-changing experience, or maybe even a few random molecular collisions in the brain that push a neurological process beyond the tipping point—to get on track. While there is no denying that the very act of blaming someone can sometimes be very useful in serving as this stimulus, this does not make free will any more of an objective reality.

We are all subject to greater or lesser degrees to “cognitive traps” where the focus of our thoughts is constrained by our mental processes and various external influences. In the absence of useful information, including knowledge about *which* information is most useful as well as a successful decision-making strategy, our freedom to get what we want is often illusory. In practice, all of our daily decisions are contributed to by a complicated web of interactions. We acknowledge the influence of others in our decisions, but there is a large space full of other, less visible factors which we prefer to leave untouched and to which we attribute our freedom. It is convenient but, objectively, not very truthful to reduce the sum of all these interactions and various factors to the exercising of our free will.

The ethereality of free will relates to that of identity, explored in the next chapter. The concept of identity can be seen as an attempt to impose a certain coherence and stability on

a bundle of often competing desires or tendencies, the strongest of which people most closely associate with a person's "true" character. A range of factors determine which ones will dominate at any one time, as well as the outcome. The degree to which the things we consider important in our lives can shift when we change environments illustrates both how mutable our identities are and how readily our "free will" blows with the wind.

Our need as individuals to avoid the instability of cognitive dissonance, and our need as a society to maintain the notion of personal responsibility, are barriers to fully acknowledging determinism and drawing the appropriate lessons from it. There is a very fine, though critical, line between using this understanding to forgive the past and using it to excuse the future.

Dealing With It

What do we do with this deep truth? The supposedly liberating effect of thought and reflection can cause a sudden petrification of our sense of freedom as we more fully understand our own nature and grasp the bigger system it is part of. It can hardly be denied that observing the human condition detachedly through the lens of a scientist, regarding human beings as automatons and seeing free will dissolve like a mirage in the desert, may seem like the ultimate in dehumanization. If one is feeling existentially moody, it is like peering into a dark abyss and staring at the apparent dismal truth that life has no purpose because we are all just marionettes controlled by the laws of the universe, our subjective experience and sense of identity eternal hijack victims of physical reality.

Being conscious and simultaneously aware that one's thoughts are being determined by the current makeup of one's brain and immediate stimuli also has an inherent absurdity about it—in essence, trying to compress subjective experience and objective understanding into the same instant. It would be impossible to live continuously aware that the thought one is having at any moment is determined, for example, by *those* previous thoughts and *this* visual stimulus and *that* memory and *this* overall thought pattern and so on. One could try doing the experiment for a brief period before suffering an existential headache from the rapid oscillations in perspective. One might well even go mad.²⁸

Fortunately for us, the emergence of any strong tendency to harp endlessly on the lack of free will would be suicidal and would have been weeded out by evolution, and an illusion of having free will is the default state to which one's view of the world generally reverts in the absence of a conscious effort.²⁹ In everyday life, just as nagging thoughts about your overdue tax return are unlikely to unduly distract your attention from a new amorous interest (and if they do, you should invest in a good accountant), the fact that your thoughts and actions are entirely determined by your brain state and experience will not normally interfere with your ability to go about life as if you were an entirely autonomous being (and if they do, you should do less thinking and reading about philosophy and get out more).

Even without obsessing about it to the point of madness, reflecting on what it means for our own thoughts to be influenced by everything around us could make us just slightly more complacent, causing some people, even highly intelligent ones, to give themselves up just a little more frequently to their most primitive desires through the self-fulfilling and therefore technically "correct" reasoning that they had no choice. Of course, it does little good for achieving what one wants to relent submissively to the exterior world and wait catatonically for things to happen. If one falls into that trap, one can reasonably be said to have had the bad luck of being unduly influenced—perhaps by reading the wrong book. Doing so is logically equivalent to jumping off a tall building and claiming that this was the "will of the

universe”, and although this may be a correct explanation from a big-picture perspective, it just as surely reflects a disturbed psychological state.

But suppose we gingerly make that critical step in accepting that free will is an illusion, and draw all the other conclusions that follow. Well, figuratively speaking, there might be a pause, even a deafening silence, with just the distant, low frequency rumblings of the universe in the background. And then, little by little, the music starts to play again, the volume starts to pick up, and we say, “So what?” We proceed to go outside and walk in the sunshine, eat the most sublime culinary creations, drink the most complex wines, fall in love, explore, travel, meet people, connect with them, talk, share, enjoy life in all its richness. Life remains what it always was. And we are armed with knowledge—even if we still sometimes long for the bliss of lost innocence...

Dealing as effectively as possible with the world’s immense problems requires us to make that critical step as we face the essential truths about existence and about what ultimately matters, and question the assumptions on which so much of public policy is based. It means confronting aspects of reality that seem instinctively to be “dehumanizing” because they tell us things about ourselves that do not fit with our notions about what it means to be human and that we do not want to hear. Seeing the big picture and recognizing the degree to which we are all slaves to our human nature so that we can take appropriate practical measures can, in fact, also be seen as the opposite of dehumanization if it permits us to act less like animals towards each other. Understanding how the brain operates in all its mechanistic detail and knowing that it is part of a larger physical system called the universe is simply another layer of truth and need not detract from the kaleidoscope of deep meaning and emotions that emerge from this complexity. But our emotions should not handicap us in the search for pragmatic ways of reducing suffering.

As I alluded to early on, we need to accept that multiple explanations for phenomena can co-exist, each reflecting a different approach or level of understanding of the world, or relevant to a different subset of reality. Each explanation may be useful, and different ways of viewing the world can therefore each have validity, provided they do not lead to conflicting conclusions. While we can focus on some aspects or interpretations of reality more than others, we must be prepared to acknowledge the validity and insights of other compatible perspectives.

Now, there have recently been some controlled, small-scale psychological laboratory experiments showing that when people believe, or are led to believe through exposure to written statements, that free will is an illusion, they are more likely to cheat, less likely to be generous and more likely to act aggressively.³⁰ Although it is always unclear how much can be extrapolated from such experiments to the real world, they do suggest that, by itself, the belief that we do not have free will can actually erode social or ethical behavior. Does this mean we should actually be economical with the truth about existence, rather than face up to reality?

I don’t think we should take the implications of such studies lightly. Spreading the isolated meme that we have no free will may further a certain basic truth about existence, but taken *alone* it is likely neither to be properly understood nor to contribute to a better world. The truth needs to be handled carefully. The information on which people’s attention is focused always has consequences, sometimes dramatic ones. But this does not mean that we should strive to cover up the most essential truths. Rather, we must be prepared to put these truths into a larger context that provides a paradigm in which to understand them and make effective, positive use of them.

It is not surprising that people are reluctant to take a detached view of the world that reveals how interrelated everything is and seems to remove a sense of control. There is a

paradoxical need for self-deception. Even if, for a proper understanding of the human condition, we need to come to terms with free will being an illusion, we still need to assume this illusion for ourselves most of the time in order to *feel* free, entering an inspired state-of-mind where we believe we can achieve anything we want. We need to live *as if* free will exists, *as if* we are the origins rather than the conduits of our streams of consciousness, as an essential strategy to survive, motivate ourselves and live in a society that demands responsibility. The feeling of being in control is an extremely important state-of-mind for achieving self-realization. The illusion of free will thus has something of a self-fulfilling aspect to it. Being happy and successful in living your dreams requires you to view yourself as a source of desires and actions. We still need to relent to our instincts and claim free will for ourselves, even if we are intellectually aware that it is an illusion.

People often mistakenly think that if free will is an illusion, then their actions have no consequence: “If everything is determined, then it doesn’t matter what I do.” This is completely false: what we do always has consequences—potentially huge ones! Determinism pointedly does NOT mean that you cannot control events through your behavior and thereby influence the future, does NOT mean you cannot achieve what you want, and does NOT mean that you should not take responsibility for your actions. In fact, the very opposite can be argued. From *within* this physically determined system, we can still embrace the vision of a better future, acting as agents of change, and allowing ourselves to be persuaded by other agents who are also inside the system. So at least the greatest fear related to free will can be laid to rest. Nothing any scientist or writer says need indelibly change the everyday sense of what it’s like to be alive, and this applies equally to the subject of determinism and free will.

A big-picture perspective on existence, including regarding free will as an illusion, need not be adopted as our primary, default way of looking at the world on a daily basis, and need not smother our instinctive pleasures with a pervasive fear of dehumanization. A deeper understanding of the processes we are part of is not by any means a substitute for, nor should it detract from, subjectively experienced beauty, meaning and human dignity. On the contrary, it needs to be seen as a tool or a catalyst for *achieving* these. Equations by no means capture the essence of meaning any more than understanding nerve impulses explains how anything actually feels. Just as a map is useful for providing orientation from time to time, the broad, objective view from outside the box can serve as a compass as we try to solve the world’s most urgent problems. To use an expression attributed to philosopher Alfred Korzybski and popularized by the founders of NLP (neuro-linguistic programming)³¹, the map is not the territory. It is simply a guide.

Being regularly aware, in a non-obsessive way, that one’s own thoughts are determined can be useful as a means of exteriorizing the sources of one’s disappointments, drawing the appropriate lessons in order to be more effective in the future and, very importantly, putting oneself in situations that one knows will stimulate the thoughts and ideas that one wants. This can be as simple and practical as, say, putting Post-its with motivational reminders in places where we are likely to see them in order to influence our future thoughts and actions. In fact, much of the principle of NLP can be seen as putting in place a structure in one’s mental processes that facilitates the generation of positive thoughts at the right moment—placing an easily triggered “billiard ball” in the right position. Analyzing how one’s brain works allows one to be more effective in manipulating it.

One cannot, however, invoke determinism in order to write off one’s own past behavior and demand understanding from others, even if the behavior was not cynically premeditated with this argument in mind. Although correct at one level, this argument would never be accepted by others, as people are expected by one another to act as if they have free will,

and a system where the rule of law as well as past commitments are not respected would quickly collapse.

But recognizing that the world is essentially, on a large scale and for the most part, deterministic, that things happen as they happen and that people are how they are for a number of reasons, provides the individual with a critically important viewpoint from which to understand human nature. Regularly viewing others' behavior as a virtually inevitable or highly likely consequence of a combination of various contributing factors can be helpful in dealing with negative events and behaviors, allowing us to act less emotionally and more rationally and tolerantly with people whose behavior troubles us, both in the private and professional spheres.

This perspective does present its own challenges. Acting detached at all times is hardly a useful social skill, not only because one would be perceived as bland, uninteresting or weird, but also because the complete suspension of any negative emotional reactions to others' behavior could be perceived as acceptance. In dealing with others, one needs to play the game. An obsessively deterministic outlook would inevitably lead to cynicism regarding the consequences of one's actions and words on others, as one assumes the simultaneous roles of actor and observer. One might have trouble avoiding the feeling of manipulating others, even though at some level this is what we (subconsciously) do in practice in our everyday relations, regardless of our good intentions. But the perspective has to exist as part of our understanding, even as we allow ourselves to revert to our intuitive perspective in our daily interactions.

If a slightly detached, deterministic outlook is sometimes relevant on a personal scale, it is all the more so at the levels of domestic and international politics and in the context of global activism. We sometimes carry the notion of responsibility to extremes, preferring to imprison repentant human beings for decades rather than implement practical measures that will reduce the likelihood of the crimes ever being committed. Demanding responsibility does not prevent or absolve us from helping to shape a system where the call for responsibility is not futile or inherently cynical. It isn't enough to simply demand it—we have to create the conditions where we can reasonably expect it from people. And for those who are unable to act responsibly, a deterministic understanding of their behavior can often reveal compassion to be an appropriate response.

On the world's political stage, leaders' emotionally influenced reactions to what they perceive as ill-will on the part of their rivals can lead to irrational courses of behavior that threaten the well-being of huge numbers of our planet's inhabitants. And among organizations trying laudably to reduce human suffering and change the dangerous course that our planet is on, there is often a lack of practical detachment to reflect on the most effective strategies that take into account human nature, even though venting anger about human rights abuses and greedy corporate profit-making may be natural and sometimes effective in promoting change.

To summarize, it remains a huge paradox, and certainly one of the most fundamental ones concerning human existence, that an essential truth about our relationship to the rest of the universe and how we operate within it needs selectively to be both ignored and embraced. Surrendering ourselves to the illusion of free will is absolutely crucial for our own happiness as individuals, maintaining a sense of control, assuming responsibility as active agents of change and being effective in getting things done. But regarding the rest of the world with a strong dose of deterministic thinking and detachment, and understanding the human situation objectively, is critical to free ourselves from unproductive and, ultimately, dangerously distracting negative emotional reactions and empty moralism. This perspective on the rest of the world, which includes viewing it as a self-contained system in which

everything is connected, with a certain unknown probability of terrible outcomes if left alone, can also spur us as individuals to take on *greater* responsibility to tinker with the system in ways that will improve the odds. Knowing that this deterministic—at some level—universe causes extreme suffering, if I can do something about it, then why shouldn't I, rather than passively observe the system's worst consequences and potential self-destruction? We cannot change the past, only the future. And although the past was determined by a previous chain of events, we can still decide to take responsibility for the future if we desire, regarding ourselves as critical nodes in a flow of causation on which a worthwhile future for humanity depends.

Scaling Up: The Bigger Picture

The molecules bumping around in our brains and in the world around us, interacting according to the laws of physics, translate not just into individuals' thoughts and actions but, ultimately, into the collective behaviors of large groups of people. We are part of a continuous system of atoms, molecules, people and populations in which everything is connected, and from the randomness and chaos, order of a sometimes predictable nature can emerge. In this section, let's explore this idea, both for the change of perspective it can induce when reflected upon, and for any pragmatic use we can make of it.

The collective properties of a large number of molecules in a system, for example, a canister full of gas, can be described by simple equations, such as those relating pressure, volume and temperature. In a similar way, the chaotic and essentially random behaviors of large numbers of distinct individuals following similar sets of rules also settle into relatively simple, large-scale patterns that can sometimes be described mathematically, although at this level of complexity, the immediate principles that come into play are further removed from the rock solid laws of physics. Complex systems, such as organisms or societies, have properties that can be better understood at a higher level than by adding up the individual properties and movements of the countless components. This concept was explored in depth by Philip Ball in his award-winning book *Critical Mass*.

Concrete, visual examples of this phenomenon include the awe-inspiring patterns displayed by large numbers of birds flying in a flock or fish swimming in a school, videos of which can be found on YouTube. If we just looked at the flight pattern of one individual bird we would not be able to guess that it was flying within the boundaries of a large, curved, wispy mass that was continuously shrinking and expanding. Neither would that bird or any other bird in the flock likely be aware of these larger-scale patterns of movement. The whole system can be seen as a computer program evolved over hundreds of millions of years, running simultaneously in each bird's brain, that dictates how to move in response to birds and other objects in the immediate vicinity, essentially applying just a few basic guiding principles.³² The same idea applies to other kinds of populations, such as ant colonies. The aggregated behavior of individual ants, without any single ant in charge and without any orientation session instructing them on what they are building, results in the construction of complex but well-defined, macroscopic structures.

These kinds of trends are commonplace in human society, such as in the predictable behavior of crowds, and often display a regularity that may at first defy understanding. Even though powerful individuals can disrupt or modify the system, the system is far more complex than any individual brain, making illusory any firm belief that we can guarantee long-term control over it, even of a benevolent kind. From a purely intellectual perspective, it can be humbling and even destabilizing to perceive ourselves as part of a larger system obeying its own rules, regardless of our individual illusions of free will and power. But there are also pragmatic consequences of understanding the larger system we are part of. When

large-scale trends are found to be leading to an unwanted outcome, we can try to determine the leverage points through which these trends can be diverted or halted. Since we cannot currently do much to change the brain's hardware, we need to try to manipulate the conditions in which it operates in order to improve the chances of a favorable outcome.

If you put similar groups of people through the same experiences, you can generally expect to get similar outcomes. Although people differ genetically from each other and thus have different characters, large groups of people brought up in similar cultural settings will, on average, tend to exhibit the same behaviors. This is the kind of detached perspective we need on human nature in order to improve the future, even when our human instinct is to attribute blame.

Without a sufficiently big-picture perspective, well-meaning individuals and organizations can devote huge amounts of energy to trying to solve problems, including alleviating misery in the world, and yet their efforts are unlikely to be optimally effective. The reasons can range from a simple lack of awareness of the latest research on the most effective specific strategies to achieve a particular result, to ignorance of what is happening on a large scale—the kind of trends that, when revealed as straight lines plotted out on appropriate graphs, or when presented in more sophisticated, dynamic bubble charts, immediately capture one's attention with their stark simplicity.³³ When these kinds of oversights result in an unsuccessful marketing strategy for a product sold by a large multinational, some shareholders may be disappointed and a few managers may find themselves re-working their CV's. But when the well-being of many of the planet's inhabitants is at stake, we need to step outside of our emotional selves, coolly analyze what is happening on a large scale, and devise appropriate strategies based on an understanding of the underlying determinants.

So, how well do we actually understand the world? Intellectually, of course, we can feel we have a pretty good intuitive grasp of how things work, and we can spot and plot regularities in piles of past data, but the crux of the matter is whether we can construct models that provide us with useful information about the future. As essayist and former trader Nassim Nicholas Taleb states in his important, iconoclastic book *The Black Swan*, "Prediction, not narration, is the real test of our understanding of the world," and he argues forcefully that our actual ability to predict is extremely poor, due in large part to a lack of information, as well as to the mistaken belief that we actually know more than we do. Even crystal clear past trends may be poor predictors of the future, as there may be other important factors, however rare, hidden or unforeseeable, that can yet have a dramatic impact. Taleb writes, "We have trouble knowing the parameters of whichever model we assume runs the world." This does not mean that there is no web of causation, that things happen independently of one another, but simply that we do not know nearly enough about all the virtually infinite factors at play to always make meaningful predictions about specific future events.

However, we do know that there are simple underlying factors driving human behavior, and there are certain resulting trends that are likely to persist, even if they do not allow us to predict future events with certainty. In particular:

- People are fundamentally driven by self-interest and the quest for status
- Altruism and empathy are weak forces
- Clusters of genetically and culturally related people tend to seek the interests of their clan above those of others
- Self-interested political leaders regularly exploit populations' nationalistic feelings as a means of maintaining power
- Wars have continually occurred throughout human history
- Complexity is increasing at an accelerating rate

- Technological advances are irreversible

How these factors will play out in terms of future events is uncertain, but it is likely to be explosive, as discussed in the chapter “Where We Are Headed”. Preventing dire consequences requires some ability to anticipate potential future scenarios and implement large-scale efforts to avert them. We desperately need better models of societal trends. The challenge is to distinguish between what we know and what we don’t, giving appropriate weight to both persistent trends and unpredictability.

Our instinctive faith in free will and individualism may, however, perversely be blinding too many of us to the large-scale trajectory of our species. We may well each be as free as a bird, but one that is flying in a large flock. We are uniquely human within, but viewed from the outside, we may be carrying out the universe’s destiny through a modern incarnation of atavistic Darwinian urges, embracing the cult of the individual, unfettered markets and competition, optimistic about the uses of powerful new technologies, with an overly naïve faith in an unwritten principle that good will ultimately win. The most important causes of the trends taking place on our planet—the drivers of human behavior that evolved over millions of years—are simple to understand, and yet it is critical to take them more seriously into account if we want to have any hope of salvaging a better future. The exponential increase in complexity taking place on our planet at this moment is a resulting large-scale trend of the utmost significance.

Our situation can be roughly understood by imagining a science fiction scenario. A few identical robots are scattered across a planet, each consisting of a computer and high-precision mechanical devices that allow them to maneuver objects. Each is programmed to build new copies of itself at a rapid rate, maximize its chances of survival, use raw materials as sources of energy and building supplies, and follow a strategy of competition and cooperation with other robots, the balance of which depends on the supply of resources and the similarity of the robot to other robots. The building process is imperfect and causes changes to occur in each new robot. Tribes of competitive robots end up multiplying and expanding throughout the planet, developing tools that allow them to manipulate their environment and carry out complex calculations. Robots continually destroy each other on a small scale and, every now and then, tribes wipe out large numbers of other robots. The tools at their disposal become ever more sophisticated and potentially more destructive, and the intelligence at their disposal continually increases. Where does this all lead?

To add an additional layer of interest that changes nothing about the robots’ actual behavior or the final physical outcome, we throw in a magical property we call consciousness that gives the robots sensations and emotions, allows them to experience their internal calculations as thought, and bestows on them the illusion of ultimate control. Welcome to planet Earth.

Of course, the above scenario is a simplification. It excludes the complex genetic component that more properly explains the sophistication of our survival and reproduction strategy—played out in the passing on of shared genes—and the balance between competition and cooperation. And by ignoring the relevance of mental states, it excludes the possibility that the robots’ overall priorities could shift over time to giving highest priority to enhancing subjective experience and to devising cooperative strategies to achieving this. But the scenario embodies the key feature of agents set loose in the world with a simple underlying goal. Individuals’ urges to satisfy their own needs, in the widest sense of the term, translate into large-scale trends at the level of the species, including the persistence of intense suffering and, increasingly, the emergence of existential threats.

It is for this reason, for example, that there is justifiable nervousness in the West about the growing economic and political power of a large, developing country like China, whose

government is not unduly perturbed even by the suffering of some of its own citizens who stray too far from the mean, with what can seem like an unstoppable momentum propelled explicitly by national self-interest—no different than the urges that spurred the growth of numerous empires throughout history. Countries' spreading influence and attempts at cultural homogenization are comparable to the growth of a plant limited only by the constraints of its habitat and competition with other plants within the same ecological niche.

If everything is determined by powerful, hidden forces, and if the billion-fold amplification of individual human nature to our species' population on a planetary scale leads to seemingly inevitable large-scale trends, how then can we really change the world? Well, a starting point is to want to. If enough smart, creative people want to shift the course of the world, it could potentially happen, by figuring out the most effective strategies that can lead to long-term stability. In that case, a better future will prove to have been in some sense determined, even if through what might be an improbable chain of events. Perhaps paradoxically, as suggested in the last section, the truth about determinism can allow us to understand with greater clarity the urgency of making a difference. It forces us to be pragmatic in favoring humanitarian values, and it can help promote a compassionate view of others by revealing their suffering as a potentially treatable symptom of the universe.

24 See www.eyetricks.com/3dstereo.htm for some examples.

25 Peter Aldhous, "The joy of parasites," *New Scientist* (20 June 2007).

26 Classic experiments showing a brief delay were published in the early 1980s by research psychologist Benjamin Libet. More recent experiments have shown an even longer delay of several seconds between the moment the brain displays activity indicating it is about to solve a problem and the moment the subject is consciously aware of it.

27 The theme of a classic novel from the early 1970s, *The Dice Man* by Luke Rhinehart.

28 As suggested by Thomas Metzinger in his essay "The Forbidden Fruit Intuition" in *What Is Your Dangerous Idea?*

29 Chris Frith, "Determining free will," *New Scientist* (11 August 2007).

30 The following article references and discusses two such studies, one by Kathleen Vohs and Jonathan Schooler and one by Roy Baumeister: Jesse Bering, "Scientists say free will probably doesn't exist, but urge: 'Don't stop believing!'" *Scientific American Mind* (6 April 2010), www.scientificamerican.com/blog/post.cfm?id=scientists-say-free-will-probably-d-2010-04-06.

31 NLP is an approach to psychotherapy that provides insights into how individuals can take better control of their own psychological functioning.

32 See, for example, Len Fisher's book *The Perfect Swarm*.

33 As an example, see physicist Sean Gourley's TED conference talk on the mathematics of war at www.ted.com/talks/sean_gourley_on_the_mathematics_of_war.html, or any of global health researcher and statistics guru Hans Rosling's dynamic presentations of social and economic trends at TED conferences, such as www.ted.com/talks/hans_rosling_at_state.html.

