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Fabricated Humans? Human Genetics, Ethics and the Christian Wisdom Tradition(1)

By Celia Deane-Drummond

Abstract: This article highlights the key social issues associated with genetic screening and testing. It identifies an uneasy combination of a cultural drive towards perfection alongside heightened perception of a risk society. Awareness of risk is particularly in evidence in clinical genetics, but is surprisingly silent in public discourse about stem cell research, which has tended to flounder through its unilateral focus on the status of the early embryo. This article concentrates on current practice, such as the use of preimplantation genetic diagnosis, and offers a critical analysis of current debates about ethical issues. It argues that Christian ethics can contribute positively to the debate by drawing on the tradition of prudence or practical wisdom, which goes beyond the secular alternatives of both the consequential analysis of risk and benefit and the precautionary principle.

Key terms: Genetic screening, stem cells, PGD, risk society, ethics, wisdom, prudence, justice.

Questions about human identity-such as, who am I? Where do I come from? What does the future hold?-are questions most commonly asked by philosophers and theologians.

The difference in contemporary society is that such questions, in the popular mind at least, are now being tackled by biologists, in particular by those working in human genetics. Along with the biologists, theologians and ethicists need to re-ask these questions too.

When we speculate about manipulating our genomes so as to re-design ourselves or even to fabricate genetically new types of human beings, anxiety rises. We worry either that our generation might play the role of Frankenstein and create monsters or that all those with disabilities will be screened out, shunned as purportedly imperfect members of the human community. On the other hand have scientists over reacted to such worries by being over-optimistic about the potential latent in new genetic technologies? Instead, theologians who are trying to understand human nature need to ask: Do we respond realistically to what is possible or not possible scientifically? Or, do we respond to the anxiety rising in society

over the fear of Frankenstein? Further, do we take into account wider socio-political implications of genetic change?

Where we are most likely to be confronted with such identity questions is in the context of the family when children are about to come into the world. Early genetic diagnosis provides a time and opportunity for genetic selection and alteration. Our motives could be therapeutic—that is, to help our future child avoid disease. Or, our motives could include enhancement—that is, the guiding of gene expression so as to provide a biological advantage to our child. At this point, the theologian needs to become an ethicist. Is genetic enhancement ethical? Furthermore, use of embryonic stem cells and therapeutic cloning raise profound questions about the legitimacy or otherwise of using in an instrumental way early embryos that have the potential to become human persons.

In this article I recommend that theologians considering such biological matters call on the classical resources of wisdom and prudence. Such prudence includes three elements of ethical reasoning: taking counsel, judging, and acting. Although practical consequences are the outcome of such ethical reasoning, I am actually advocating a virtue ethic here, but it is one that is informed by theological reflection. Prudence is based on wisdom; and wisdom places us in touch with the Goodness of God. When no absolute map exists to tell us exactly what route to follow through these ethical difficulties, getting in touch with the personal Good through wisdom will be indispensable in serving the common Good when formulating public policy.

Who are We, Genetically Speaking?

This century has already seen the publication of the first draft of the sequence of

nucleotides that go to make up the sum total of human genetic material, the human genome. By June 2000 97% of the human genome had been mapped with 87% sequenced; and by 2005 it was virtually completed. Surprising, perhaps, was the discovery that humans have a little under 25,000 genes, far less than anticipated, approximately the same genes as the garden weed thale cress, and about twice that of the simple nematode worm! With this knowledge comes the possibility that the genetic causes of various diseases will be identified, along with identification of the propensity for disease. Such diseases are not just the more familiar ones such as Huntington's chorea, or cystic fibrosis, but also susceptibility to other diseases such as many cancers, Alzheimer's disease, coronary heart disease and so on. There are about 4,000 known genetic diseases inherited according to single traits. Some clinical geneticists believe that all diseases have a genetic component- that is a genetic propensity to resist or succumb to a particular disease. Notice that the language that is used here is the language of *medicine*, of disease and its possible diagnosis. One might think, at first sight, that there is really no ethical dilemma at all, for the search for the cure of disease has been at the heart of medical practice since early civilisation. What, we might ask, could be nobler than that?

However, alongside optimism about the possibility for cures of various diseases, there are those who are much more wary of possible developments. For example, in many cases there is an enormous gap between diagnosis of a particular disease and its prognosis or treatment. Down syndrome, for example, was one of the earliest genetic conditions to be recognised, and one of the earliest to be identified as having a genetic basis, arising from an extra chromosome number 21. This syndrome now has high priority in a UK government-screening programme. The government white paper on genetics, published in June 2003,

promised that all pregnant women living in the UK would be offered screening for Down syndrome. This is routinely done by identifying those who are 'at risk' through a blood test for AFP protein levels and then offering amniocentesis, followed by more specific genetic tests. Those who are offered amniocentesis are expected to accept termination as a way of 'treating' the disease. The foetus with Down syndrome, in other words, is labelled as unacceptable on account of its particular genetic condition; it is *screened out* of the population. In addition pregnant mothers are allowed legally to terminate a foetus with this condition right up to the day before the birth due date. We need to ask ourselves if this is so very different ethically from the collapse of the distinction between eugenics and euthanasia in the last century, where young babies who were identified as 'defective' were allowed to die, or in some cases, actively killed. By labelling certain conditions as unacceptable, are we narrowing the terms of what it means to be human in purely genetic terms? Or is this an acceptable act of compassion on those families who suffer under the burden of bringing up children with severe incurable problems?

The Social Context

One of the main differences between the eugenic practices of the twentieth century and the current drive towards genetic screening and testing is that the social context is very different. There is deep suspicion of government led programmes for genetic cleansing or enhancement, the focus is far more on the rights of the individual parents to decide and thereby have autonomy. In addition, the social context of the twentieth century was optimistic about the possibility of changing the genetics of the human population for the good. Geneticists, in the light of knowledge about the way genetic diseases are carried in populations, are now much more sanguine than they once were about the extent to which genetic science will, in fact, lead to significant changes in human evolution. The

myth, nonetheless, remains intact, that those who opt for screening practices are improving their future and the future of their children. In addition, the language of genetics is a language that relies heavily on the language of risk. Such language puts pressure on those who make decisions to decide in such a way so as to *avoid the risk*, often without any real understanding of what that risk actually means in practice.

Risk Discourse in Relation to Stem Cells

Genetic technologies are becoming more and more inventive of new ways to support or supplement current medical practice. Once we focus on genetics in medicine, then, the possibility opens up for novel forms of therapy. One issue that has received particular public attention is the use of embryonic stem cells, derived from 'spare' IVF embryos, or created by nuclear transplant (cloning) technology. Media discourse around ethical issues associated with the use of embryonic stem cells has focused on a polarised debate on the status of the embryo, once again pitting conservative religious views about the personhood status of the early embryo against those of scientists who are concerned to promote what they perceive as the medical benefits.

It is clear that since 2000 the general shift towards approval has been fostered by 'personal interest' media stories, telling accounts of particular cases of appalling suffering that could, allegedly, be cured by stem cell treatment.⁽²⁾ By contrast with the ready acknowledgement of risk in specific cases of genetic engineering of humans, the public discourse about using embryonic stem cells derived through cloning technologies has largely failed to include any discussion of risk, apart from the risk of cell rejection by not using cloning technology. In other words, the risk of lack of therapeutic success of such technology has been barely mentioned. Overall, there is what Jenny Kitzinger

has described an 'imperative of hope' in the discussion around stem cells, which is not based on real results, since these are at present unknown.(3)

This is broadly similar to the early rhetoric associated with genetic engineering in the wake of the discoveries of James Watson and Francis Crick, and also at the initial stages of the human genome project. Robert Song has suggested that the positive statements about the possibilities inherent in human genetics amounts to a secular soteriology.(4) Such a lack of attention to the real possibility of failure would not be the case where scientists were asked to speak candidly about their research in a more academic context, where risks are more genuinely acknowledged. Instead, when scientists are asked to discuss the scientific issues in the public domain, the risks factors are played down, and perhaps surprisingly, are also not picked up by the opponents of the research.

There was one isolated report in *The Economist* which did mention possible pitfalls of the new stem cell technology, for mouse cells have until very recently been routinely used as 'feeder' cells in maintaining human stem cells lines, and hence may run the risk of transfer of animal viruses.(5) The report was also aware of the political restrictions in the USA that amounts to federal funding for the use of established embryonic stem cell lines only, rather than the creation of new ones. All these approved lines were grown using mouse feeder cells. Nonetheless, this is an isolated example in an otherwise strong rhetoric of hope.

Preimplantation Genetic Diagnosis in a Risk Society

I am assuming, for the purposes of this discussion, that pre-implantation genetic diagnosis is morally considerable. Those who take a very 'high' view of the embryo

from the moment of conception would not support either IVF or PGD which relies on a similar method. For the present purposes I am adopting a more gradualist position, that is to say that while all human life has value, the foetus at the more advanced stages of development is worthy of a greater degree of protection compared with the early embryo. One can distinguish between the value of the early embryo, and the dignity associated with personhood.(6) Hence, PGD is worthy of moral consideration and not ruled out of court. Pre-implantation genetic diagnosis uses IVF procedures, and then removes a cell at the eight-cell stage in order to test for genetic disease. PGD is offered to those who have a very 'high risk' of giving birth to a baby with a genetic disease. It is important to point out that the language of clinical genetics is always the language of probability, rather than certainty. It is a way of trying to manage and control the concept of 'high risk' or 'low risk' by evaluating the future in terms of likely outcomes.

Ulrich Beck has argued, more generally, that we now live in an unpredictable and even hazardous 'risk society', one that has replaced the overall paradigm of scientific progress and confidence about the future.(7) Gene technology, in this scenario, does not so much reduce risk as heightens its possibilities for disaster, so that:

Gene technology pits humankind into an almost godlike position, in which it is able to create new materials and living creatures and revolutionise the biological and cultural foundations of the family. This generalisation of the principle of design and constructability, which now encompasses even the subject whom it was once supposed to serve, exponentiates the risks and politicises the places, conditions, and means of their origin and interpretation.(8)

In other words, the possibility of re-designing humans through genetic technologies, actually increases, rather than reduces the overall sense of anxiety about the future. We have images here, not just of fabricated humans, but humans as Frankenstein (or even

Hybrids), technology overreaching itself so that it is beyond human control. Beck is particularly critical of the 'creeping' nature of techno-economic sub-politics which has informed medical practice, but which has, remarkably, escaped public discussion, only becoming aware of itself after the event. He therefore goes on to suggest that medical, including genetic, progress becomes institutionalised, further it is 'the institutionalised revolution of the lay public's social living conditions without its consent.'⁽⁹⁾ It amounts to a "noiseless social and cultural revolution." Yet because it is not yet in the official political sphere, decisions are imposed in a way that normally would be totally unacceptable in a democratic society. One could even view the British government white paper on genetics (2003) as following in the *wake* of medical change, rather than serving to shape its development.

Beck has sounded some alarm bells that may only be resolved in public rejection of the medical technologies that the British Government white paper of June 2003 seeks to endorse. He argues that:

the practice of having public political discussions only after research and investment decisions have been made needs to be broken up. The demand is that the consequences and organisational freedom of action of microelectronics or genetic technology belong in parliament before the fundamental decisions on their application have been taken. The consequences of such a development can easily be forecast: bureaucratic obstacles to plant automatic and scientific research. This is, however, only one variant of this model of the future.⁽¹⁰⁾

Alternatives include intermediate forms of social control, which avoid the centralisation of government, but still create compulsory jurisdiction. The Human Embryology and Fertilisation Authority (HFEA) falls into this category, mediating between research scientists, government policy and law, and public interests. It may be able, then, to perform a critical role in helping to avoid the kind of tendencies towards loss of human

integrity in a way that escapes democratic procedure implicit in Beck's critique. One of the problems, of course, is that the HFEA does not have the political power to create compulsory jurisdiction. This then leads to high profile cases that are taken through the courts that fail to serve public interest. Clearly, the limited regulation that is possible through this authority is better than no regulation at all, which is the case in the USA.

The HFEA has licensed the use of PGD for fragile X, muscular dystrophy and Huntington's chorea. It has also allowed concurrent HLA tissue typing of an embryo by the Hashmi family so that it can be a donor of cord blood stem cells in order to help a sibling who is affected by *beta thalassaemia major*, an inherited genetic disease. The case raised ethical issues about whether the embryo was being 'used' in an instrumental way in order to help the sibling. Media presentations of the case used salvific language, a 'saviour sibling'. In a subsequent case, the Whitakers, where there was no genetic testing of the embryo, but simply a request for tissue typing in order to help a sibling affected by black fan anaemia, HFEA refused permission.⁽¹¹⁾ The Whitakers have subsequently had a child through IVF in Chicago, gaining the tissue match and treatment for the affected child.⁽¹²⁾

At the time, as far as the HFEA was concerned, it was ethically permissible to rule out certain characteristics, and so warranting PGD, but not to rule in positive characteristics that will be used to help another child recover, unless already permitted in order to avoid a disease. The argument in this case turned on debates about the welfare of the child. In the case of black fan anaemia, the sibling would be instrumentally created and undergo invasive treatment (ie IVF and biopsy of the embryo for a fertile couple), in order to help another in a procedure that may or may not be successful in treatment. In addition, of

course, there would be considerable 'wastage' of those embryos that were not a tissue match.⁽¹³⁾ The subtle logic of this position was not immediately obvious to media commentaries on the case, which focused on the medical benefits to the affected child, suffering from a life-threatening disease.

There are, nonetheless, a number of reasons why it is possible to argue for HLA typing through PGD in order to help a sibling suffering from a life threatening disease. In the first place, how far the child is really wanted or simply created to serve the sibling's interests is not possible to know with any certainty, in all probability the child would be loved and wanted as much as any other child. The psychological effects on any child born in this way would clearly need to be carefully monitored. However, if a child born subsequently who was not the correct match had to endure watching a sibling slowly die it is equally likely that this would have a damaging psychological effect. Of course, this assumes that the technology will be successful, and the possibility of failure would need to be taken into account. It is also important to bear in mind that approval needs to be conditional on all other avenues having been explored in terms of treatment. The risk to the child born incurred by IVF and biopsy used in PGD technology also needs to be taken into account, since this risk is added to the otherwise healthy embryo when PGD is used simply for HLA typing.

So far this does not seem to be a problem, but if subsequent results suggested an increase in, for example, disease incidence, causally linked to the biopsy process used in PGD, then the technique would need to come under review again. There are also logical inconsistencies, for example, a quarter of all embryos created by IVF would have the correct HLA tissue match, but when this is added to screening for disease the likelihood

of combining both disease free and correct tissue match is very much smaller again, depending on the genetic history of the parents. In other words, it would take far more cycles in order to find an embryo that met both requirements, leading to a quantitative increase in destruction of otherwise healthy embryos when HLA typing is combined with genetic screening. Of course, if early embryos have no moral worth then this is not an issue, but it does become so if some measure of value is afforded to the early embryo.

The original more conservative stance of the HFEA is also incompatible with its current liberal stance towards human cloning for 'therapeutic' purposes, where cloned embryos are instrumentally *used* for medical treatment of others, though of course in this case a child is not born, and the cloning process would be used simply to generate a given limited tissue type.⁽¹⁴⁾ This may be one reason why there has been a shift in HFEA policy towards the use of HLA typing for affected siblings to a more liberal position, so that PGD can now be used without the absolute requirement to screen for genetic disease as well. One of the factors considered by the commissioners was the relative cost of having a child with a disorder, compared with the cost of PGD technology. Hence, an economic argument was brought to bear, in a way that was not the case for straightforward IVF treatment for fertility.

One of the main reasons why the Hashmi case caused so much controversy, going as it did from High Court Ruling against legality of the HFEA ruling, to the Appeal Court Judgment in favour of the ruling, was the issue of adequate public consultation. The ethics and law committee recommended permission in both cases; HFEA licensing committee permitted just the Hashmis to have a licence, though even giving this permission was highly controversial. Given the public consultation and ethical debate that has taken place since these cases arose, it is hardly surprising that permission has now been given to a family

with very similar circumstances to the Whitakers, to go ahead with tissue typing in order to help an affected sibling. The public perception of this change is that its original decision was 'political', rather than ethical; however, it is actually more consistent with its existing practice.

Fabricated Then Fabulous Humans?

PGD seems to fit somewhat uneasily and even precariously between individual familial genetics and an overall genetic screening and testing project with its public health goals and aims. Those who demand access to this 'treatment' include couples already seeking fertility treatment through IVF, those with a known risk of a genetic disease and those who want a specific child, such as specific gender, and now more recently, those who want to help a sibling affected by a debilitating lethal disease. At present current UK regulation rules out the use of PGD for gender selection, unless used for a sex linked genetic disorder. There is little regulation of other newer sperm sorting techniques designed to improve the chances of having a male or female baby.

Deborah Steinberg suggests that the language of PGD is one that focuses specifically on the technical process and the embryo, not taking sufficient account of the role of women. The success rate for PGD is less than IVF, hence subjecting women to many more difficult treatments. She suggests that taking women out of the process echoes a more deeply encultured anxiety about women's sexuality and reproduction, the site of pollution and danger in ancient religious ritual.⁽¹⁵⁾ I suggest that the removal of women from PGD talk is not deliberate in the way she suggests, but a necessary outcome of the technologisation of human biology in general. It would be an exaggeration to call this technologisation 'dehumanising' or even 'post-human', involving the loss of human integrity, but the social

trends need to be noted carefully. Yet she is correct, it seems to me, to suggest that one of the latent anxieties among those with religious sentiments is that such procedures interfere with processes that have traditionally been under divine providence. It therefore touches the deepest aspects of human experience. Of course the selection of tissue type can hardly be viewed correctly as eliminating chance, but the concept that taking away even an aspect of chance implies, to some theologians at least, that this is tantamount to challenging that person's human freedom and identity.(16) Hence while those who object to the technology may be drawing on deeply held religious views about the place of reproduction in human society, it is unlikely that those who perform the acts are acting out of a sense of trying to control or even suppress women's sexuality in the way Steinberg implies.

At the moment PGD is restricted to 'serious' genetic conditions present in family members. The licensing of those conditions approved by HFEA for PGD is likely to increase as more disease genes are discovered in the absence of possible cures. There will also be a similar licensing of those conditions that are allowable for indirect treatment by using cord blood or bone marrow for an affected sibling. But in this context we need to ask two separate questions. The first is what is serious or not serious? Søren Holm warns against what he calls 'severity creep', that more and more conditions will be labelled as serious over time.(17) Some American deaf couples have sought to use PGD to select positively for deaf children, so that they could be part of the deaf community. Are they allowed to bring only the 'best possible' child into the world, judged by medical science?

The possibility that PGD could be used for *genetic enhancement* is ever on the horizon. We now have the spectre not just of *fabricated humans*, but *fabulous humans*. PGD followed in the wake of IVF, germ line therapy is die next logical step. There are prominent ethicists,

John Harris among them, who argue strongly that if it is possible to manipulate our hereditary material 'safely' then why not do it? He sees no ethical objection to not allowing such a development to take place.(18)

John Harris writes as a secular philosopher in support of genetic enhancement. There are other voices from a Christian point of view that are equally supportive of the possibility of genetic improvement through germ line therapy. Peter Vardy, for example, in his book, *Being Human*, suggests that 'it would seem entirely logical for human beings to continue to use their reason to help their species evolve.'(19) He is also remarkably cavalier about the fact that there are bound to be unfortunate accidents, but this has to be tolerated for the sake of the eventual (presumed good) outcomes. There is, however, an important ethical difference between taking medical risks in order to help those affected by disease, and taking risks with future generations. Vardy fails to distinguish adequately between these two possibilities.

In the wake of the report in February 2004 that Korean scientists had managed to derive embryonic blastocysts via cell nuclear transfer, Ian Wilmut has gone further than most in his suggestion that there are moral grounds *for* using embryonic stem cells because of the likely benefits, so that 'it would be immoral not to do it.'(20) He also argued that cloning technology could be developed to treat genetically inherited disease, though of course this would inevitably mean reproductive cloning. The clone in this case would be of an IVF embryo that had not been permitted to develop, the cells from the embryo would be genetically modified and then used as the nucleus in another enucleated egg deriving from the mother. Given the difficulties associated with cloning Dolly to a mature adult, such an apparent endorsement of germ line therapy via cloning technology seems to me to be entirely unwarranted. There are, of course, ethical issues associated with the 'use' of a cloned embryo as genetic material for

another human being, though scientists were cavalier about this possibility, as the embryo itself would not be viable because it is affected by genetic disease.

Beyond the Precautionary Principle

Francois Ewald(21) suggests 'precaution appears when scientific expertise comes up against its own limitations and forces the politician to make sovereign decisions, alone and without recourse to others.'(22) Once precaution is taken into account, the possibility of irreversible accidents in exerting human power over nature. Human genetic technologies also create new kinds of dependencies, rather than equalities, new forms of power over others. The precautionary principle would allow for the fact that these inequalities exist and try and confront them.

The idea that there is justice exercised in genetic services is a myth, even allowing for the fact that it may be available to all, justice is not simply about availability of genetic services but the much broader question of whether it will ensure the greatest good for the greatest number, that is social justice. The current widening access to IVF and PGD through the NHS, along with expansion of genetic services in general, suggests that the public health lobby to promote genetic services has won. How far this represents a form of social injustice by siphoning off scarce resources used for other medical conditions is open to discussion. If not, one might envisage a driving motivation for the new technologies as an economic goal, rather than an altruistic one, hence raising the spectre of eugenics, a deliberate screening out of the unfit. In addition, the precautionary principle is not simply a matter of spreading risks throughout the population, but of preventing harm in the first place.

The Art of Practical Wisdom/ Prudence

I suggest that the precautionary principle is a secularised version of the tradition of practical wisdom or prudence.⁽²³⁾ Given that this is the case, then developing a prudential understanding along more Christian lines would seem to offer a mediating approach towards secular ethics. The precautionary principle allows for self-criticism of policy and practice in a way that fails dismally when a case study approach is used, for attendance to individual cases necessarily narrows the attention of the observer to particular details and specifics of particular problems and dilemmas. I am not suggesting that we should never consider problematic cases, but setting policy simply through case analysis simply will not do; we end up with a rag bag approach that fails to take into account wider concerns of society and the need to work for the common good.

Practical wisdom is particularly significant for ethics, since it sets the way individual virtues must be expressed in particular circumstances. Developing prudence is not just about one's inner attitude, though it includes this; but it is also about how this attitude is expressed in action. The three elements of reasoning integral to prudential decisions are taking counsel or deliberating, judging, and acting. If the goal is faulty, this leads to what Aquinas describes as "sham prudence." Indeed, for the biblical writers discernment and wisdom are intimately linked with the fear of the Lord (Proverbs 1.7, 2.5, 9.10 etc.). Hence, forms of discernment that act against the needs of the community amount to folly. Perhaps more accurately we could say that the goal is a *partial* good, for it benefits relatively few people. Hence, a virtue ethic orientated around wisdom includes the idea of consequences, but it is in relationship to orientation towards the Good. Aquinas also used the term "incomplete prudence" to indicate that the good is narrowed to particular individuals.

Prudence, when viewed in a Christian way, becomes the means of deciding what it is to express a particular virtue, be it charity, justice, temperance or fortitude. It is one of the reasons why it is the first of the four cardinal virtues.

Prudence, then, expands the notion of the precautionary principle by allowing precaution to be just one of the virtues associated with it. The others are memory of the past, insight into the present, shrewdness about the future, reason, understanding, and openness to being taught.⁽²⁴⁾ Memory of the past would, of course, include a deep awareness of the way the 'unfit' have been abused through genetic means in our recent history. Those given responsibility for regulation of such processes also need to have insight about the present, that is a clear sense not just of the genetic 'discoveries' being made in the name of science, but also its social and cultural consequences. Shrewdness about the future is rather different from simply acting out of precaution, for it implies an ability to act which precaution does not; it implies realism about human motivations and tendencies to sin, as well as achieve goals. Reason and understanding go together; they express the ability to synthesis information as well as simply acquire knowledge. Openness to being taught would also include openness to learning from those with genetic disorders, as well as openness to acquiring knowledge through latest research journals and projects. A Christian would argue that those with learning disabilities have much to teach those who do not, hence to render them as worthless members of a community, or worse, as not deserving to exist, needs to be challenged and confronted. Such attitudes and prejudices are hard to break; even the smallest degree of self-examination will show degrees of prejudice towards those who are different from us. However, prudential living requires us to take responsibility for such inner transformation of self, so that we learn to move beyond the barriers that have ensnared our lives through the absorption of unchallenged cultural prejudices.

Wisdom Among the Virtues

How does prudence connect with the other virtues? Aquinas describes the seven gifts of the Holy Spirit as wisdom, understanding, counsel, fortitude, knowledge, piety and fear of the Lord.(25) In as much as it can be learned, it can be shared by all those of good will, whether Christian or not. In this sense it is aligned with the idea of natural law. Yet divine Wisdom also finds expression in the eternal or divine law, which for Christians is expressed in Christian discipleship (Eph 1. 8-10). Hence a measure of whether an action is wise or not is in relationship to this divine law, a point made repeatedly by Aquinas in his *Summa Theologiae*, especially in the third part.(26)

For Aquinas wisdom is one of the three intellectual virtues of speculative reason, the others being *understanding*, or grasping first principles, and *scientia*, which denotes the comprehension of the causes of things and the relationship between them. In other words wisdom is the understanding of the fundamental causes of everything and their relationship to everything else. Human wisdom is a virtue directed towards the Wisdom of God, for while wisdom can be learned it cannot be grasped or used for human aggrandisement. In the fullest sense human wisdom is only possible through the gift of the Holy Spirit by the grace of God. The Christian vocation includes developing the virtue of wisdom.

Practical Implications

Current debates in this context, for example, hinge on how far and to what extent we believe that individual liberty and autonomy of the parents to make reproductive decisions can outweigh other concerns. We need to be sanguine about the practical reality of assisted reproduction techniques, for the most part being highly stressful methods that are unlikely to take over or become the norm. There also needs to be much more critical appreciation

of the social pressures on women in terms of their 'choices' in the context of a risk society. In addition, any public image of new armies of designed (hybrid) children through this method is quite simply wild speculation. Parents and all those on boards facing difficult choices about whether or not to allow a procedure to go ahead need that ancient virtue of practical wisdom and quality of insight. Added to this we need the virtue of compassion, including that towards those with disabilities. Compassion would include a sense of the tragic in any interventionist method, including those cases where early embryos are 'wasted.' Parents need to know the positive life that those who have disabilities can lead, rather than just present them with a bald choice that stresses the statistical probability of having an affected baby. The economics of caring for those with disabilities might suggest a crude economic prudence in favour of reproductive interventionist technologies. However, such a shallow form of prudence is not what Aquinas had in mind. Rather, prudence as he saw it was aligned with the common good.

Fostering Justice as Virtue

Prudence is closely allied to justice, which would include the principle of equal dignity and rights of all human beings. Justice is also a virtue worth mentioning in this context, not just justice in relation to access to resources, but just distribution of scarce medical goods along with justice towards those who are, for whatever reason, marginalized by reason of a particular genetic condition. Somewhat bizarrely Peter Vardy suggests that given that there is deep social inequality between those from different parts of the world that we can do little about, so there is no reason to rule out buying genetic advantage, on the basis that the 'theory of equality does not work in practice.'⁽²⁷⁾ To give up on issues of justice for pragmatic reasons seems to me to be wholly unacceptable.

Conclusions

In a risk society it is easy simply to follow the path of least resistance and accept what seems to be the least risky course of action to take. But this is making a judgment on a narrow interpretation of risk and benefit seen in a pseudo scientific context, detached from wider social issues. Prudence, instead, encourages a sense of stillness, a silent contemplation that facilitates decision-making, one that is open to the moment of insight, rather than an impulsive reaction to perceived threat. The precautionary principle does not actually tell us what to do; it is an element of prudence, so it leaves us without any basis for activity as such. From a Christian perspective the notion of prudence needs to include both fortitude, which is a sense of willingness to suffer for the sake of the good, and charity, the ability to love beyond what we might be able to do through our natural instincts towards friends and family, and temperance, the ability to say no when our needs, rather than our wants have been met. Prudential decision making is not simply individual, but reaches out to family and political spheres as well. It is therefore capable of forming and informing institutional ethics, an area of vital significance for regulatory bodies such as the HFEA. I will leave the final word to Thomas Aquinas, who was only too aware of the need to think on a number of different levels: 'Now the personal good, which is the interest of ordinary prudence, is subordinate to the common good, which is die interest of political prudence.'(28)

Endnotes

1. This article was originally presented at the Ian Ramsey conference entitled 'A Post Human Future' held at St Anne's College, Oxford, and delivered on July 21st, 2004. Aspects of this paper were also presented to the Science and Religion Forum annual conference in September 2003, and a postgraduate theology seminar on media discourse about stem cells at Manchester University on June 18th, 2004. I am grateful to the participants at all these meetings for stimulating questions and discussion.
2. Note that adult cloning raises fewer ethical issues, but the focus has been on the use of embryonic stem cells derived from cloning, where the possibility of effectiveness in treatment is purported to be higher. For discussion see Anne McClaren, ed. *Cloning: Ethical Eye* (Geneva: Council of Europe, 2002).
3. Jenny Kitzinger and Clare Williams, 'Envisioning the Future: Legitimizing

Hope and Calming Fears in the Embryo Cell Debate', *Social Science and Medicine*, 2004, in press.

4. Robert Song, 'The Human Genome Project as a Soteriological Project' *Brave New World? Theology, Ethics and the Human Genome*, ed. Celia Deane-Drummond (London: Continuum/T & T Clark, 2003), 164-84.
5. Editorial, 'Baby Steps', *The Economist*, Vol. 370, Issue 8356 (December 30th, 2003).
6. This is discussed in a helpful way by Thomas Shannon in T.Shannon, 'Grounding Human Dignity', *Dialog*, Vol. 43 (2) (June 2004), 113-117.
7. U. Beck, *Risk Society; Towards a New Modernity* (London: Sage, 1992) 51-2.
8. Beck, *Risk Society*, 200.
9. Beck, *Risk Society*, 206.
10. Beck, *Risk Society*, 229.
11. Black fan anaemia is a genetic disease, but in this case it had arisen spontaneously, so screening for absence of disease was not necessary. I am also grateful to my doctoral student, Stephen Bellamy, for helpful discussion on these cases,
12. It is too early to tell if the treatment using stem cells from umbilical cord blood has been permanently successful, but current indications are that it has led to successful treatment of the disease. Another possible use would be bone marrow transplant, but the use of whole organs for the t ruled out in the UK.
13. One in four embryos would be expected to be a good tissue match for the sibling.
14. For a discussion on the ethics of human cloning and stem cell research see Celia Deane-Drummond, *The Ethics of Nature*, (Oxford: Blackwells, 2004), 124-9.
15. She draws on Mary Douglas's work, *Purity and Danger*, for this assessment. Deborah Steinberg, *Bodies in Glass: Genetics, Eugenics, Embryo Ethics*, (Manchester: Manchester University Press, 1997) 106.
16. For discussion of this see Maureen Junker Kenny, 'Embryos in Vitro, Personhood and Rights', *Designing Life? Genetics, Procreation and Ethics*, ed. Maureen Junker-Kenny (Basingstoke: Ashgate, 1999) 130-158.
17. Søren. Holm, 'Ethical Issues in Preimplantation Genetic Diagnosis', *The Future of Human Reproduction: Ethics, Choice and Regulation* eds. J. Harris and S. Holm (Oxford: Clarendon Press, 1998), 185; for full article 176-90.
18. J. Harris, 'Rights and Reproductive Choices', *The Future of Human Reproduction*, eds Harris and Holm, 1-37, esp. pp. 31-3.
19. Peter Vardy, *Being Human: Fulfilling our Genetic and Spiritual Potential* (London, DLT, 2003), 71.
20. I. Wilmut, 'The Moral Imperative for Human Cloning', *New Scientist*, Vol.181. Issue 2435 (21st February 2004), 16.
21. F. Ewald, 'The Return of Descartes' Malicious Demon: An Outline of a Philosophy of Precaution' *Embracing Risk: The Changing Culture of Insurance and Responsibility*, eds. T. Baker and J.Simon (Chicago and London: University of Chicago Press, 2002) 292, full article 273-301.
22. Ewald, 'The Return of Descartes' Malicious Demon', 295.
23. See, Deane-Drummond, *The Ethics of Nature*.
24. See C. Deane-Drummond, *Creation Through Wisdom: Theology and the New Biology* (Edinburgh: T & T Clark/Continuum, 2000), 100.
25. The traditional formulation takes its bearings from the virtues possessed by the coming Messiah, as described by Isaiah 11.1-2, and taken up in the earliest Christian traditions as corresponding to the gifts of the Spirit. Romanus Cessario, *Introduction to Moral Theology*, (Washington: The Catholic University of America Press, 2001), 205-12.
26. For discussion see Cessario, *Introduction*, 215-6. In the light of this it might seem

surprising that some moral philosophers have tended to abstract the idea of natural law from Aquinas, and ignored its link with covenant relationships. For discussion see Celia Deane-Drummond, 'Aquinas, Wisdom Ethics and the New Genetics', *Re-Ordering Nature: Theology, Society and the New Genetics*, eds. Celia Deane-Drummond and Bronislaw Szerszynski, (London: Continuum/T & T Clark, 2003), 293-311.

27. Vardy, *Being Human*, 66.

28. Thomas Aquinas, *Summa Theologiae, Volume 36, Prudence*, trans. T. Gilby, (London: Blackfriars, 1973) 2a2ae, Qu. 47.11.

