

Is genetics changing what it means to be human?

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Genetics and humility—a contradiction in terms?

The world of genetics can be intensely misleading, since it lends itself to oversimplification. Images of 'designer babies', the rampant cloning of famous and infamous individuals, and the engineering of our very essence through outlandish genetic manipulation serve to mislead theologically as well as scientifically. So does talk of techno-eugenics, the segregation of what some writers refer to as 'GenRich' individuals from mere 'Naturals', re-designing the human species, the emergence of genism, and the creation of posthumans. Such images fire the imagination, but do nothing for serious debate and analysis.

Discussion of topics like choosing our children's genes tends to revolve around choosing genes for fair hair, blue eyes, intelligence, physique, good looks, avoiding baldness, or whatever. The ephemeral nature of these longings only serves to demonstrate their superficiality, let alone the scientific precision, clinical complexities and expensive resources that would be required to achieve them. Unfortunately, instead of demythologising such fantasies as empty claims, they are taken seriously and are used to construct tirades against realistic and therapeutically based genetic choice. The latter can then be dismissed on the ground that its goal is that of producing perfect babies, designed to order. These twin themes of perfectibility and designer babies carry powerful negative theological overtones, with their message that science is assuming redemptive powers; salvation can be found in biological manipulation, and the hope of a better life emanates from genetic intervention.

Christians rightly reject any such paradigms grounded in such quasi-scientific aspirations. The trouble is that these paradigms are based on little more than irresponsible journalistic hype (sometimes aided and abetted by scientists who should know better).

The position I take is to argue that the Christian task should be that of debunking this fatuous mythology, and not use it to frighten and mislead the faithful. To use it as the foundation on which to construct a case against genetic intervention in the name of Christ, is to fall into the same trap as those who look for a biological version of the new heavens and new earth. While the intentions of these two groups are radically different, they both accept the hubris implicit within a scientific vision that assumes that nothing lies outside its manipulatory abilities.

Starting from a baseline like this, any assessment (Christian or otherwise) of the prospects opened up by genetic intervention, will be mired in opposition to them. The rationale of this opposition is rejection of hubris rather than an analysis of the prospects opened up by serious genetic science. Neither does rejection of this ilk stem, of necessity, from the application of biblical principles, even acknowledging the problems encountered in their interpretation in a contemporary area like this one.

My standpoint is that the rejection of hubris (valid as it may be as a general principle) should not be the Christian's starting point. It is far more relevant that we embrace humility, since it is this alone that enables a rigorous assessment of the merits of what can and cannot be accomplished by genetic science.

With this in mind, I shall employ a *therapeutic framework* that will help direct our gaze towards what can be realistically accomplished for the benefit of real people. Within this framework, the guiding principle is the good of people, especially patients, with its commitment to improve the quality of the patient's life and possibly the replacement of illness by health. This is a positive hope, but it is also a realistic one. The genetic intervention may not work; our hopes may be dashed. But the attempt is to be encouraged as long as our expectations are guided by realistic clinical and

scientific goals. There is no hint here of striving for perfection or of an ageless existence in a disease-free body. The dominant value is that of humility, demonstrated by caring for those in need, and of utilizing powerful technologies in the service of those potentially capable of benefiting from them. Emphasis upon the good of the person helps to keep the focus on what is largely a therapeutic agenda.

Unfortunately, these soothing general principles will not help allay the deep concerns felt by many, Christians included. After all, aren't we talking about genetic control, and isn't it the control element that is so deeply problematic, and isn't it this element that is the antithesis of humility? Let us, then, explore what genetic control might amount to.

Genetic control and the person

One has to admit that the realm of genetic control is a subtle one. Repeatedly one hears of gay genes, IQ genes, and genes for aggression. Regardless of which gene one is allegedly interested in, the basic message is the same – there are genes that cause us to act in certain ways. The underlying assumption is that there is a direct correlation between genes and disease, genes and behaviour, or even genes and belief. It may even be that we can choose genes for our children, rendering them intelligent, bright, beautiful, and possibly even virtuous. The hope appears to be that we could ensure that they turned out to be compliant to our wishes, becoming entrepreneurs, scientists, or accountants, or excelling in chess, football or ballet. Perhaps we could increase the likelihood that they follow Christ. Take your pick; all that is required is that you choose the appropriate genes!

These are disturbing possibilities, since they undermine central elements within our responsibility as human beings. If I have no choice but to be aggressive, I may find myself unable to be a peacemaker and to love my neighbour as myself, as Christ would have me act. It may even be that the fruits of the Spirit cannot manifest themselves in my life, not because I am being unfaithful, but because I am genetically inclined to be jealous, angry and selfish. Could my Christian journey amount to nothing more than a genetic predisposition?

These are unsettling vistas, since they presuppose that all we stand for can be explained in genetic terms, which is usually interpreted as explaining away everything we stand for. We live according to certain basic genetic designs; modify the designs, and we become different people with different personal characteristics. Look to the future and individuals will be designed according to some controllers' whims. All is in the genes and the genes explain everything. But is this the case?

The link between individual genes and behaviour is far more complex than suggested by the 'gene for X' scenario. This is because multiple interacting genetic factors usually contribute to a trait. Besides this, environmental factors are also of major relevance, with genetic and environmental factors interacting in a complex manner. Interestingly, genes are switched on and off in response to a variety of pressures, both during development and later on in cell life, while the proteins produced by genes may subsequently be modified themselves.

Consequently, the actions of a single gene (or even set of genes) will rarely be the only cause of a particular condition. The pathway between a gene, a particular protein, and an individual scoring highly on an IQ test, or having an aggressive personality, is very indirect. Genes influence behaviour, but concentrating on genes to the exclusion of other factors grossly oversimplifies the human condition.

The world of behavioural genetics points clearly to the conclusion that aspects of our character and personal identity have a genetic basis. This is not surprising, since we are our bodies, and our bodies are us. Genetic factors are inevitably involved, even at the deepest levels of what makes us the people we are. But this in no way threatens the conception of a person as a rational being, capable of taking responsibility for ourselves as free agents. Neither does it detract from our ability to act as God's agents and stewards in his created order.

Human beings have a freedom that is constrained by biological and environmental circumstances and also by genetic make-up. This is valuable self-understanding since it helps us appreciate our moral and spiritual limits, as well as our addictions and predispositions. We can also

learn how God's grace can renew what we are as people, working through our physical bodies and genetic substratum.

We are 'of the earth', and we recognize that God himself was incarnated to become one with us: to become flesh, with (among many other things) its genetic building blocks. These building blocks, however, are far from unalterable, since the environment affects everything to which they give rise. Surprisingly, this includes the micro-environment at the level of cells and tissues, as well as the far more obvious external influences. Hence, it is unwise to attempt to see genes as isolated units. The relationship between them and a diversity of environmental influences is an intimately interlocked one.

What this means is that genes are switched on and off indirectly as well as directly. Advertently or inadvertently, their functioning may be modified by the nature of the environment in which children grow up and function. People and their bodies do not exist in a social vacuum. A vast range of genetic and social factors will always exist alongside one another.

Compare the quality of life of the following: i) those with potentially excellent health but living in a malnourished community where their efforts are devoted to mere survival; ii) those brought up in abusive homes and characterized by behavioural problems as adults; iii) those with cystic fibrosis or some other equally debilitating condition but brought up in loving and supportive homes and communities; and iv) in the future, those brought in to the world by cloning or following genetic modification of some description but raised in a loving environment where they are cherished for all they represent as individuals in their own right.

Here we have different forms of control – social in the first two and biological in the latter two. None of these outcomes is inevitable, regardless of the genetic influences. What is of crucial significance is the ability to be oneself and to relate productively to others within the human community. Relationships such as these emanate from our personhood, as those made in the image of a triune God. The manner in which humans are treated should always be viewed within the broader context provided by human relationships, and never simply within the much narrower framework of biological parameters. Any choices we make should be choices to benefit people, and not simply to enhance disconnected building blocks, whether genes, livers or brains.

To argue like this is to argue for a person-centred model, and this is the model that governs every facet of my approach to genetics, or for that matter to neuroscience. And I regard it as a model that is consonant with biblical and theological imperatives. We are people made in the image of a personal triune God, and created to relate to each other within community as well as to God as our creator and redeemer.

Genetic design within a person-centred model

In terms of a person-centred model, we acknowledge that we make choices for ourselves and on behalf of others, because people have to make choices. Some of these choices will not raise any genetic or technological issues, and do not generally elicit vigorous ethical debate. Others will, such as when genetic choices are made at the earliest stages of children's existence - probably when they are or were embryos. The thrust of my argument is that non-genetic and genetic choices should be viewed within a unitary framework.

Is there, then, any place for what might be called genetic design? Or, alternatively, is any form of genetic design to be decreed as unacceptable for Christians? What sort of thing do I have in mind? Let's think speculatively for a moment.

In a future world, it is possible to envisage exceedingly precise forms of genetic design. The first of these introduces us to a patient with Alzheimer's disease (AD), when the protein deposition largely responsible for the symptoms of the disease can be prevented by genetic means. The result is that very early cases of the disease can be prevented from developing further. This would be an excellent example of gene therapy.

The second hypothetical 'patient' is an embryo, which is known to have a (set of) gene responsible for some forms of AD. This embryo has a vastly increased chance of developing AD by the age of 60 years. In this imaginary world gene therapy has reached a stage where this AD-

causing gene can be replaced by a normal gene, without giving rise to deleterious side effects. As a result, the likelihood that this future individual will suffer from AD can be decreased markedly. In another very similar scenario, genetic manipulation of an embryo could hypothetically be employed to decrease the likelihood of an affected individual developing heart disease at 50 years of age. Both are examples of very sophisticated gene therapy that borders on genetic enhancement.

The third ‘patient’ is also an embryo; the future individual will suffer from mental retardation. Let us imagine that it were to prove possible to genetically manipulate the embryo to produce an individual with ‘normal’ mental abilities. Such an individual would be radically different from early infancy onwards, and would truly have been enhanced. The contrast between the unaltered (non-manipulated) and the altered (manipulated) states would be dramatic, in that the two ‘people’ may be practically unrecognisable as potentially the same individual.

These possibilities are not put forward as justification for contemplating moving in any of these directions. All I am contending is that, in the same way as normal brain function is preferable to epileptic fits, or normal eyesight is preferable to myopia or glaucoma, we should not dismiss out-of-hand means (including genetic means) of remedying major defects.

What might we take away from these futuristic scenarios?

- The context I have provided is that of medical treatment, and this will continue to be the dominant context in most situations. The significance of this context is that it serves to control and limit scientific bravado. While it does not provide an infallible framework, it differs significantly from that in which the ultimate goal is the creation of a race of supermen and superwomen. This is the contrast between therapy and hubris, and it serves as a reminder that genetic ventures occur in both contexts and not solely in the latter.
- A therapeutic context is a reminder that the welfare of individuals is paramount. If ever this is lost, a framework for person-centred decision-making is also lost. At a broader level community-centred decision-making is crucial. In other words, these contexts are reminders that genetic therapy and modification are to be used to serve and assist people in need. To ignore the welfare of the needy and downcast, and use genetic interventions to serve the aspirations of those wanting perfect children or idealized offspring, is to misconstrue the science and misappropriate a therapeutic context.
- A continuum exists from unremarkable therapy through to startling new vistas: from genetic-based medicines, to the ability to determine individuals’ future characteristics, and ultimately to the precision of an all-embracing genetic knowledge of our biological essence. Failure to acknowledge this continuum in order to concentrate solely on the power to manipulate people is deeply troubling. Those who are fearful will oppose all forms of genetic science; those who are filled with bravado will seek to use the power of genetic science for self-aggrandisement. Recognition of the continuum provides a productive middle way.
- Science is not omnipotent; and even the degree of understanding and control I have hypothesized is unrealistic. All human control and all human expertise are severely limited, limitations that stem from both a mixture of human finiteness and human sinfulness. It would be a tragedy if our assessment of genetic science became warped by false illusions of scientific power. A backlash against such arrogance could lead to rejection of any use of genetics therapeutically. This, in turn, may cause us to turn our backs on abilities made available to us by God.
- Genetics in isolation provides a limited understanding of what constitutes the human person. It has to be seen alongside the environment within which individuals develop and function. It is this interaction between genetic and environmental factors that is basic to everything we are as people. This in no way invalidates the significance of genetics, but it does serve to place it within a broader biological context.

- The human person is always susceptible to manipulation, behaviourally, politically, pharmacologically and, in rare instances, genetically. There is no escape from this, because relationships with others are central to human existence, and these demonstrate the ease with which we abuse and exploit others for base ends. This emphasis on relationships stems from what we are as persons made in the image of a triune God. Relationships are central to the functioning of the godhead, and to every facet of human existence - biologically as well as spiritually.

This discussion has pointed to a place for design within genetics, but design of a far more limited and humble variety than so often encountered in these debates. It is far removed from the bravado and hubris associated with the picture of a factory production line of identical and preordained babies. The challenge is to determine how we do these things, and under what circumstances we do them, because this is where responsibility, judgement and discernment come into play. We can't do anything we like; we shouldn't do anything we like. But we should do all we can to improve the quality of the lives of those around us, whether by using biological means or simply by treating them as beings of importance and as people who matter.

This it seems to me is where Christians should be contributing to this debate. If we consider that God is sovereign over all, he is sovereign over the genetic realm, just as he is over human life, human community, and the ecosphere. Divine grace and creativity are evident in all these realms, and human creativity is to follow suit. If we can say that God works through creation and, therefore, through what we describe as the natural world, there is no reason to say that he does not also work through the basic processes described by biology and, therefore, through genetic mechanisms.

Humility is essential for rigorously assessing the merits of what can and cannot be accomplished by genetic science. Using the therapeutic and person-centred framework I have advocated, our eyes can be directed towards what can realistically be accomplished to benefit the patient. This is a far cry from the hubris sometimes encountered, but also from the anti-hubris that has become so caught up in the fear of extravagant claims that it has lost sight of the good that could be accomplished by utilizing some of these technologies.

Nevertheless, there is a cautionary lesson here, and this is to beware of obsession with the normal, something that could be accentuated by any of the current biomedical technologies. The genetic realm is as limited as any other, and talk of designing wonderful new human beings is futile. On the other hand, the rejection of a modicum of limited and very cautious design is the outcome of a spirit of fear rather than a spirit of faithfulness. We are to do what is consistent with the nature and purposes of God, and are to assess all scientific developments by the benchmark of whether they appear to forward God's work in creation. Daunting as these tasks are, and inadequate as we are to tackle them, they are enriched when theological, scientific and ethical insights are brought to bear on them in an integrated fashion.

Does genetic manipulation stand in opposition to God's purposes?

Once again, though, we return to the recurring theme that there seems to be something inherently different about any form of genetic manipulation, even the therapeutically-based variety I am advocating. The feeling is that somehow fiddling with genes is an intrusion into the locus of what makes us human. Genes are different; some even refer to them, or at least DNA, as sacred. Listen to one such concern:

We stand today at a crossroads where quite literally the future of the human race is at stake. I do not mean the survival of the human race, but something more sinister: the altering of the very concept of *what it means to be human*. The issue is not whether future generations shall live; the issue is what future people – if we call them such – shall be like. (Erwin W Lutzer, 2003)

These words by a Christian pastor encapsulate the theological as well as social concerns raised by any intrusion into the genetic make-up of human beings. It is an intrusion too far, no matter what

the motives or intentions. And it is in this context that one encounters Christian writers who see virtue in what is sometimes referred to as the *genetic lottery*, the uncertainty that lies at the core of normal human reproduction. Some regard such uncertainty as being central to the maintenance of human dignity, in part perhaps because this is where God's influence reigns supreme. This leads to the stance that manipulation of this realm is deeply antithetical to Christian aspirations, putting as it does unwarranted control into human hands.

What we emerge with, then, is a clear illustration of science and theology pulling in opposite directions. And so, we are presented with a modern-day illustration of the well worn 'science-religion warfare' metaphor. You can have genetic control or God's control, but not both. Which do you choose: to be a slave to secular science or a faithful follower of Christ? In my view, this choice is disastrous and totally unwarranted.

After all, when the genetic lottery goes seriously wrong, resulting in distressing diseases, we attempt to rectify what has gone wrong. Conventionally, this is done indirectly, by manipulating the results of the genetic errors using conventional medical approaches. But is there any difference in principle between this and directly influencing genetic combinations? Both are forms of control.

Underlying all such niceties is a more fundamental query, and this is whether or not we are prepared to accept what the genetic lottery turns up. The history of medicine and medical intervention suggests that we are not prepared to do this. Diseases galore have been tackled, even though many of them have genetic bases. Consequently, to accept whatever the genetic lottery doles out is genetic fatalism, and a rejection of the wholeness of human existence. There is no difference in principle between the genetic lottery, the accident lottery or the environmental lottery. There are chance elements in all three, and all three may have dire repercussions for the character of human life. We either tackle all three, or we ignore all three.

In principle, there is nothing sacrilegious about modifying DNA or any processes at the commencement of human life; they have the potential for extending the work of God, as long as the modification is guided by the well being of humans. Such creativity accords with God's creative activity in nature.

This is not *carte blanche* for carrying every modification imaginable at the genetic level, any more than it would be at any other level. Discernment is always required, and a weighing of possibilities is always called for. This is not an argument that everyone should be born 'normal', since obsession with the normal is itself a stumbling block. There is no ideal in human existence, and there is no genetic ideal to be approximated. Genetically, we are all flawed in various ways, and the interaction between combinations of genes that seem to be beneficial and those that seem to be deleterious is intimate and complex. To look for a genetically perfect human ideal is not only to treat humans as unchanging, but to ignore our human creatureliness and the randomness of all new genetic combinations. A Christian perspective is far more realistic than this with its concern for the weak and disadvantaged, the unlovely and the impoverished, the outsiders and the downtrodden.

But could genetic knowledge go too far? Imagine the following.

It is possible to envisage a world where the genetic make-up of individuals is totally known and, hence, is open to being analyzed by others. Genetic 'chips' are available, and these could be used to read out our individual genetic make-up. Theoretically, everything that could be known about us genetically is open to scrutiny. Information is available about the functioning of our kidneys or brain, the chances of our manifesting a whole range of cancers or heart disease, and even our ability to cope with stress, or our proneness to depression. This is where the human genome project may lead, presenting as it does enticing therapeutic vistas, or alternatively, dire predictions of abusive control and a loss of human freedom. Of those two paths, it is the negative one that is so often highlighted.

Genetic knowledge of this order could enhance people's understanding of themselves and their world. For instance, instead of having to think vaguely about, say, cholesterol levels, which may or may not have the significance attributed to them for particular individuals, people would theoretically have a far more precise means of knowing whether these levels should be taken seriously in individual cases. Whether or not people could cope with such detailed information is another matter, since the medicalisation of life may become overbearing.

However, even in a world characterized by this level of genetic foreknowledge, there would still be an intimate connection between people's genes and the numerous environmental factors to have influenced genetic expression since the first few days of embryonic existence. A strong predisposition to develop stomach cancer is affected by dietary, neuroendocrine, external environmental, and attitudinal factors. It is a person who develops stomach cancer, not a set of genes. In other words, even in some future world of genetic foreknowledge, the crucial context will still be that of people in their wholeness, and not genes in some aseptic, depersonalised cellular compartments. A predisposition for a disease or behavioural trait is not the same as having that disease or expressing that trait.

Nevertheless, this discussion raises an even more fundamental notion, namely, that we can be 'known' biologically ('known' genetically). For some this is the ultimate in genetic determinism. This is an unfortunate conclusion, because the accuracy of the predictions will depend on factors additional to, and interacting with, the genetic. Just as genes contribute to what we are as people, the persons we have become influence our genes. Consequently, genetic determinism is far less of a threat than once supposed, and reductionism should be regarded solely as a methodological tool.

Is Armageddon inevitable?

If we decide to opt for knowledge over ignorance, a choice between human embryos based upon genetic considerations may have to be made in some cases. At a more general level, research on human embryos raises similar issues, where the anticipated outcome of the research, albeit some distance into the future, is improvement of human health. The general thrust of acting as God's stewards comes into play here as well, since there are two possible courses of action, both of which have problematic elements. We may seek a definitive answer to the question of when human life (personhood) begins, and the answer with which we emerge may preclude any ventures involving embryos. Alternatively, if our focus is placed, not upon the embryo alone, but upon the choice that has to be made - between the interests of early embryos and that of children and subsequently adults who will have a potentially serious genetic condition - the nature of the ethical decision-making will have changed. This is where Christians (as well as others within the community) reach different conclusions, since explicit biblical teaching is unavailable. Equally sincere Christians arrive at different conclusions depending upon the respective emphases placed upon the embryo in isolation and the embryo within the broader human community.

Simple solutions will probably by-pass this choice, since they will concentrate on one party or one interest, out of all those directly or indirectly affected. In order to do justice to a range of theological motifs, a number of guiding principles will have to be consulted and balanced. These will not provide definitive answers, but they will hopefully enable us to construct a helpful forum within which to debate the respective merits of contending forces.

The *first motif* is provided by the urge to restore the material world: to improve it, care for it, and cure those with distressing conditions. Inevitably, our attention is on human beings in need of medical help and assistance. If there are current or imminent scientific measures that might realistically be able to alleviate serious illnesses, under normal circumstances they should be pursued. This should be within the bounds of a balanced life-style and broad overall interests. It is from this foundational principle that we should turn to examine the specific issues emanating from the way in which we treat human embryos.

This introduces the *second motif*, which confronts us with the question of whether some of these conditions can best be tackled at the embryonic stage or later on in fetal or more likely in postnatal life. In searching for an answer here we will be guided by the scientific and clinical evidence. Both

stages may be relevant, and both should be amenable to further consideration. At any particular time, one may be preferable to the other on account of the level of clinical understanding and/or moral preferences.

In moving in the embryonic direction, a *third consideration* becomes relevant. Might the destruction of human life, even at its very earliest stages, lead to an objectification of human life? Any destruction of human life, or any use of human tissue following a tragedy, should prompt this consideration. Awareness that human powers can be used in manipulatory ways should instill caution into our grand ventures. After all, human dignity is readily sacrificed in the pursuit of meagre ends. And yet, there is a balancing perspective. The other participants in therapeutic decision-making are also human beings, and neglecting what could be done to assist them may threaten aspects of their dignity. They may be held hostage, by unduly elevating rudimentary human life in the form of the earliest stages of human development. No one direction is self-evidently more appropriate either theologically or ethically, without working through the issues in each individual situation. Judgement and discernment are mandatory.

For Christians there is also a *fourth motif*, namely, one's dependence upon God. While this as a global principle will not immediately answer the sort of very specific questions raised in this discussion, it is the fundamental relationship that is the bedrock for all considerations such as these. Couples contending with invidious genetic conditions, like cystic fibrosis say in their family, should be guided in all their decisions by their dependence upon God. This will help them come to terms with the agonies and trauma of the ambivalence implicit within their moral decision-making. Where there are no 'correct' answers, there are answers that demonstrate faithfulness to one's relationship to God and one's position within a community of the Lord's people.

As science encroaches increasingly on realms that once lay outside human control, one has to ask whether the sphere of God's control is being eroded. In other words, do we wish to confine God's domain to areas of life where there is little, if any, human control? Indeed, is there an inverse relationship between divine and human control? Questions of this ilk are especially poignant in the genetic area since genetic modification appears to have creative overtones. If we argue that the mandate to act as good stewards of God's creation is a limited mandate, in that it excludes the genetic realm, it behoves us to establish what those God-ordained limits are.

In the face of these possibilities, the position I have arrived at is that, since I have contended that God is sovereign over the genetic realm, just as he is over all aspects of human life, genetic modification brought about by humans has the potential for extending the work of God. This has its dangers and its pitfalls, since appallingly injudicious choices can be made. However, if we refuse to go down this path we will end with the appalling paradox of confining God's activity to an ever-shrinking and ever-decreasing realm of ever-increasing irrelevance.