

## Theologically Modified Genetics: Further Theological Reflections on the Practice of the New Genetics

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**Abstract:** A recent suggestion that public responses to developments in agricultural biotechnology raise deeper *theological* questions indicates a need and an opportunity for Christians to articulate a theological vision that might constructively shape the nature and priorities of research in modern genetics. In this article I draw on a cultural-hermeneutical understanding of the practice of science and a Christologically grounded conception of imaging God in the created order to outline ways in which the practice of genetics could be revisioned within Christian communities: at the levels of mythos, world view, social practice and cultural reflection.

IN A PAPER COMMENTING ON POPULAR RESPONSES to controversies over agricultural biotechnology in Britain in the 1990s, Celia Deane-Drummond, Robin Grove-White and Bronislaw Szerszynski observe that the concerns of “ordinary people” expressed in focus group discussions go beyond anxieties about the environmental and health risks that new technologies may pose.<sup>1</sup> Their deeper concerns are ontological – indeed theological – in nature. They are about what it means to be human in a world being reshaped by biotechnology. In the light of this, they call on Christians to foster a more reflective theological engagement in the biotechnology debate, neither embracing the new

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1. Celia Deane-Drummond, Robin Grove-White and Bronislaw Szerszynski, “Genetically Modified Theology: The Religious Dimensions of Public Concerns about Agricultural Biotechnology”, *Studies in Christian Ethics* 12, 2 (2001) 23-41. See also Celia Deane-Drummond, Bronislaw Szerszynski (with Robin Grove-White) (eds.), *Re-ordering Nature: Theology, Society, and the New Genetics* (London: T & T Clark, 2003).

technologies uncritically nor rejecting them in principle but addressing those deeper theological questions.<sup>2</sup>

The “ontological anxiety” expressed by lay people has very likely been prompted by the remarkable developments in genetics research in recent years and the promise of far-reaching biomedical and biotechnological applications, particularly in such areas as reproduction, cancer diagnosis and treatment, and in improved food production. There is a sense that we are on the threshold of major changes in the very conditions of “life itself”.<sup>3</sup> Perhaps the most widely shared feeling is one of ambivalence. On the one hand, people feel excited and fascinated about the enormous potential that modern genetics has for improving the human condition and overcoming human disease and suffering; on the other hand, they fear the potential for destructive and irreversible changes to the basic ecology of life.<sup>4</sup>

Whilst people *are* concerned about the deleterious social, political and environmental impacts of genetic technologies (for example, whether the creation of “gene banks” will compromise personal privacy, or whether the commercial use of genetically modified crops will lead to the development of superweeds), the more profound questions are about what such developments will mean for human personhood, the shape of human society, and our relationship to the non-human world.

Many people believe that developments in genetics have the potential to transform not only the practices of the life sciences, medicine<sup>5</sup> and agriculture, but the way we think about the world. John Opitz believes we are confronted with the “geneticization” of western civilization.<sup>6</sup> Similarly, Barbara Katz Rothman comments:

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2. An extensive and growing literature addresses the theological challenges of biotechnology. Much of this has been directed at questions concerning human genetics. In relation to agricultural and plant biotechnology, see Michael Banner, “On Not Begging the Questions about Biotechnology” in *Christian Ethics and Contemporary Moral Problems* (Cambridge: Cambridge University Press, 1999) esp. 224; and Donald Bruce and Don Horricks (eds.), *Modifying Creation? GM Crops and Foods: A Christian Perspective* (London: Paternoster Press, 2001).

3. Sarah Franklin, “Life Itself – Global Nature and the Genetic Imaginary”, in Sarah Franklin, Celia Lury and Jackie Stacey (eds.), *Global Nature, Global Culture* (London: Sage, 2000) 188-227.

4. For a sample of general discussions of recent developments in genetics see: Jürgen Habermas, *The Future of Human Nature* (Cambridge, MA: Polity, 2003); Francis Fukuyama, *Our Posthuman Future: Consequences of the Biotechnology Revolution* (London: Profile Books, 2002); Bill McKibben, *Enough: Genetic Engineering and the End of Human Nature* (London: Bloomsbury, 2003); Gregory Stock, *Redesigning Humans: Choosing Our Children's Genes* (London: Profile Books, 2002).

5. John Bell, “The New Genetics in Medical Practice”, *British Medical Journal* 316 (1998) 618-20.

6. John Opitz, “Afterword: The Geneticization of Western Civilization: Blessing or Bane?” in Phillip Sloan (ed.), *Controlling Our Destinies: Historical, Philosophical, Ethical and*

Genetics isn't just a science. It's becoming more than that. It's a way of thinking, an ideology. We're coming to see life through a "prism of heritability", a "discourse of gene action", a genetics frame. Genetics is the single best explanation, the most comprehensive theory since God. Whatever the question is, genetics is the answer. Every possible issue of our time – race and racism, addictions, war, cancer, sexuality – all of it has been placed in the genetics frame.<sup>7</sup>

In the light of such comments, to name lay anxieties as "theological" may seem to state the obvious. However, in the more specific context of the professional practice of genetics and the associated activities of ethical evaluation and public communication, this is a provocative claim. In the now extensive literature on public attitudes to genetics and biotechnology, even amongst those who recognise the deeper cultural anxieties being expressed, the dominant discourse continues to be largely secular and instrumental in nature. A cursory survey of the main journals in this area – such as *Science, Technology and Human Values*, *Public Understanding of Science*, *Perspectives in Biology and Medicine*, *Science and Public Policy*, *New Genetics and Society*, *New Scientist*, and *Science as Culture* – reveals an almost complete absence of any significant theological voices in debates about the social meanings of the new genetics.

I want to focus on what I believe are two key reasons for this marginalising of theological discussion. First, a neo-positivist epistemology of science, which assumes a firm separation between the objectivity and formal rationality of scientific investigation, and the contextual questions of values and meanings, continues to be influential. Moreover, this instrumental rationality extends to the ethical governance of science. As John Evans has demonstrated in relation to the regulatory role that bioethics plays within biomedical research and medical practice, the dominant rationality is formal and proceduralist, such that the larger questions of substantive meaning and purpose tend to be suppressed.<sup>8</sup>

Gerard McKenny identifies a second factor, namely that a great deal of theological discussion about genetics is either at a broad abstract level, dealing with the wider "downstream" implications of genetics

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*Theological Perspectives on the Human Genome Project* (Notre Dame ID: University of Notre Dame Press, 2000) 429-50.

7. Barbara Katz Rothman, *Genetic Maps and Human Imaginations* (New York and London: Norton, 1998) 13.

8. John Evans, *Playing God? Human Genetic Engineering and the Rationalization of Public Bioethical Debate* (Chicago: University of Chicago Press, 2002).

research and innovation, or at the micro level of particular techniques, such as IVF or stem cell technology.<sup>9</sup> McKenny argues that there is a need to address the intermediate level of the social and institutional practices of research, which includes the funding and social organisation of research, the role of corporate and governmental bodies, including the diverse committees that regulate and monitor research, and the forms of interaction with NGOs, the media and other bodies. It is at this rather “messy” intermediate level that most of us are engaged (in one way or another) with the practice of genetics, either as scientists, patients, consumers, ethicists or public servants. Here, we need more skilled and effective theological engagement and reflection.

In this paper I explore how these two key impediments to a more effective Christian engagement in debates about genetics can be overcome. With respect to the first, I draw on the cultural hermeneutical approach to the practice of science associated particularly with the work of Brian Wynne and his colleagues at the Centre for the Study of Environmental Change at the University of Lancaster.<sup>10</sup> With respect to the second, I draw on what Daniel Bell calls the “emerging tradition” of public theology, an approach to the public expression of Christian faith that foregrounds rather than downplays the particularity of the narrative of Jesus, and which emphasises the political character of the church as a community called to embody the alternative polity of the kingdom.<sup>11</sup> In the context of this theological perspective, I explore the contrast between the motifs of “playing God” and “imaging God” as a way in which Christian communities can critically evaluate and reframe the ethos and practice of genetics.

#### A HERMENEUTICAL UNDERSTANDING OF THE PRACTICE OF SCIENCE

Over the past thirty years the classical positivistic view of science has been discredited, at least in scholarly terms, by the impressive efforts of a vigorous “social studies of science” community.<sup>12</sup> Numerous studies have challenged the assumed fact/value and science/politics divisions and shown the ways in which underlying institutional interests, political values and worldview assumptions are embedded within the models

9. Gerard McKenny, “Technologies of Desire: Theology, Ethics and the Enhancement of Human Traits”, *Theology Today* 59.1 (April 2002) 90-103.

10. See Brian Wynne, “May the Sheep Safely Graze? A Reflexive View of the expert-lay knowledge divide” in S. Lash, B. Wynne and B. Szerszynski (eds.), *Risk, Environment and Modernity* (London: Sage, 1996) 44-81.

11. See Daniel Bell, “State and Civil Society” in Peter Scott and William T. Cavanaugh (eds.), *The Blackwell Companion to Political Theology* (Oxford: Blackwell, 2004) 423-38.

12. See Sheila Jasanoff et al (eds.), *Handbook of Science and Technology Studies* (Thousand Oaks CA: Sage Publications, 1995).

and procedures of science.<sup>13</sup> Despite this critique, the view that science itself is neutral with respect to its wider social contexts remains dominant. Nevertheless, there is recognition that the ethical implications of scientific research need to be addressed carefully.<sup>14</sup> But in a neo-positivist view of science, ethical discussion tends to focus narrowly on technological applications and the associated risks, emergent inequalities, infringements of rights and so on.<sup>15</sup>

Why has this neo-positivist self-understanding of science continued to be so influential? One reason is the remarkable continuing success of modernist science in penetrating the secrets of nature and harnessing the natural world for human benefit.<sup>16</sup> The everyday discourses of science itself also sustain the neo-positivist approach. The primary languages of science – empirical observation, careful measurement, the deployment of mathematical and objectivist explanatory models – all reinforce the self-understanding of science as being about “the facts”. Discussions of values are habitually experienced as extrinsic to central disciplinary concerns. Another key factor is the well established culture of science. Scientific research is a now a huge enterprise in the developed world and scientific modes of thought pervade our culture. They provide the taken for granted understandings of how the world works. Finally, the influence of neo-positivist understandings continues because of what are perceived to be the unacceptable relativistic implications of more radical constructivist approaches to science which question whether scientific modes of explanation are any “truer” than more traditional forms of knowledge. For many, science provides a superior way of testing and choosing between rival models of the world. Thus, in a choice between constructivism and realism, scientists will still confidently defend the latter.<sup>17</sup>

The “cultural-hermeneutical” approach taken by Wynne et al provides a way of overcoming the strait jacket of a neo-positivist

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13. Jan Golinski, *Making Natural Knowledge: Constructivism and the History of Science* (Cambridge; New York: Cambridge University Press, 1998).

14. See Brian Wynne, “Creating Public Alienation: Expert Cultures of Risk and Ethics on GMOs”, *Science as Culture* 10.4 (December 2001) 445-82; see Ted Peters’ distinction between the operation of the “myth” of genetic essentialism within public and media discussions of molecular biology and the more “rational” approaches of the molecular biologists themselves: “The Genetics-Theology Interface”, *Interface* 1/2 (October 1998) 93.

15. See Gerard McKenny, *To Relieve the Human Condition: Bioethics, Technology and the Body* (New York: State University of New York, 1997).

16. See Francois Jacob, *The Logic of Living Systems* (London: Faber, 1974); Edward Wilson, *On Human Nature* (Harvard: Harvard University Press, 1978); Edward Wilson, *Consilience: The Unity of Knowledge* (London: Abacus, 1998).

17. See the extensive literature on the so-called “science wars”. See Arthur Peacocke’s defence of “critical realism” in “Science and the Future of Theology: Critical Issues”, *Zygon* 35.1 (March 2000) 119-40.

ideology of science whilst at the same time avoiding the relativism of the radical constructivists. Instead of provocatively denying the (at least) provisional truthfulness of scientific accounts of reality, the “cultural-hermeneutical” approach highlights the complex and subtle ways in which background views of nature and society shape the “internal” developments of the science itself.<sup>18</sup> This influence is not an impediment to understanding and deciphering the real, but a necessary underpinning.<sup>19</sup>

This approach has a number of implications for the way we understand the practice of science. First, we can see that the cognitive and social boundaries drawn between science and its social contexts do not reflect some objective epistemological principle (fact/value division) but are always a matter of negotiation. As a result of historical, cultural and institutional processes, people we have come to call “scientists” have been able to establish a distinct sphere of activity that nevertheless depends on a continuing relationship with its contexts.<sup>20</sup> Furthermore, such boundaries are “porous” and the nature of the “traffic” across them will depend on the attitudes and activities of both scientists and their interested publics.<sup>21</sup>

Second, “science” is necessarily practised within some horizon of meaning, mythos or cultural imaginary. Whilst there is little trace of such in the explicit specialist discourses of scientific disciplines, a

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18. Insightfully, Nicholas Smith explores the broader question of the relationship between the mode of scientific inquiry and questions of background meaning in his *Strong Hermeneutics: Contingency and Moral Identity* (London: Routledge, 1997). Smith argues that the remarkable success of enlightenment science has deepened unstable dualisms: between fact and value, science and culture. He distinguishes between three different hermeneutical responses. The first, *weak hermeneutics*, is developed by the strong constructivists and postmodern philosophers such as Rorty and Foucault. Here, the claims to truth by science are deconstructed as cultural and political projections onto nature. It is this radical constructivism which has provoked such controversy in recent years in the so-called “science wars”. The second, *deep hermeneutics*, is represented by Jürgen Habermas’ project of overcoming the distorted nature of modernity by complementing the technical rationality with a communicative rationality. The third, *strong hermeneutics*, is represented by Taylor, Ricoeur and Gadamer. For example, Taylor argues that in our engagement with the world we operate within inescapable moral frameworks which provide the fundamental moral sources for the strong discriminations we make. In this perspective, there is no denial of the truthfulness of scientific inquiry, but rather an acknowledgment that it necessarily arises out of the interpretive moral framework of a community’s social and cultural meanings.

19. See Alasdair MacIntyre’s comment that objectivity is a moral not a procedural value, “Objectivity in Morality and Objectivity in Science” in H. T. Engelhardt and D. C. Callahan (eds.), *Morals, Science and Society* (New York: Hastings Center, 1978) 21-39.

20. See Thomas Gieryn, “Boundaries of Science” in Sheila Jasanoff et al (eds.), *Handbook of Science and Technology Studies* (Thousand Oaks, CA: Sage Publications, 1995) 393-444.

21. See Simon Shockley and Brian Wynne, “Representing Uncertainty in Global Climate Change Science and Policy: Boundary Ordering Devices and Authority”, *Science, Technology and Human Values* 21.3 (Summer 1996) 275-302.

mythos of science underpins the conventions of scientific practice. This mythos is more explicit in the ideological and polemical statements of leading scientists<sup>22</sup> and also circulates through the representation of iconic figures of science such as Galileo, Newton, Darwin, Einstein, Hawking, Gould, Dawkins and Sagan. Such a background practical-metaphysical vision is taken for granted within the practice of science: in problem definition, theory development and ongoing empirical research.<sup>23</sup> This symbolic matrix also powerfully supports the claims of science on the public purse and draws people into the study of science. The core idea of this mythos is that scientific discovery is vital to the realisation of human freedom, either through increased understanding (the secular variant of “the truth shall set you free”) or through increased technological control.<sup>24</sup>

A corollary is that the practice of science is an integral element of the wider cultural project of modernity, more specifically, a liberal capitalist modernity. This culture sustains the enlightenment dream of human progress through the emancipated expression of the inherent intellectual, ethical and aesthetic structures of human consciousness.<sup>25</sup> The practices of science, especially in the various fields of genetics and cosmology, are thus central sites for cultural debate about modernity, a debate between those who remain confident about the progressive and liberatory meaning of science, and those who are increasingly anxious about its destructive, alienating and nihilistic consequences. This debate occurs particularly in controversies over genetic engineering and the new genomics.<sup>26</sup> On the one hand, these projects are welcomed as the mature fruit of the project of making humanity “masters and possessors of nature”. On the other hand, the perceived erosion of limits and boundaries between humans, nature and machines reinforces fears about the ultimately catastrophic consequences of the project.<sup>27</sup>

As Wynne and others have indicated, a major problem is that this ambivalence about the cultural meanings of science is largely marginalised and given unsophisticated expression in the concerns of

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22. See John Brockman, *The Third Culture* (New York: Simon & Schuster, 1995).

23. See Thomas Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1972).

24. Mary Midgley, *Science as Salvation: A Modern Myth and its Meaning* (London: Routledge, 1992).

25. See Lesslie Newbigin’s critique of science in *Foolishness to the Greeks: The Gospel and Western Culture* (Grand Rapids MI: Eerdmans, 1986).

26. See Lee Silver, *Remaking Eden: Cloning, Genetic Engineering and the Future of Mankind* (New York: Avon Books, 1998); Brian Appleyard, *Brave New Worlds: Genetics and Human Experience* (London: Harper Collins 1999); Fukuyama, *Our Posthuman Future*.

27. See Bill Joy, “Will the Future Need Us?” *Wired Magazine* (April 2000) 238-62

lay people who worry about scientists "playing God".<sup>28</sup> Ironically, this serious contextual debate about the cultural purposes of science takes place most fully in popular culture, as reflected in the continuing fascination with the story of Frankenstein and the discourses of popular science fiction film.<sup>29</sup> Meanwhile, the dominant approach to ethics, institutionalised in the specialities of bioethics and in bioethics committees, generally remains narrowly framed within the instrumentalist-positivist discourse of modernist science.<sup>30</sup>

A more hermeneutical approach to the practice of science when applied to genetics would bring into sharper focus the importance of contextual factors, including the broader political economy of neoliberalism and the mythology of late modernity. It would draw our attention to the progressive re-orientation of research priorities around the commercial interests of major transnational corporations.<sup>31</sup> Much of agricultural biotechnology research, for example, is now driven by the interests of major agribusiness corporations, such as Monsanto, Astra Zeneca, and is increasingly framed by the conflicts over the restructuring of world trade in terms of the World Trade Organization and TRIPS (trade-related aspects of intellectual property rights). A more hermeneutical approach would also make us aware of the "geneticising of society".<sup>32</sup> As noted earlier, "genetics" has become a master discourse for many of the life sciences, particularly with the advent of the human genome project and the flow of discoveries of the genetic component of various human traits. Such developments have reinforced cultural tendencies towards genetic essentialism and reductionism.<sup>33</sup>

A different kind of public discourse about science is needed, one which takes more seriously its contextual political and mythic significance.<sup>34</sup> Irwin and others have argued for a "civic epistemology" of science which enables expert scientists and lay "consumers" to come together in a common civic conversation, which recognises that both

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28. See Wynne, "Creating Public Alienation".

29. Jon Turney, *Frankenstein's Footsteps: Science, Genetics and Popular Culture* (New Haven: Yale University Press, 1998).

30. McKenny, *To Relieve the Human Condition*.

31. For critiques of biotechnology practice, see Mae-Wan Ho, *Genetic Engineering: Dream or Nightmare, A Scientist Challenges the Science* (Institute of Science in Society at <http://www.isis.org.uk/>, 2002); D. Goodman and M. Redclift, "Engineering Life: Agri-Biotechnologies and the Food System" in *Refashioning Nature: Food, Ecology and Culture* (London: Routledge, 1981) 167-97.

32. D. Nelkin and M. Susan Lindee, *The DNA Mystique: The Gene as a Cultural Icon* (San Francisco: Freeman, 1995).

33. Katz Rothman, *Genetic Maps and Human Imaginations*.

34. See Wynne's critique of "ethics" and risk in "Creating Public Alienation"; see also L. Levidov and S. Carr, "How Biotechnology Regulation sets a Risk/Ethics Boundary", *Agriculture and Human Values* 14 (1997) 29-43.

experts and consumers are more fundamentally citizens together with a shared responsibility to work for the common good.<sup>35</sup> Many Christians are involved in various practices being significantly re-shaped by genetics. We need to ask: how can a theologically grounded vision of life, of the nature and meaning of human existence, and of our relationship to the non-human world be communicated more clearly within these practice contexts?

#### PLAYING GOD OR IMAGING GOD? TOWARDS A THEOLOGICAL REFRAMING OF THE PRACTICE OF GENETICS

One fruitful way of reframing the practice of genetics theologically is to consider more closely the connections and contrasts between the motifs of “playing God” and “imaging God”. The term “playing God” has been widely used in relation to genetics research and its applications.<sup>36</sup> As Brian Wynne comments, this term is generally viewed as something of a cliché, an expression of the subjective anxieties of lay people concerning the pace of change and implications of the new genetics.<sup>37</sup> Typically, “playing God” is a rhetorical term (often used in book or article titles without much substantive analysis) to frame concerns about the dangers of scientific hubris and of transgressing the limits of nature and social mores. But, despite the reference to “God” there is typically little theological content to the concerns expressed.<sup>38</sup>

Yet the reference to “God” in this popular image can and should be taken more seriously as a way of opening up the occluded theological meanings of genetics. Rather than simply criticising the idolatrous trajectory of “playing God”, the challenge is to explore the deeply ambivalent theological character of the scientific enterprise of modernity.

The relationship between “playing God” and “imaging God” has been explored by various Christian geneticists and theologians of science. For example, D. Gareth Jones, Professor of Anatomy at the University of Otago in New Zealand, argues for a more nuanced and

35. See A. Irwin, *Citizen Science: A Study of People, Expertise and Sustainable Development* (London: Routledge, 1995); F. Clark and D. Illman, “Dimensions of Civic Science: Introductory Essay”, *Science Communication* 23.1 (September 2001) 5-27; and J. Gristock, *Science and Society: towards a democratic science* (London: British Council, 2001).

36. See June Goodfield, *Playing God: Genetic Engineering and the Manipulation of Life* (New York: Random House, 1977); Andrew Dutney, *Playing God: Ethics and Faith* (Melbourne: HarperCollins, 2001); Ted Peters, *Playing God? Genetic Determinism and Human Freedom* (New York: Routledge, 1997).

37. Brian Wynne, “Interpreting Public Concerns about GMOs – Questions of Meaning” in Celia Deane-Drummond, Bronislaw Szerszynski (with Robin Grove-White) (eds.), *Re-ordering Nature*, 221-50.

38. See, for example, Hilary and Steven Rose, “Playing God”, *The Guardian*, 3 July 2003.

sympathetic approach to the idea of “playing God”.<sup>39</sup> Jones points out that the term ought not suggest simply overweening hubris, but the practical reality of the kinds of unprecedented choices that developments in genetics force us to make.<sup>40</sup> We now have to “play God”, for example, in relation to treatment options for various diseases, whether or not to extend life, to select embryos without genetic abnormalities, and so forth. For Jones the way in which we should “play God” is by living out our creational mandate of being made in the “image of God”:

...since humans are made in God’s image...in some of our attributes we are to function like God. Regardless of how much our God-likeness has been shattered by sin and rebellion, we remain images of our maker, albeit tarnished images. As such, we demonstrate a great deal of his [sic] creativity and inquisitiveness. Consequently humans as scientists are humans as God’s images, probing and thrusting into the creation, attempting to understand it and make it accountable as God’s stewards. Within the medical sphere, the desire is to exercise at least limited control over evil in the form of disease, disease that would ravish and destroy all that is beautiful in God’s world.<sup>41</sup>

Theologians such as Ted Peters, Phillip Hefner and Ronald Cole Turner, who have been generally supportive of modern genetics research and development, have taken a similar approach. While recognising that “playing God” in its negative sense involves overreaching, going beyond the limits of God and nature, Peters, for example, argues that genetics can be framed better in terms of the *imago Dei*, or in terms of humans as “co-creators”. In the Conclusion to his 1997 book, *Playing God?* he comments:

It is worth noting that virtually all Roman Catholics and Protestants who take up the challenge of the new genetic knowledge seem to agree on a handful of theological axioms. First, they affirm that God is the creator of the world and, further, that God’s creative work is ongoing. Second, the human race is created in God’s image. In this context, the divine image in humanity is tied to creativity. God

39. D. Gareth Jones, “Playing God: Scientific, Ethical and Technological Challenges”, Seminar presented at St Edmund’s, Cambridge, 22 June 2004. Transcript accessed at: <http://www.stedmunds.cam.ac.uk/faraday/CIS/st-edmunds/jones/index.html>.

40. See Audrey Chapman, *Unprecedented Choices: Religious Ethics at the Frontiers of Genetic Science* (Minneapolis: Fortress Press, 1999).

41. D. Gareth Jones, “Making Human Life Captive to Biomedical Technology: Christianity and the Demise of Human Values”, *Center for Christian Bioethics Update* 11, 4 (December 1995). Accessed at <http://www.llu.edu/llu/bioethics/llethup114a.htm>.

creates. So do we. With surprising frequency, we humans are described by theologians as “co-creators” with God, making our contribution to the evolutionary process. Third, these religious documents place a high value on human dignity.<sup>42</sup>

Whilst Christian scientists such as Jones tend to draw their substantialist understanding of the *imago Dei* directly from the texts of Genesis,<sup>43</sup> Peters et al frame the associated concepts more theologically in terms of the canonical narrative of creation, fall and redemption. There are problems with both approaches. Jones’ approach, which is shared by many Christians in science, fails to address the need to re-interpret the Genesis account of the *imago Dei* in terms of the narrative of Jesus and the kingdom. Similarly, Peters et al fail to articulate the *imago Dei* Christologically and to consider what that implies for their understanding of humans as “co-creators”.<sup>44</sup>

Colin Gunton provides a better approach in his project of recovering a Trinitarian ontology of creation in the context of late modernity. Gunton argues that a deep theological connection exists between an ostensibly secular modernity and Christian understandings of God.<sup>45</sup> His central contention is that in western modernity the conceptions of human personhood, human community and humanity’s relation to the non-human world have been formed in large part in reaction against what he calls the “Parmenidian” notion of God (emphasising oneness at the expense of difference) that came to shape the theology and practice of Western Christendom.

Paradoxically, even as this Parmenidian God was repudiated, its basic non-relational character was reproduced in the “rootless will” of late modern individualism, a defective anthropology lying at the heart

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42. Peters, *Playing God?* (quotation downloaded from “Conclusion: Theological Commitments to Human Dignity”, <http://www.counterbalance.org/genetics9.html>).

43. At the end of his review of the Scriptural background to the *imago Dei*, Douglas John Hall comments: “The usual practice in expositing the theology of the *imago* is to concentrate on the Genesis references, with some attention to that aspect of the New Testament teaching that finds in the Christ an embodiment of the *imago*. This approach tends to cast the entire discussion of the *imago Dei* in a speculative mode, artificially supported by biblical “evidence”.... But when the New Testament discussion of the *imago* makes the ecclesiological link between the creational theology of this symbol and the redemptive process of “being conformed to” the image of God incarnated in the Christ, it translates the whole discussion into existential terms”. Hall, *Imaging God: Dominion as Stewardship* (Grand Rapids MI: Eerdmans, 1986) 86.

44. For critical discussion of use of the *imago Dei* motif in relation to technology in general, and biomedical technologies in particular, see Peter Scott, “The Technological Factor: Redemption, Nature and the Image of God”, *Zygon* 35.2 (June 2000) 371-84 and James Walter, “Theological Issues in Genetics”, *Theological Studies* 60.1 (March 1999) 124f.

45. Colin Gunton, *The One, The Three and the Many: God, Creation and the Culture of Modernity* (Cambridge: Cambridge University Press, 1993).

of many of the political, social and ecological problems of our contemporary world. The sobering import of Gunton's argument is that the demonic and nihilistic trajectories of secular modernity have their ultimate roots in the failure of Christian theology to maintain its relational Christological and Trinitarian vision of God.<sup>46</sup>

Gunton's analysis of "playing God" thus goes beyond that of Jones, Peters and others to expose the manner in which secular modernity carries forward a distorted theological vision.<sup>47</sup> This important argument has been developed in slightly different ways by a range of theologians, most notably members of the "radical orthodoxy" movement, such as John Milbank, William Cavanaugh and Eugene McCarraher,<sup>48</sup> but also by writers such as Oliver O'Donovan and Lesslie Newbigin.<sup>49</sup> It implies that engaging theology with developments in science requires both a deconstructive critique of its theological underpinnings and a constructive re-framing in terms of the Christological, eschatological and Trinitarian vision of the gospel.

#### JESUS, THE PARADIGMATIC IMAGE OF GOD

Like many others, Gunton argues that the biblical motif of the *imago Dei* needs to be approached Christologically, in terms of the eschatologically oriented gospel narrative of Jesus. In his life, ministry, death, resurrection and ascension, Jesus truly images God within creation. Jesus uniquely fulfils Israel's calling to image God before the

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46. See Michael Buckley, *At The Origins of Modern Atheism* (New Haven: Yale University Press, 1987).

47. The pathological theological sources of secular modernity have been explored in an interesting way by David Noble in his book, *The Religion of Technology: The Divinity of Man and The Spirit of Invention* (London: Penguin, 1999), where he points to the idea of humans imaging God through technological innovation, as indicative of a deeper desire for perfection and transcendence through technology. Noble's critique is one of many accusing "the Judeo-Christian tradition" for inculcating an otherworldly contempt for the material, the particular and the temporal. See Lynn White, "The Historical Roots of Our Ecological Crisis", *Science* 155 (1967) 1203-1207. Although not explicitly challenging the Christian provenance of modernist science, another profound reflection on the secular appropriation of a divine calling has been Mary Shelley's *Frankenstein*, in which the noble scientist, Victor Frankenstein, expresses the dream that he might become the creator of a new species, and even further might overcome the barrier of death. Mary Shelley, *Frankenstein, or A Modern Prometheus* (London: Penguin, 1992 [1818]) esp. 52-53.

48. John Milbank, *Theology and Social Theory: Beyond Secular Reason* (Oxford: Blackwell, 1990); William Cavanaugh, *Theopolitical Imagination* (Edinburgh: T & T Clark, 2002); Eugene McCarraher, "The Enchantments of Mammon: Notes Towards a Theological History of Capitalism", *Modern Theology* 21.2 (July 2005) 429-61.

49. Oliver O'Donovan, *Desire of the Nations* (Cambridge: Cambridge University Press, 1996); Lesslie Newbigin, *The Gospel in a Pluralist Society* (Grand Rapids: Eerdmans, 1989).

nations.<sup>50</sup> He is the true Adam who brings freedom and life, rather than servitude and death (Romans 5). He is the one crowned with glory and honour (Hebrews 1), who has overcome the principalities and powers (Colossians 2). The risen and ascended Jesus realises God's purpose for humanity and also for the whole creation (Romans 8). Moreover, intrinsic to the gospel narrative is a deeper trinitarian understanding of God that overcomes the inadequacy and arbitrariness of the Parmenidian view and brings into proper focus the relationality of both divine and human agencies.

The call of humans to image God in creation then, does not mean some general human quality or calling, albeit warped by sin (a "tarnished image") which can still frame the practices of science. Rather it is a vocation represented paradigmatically by Jesus, realised in his life of faithful obedience and consequent glorification, and which now defines the vocation of humanity, first for the baptised people of God, but also ultimately for the whole world.<sup>51</sup> As Christoph Schwoebel writes:

The perspective from which the created destiny of humanity to live as the image of God can be known, is therefore the perspective of faith as the eschatological existence of New Being which is grounded in the restoration of the relationship between God and humanity through God's justifying grace in Christ. For this reason the image of Christ is the only way in which human beings are enabled to recognise their created destiny as the image of God.<sup>52</sup>

In his 1990 Didsbury Lectures, published as *Christ and Creation*, Gunton develops the theme of the risen and ascended Christ as the image and likeness of God in relation to the created order, and the particular role of the church in expressing Christ's rule within the structures of history and nature.<sup>53</sup> I will note briefly four aspects that can inform what it might mean to image God in the context of modern genetic practices.

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50. See Douglas J. Hall, *Imaging God: Dominion as Stewardship* (Grand Rapids: Eerdmans, 1986); Jürgen Moltmann, "God's Image in Creation: Human Beings" in *God in Creation: An Ecological Doctrine of Creation* (London: SCM Press, 1985).

51. See John Yoder, *Body Politics: Five Practices of the Christian Community before the Watching World* (Nashville TN: Discipleship Resources, 1992) p. ix.

52. Christoph Schwoebel, "Human Being as Relational Being: Twelve Theses for a Christian Anthropology" in Christoph Schwoebel and Colin Gunton (eds.), *Persons Divine and Human* (Edinburgh: T & T Clark, 1991) 152.

53. Colin Gunton, *Christ and Creation* (Grand Rapids: Eerdmans, 1992).

## 1. The fully human (relational) person

On the one hand as the risen and ascended Messiah of Israel and the world's true Lord,<sup>54</sup> Jesus realises both true freedom of humanity and divine power in relation to God's creation. He has gone before us and now rules at the right hand of the Father in splendid liberty and glory. His exultation is not simply "the end" of his life in the sense of its closure, but rather an entering into that vocation to which all humanity is called (Hebrews 2, Romans 5). Yet on the other hand, he does not "forget" his humiliation and assume the arrogance of power.<sup>55</sup> He is the lamb upon the throne. We know Jesus not as the overbearing ruler, but as the servant who washes his disciples' feet, who is present to us in the poor and the dispossessed, in the outcast and discarded (Matthew 25). Indeed, in his vocation as the first born of a new humanity Jesus embodies that Trinitarian self-giving love that is at the heart of God. In Jesus, at last, human being truly images the perichoretic life of God.

## 2. The true "lord of creation"

In his resurrection Jesus inaugurates the reconciliation and perfection of all things in the created order (Colossians 1, Ephesians 1, Romans 8). His resurrection is not just about overcoming his own death, nor even just about saving those who follow him from death (1 Cor 15). Beyond that, it encompasses the liberation and the perfection of the whole creation, the realisation of its true "sabbath rest". His act of obedience establishes that true heavenly city in which the tree of life is to be found and which is bathed in the light of God's presence. At last, in Jesus, humankind has exercised that dominion which gives to the creation its true freedom, found in the blessings of God's direct presence, the overflowing vitality and fecundity of God's own being.<sup>56</sup>

## 3. The source of human community

In the outpouring of the Holy Spirit, the ascended Jesus forms that new human community, the church. Christ's rule over, and presence within, the created order is provisionally realised in the ecclesial prac-

54. N. T. Wright, *Jesus and the Victory of God* (Minneapolis: Fortress Press, 1996).

55. Hall comments: "If Jesus reflects the fullness of deity – if Jesus is the image of God – then it will no longer suffice to put forward the most noble and exalted of human capabilities and call them *imago Dei*. For the one who is exalted here is the one who was brought low, whose glory is inseparable from his afflictions (Col 1:24) and whose 'body', the church, is called to live a life of 'compassion, kindness, lowliness, meekness and patience, forbearing one another, and...forgiving' (3:12f.); *Imaging God*, 78.

56. See Karl Hein, *Jesus the World's Perfecter: The Atonement and the Renewal of the World*, (Edinburgh: Oliver and Boyd, 1959) esp. 170-71.

tices of communal worship, life together, and witness to the wider world.<sup>57</sup> Here the relational, mutual, outgoing life of persons in communion at the heart of imaging God can be discovered. As John Yoder has reminds us, such worship is not a separate “religious” activity, but a set of political practices that anticipates the politics of the eschatological city.<sup>58</sup> The church thus images God paradigmatically in its worship, an imaging framing its various communal processes, including its economics, practices of communal deliberation, and so on.<sup>59</sup>

#### 4. The lord of history

The active rule of the risen Christ also gives shape and direction to the flow of human history, though in largely hidden (or cruciform) and surprising ways. The risen Christ does not simply stand at the end of history, waiting in the wings as it were, for the completion of the drama of humanity and the created order. Rather Christ rules in the world through the preaching of the Word, energised by the Spirit. The gospel works as the mustard seed, as a dynamic two-edged sword, as a fragrance leading both to life and to death. The Word is not passive, subordinate to other more dynamic forces of history. Rather the presence of the divine Word is the primary creative (and also unsettling) force in history, opening new “public spaces” for the good news to be freely spoken and heard. Yet this history is not simply one of conversion and steady moral improvement, but of the apocalyptic tension between light and darkness. This dynamism entails a significant responsibility for the people of God, to continue to live out its implications. As Jacques Ellul comments, the failure of the church to take responsibility has often led to the parodic expression of terrible and destructive forms of “anti-gospel”.<sup>60</sup>

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57. Don Saliers, *Worship and Theology: A Foretaste of Glory Divine* (Nashville: Abingdon, 1994).

58. Yoder, *Body Politics*.

59. “It would be sheer arrogance, of course, on Christians’ part if they translated this affirmation that one meets genuine humanhood in the church, while in the world at large one encounters only the distorted humanity of the ‘fallen’.... The image of God, this symbol for humanity-as-God-wills-it, is not something that Christians have; it is a spiritual movement into which they are being initiated”; Hall, *Imaging God*, 85.

60. See Jacques Ellul, *The Ethics of Freedom* (Grand Rapids: Eerdmans, 1976). However, “taking responsibility” does not mean trying to take control. See Yoder, *The Politics of Jesus* and Alexander Sider, “To See History Doxologically”, paper delivered to Historic Peace Church Consultation, Bieneberg Seminary, Switzerland 24 June 2001 (<http://www.peacetheology.org/papers/sider.html>).

## IMAGING GOD IN CHRISTIAN COMMUNITY: FROM EUCHARISTIC WORSHIP TO GENETIC PRACTICES

How do Christians, as baptised disciples of Jesus, called to be “reformed” in the likeness of Jesus, live out our vocation to “image God” within our world? In particular, what does this mean within the diverse practices of genetics, including those of laboratory research, government policy development, regulation, corporate investment decisions, patenting, public discussions, clinical applications, and choices in relation to genetic medicine or genetically modified foods? I argue that participating in such practices (as consumers, citizens, researchers or policy makers) implicates us in an inherently dialectical tension between the mythos of secular modernity (“playing God”) and the counter mythos of the eschatological kingdom (“imaging God”). The practice of modern genetics is a site of continuing eschatological conflict, always in danger of becoming a parody, a counterfeit way of imaging God.<sup>61</sup> The task for Christians is therefore to reframe the various practices of genetics in ways that faithfully express Jesus’ way of imaging God.

The role of the church as worshipping community is central to the reformation of people in terms of Christ’s imaging of God; as Gunton comments: “The image of God takes shape, is renewed, as human beings are formed in community by the Spirit through Christ”.<sup>62</sup> At the centre of this process is the preaching of the word and the practice of the sacraments, baptism and eucharist. Gunton points out that the eucharist is not merely a “spiritual” practice focussed on one’s individual and inward life, but an enactment of that covenantal relationship with God that is to be lived out in the world. In eucharistic worship we first learn what it is to “image God”, to be followers of Jesus, to develop the ethos of praise and thanksgiving for the gift of God and the virtues and disciplines of a kingdom community.

In a similar way, William Cavanaugh shows that the eucharist, as an embodied narration and enactment of the gospel, provides a context for penitentially critiquing the range of material practices within which our lives are embedded. In his study of how the Catholic church responded to the dictatorship of the Pinochet regime in Chile in the 1970s and 80s, Cavanaugh juxtaposed the eucharist and the practice of torture by which the regime disciplined the social body of Chilean society.<sup>63</sup> More

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61. See Brian Alexander, *Rapture: How Biotech became the New Religion* (New York: Basic Books, 2003).

62. Gunton, *Christ and Creation*, 112.

63. William Cavanaugh, *Torture and the Eucharist: Theology, Politics and the Body of Christ* (Oxford: Blackwell, 1998).

recently he has juxtaposed the practice of the eucharist with the dominating practices of our consumer culture, inviting us to consider what kind of alternative economic life Christian discipleship entails.<sup>64</sup>

Ronald Cole-Turner explores the counter-cultural meanings of the eucharist in relation to biotechnology.<sup>65</sup> After noting that the sharing of the cup and the bread unavoidably involves the church in the world of biotechnology, he asks if the prayer for God's blessing might not also involve a prayer that the Holy Spirit may infuse "not just these particular products of biotechnology, but the whole enterprise with a reorienting and transforming light":

Left unclaimed and unblessed, biotechnology is frightening. Biological weapons and bioterrorism aside, it is easy to imagine countless offenses against nature and human beings perpetrated by genetic engineering and biotechnology, even by those who claim well or who act with public approval. Therefore, we want to ask if it is possible, by and in prayer, for the church to claim not just bread and wine piecemeal but biotechnology wholesale, to claim it as God's, to subject it to blessing, and thereby to give it a meaning beyond its own blind power. If we cannot escape technology's intrusion into the sacrament, can we hope and pray for a sacramental intrusion upon technology, that in biotechnology's visible form as human work the hidden substance of God's work might take on concrete reality? Yet to do so is to act with theological boldness, exerting a claim that is not ours but God's, the claim of God to be creator and Lord of all, even to be Lord of biotechnology.<sup>66</sup>

The communal task of contesting the "frightening" possibilities of an unhallowed biotechnology and of "subjecting it to blessing" is difficult but exciting. The task is difficult because we are generally used to keeping church worship separate from the larger world of economics, politics and technology, finding it strange to mix them. Yet it is exciting to bring the good news of Jesus' kingdom, of the loving and liberating agency of the one who truly images God within creation, to bear on the complexities, choices and dilemmas of our geneticised world. It is beyond the scope of this article to explore this task in relation to specific areas of practice. Instead I shall indicate briefly how the four aspects of

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64. William Cavanaugh, "Consumption, the Market, and the Eucharist", *Concilium* 41.2 (June 2005) 88-95.

65. Ronald Cole-Turner, "Biotechnology: A Pastoral Reflection", *Theology Today* 59.1 (April 2002) 39-54.

66. Cole-Turner, "Biotechnology".

Jesus' paradigmatic imaging of God might begin to re-frame Christian participation in biotechnology.

### 1. Loving relationship versus Promethean ambition

The remarkable successes of modern biological sciences, particularly those of evolutionary biology, molecular biology and the new genetics have strengthened a culture of Promethean optimism within the scientific community. A growing confidence exists amongst scientists that the "secrets of life" are being unravelled (or decoded) and that with the successful sequencing of the human genome there is a platform for overcoming many weaknesses of the flesh and controlling life purposes for human ends. The scale of genetics research has expanded enormously in recent years, with rapid development of new techniques and instrumentation (for example, sequencing technologies) enabling ever more detailed understanding and control of life processes at a molecular level. Moreover, biotechnology research and development has become big business, with intense competition around the world for research grants, breakthroughs and patents.

The Promethean confidence of contemporary biological research is evident in many of the titles celebrating developments in genetics, for example, *Remaking Eden; Redesigning Humans; The Last Mortal Generation*. Edward Wilson's declaration in the last chapter of *On Human Nature*, provides one of the clearest recent expressions of this spirit. To God's questions of Job, climaxing with "Have you comprehended the vast expanse of the world? Come, tell me this, if you know?", Wilson responds: "And yes, we do know and have been told. Jehovah's challenges have been met and scientists have pressed on to uncover and to solve even greater puzzles". He ends his book with a ringing, explicit affirmation of the "true Promethean spirit of science".<sup>67</sup>

At the same time, anxieties about scientists transgressively "playing God" suggest a pervasive public ambivalence towards the new genetics. Rather than being a noble Promethean figure, the modern scientist is often perceived as Faustian, acquiring hitherto forbidden knowledge and in the process losing his/her soul, or as Frankenstein creating a monstrous world for which s/he is unwilling or unable to bear responsibility.<sup>68</sup>

While Christians should have some sympathy for such critiques, this should not include an endorsement of an alternative neo-romantic mythos.<sup>69</sup> A Christian critique of the Promethean mythos of modern

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67. Wilson, *On Human Nature*, 202.

68. See Turney, *Frankenstein's Footsteps*.

69. See Bruce and Horrocks (eds.), *Modifying Creation?*

science entails a recovery of the Christian motif of “ruling the world” that it distorts. The “transgressive” character of the secular modernity expressed in genetic practices is not simply a violation of “natural” limits but ultimately an anti-theology. Our challenge is to re-imagine the practices of genetics in terms of a Christological or trinitarian mutuality, in which knowledge practices are sustained by an ethos of praise and thanksgiving, of creaturely humility, of love for one’s neighbours and respect for the dignity of things. In the context of genetics research, this would mean support for research and technological application that is in genuine partnership with those communities of people most urgently in need of help.<sup>70</sup> It is a scandal, for example, that the great proportion of biomedical research funding and activity goes into the needs and aspirations of first world consumers with comparatively little directed towards the plight of poorer communities in the developing world.

## 2. The care of creation versus the re-shaping of nature

The power of modern genetics – and thus the life sciences in general – to comprehend and to control living things at a most fundamental level continues to grow. In the progressive re-fashioning of nature, we are now witnessing the rapid outworking of the technoscientific possibilities of a new bio-informational paradigm. In the field of agricultural biotechnology, we can see this in the development of new forms of transgenic hybrid materials<sup>71</sup> and less obviously in the further extension of agro-industry involving a displacement of traditional, adaptive forms of agriculture.<sup>72</sup> In human genetics, the new genomics makes the possibility of “re-designing humans” both thinkable and feasible.<sup>73</sup>

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70. Francis Collins, current Director of the Human Genome project, writes of modelling his practice of genetics on the example of Jesus as healer, concluding “that not to pursue genetic research would be the most unethical position of all, because in so doing we would doom many individuals, including perhaps ourselves, to the absence of an intervention that’s needed to alleviate suffering that lies ahead”; “The Human Genome Project: Atheistic Reductionism or Embodiment of the Christian Mandate to Heal?” *Science and Christian Belief* 11, 2 (1999) 99-111. What is interesting is the absence of any reflection on the necessary tension between a Christian vision and the dominant enlightenment framework with which the mandate to “reduce suffering” is primarily framed. See Gerald McKenny, *To Relieve the Human Condition*.

71. Les Levidov, “Democratizing Technology – or Technologizing Democracy? Regulating Agricultural Biotechnology in Europe”, *Technology in Society* 20 (1998) 211-26. Levidov documents ways in which the practices and discourses of agricultural biotechnology effectively reconstruct nature and agriculture in biotechnological terms.

72. Brian Halweil, *Ecological Farming – Reducing Hunger and Meeting Environmental Goals*, Worldwatch Institute, World Summit Policy Briefs website (11 June 2002) <http://www.worldwatch.org/node/1727>.

73. See Stock, *Redesigning Humans*; Silver, *Remaking Eden*.

Yet whilst the greatest excitement about the new genetics arises in response to the novel techniques of genetic manipulation, its deeper intellectual power lies in its comprehensive view of life. This view is both multilevel and temporal: multilevel insofar as it extends from the operation of the simplest of living structures through to the awesome complexity of the human brain; temporal insofar as the biological diversity of our planet is understood as the present phase of the long term evolution of life, shaped by the dialectic between organic variation and selective pressures, producing organisms of increasing complexity and function.

The non-teleological and nihilistic view implicit in modern technoscience is at odds with a Christian vision that the world is God's creation, whose purpose is ultimately to share in the glorious liberty of the children of God. Yet how can the doctrine of creation be articulated in a way that takes seriously the well established and still positive research programme of neo-Darwinian evolutionary theory? Can the doctrine of creation provide an alternative vision of nature which either corrects or contests a Darwinian view of life by locating biological processes within some larger context of moral order?<sup>74</sup>

Following Gunton, I suggest that a trinitarian ontology of creation, proclaimed in the church's worship, is crucial for the theological re-shaping of the practice of genetics. Seeing nature as a created order sustained by the relational love of the triune God enables us to appreciate both the rich diversity and underlying unity of things, an ecological connected-ness characterised by other-ness, freedom and radical dependence.

This trinitarian ontology of creation can reframe the practice of science in a number of ways. First, it grounds the radical freedom, diversity and inter-dependence of the created order in the outgoing love of God. It also suggests that the value and moral purpose of creation are not intrinsic features, but emerge in and through their related-ness to the triune creator: an eschatological openness rather than a teleological directedness. It is a framework which thus supports the limited validity of non-teleological explanatory models at simpler levels of material organisation, and at the same time takes seriously the emergent nature of higher level properties associated with increased complexity and ecological diversity. It also contextualises human intervention in the material world, including emerging gene technologies, within a framework of divine meaning and purpose: the eschatological openness

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74. See Oliver O'Donovan, *Resurrection and Moral Order* (Leicester: InterVarsity Press, 1986); Anthony Baker, "Theology and the Crisis of Darwinism", *Modern Theology* 18.2 (April 2002) 183-214; Barry Richardson, *Christianity, Evolution and the Environment* (Sydney: UNSW Press, 2001).

of the created order to its intended resurrection freedom. This entails both a respect and a reverence for the integrity and dignity of the diverse forms of being in the world, and at the same time the openness of that being to transformation by the Spirit-filled Lord of the earth.

Rowan Williams expresses how an underlying trinitarian vision of the world as God's good creation can foster a more respectful and relational approach to scientific investigation:

to penetrate the workings of the world, to understand its intelligible shape, is to come into contact with a divine action that is reasonable – consistent with itself, accessible in some limited ways to our minds. In the language of Jewish scripture, true thinking, true knowing of the world is becoming aligned with God's wisdom, God's self-consistency in purpose and action, which the Jewish people thought of as a living principle in the universe. But because of this, true thinking is also becoming aligned with the intimate relation of the world in all its variety with God; it is to relate to God by being "in tune" with the relation of the physical universe to God. If the world manifests the glory and love of God, it is a manifestation that leads to relationship; it is not simply a pattern that we admire, but an ordered life in which we can have a share.... to understand creation as a gift from God, as something that makes relation with God possible, is also to become able to make creation a gift – to receive it from God in blessing and thanksgiving, to offer it back to God by this blessing and gratitude (that is, to let go of the idea that it is just there for our use), and to use it as a means of sharing the divine generosity with others.<sup>75</sup>

### 3. Ecclesial community and the "republic of science"

One significant claim of the apologists of modern science is that science embodies the true form of a free society. In their classical formulations of this political vision, Robert Merton, Karl Popper and others argue that science embodies an alternative political rationality, marked by open communication, shared knowledge and critical argument, in contrast to the closed, dogmatic and hierarchical culture of a clerically dominated society.<sup>76</sup> In order to function as an open society dedicated to the discovery of objective knowledge, science should be well funded, and granted a high degree of political autonomy.

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<sup>75</sup> Rowan Williams, "Changing the Myths we Live By", Environment Lecture, 5 July 2004 ([http://www.archbishopofcanterbury.org/sermons\\_speeches/2004/index.html](http://www.archbishopofcanterbury.org/sermons_speeches/2004/index.html)).

<sup>76</sup> Robert Merton, "The Normative Structure of Science", in *The Sociology of Science: Theoretical and Empirical Observations* (Chicago: University of Chicago Press, 1973).

However, with political and economic establishment, the “republic of science” experiences its own corruption and closure in, for example, the entrenched elitism of specialisms, and the secrecy and manipulation of results often required by government, military and commercial funding agencies.<sup>77</sup> This has meant not just the distortion of the peer review process, but also the undermining of the “public good” character of the research enterprise. Paradoxically, the secular (or “public”) languages of science have also constrained public debate about value and cultural issues integral to policy and research. This constraint is particularly evident in the technocratic discourse of official enquiries on matters of genetics.<sup>78</sup>

In response to all this, in recent years there have been various proposals for greater civic engagement in the governance of science.<sup>79</sup> These include citizen’s juries, consensus conferences, and deliberative workshops. Whilst employed by various governments, the extent to which they have become an integral part of government policy-making and regulation of research and development has varied. At best they have been effective in enabling greater communication between policy elites and the wider community, fostering a greater awareness of the scientific issues by lay people, and of lay people’s concerns by researchers and policy makers. At worst, such meetings simply serve to legitimate what remains a highly restricted and non-democratic system of governance.

For such measures to be effective they need to form part of a general strengthening of effective systems of public governance of research. As noted above, one of the worrying contextual problems of genetics research is the extent to which it has been privatised, a process which has meant that research priorities have not been directed towards serving “the public good”, and the profits of research have been concentrated in private hands. This has been particularly so in the global context,<sup>80</sup> where biotechnology research has been increasingly shaped

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77. See E. Press and J. Washburn, “The Kept University”, *The Atlantic Monthly Digital Edition* (March 2000) (<http://www.theatlantic.com/issues/2000/03/press.htm>); also Mae-Wan Ho and Jonathan Mathews, “Suppressing Dissent in Science”, *I-SIS Mailing List* (16 Feb 2001).

78. See Vikki Fraser, “Biotechnology and Ethical Discourse” (unpublished seminar paper presented in the Seminar Series 2000 at the Centre for the Study of Ethics in the Market, Government and the Professions, Queensland University of Technology).

79. See The British Council report advocating a “mode 2” form of science involving the creation of “transactional spaces” for civic engagement in the governance of science; J. Gristock, *Science and Society: Towards a Democratic Science* (London: British Council, 2001). See also Steve Fuller, *The Governance of Science* (Buckingham: Open University Press, 2000).

80. Concerning the relationship between biotechnology research and third world agricultural needs, see G. J. Persley and M. M. Lantin (eds.), *Agricultural Biotechnology and*

by the interests of global agri-business companies, often to the disadvantage of rural economies in developing countries. Hence, there remains a need to maintain publicly funded research, and to foster various “community science” initiatives which are guided by the interests of poor communities themselves.<sup>81</sup>

What contribution can Christians, especially at the level of congregations, make to the development of more open forms of the governance of science? Unfortunately, in my experience Christian congregations rarely engage seriously with some of the more technical and policy issues. Such deliberations are left to formal denominational bodies, thus exacerbating the expert-lay divide.<sup>82</sup> Yet it is not as though questions of “genetics” are remote from the everyday lives of Christians. Increasingly, Christians are drawn into the practices of genetics, either as researchers themselves, or as patients, farmers, participants in genetic counselling processes, or as consumers facing choices over genetically modified foods. Undoubtedly the most pressing and fruitful areas of genetic concern will have to do with medicine and the care of the sick, elderly and dying; all areas involving intense biomedical research and innovation and in which the new genetics will have an enormous impact. But we are also all of us implicated in the transformations in agriculture associated with the political economy of GM crops and animals.<sup>83</sup>

The capacity of Christian congregations to engage Christianly with the wider public sphere depends upon a rediscovery of the politics of Jesus in the core practices of communal worship. As John Yoder notes, processes of communal discussion, centred on the prophetic word of the gospel, and at the same time providing space for “everyone to take the floor”, are a vital and integral part of authentic worship.<sup>84</sup> Developing the skills and habits of genuine dialogue will help to inculcate the gospel more firmly in the lives of lay Christians. It will provide a space within which the “theological” concerns emerging with ostensibly “secular”

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*the Poor: An International Conference on Biotechnology* (Consultative Group on International Agricultural Research, 2000) (<http://www.cgiar.org/publications/agribiotech.html>).

81. See, for example, the first International Peasant-Scientist Conference held in Kuala Lumpur in September 2002, reported in PANUPS (Pesticide Action Network Updates Service) “Forging a Science for the People” ([http://www.panna.org/resources/panups/panup\\_20021018.dv.html](http://www.panna.org/resources/panups/panup_20021018.dv.html), 18 October 2002).

82. See Newbiggin’s call for greater congregational deliberation in *Truth to Tell: The Gospel as Public Truth* (Grand Rapids: Eerdmans, 1991) 85f.

83. A creative response to global agribusiness has been the “slow food movement”, see Roger Downey, “Save the World: Eat” *Seattle Weekly* (15 August 2001). ([http://www.e-venthorizon.nethealth\\_environ/slowfood.html](http://www.e-venthorizon.nethealth_environ/slowfood.html)).

84. Yoder, *Body Politics*; see also John Yoder, “The Christian Case for Democracy” in *The Priestly Kingdom: Social Ethics as Gospel* (Notre Dame: University of Notre Dame Press, 1984).

public issues can be raised and brought into creative tension with the message of the kingdom. Congregational dialogue will enable lay people to express and contribute their own more contextual experiences of illness, health, food and reproduction, and to resist the pervasive tendencies towards greater medicalisation and geneticisation of life.<sup>85</sup> In turn, such congregational dialogue has the potential to model the kind of communal deliberation called for by many people concerned about the inadequate processes of scientific communication and public consultation.<sup>86</sup>

#### 4. Christian hope and secular bioethics

The place of genetics in modern culture abounds in paradoxes. One paradox is evident in the contrasting public and professional discourse surrounding developments in genetics. While the discourses of bioethical assessment are predominantly formalist and proceduralist, making it difficult to articulate questions about the larger moral purposes of scientific endeavour, in the wider culture, advances in genetics have led to a profound re-shaping of our historical imagination. Where on the one hand, a great deal of energy and time is invested in debating the morality of stem cell research (for example), on the other hand a “genetic imaginary” has come to shape our most basic understanding of the human journey in the world. Many people now take for granted a human story that has its beginnings in the fortuitous evolutionary emergence of homo sapiens and points to the increasing possibility, even necessity, of taking control of future evolution through the use of genetic technologies.

A second paradox is that whilst the remarkable successes in modern biotechnology have strengthened a sense of confidence in the idea of human progress, deep unease and uncertainty also exist about the future for humanity, particularly in the light of growing ecological problems. This paradox has been well captured in the contrasting titles of two recent books. One is Damien Broderick’s *The Last Mortal Generation*, in which Broderick eloquently explains the advances in science that will surely lead to overcoming the problems of human

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85. See M. Therese Lysaught, “From Clinic to Congregation: Religious Communities and Genetic Medicine”, *Christian Scholars Review* 23.3 (March 1994); Joel Shuman, *The Body of Compassion: Ethics, Medicine and the Church* (Boulder: Westview Press, 1999); Arthur Frank, *The Wounded Storyteller: Body, Illness and Ethics* (Chicago: University of Chicago Press, 1995).

86. Judith Scoville, “Do Christians have a moral obligation to support agricultural biotechnology?” *Studies in Christian Ethics* 14.2 (2001) 42-50, provides a good example of how an ecclesial ethic can shape judgements on desirable forms of political economy.

senescence and death as biological problems.<sup>87</sup> The second is Fred Pearce's recent book on the imminent threat of global warming, *The Last Generation*. Pearce, like James Lovelock, believes that it is probably already too late for humanity to avoid catastrophic climate change brought about by the amount of carbon dioxide being pumped into the atmosphere since the beginnings of the industrial revolution.<sup>88</sup>

In relation to the first of these paradoxes, the challenge for a Christian practice of genetics is to contribute to forms of public discourse which enable us to guide our choices and priorities more clearly by a sense of the common good for humanity and for the non-human world, rather than by formal ethical procedures that mask the inequity and unsustainability of a great deal of research. In relation to the second, the challenge for Christians is to resist the notion that it is possible to control our history and destiny, and instead to live in the hope of the saving power of the crucified Lord, at work within the lives of faithful human communities.

#### CONCLUSION: "PLAYING GOD" OR "IMAGING GOD"

In this article I have argued that there is a need for greater theological engagement at the level of the institutionalised practices of science. At one level this requires challenging the dominant instrumentalist discourses of scientific practice and public ethical evaluation and giving voice to the wider ontological concerns that have arisen from advances in genetics. It also involves reflecting on the imaginative vision that drives modern science. The Promethean notion of "playing God" is a useful focus for such reflection. The alternative motif of "imaging God" entails a very different Christian discourse and social practice, one which does not simply reject the extraordinary developments of modern genetics, but instead re-frames them in terms of the narrative of Jesus' kingdom, the outflowing love of the triune God and the *koinonia* of mutual service in human community.

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87. Damien Broderick, *The Last Mortal Generation* (Sydney: New Holland Publishers, 1999).

88. Fred Pearce, *The Last Generation: How Nature Will Take Her Revenge for Climate Change* (London: Eden Books, 2006).