

phers as David Chalmers (1996) and John Searle (2004) have provided cogent criticisms of the materialist position and its failure to account for the facts of consciousness. In particular, Chalmers has produced a revised dualism that attempts to reconcile the findings of science with the reality of conscious experience. In his *naturalistic* dualism, he sees conscious experience as something above and beyond the purely physical but cannot accept that it could have a causal influence over the physical. Instead of positing consciousness as a separate substance or realm, Chalmers makes it a *property* of the physical universe that is exhibited in certain situations and governed by certain psycho-physical laws. In this model, consciousness is like a field that emanates from brain-like structures and reflects physical brain processes in a medium of sensory quality. So instead of saying that the physical “communicates” with consciousness, Chalmers sees consciousness as a built-in property of physical matter: a kind of extra dimension.

Despite his reservations about using the term, Chalmers is advocating a kind of *epiphenomenalism* where consciousness observes the world but can have no effect on the events that occur. So, in the last analysis, modern dualism, like modern materialism, simply sees the human race as a collection of highly sophisticated biological machines. If our little consciousness is to be granted any validity, it is only as a powerless witness of the inexorable unfolding of physical law.

#### 4. Science and Society

In our consideration of the scientific turn of mind, we first discussed the scientific method and showed how scientific observation implicitly excludes human subjectivity. We then traced the development of science’s view of the human race, starting with the theory of evolution and ending with the modern view that human intelligence is best understood as a form of biological computation. Finally, we examined the philosophical implications of the scientific turn of mind, showing that consciousness is either excluded as something distinct from physical processes, or it is considered a mere epiphenomenon emerging from matter but unable to act as a cause in its own right.

Upon reflection, and considering that science excluded human subjectivity from its methodology in the first place, it should come as no surprise that science finds consciousness difficult to integrate back into its world picture. The idea that consciousness is somehow a superfluous addition to the physical universe is a natural consequence of having ceded primary reality to the physical world. By only looking for and acknowledging physical causes and physical effects, natural science lacks any methodology to investigate consciousness directly or any way to categorise it within its taxonomy of existing phenomena. We must remember that science *set out* to provide an explanation of the universe in terms of entities that can be objectively observed. The surprise has been

how inordinately successful this enterprise has proved to be. What began as an attempt to understand the mechanics of bodies in motion has uncovered physical explanations that seem to unify our whole existence.

#### 4.1 The Scientific World View

It is the success of the scientific enterprise and the technology it has produced that provide the most cogent arguments for our acceptance of the scientific world view. If we can just put aside our concerns about consciousness and subjectivity, then, says science, we can get on with the real business of discovery and progress.

However, our concerns about the status of human subjectivity are hardly trivial. If we follow the scientific method to its natural conclusion, then we must consider that all our ideas about freedom, creativity, intelligence, morality, goodness, beauty, truth, love, meaning and purpose are ultimately without foundation. This all hinges on our idea of freedom. If we consider that the universe is ultimately physical and governed by physical cause and effect, and that consciousness can have no effect on these processes then we have to conclude that there is no such thing as *pure* freedom. As Daniel Dennett has argued in his recent book *Freedom Evolves* (2003), freedom is rather the ability of the human brain to pause and consider various alternatives, instead of following the immediate impulse of instinct. According to our scientific view, this pausing and considering is simply an effect of having a more sophisticated brain, that can hold more possibilities and perform more complex comparisons. In the end it is the mechanism of the brain that will determine which alternative is chosen and not any supposed disembodied “free will.”

If we accept this idea of freedom then everything else falls with it (Dennett calls this “Darwin’s Universal Acid” (1995)). For what moral value can we place on anyone’s action if they were programmed to behave in that way by their genes and the effects of the environment on the connections in their brain? Certainly we should still punish wrong-doers because the threat of punishment changes the behaviour of the machine. But finally we cannot blame someone for their actions. For there is no one who is responsible - to be responsible you must have some genuine freedom. Even our certain feeling that this must be wrong can be explained as another effect of evolution, i.e. we evolved to feel outraged by certain acts that threaten the safety and survival of the community (such as murder, theft, cruelty and dishonesty). So we have these moral feelings simply because they enabled us to form strong and stable communities that fared better than completely disordered collections of selfish individuals - not because there is anything “ultimately” wrong with killing, as nature attests in every way.

So, behind everyday existence, our scientific understanding of evolution presents a picture that is singularly lacking in meaning or purpose. These too are illusions that nature has constructed to keep our systems motivated. For

evolution shows that we arrived on earth as the result of a blind interaction of physical processes driven by natural selection. And our own lives, our own aspirations and search for meaning, are simply the workings out of meaningless neural excitations in our brains. Even our moments of creativity and inspiration are simply the result of complex brain processes, of which we remained unaware until they popped into consciousness “ready-made.” Such is the view of science.

You may respond to all this by saying “so what?” And who really believes all these ideas, apart from a few philosophers and scientists? For the rest of us, we just get on with our lives. And who knows, maybe the scientists are wrong.

As for the scientists being wrong, we will discuss that in the next chapter. For now, we must see that the scientific/materialist world view is important because it now almost exclusively directs the course of our social development. Regardless of what we believe in our private lives, once we engage with society, we are involved in a system that is dedicated to the idea of progress through the application of science and technology. This means the scientific world view is embedded in the form and structure of the organisations we work for and the technologies that we use. And this also means that the actual operation of our world is characterised by the same disregard for the intrinsic value of human subjectivity and the same lack of ultimate meaning or purpose (Barglow, 1996).

## **4.2 The Technological System**

To make this clear, we must now consider the global economy as one vast *technological system*,<sup>11</sup> and investigate the general principles by which it operates. We have already discussed the broad outline of this system in Chapter 8. There we showed that the fundamental decisions about the future direction of the world’s economies are made by global financial institutions and by trading in the global capital markets. It is here that the money is invested that becomes the next industry and the next technology. And the basis of these investment decisions is easy to recognise: they are motivated by the expectation of profit. At the next level down, in the corporate enterprises and businesses, projects are proposed and money is spent. Again the motivation is the expectation of profit, either for the business entity as a whole or for the individuals running it. Within this, short-term goals may centre on gaining more control (over an industry, over a government, over a competitor, etc.) but these activities are still aimed at realising a longer-term profit advantage.

Against this pure profit motive are arranged the various national governments of the world. Each one of these is more or less dedicated to promoting the interests of the national population it represents. This makes the motivations of particular governments somewhat less straightforward than those of the business community. Democratic governments are certainly swayed by a desire to be re-elected and remain in power. And within this there may be some genuine concern to improve the well-being of the population. However, these

aims are increasingly dependent on a government's performance in managing the economy. And, as we discussed in Chapter 8, economic performance is now dependent on attracting international capital investments. Therefore, at least in the developed world, governments are becoming subsumed into an international economic order. Their job is to promote national interests via negotiation and to make their respective economies as attractive as possible for global capital investment. In doing this they must also make the transition to a global economy as palatable as possible for their respective populations. This means governments are increasingly becoming managers of economic and technical change, and are really working in conjunction with the aims of the global business system. For this system does not want mass civil unrest - it wants order maintained so that business and trade can continue without interruption. The older role of government in managing the defense of the nation is still apparent, but the military dominance of the US means that the administration of force has also become a global affair. Now the aim is not to dominate other states by military occupation, but to operate an international police force to maintain the global economic order.

The glue that holds this alliance of national governments and global business together is the desire for more wealth (and the associated benefits of economic, military and personal power and prestige). And the means of generating this wealth is via the continued growth and development of science and technology, the increasing exploitation of the earth's natural resources and the integration of a greater and greater proportion of the world's population into the global economic system. Technology is fundamental to this process because of its effects on *productivity*. This simply means that by doing things more efficiently we can obtain more output from a process using the same or less input. And more output means more goods, more services, more information and more wealth. So the focus of the progress of science and technology is to make physical processes more *efficient* and *effective*. For example, a nuclear warhead is a more efficient and effective way of killing people than sending over large numbers of aircraft to drop high explosive bombs, just as a microprocessor is a more efficient and effective way of processing information than a circuit using relay switches. And, as we have discussed, it was the extraordinary efficiency and effectiveness of modern information technology that enabled the creation of the modern global economy in the first place.

However, the technological phenomenon goes further than the simple invention and use of technological artifacts. The unifying theme of this book is that technology is an outer expression of the scientific turn of mind. For technology, in essence, is the attempt to increasingly control the human and natural environment via the application of effective methods. And science is the parallel attempt to explain and predict physical processes via the formulation of scientific hypotheses (which in turn are trying to express underlying

effective methods operating in nature). In both domains the aim is to reduce and understand nature in terms of formal effective methods. And equally, in both domains, this concentration on finding effective methods means that human subjectivity is left out of the equation. So, as a general principle, technology replaces human judgement, sympathy, creativity and intelligence with the rule of law. In the industrial revolution, it was steam powered machinery that replaced the labour of the artisan. Henceforth, the factory worker would have to fall in line with the dictates of the machine and the clock. Today, at all levels of the economy (not just on the factory floor), our organisations are embodiments of effective methods. We are paid by computer programs, we make requests via computer-generated forms and we work according to computer-generated and computer-monitored budgets. With each further advance, our human subjectivities are increasingly insulated behind a layer of information system technology.

That is not to say that human creativity has been extinguished and that everything is done according to a book of rules. Technology relies on human creativity for its development and businesses are continually seeking creative ways to increase sales, develop new products, penetrate new markets, etc. However, in the final analysis, all this creativity is used by, and absorbed into, a system that itself is the antithesis of creativity. So, whenever a promising new idea is discovered, an organisation will immediately set about exploiting it by encasing it in a new system of effective methods. Organisations even attempt to implement effective methods to encourage creativity. For, as we have discussed, science does not acknowledge true, or uncaused creativity. What it sees is that the human brain has some as yet undiscovered effective methods that it uses to generate new ideas. Once these methods can be formalised then the expensive creative input of human individuals can be discarded.

#### **4.2.1 Technological Determinism**

However, if we consider who controls the progress of technology and the evolution of the global economy, we find the answer is difficult to pin down. For, as we have discussed, the effective power is no longer in the hands of any national government (with the possible exception of the United States, if it chose to exercise it). Instead it rests in the abstract world of global finance capital. And here, while the major players can get together to override the economic decisions of individual nation states (such as in setting the values of currencies and interest rates), there is little chance for any group to fundamentally change the evolution of the overall system. That is because economic decisions are controlled by abstract market forces. So, while large financial interests can dominate a market in the short-term, unless these interests themselves behave rationally, they will soon run out of funds and influence. The logic of the market is that money must go where it can find the best return on investment.

However large and powerful an institution becomes, it still must respect this law, otherwise a competing institution will soon take its place.

The logic of the market also more or less ensures that technological innovation and development is rewarded once it can be translated into short-term profit. As we have seen, longer-term government investments in the development of military and space technology were first necessary to kick-start the computer and information technology revolutions. Given this lesson, governments now routinely invest in the development of new technologies in the hope that the final benefits and profits will accrue to their nation state. In this way, public funding forms an important link in the process of technological development, but one that is again essentially competitive. For behind these investments is the global community of professional researchers and academics who will travel to where their expertise is best rewarded.

And so it is that market forces predominantly determine the development of technology. Governments may try and intervene for ethical reasons, such as with human cloning, but this is mainly to avoid the potentially harmful or destabilising effects of new technologies, rather than a demonstration that governments direct the course of technological development. If a technology is discovered whose benefits appear to outweigh the costs, then that technology will be developed by somebody, somewhere and put to the final test in the marketplace.

Looked at in this way, we can see that the technological system is a vast collection of effective methods dedicated to the pursuit of growth and profit. At the very top, the market traders and financial institutions devise effective methods for the investment of capital (as evidenced by the increasing control of the global capital markets by computer-generated predictions and decisions). At the next level, global corporate businesses devise effective methods for the control of their external and internal environments (including hierarchical management structures and processes for the control of employees and production, systems of control over networks of suppliers and distributors, and the effort to control the marketplace by exerting influence on governments, competitors and consumers). Smaller business fits into and finds a role within this corporate dominated environment, and similarly employs effective methods in pursuit of profit. And, at the bottom level, technological artifacts, production processes and management directives embody effective methods that control the day-to-day activity of our working lives.

The crucial point is that the technological system is controlled by the logic of its own effective methods. And these effective methods are devoid of human subjectivity. This means they simply execute (as a computer program does) without consideration for their effects on the natural and human environment. So, although the system is run and maintained by human subjectivities, these subjectivities can have little influence on the basic profit-seeking behaviour

of the organisations that they serve. For, if one business fails to exploit an opportunity for profit, then another one will.

#### 4.2.2 The Influence of the Human Race

However, the human race still has an influence on this system. In the first place, the economy simply could not function without the acquiescence of the billions of individuals caught up in its daily operation. The primary means of gaining this agreement is through financial remuneration and the restraining effects of government regulation. History has shown (in fascism and communism) that imposing technology by force does not produce the best results. Instead, we are encouraged to participate in the economy via the reward of access to increasingly more sophisticated technologies that make our lives easier and more comfortable. In turn, governments are expected to restrain the most destructive effects of profit seeking by putting laws in place that all must obey. In this way the state acts as a “referee,” making sure the system can continue to operate, while giving the people a sense that their democratic votes can influence the controlling powers. But, as we have discussed, this ability to regulate business is being eroded by globalisation. Now governments are more like national enterprises that must compete with other national enterprises for investment. To stop the development of a destructive technology or industry now requires that all the major governments in the world agree on a course of action. And if that industry promises great profits for a relatively poorer economy, then agreement may be hard to find. For example, consider the tensions over the destruction of the natural environment and the industrialisation of China and India.

Secondly, humanity can influence the evolution of the technological system by voting with its purchases, i.e. it can reject certain products or technologies simply by not buying them. However, arrayed against this power of choice are the world’s multi-billion dollar advertising and public relations industries. Their job is to influence public tastes and opinions to ensure that particular technologies and products are accepted (again using well-understood effective methods). More generally, the global media industry is there to persuade the world’s population that our current technological way of life is not only the most desirable, but the only practical way that we can live on earth. And the same ideas are propagated through our modern scientific educational systems. If we add to this the fact that consumers can only ever *reject* a product or technology, it becomes clear that consumer choice does not have a decisive influence on the development of technology. It is rather an unpredictability that the system has to *contend* with and control as best it can.

So, if we consider the overall picture, we can see that no one in particular is in charge of, or is responsible for, the evolution of the technological system. While the human race, in aggregate, has the power to stop or change the direction of this progress, it chooses (and is persuaded) not to act. This means, by default,

our economic and social lives are primarily directed by the internal logic of the system itself. In this way we serve the gods of personal profit and the pursuit of comfort and convenience through the progress of science and technology.

### 4.2.3 Technology and Human Values

Because the technological system is simply an aggregate of technologies and techniques, it can only reflect back to us its own nature. And this nature is determined by the scientific turn of mind that lies behind it. So, at work, we are continually being *measured*. Everything is pinned down and quantified, costed and streamlined for efficiency. If we want to know something qualitative, like how happy or satisfied our employees are, we immediately create a scale, a questionnaire, something we can analyse with software, and turn into a number. If we look for the underlying meaning or value that our lives are serving, we find we are serving a system that has excluded human values and meanings. Instead we are serving the technological imperatives of progress and the pursuit of greater efficiency and greater profit. Perhaps in education and health care we can say we are doing something worthwhile. But from the perspective of the system, education is to train people to adopt the scientific turn of mind so that they can become productive members of society, and health care is necessary to maintain that productivity (not forgetting that both these areas offer profitable business opportunities in their own right).

That is not to say that people do not serve human values in their working lives. But this has become a personal matter. Our global society is not primarily concerned with creating a better, fairer world, or ending human suffering, or promoting human happiness. We may say that things are getting better in these areas, but these are *side effects*. If the world wanted to end starvation with the same determination that it waged the Second World War, then there would be no more starvation. But that is not our priority. We are content to go along with the system, with its profit-seeking behaviour, and the rewards it provides, and to let others worry about human values.

In case you are thinking that this sounds overly critical or pessimistic, we must not forget that the beneficial side effects of technological development have also been considerable. For example, in the developed world, we are better educated, better fed and enjoy better health than at any other time in recorded history. We are also less oppressed by physical violence and coercion, more free to express our ideas and generally more comfortable and secure. Our lives are above all full of convenience: most of us are released from the necessity of hard physical labour, we can take care of our lives, cooking and maintaining our homes with minimal effort, we can communicate at will across the globe and we are surrounded with avenues for travel and entertainment. And while we must acknowledge that a large proportion of the human race still lives in

abject poverty, both within and outside the developed world, there are signs of improvement even here.

#### 4.2.4 A Technological Utopia?

However, what is at issue is not whether the technological system is good or bad. The question is, can we do better? And if so, how can we do better? For the world is already responding to the immediate problems of global warming, terrorism, nuclear proliferation, poverty, disease, etc. But it is responding *technologically*. It is hoping to continue with business as usual, extending technique and technology into every aspect of life, until we reach a technological utopia where all such problems are solved. For the scientific turn of mind, such a scenario no doubt appears most reasonable and rational.<sup>12</sup> But for us, now that we have uncovered the basic denial of human subjectivity that lies at the root of such scientific thinking, we must ask again whether our faith in purely technological solutions is justified. This question finally boils down to whether the objectified scientific view of the universe is correct. For, if everything can be explained via physical cause and effect, then we must be living in a technological universe, i.e. a universe that can be understood entirely in terms of the execution of effective methods. And in such an existence it makes perfect sense to approach everything as a technological problem.

However, in the next chapter, we shall be arguing that there is an essential error or oversight in our purely scientific, technical and computational understanding of the universe. As a result, we shall be suggesting that the scientific turn of mind has run its course. For we already have the basic technologies necessary to solve most of the material problems that face the human race. What we lack is an understanding and acknowledgement of our own human subjectivity and its role in causing the problems that face us. And for that we require a much broader science, one that goes beyond the objectively observable, and finally embraces the inner domain of consciousness.

## Notes

- 1 A more detailed analysis of Galileo's foundational role in the development of modern science is given in Edmund Husserl's classic work *The Crisis of European Sciences and Transcendental Phenomenology* (1937/1970, pp. 23-59).
- 2 This prediction of Einstein's theory was confirmed by an observation of the position of the stars close to the sun during a solar eclipse in 1919.
- 3 The idea that science progresses via the repeated falsification of scientific theory was first proposed by the Austrian philosopher Karl Popper in his influential work *The Logic of Scientific Discovery* (1935/2002).
- 4 For instance, see the work of Stephen J. Gould on punctuated equilibrium (2002).
- 5 Gregor Mendel was a nineteenth century Austrian monk who formulated the basic laws of heredity as a result of experiments breeding garden peas.