

## GENETIC ENGINEERING AND WHAT IS NATURAL

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*Some argue that genetic engineering and other scientific practices are morally wrong because they are 'unnatural'. Prince Charles took this line in his 2000 Reith Lecture. But as Mary Warnock here points out, attempts to justify the moral condemnation of a practice on the grounds that it is 'contrary to nature' are notoriously difficult to sustain.*

Prince Charles, in his Reith Lecture, rebuked biologists for drawing society into areas which 'belonged to God and God alone', urging them to try, if they wished, to understand Nature, but not to change it. The lecture drew a response from many confused and vaguely frightened people. The new biotechnology seems to have opened up possibilities of changing the genes of plants and animals in a way which is contrary to Natural Laws. Because this appeal to Nature is often used in arguments about genetically modified crops, transgenic animals (that cross species boundaries), cloning, and so on, it is worth revisiting the question of what we mean by 'Nature', as a matter of some practical importance. What validity, if any, has an appeal to what is or is not Natural in such arguments?

It is a question of immense historical complexity, and I can do no more here than touch on a few of the issues involved. First, I want to put on one side, it may be thought with undue briskness, the relation supposed by Prince Charles to hold between God and Nature, though this in itself is a rich and complicated subject. God and Nature were linked in his lecture through the concept of changes that should not be made, laws that should be regarded as absolutely constricting, barriers, such as that between one species and another, that should not be crossed. And these laws were assumed to have been laid down by God. Therefore to pursue activities, or conduct experiments, that seem

to breach them is to offend against the will of God, whether God is held to have created the universe in one seven-day spurt, or allowed it to develop more slowly, through evolution. But for Prince Charles, and certainly for many who share his fears of the new biotechnology, if the language of Theism were removed, the arguments would remain just as powerful. Whether God invented the laws which govern the natural world, or whether no one invented them, it is wrong to attempt to interfere with them. There are not two separate offences, an offence against God and an offence against Nature. They are one and the same offence. For the purposes of the argument, reference to what is God's domain and his alone can be seen as a metaphor which appeals to and seems usefully reinforcing to some people and not to others. Though, as I hope to show, there are other places where the ideas of nature and of religion overlap, for the time being I wish to say no more of any arguments against biotechnological interventionism which derive from theology.

So we are left with Nature itself. In the Third Book of his *Treatise of Human Nature*, David Hume was searching for some general 'principles upon which all our notions of morals are founded' (book 3, part 1, section 2), and he said 'should it be asked whether we ought to search for these principles in nature, or whether we must look for them in some other origin? I would reply, that our answer to this question depends upon the definition of the word Nature, than which there is none more ambiguous and equivocal.' And he agreeably goes on to point out that what is natural is sometimes defined as the opposite of what is miraculous, 'In which sense every event that has ever happened in the world (excepting of course those miracles on which our religion is founded) is natural'; so in saying that something is natural 'we make no very extraordinary discovery'. Adapting Hume's ironic remarks to the biotech world, we might agree that in one sense, it is impossible, unless we believe in miracles, that the laws of nature should be defied, and thus that whatever it is possible to do is necessarily in accord-

ance with them. However, this would suggest a trivial use of the word 'natural'. We need to find a concept of nature that has more content if we are to assess the force of those arguments against biological interventionism which rely on it.

First, as was quickly pointed out both by his sister and his father, Prince Charles's distinction between learning how Nature works and changing it cannot be the source of a distinction between what is permissible and what is to be prohibited. It is not intervention itself that is contrary to Nature; or, if it is, then being contrary to Nature cannot be something we should worry about. For it cannot be denied that it has been a crucial motive of human beings since they first began to exist to overcome natural obstacles, to develop methods of cultivation, to improve their crops and their cattle, and of course to cure as many of their own ills as they could, by medical and surgical interventions. Civilisation is essentially built upon the foundations of Nature that has been changed.

Prince Charles allowed, as he was bound to, that agriculture was, in one sense not 'natural'; but he contrasted producing genetically modified crops with 'traditional methods of agriculture which have stood the test of time', because 'they are working with the grain of nature'. This contrast cannot stand up to investigation. All agriculture works against the grain of nature, that is indeed its whole purpose. But the distinction between the traditional and the new is, manifestly, central to the argument. So, though I do not wish to take sides for or against genetically manipulated foods (some of which I believe to be worth producing, others not), I want to raise the general question of what it is about genetic modification, whether of plants, animals or human beings that rouses such strong feelings, and seems to inspire such panic? Does this panic amount to a moral imperative to biological scientists and doctors to go no further?

It is sometimes said that our fear of misuse of the new technologies arises from our fear of risk. There is probably

some truth in this. At the time, in the 1980s when it seemed as though 'gene therapy'(the replacement of faulty genes in embryos, or in children who had been born) was likely to be the way forward in the battle against monogenetic diseases such as cystic fibrosis, there was a strong argument that such replacement should be carried out only in somatic cells, which had fully differentiated into, as it might be, a part of the lung or the spinal cord of a fetus or a child. This would mean that while an individual might be cured of his disease, his offspring would not be affected. In contrast it was held that germ-cell therapy, which would entail the change of gene being effective for all the offspring of an individual for all time, must never be undertaken. The risks were too great, and the consequences for the whole human race too unpredictable. There are some long-term risks that are too great to be outweighed even by apparently certain short or medium-term benefits. Such was the argument at the time. The possibility of gene-replacement therapy now seems more remote than it then did. But the argument has not been overturned. Moreover in many ways we have become a risk-averse society. We wish to be certain that our drugs are tested, our food uncontaminated, our rail tracks safe, our air clean. Safety is high on our agenda; and though people often exaggerate the possibility of proving safety,(which would always mean predicting the future), our inevitable ignorance of the consequences of altering the human gene-pool is just too great.

Nevertheless, it is not simply the risks attached to genetic intervention that make so many people recoil from it. It is not unpredictability but rather its opposite which horrifies them. For they hold that intervening to change someone's genes irrevocably changes that person, making them fit a desired pattern, not of their own choosing, but chosen for them by their parents, or by society as a whole. It is this fear, or some variant of it, which inspires the horror with which human cloning is commonly viewed. Suppose that a man arranged to have himself cloned, the nucleus of a cell

from his body transferred to an egg whose nucleus had been removed, and inserted into a human uterus for gestation. The resulting baby would share almost his entire genome (only a few, though in fact important mitochondrial genes deriving from the egg donor). This baby would be his identical twin, though of a different generation, and would grow up knowing exactly how he would turn out, when he would go bald, whether he would become a gambler or a lothario. Such is the common belief. Far better, surely, to let Nature take its course, without laboratory intervention.

Of the two great myths that express our fears of biological science, Mary Shelley's *Frankenstein, or the New Prometheus* (1818) and Aldous Huxley's *Brave New World* (1932), it is the second that speaks to our horror of being manipulated. Mary Shelley deliberately sought, as she said, 'to speak to the mysterious fears of our nature, and awaken thrilling horror'. The thrilling horror was indeed of the misuses of technology, but to produce life that would spin unpredictably out of control. By the time of *Brave New World*, however, the fear was that scientists, or they acting at the command of politicians, would be able to create not monsters but human beings, according to specification. As early as the 1920s, Julian Huxley, Aldous's younger brother, and a biologist, was writing about the vast powers that science was about to have at its disposal. In his *Essays in Popular Science* he wrote, 'At present we do not know how to produce mutations, but the belief that we shall eventually be able to do so underlies our work, and once we have discovered the way, our knowledge of the laws of heredity will enable us to build up improved races of animals and plants as easily as the chemist now builds up every sort and kind of substance in his laboratory.' No sooner was the discovery of DNA published, in 1953, than these possibilities began to seem actual. Nature's course could be irrevocably diverted.

We are often told that genes are 'the building blocks of life'; and it is shocking to learn that genes may be shared by human beings, fruit-flies, even plants. Our humanity

seems at once diminished. And if we add to this the fact that the building-blocks can be rearranged, suddenly the old order appears to collapse. For nothing has seemed more certain than that species were separate, each in its own compartment, even if the compartment walls might very gradually shift. We love to have some rock to cling to; and the traditional course of Nature, the Natural Order, is a rock we can hardly bear to give up.

This, then, is the meaning of the appeal to Nature in arguments for the restricting and regulating of the biological sciences. Should such appeals therefore be disregarded as mere sentimental expressions of traditionalism? After all, every new scientific perspective has met with fierce resistance. One has only to think of the fate of Galileo. And Newtonian physics which seemed to show that everything in the world, including humanity, could be reduced to its physical components, so that human beings like the rest were in principle wholly predictable according to natural laws, was as shocking in its time as the new biology. Reductionism always leaves out what seems most precious: human freedom, and the spirit of man.

It is important at this point to distinguish two very different propositions. The first is the proposition of wholesale reductionism, that a person is determined by his genes and that his character and the course of his life can be read off from his genetic map, or genome. Secondly, there is the much lesser claim, that some conditions are the outcome of a single faulty gene within a cell of a single type in the human body. To accept this proven proposition does not commit us to the first proposition, genetic determinism.

If full-blown genetic determinism were true, then to choose in advance to alter a person's genome, or to cause him to be born with a genome identical to one's own would be to exercise enormous power over him, and would generally be regarded as immoral exploitation of one person by another (though whether, if we really believed in genetic or any other kind of determinism, there would remain a use in our vo-

cabulary for such words as 'immoral' is another question). If, however, a gene can be altered or its function changed in order to remedy a painful or life-threatening condition, this is not unlimited exploitation, but a limited medical intervention as defensible as any other invasion of the human body with therapeutic intent. Indeed, I would go further and suggest that as human beings, capable of trying to remedy one another's ills, we have a duty to carry out such interventions, after their effectiveness has been properly researched. Human Nature is in no way thereby changed.

The acceptance of the lesser claim leaves human beings as they always were, conscious, capable of making decisions, and, uniquely, being human, capable of trying to improve the general lot of mankind.

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