

**MERIC SROKOSZ****Humility: A Neglected Scientific Virtue?**


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*This brief paper argues for the need to reinstate humility as a key virtue in the lives of scientists who are also Christians. In a world where the scientific enterprise increasingly lacks an agreed moral compass, as evidenced by the mounting number of cases of scientific misconduct coming to light, it seems incumbent on Christians to demonstrate Christ-likeness in their professional lives. Of all the Christian virtues humility is perhaps the one that most clearly distinguishes (or should distinguish) the believer from the world, whether that is the world of science or of daily life. Furthermore, humility may allow the scientist to avoid or overcome the temptations and the dangers of hubris associated with the scientific life.*

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**Key words:** virtue, science, engineering, technology, humility.

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**Introduction**

The range of ethical issues facing scientists today is enormous, whether in biomedical,<sup>1</sup> genetic,<sup>2</sup> environmental,<sup>3</sup> or any other type of research. Even the rarefied atmosphere of pure mathematics can be ‘polluted’ by the possible military applications of what seem like abstruse concepts; for example, for code breaking.<sup>4</sup> There has been considerable discussion of the ethics of carrying out certain types of research – the use of animals in biomedical research being an obvious example. However, there has been much less discussion of the ethical, or otherwise, character of the individual scientist, despite several recent prominent cases of scientific fraud and misdemeanour.<sup>5</sup> As Christians, who are also scientists, we need

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1 E.g. Bryant J.A, Baggott La Velle L. & Searle J. 2005 *Introduction to bioethics*, Wiley-Blackwell.

2 E.g. Deane-Drummond C. 2005 *Biotechnology: a challenge to theology and ethics*, pp.361-390 in Southgate C. (ed.) 2005 *God, humanity and the cosmos*, 2nd edn., T & T Clark, London.

3 E.g. Northcott M.S. 2007 *A moral climate: the ethics of global warming*, DLT, London.

4 E.g. Singh S. 2000 *The code book: the secret history of codes and code-breaking*, Fourth Estate, London. In this respect the great pure mathematician G.H. Hardy was proved wrong in his statement that “Real mathematics has no effect on war.” p.140 in *A mathematician’s apology*, Cambridge University Press (Canto edition 1996), Cambridge – originally published in 1940.

5 A recent publication on these issues from the US National Academy of Science, National Academy of Engineering, and Institute of Medicine and National Research Council’s Committee on Science, Engineering and Public Policy (CSEPP) 2009 *On being a scientist: a guide to responsible conduct in research* (3rd edn, National Academies Press, Washington DC) makes no mention of the virtue of humility. The focus is on the behaviour rather than the character of the scientist. The only clear mention of ethical values (pp.3 & 48) state, “Research is based on the same ethical values that apply in everyday life, including honesty, fairness, objectivity, openness, trustworthiness, and respect for others.” and “The values on which science is

to think carefully about how our faith should impact our work. The aim of this note is to explore briefly the role of what seems to be a neglected Christian virtue – humility – in the scientific life.

The development of modern science arose in the predominantly Christian milieu of Europe, beginning in the so-called Middle Ages and going right up to the beginning of the twentieth century.<sup>6</sup> In the twentieth century, and even more so now in the twenty-first century, the secularisation and growing pluralism of Western society<sup>7</sup> has to some degree cut science off from its Christian heritage.<sup>8</sup> In the past, as with other areas of public life in the Western world, science was underpinned by the prevailing Christian ethic that permeated society and was probably the common assumption and shared belief system of the majority of scientists.<sup>9</sup> Today such a shared belief system no longer exists in the wider scientific community in the Western world. As noted by MacIntyre ‘There seems to be no rational way of securing moral agreement in our culture.’<sup>10</sup>

One way of describing the Christian ethic is in terms of virtue, a perspective that has recently been considered by Wright,<sup>11</sup> and that is the approach that will be explored here for the scientific life, with the focus on humility. Shapin has examined the role of virtue in the scientific life in recent decades and how this differs from the past.<sup>12</sup> He aims ‘to show how

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based – including honesty, fairness, collegiality, and openness – serve as guides to action in everyday life as well as in research. These values have helped produce a scientific enterprise of unparalleled usefulness, productivity, and creativity. So long as these values are honored, science – and the society it serves – will prosper.’ The latter seems naïve, as it does not address the issue of why they should be so honoured. On the issue of whether scientific fraud is increasing see Steen R.G. 2012 Retractions in the scientific literature: is the incidence of research fraud increasing? *J Med Ethics*, 37, 249-253.

6 Hannam J. 2009 *God's philosophers: how the medieval world laid the foundations of modern science*, Icon Book, London; Grant E. 2006 *Science and religion, 400 BC to 1550 AD: from Aristotle to Copernicus*, Johns Hopkins University Press, Baltimore; Olson R.G. 2006 *Science and religion, 1450 – 1900: from Copernicus to Darwin*, Johns Hopkins University Press, Baltimore.

7 I do not feel qualified to comment on science and ethics in non-western societies, so will restrict my attention to the western world of which I am part.

8 This change can be seen too in areas other than science, for example, in the legal system; see Burnside J. 2011 *God, justice and society: aspects of law and legality in the Bible*, Oxford University Press, Oxford, 542pp.

9 Whether the majority of scientists subscribed to a Christian ethic is difficult to establish prior to the 20th century due to lack of data. On the religious beliefs of scientists in the 20th century see Larson E.J. & Witham L. 1997 Scientists are still keeping the faith, *Nature*, 386, 435-436.

10 MacIntyre A. 2007 *After Virtue*, 3rd edn., University of Notre Dame Press, Notre Dame (p. 6), who discusses the loss of an agreed moral basis in our society. Interestingly, humility is not listed in the index of this book.

11 Wright N.T. 2010 *Virtue reborn*, SPCK, London.

12 Shapin S. 2008 *The scientific life: a moral history of a late modern vocation*, University of Chicago Press, Chicago.

and why people and their virtues matter to the making and authority of late modern bodies of technical knowledge'.<sup>13</sup> Fundamentally I agree with him that people (scientists) and their virtues matter in the scientific life.

A definition of a virtue is 'any one of a set of interdependent traits which, as a set, adapt a person for living an ideally human life and express the proper human potential'.<sup>14</sup> More simply, a virtue is a quality that a person possesses that is regarded as morally good. However, as noted earlier, the question of what is considered morally good is no longer clear in our society, and that partly motivates the writing of this paper. For the Christian, the Bible and, more specifically, the New Testament, particularly its depiction of Jesus and his teaching, define the ideal human life and what is morally good. Wright notes that, 'The name for this way of being human, this kind of transformation of character, is *virtue*.'<sup>15</sup>

It is clear that there are a number of virtues that can be seen to be common to the Christian life and the scientific life: honesty (or truthfulness; Eph. 4: 15, 25), fairness (or justice; Prov. 1: 3), trustworthiness (or faithfulness; Gal. 5: 22), respect for others (or acceptance of others who differ from us; Rom 15: 7).<sup>16</sup> Less obvious perhaps, *a priori*, is the relevance of the Christian virtue of humility to the scientific life. Therefore, this short paper is a brief exploration of the importance of the virtue of humility in the scientific life.

## Humility

As noted by Worthington, in his short but perceptive book on humility,<sup>17</sup> humility is difficult to define and a clear scientific understanding of humility does not exist yet.<sup>18</sup> He chooses instead to examine humility through

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13 *ibid* p.1

14 p. 881 in Atkinson D.J. & Field D.H. (eds) 1995 *New dictionary of Christian ethics and pastoral theology*, Inter-varsity Press, Leicester.

15 Wright *op. cit.* p.6.

16 cf. note 5 above, where the quote from CSEPP mentions "honesty, fairness, objectivity, openness, trustworthiness, and respect for others."

17 Worthington E.L. 2007 *Humility: the quiet virtue*, Templeton Foundation Press, Philadelphia & London. Note that Worthington does not discuss the role of humility in the scientific life.

18 Though he notes that there have been a few recent scientific attempts to understand humility. *Op. cit.* Chapter 5 and References. Since his book was published there seems to have been something of a burgeoning of research on humility. See, for example: Davis D.E., Hook J.N., Worthington E.L., van Tohgeren D.R., Gartner A.L., Jennings D.J. & Emmons R.A. 2011 Relational humility: conceptualising and measuring humility as personality judgment, *J. Personality Assessment*, 93, 225-234; Davis D.E., Worthington E.L. & Hook J.N. 2010 Humility: a review of measurement strategies and conceptualization as personality judgment, *J. Positive Psych.*, 5, 243-252; Tangey J.P. 2005 Humility, pp.411-419 in *Handbook of Positive Psychology*, Oxford University Press, Oxford; and references therein. However, a search of the Science of Virtues project website failed to find any reference to humility (see <http://scienceofvirtues.org/> accessed 04-06-12).

human exemplars. Rather than reprise his work I will focus instead on some of the biblical material on humility and examples of it. It is worth noting at the outset that humility was not considered a virtue in the Graeco-Roman world at the time of Jesus. In fact it was seen as a characteristic of slaves and therefore not desirable. Commenting on Peter's call to Christians to be humble in 1 Peter 3: 8, Witherington notes that, 'The Greek word *tapeinophron* is interesting because it has a unique meaning in Christian contexts. In pagan contexts it is a derogatory term meaning something like "base-minded, ignoble, low, mean", and often it was applied to slaves and their behaviour. But Peter sees it as a virtue.'<sup>19</sup> In contrast, Aristotle – perhaps the pre-eminent classical writer on virtue – saw the four cardinal virtues as courage, justice, prudence and temperance. His 'vision of the virtuous person always tended to that of the "hero", the moral giant striding through the world doing great deeds and gaining applause'.<sup>20</sup> As we shall see from the biblical material examined below, the contrast could not be greater with the Christian view of the virtuous person. Wright concludes that, 'Aristotle's tradition led ultimately to pride',<sup>21</sup> the very opposite of humility.

The biblical material on humility is extensive, so here I will only consider two exemplars of humility – Jesus and Moses – and briefly look at some of the keys scriptural passages.<sup>22</sup> Beginning with Moses, we note that he is described as the humblest man on Earth (Num. 12: 3). How did he gain that ascription? On one level he was a hero who led the people of God from captivity to freedom. However, the characteristic that probably led to the ascription 'the humblest man on Earth' is perhaps best exhibited in his actions following the incident of the golden calf in Exodus 32. God offered to make Moses and his descendants into a great nation, after destroying the rest of Israel because of their worship of the golden calf (32: 7-10). Rather than accept God's offer, Moses intercedes with God on behalf of the people and God relents (32: 11-14). Moses's primary concern was God's honour and God's people rather than his own glory. God's challenge to His people 'to act justly and to love mercy and to walk humbly with your God' (Micah

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19 p. 595 in Witherington B. 2010 *The indelible Image: the theological and ethical thought world of the New Testament. Vol. 2 The collective witness*, IVP, Academic, Downers Grove, Illinois. cf. pp.384-385 in Witherington B. 2009 *The indelible Image: the theological and ethical thought world of the New Testament. Vol. 1 The individual witnesses*, IVP, Academic, Downers Grove, Illinois.

20 Wright *op. cit.* pp.31 & 62.

21 Wright *op. cit.* p.207.

22 In what follows I treat the scriptures canonically (see Thiselton A.C. 2009 *Hermeneutics*, William B. Eerdmans Publishing Co., Grand Rapids, Mich.), and as having direct relevance to us today. While there are clearly differences in the socio-cultural context of the O.T., the N.T. and the present day, with regard to how humility is viewed, the socio-cultural gap seems rather narrow. An Aristotelean-like "hero" seems a common image in our TV programmes and films, which many people aspire to imitate. In contrast, I chose a Christocentric focus for what follows, given that Christ-likeness is the ethical aim for Christians.

6: 8) is surely a call to reflect Moses's character. Of course, the person who embodies that humility fully is Jesus.

The tradition of *imitatio Christi* (imitation of Christ) is a long-standing one going back to Jesus's own call to his disciples to follow him (e.g. Matt. 4:19), setting them an example and telling them they should do as he has done (John 13:15) and to Paul's exhortation to the Corinthian believers to imitate him as he imitated Christ (1 Cor. 11:1). With respect to the virtue of humility, in this too believers are to be imitators of Christ. Wright notes that, 'Insofar as Jesus' life constitutes a "moral example", it is that he modelled an entirely new aspect of "morality" – namely, humility, a willingness to suffer without recrimination, and a determination to forgive those who were not asking for it.'<sup>23</sup> Jesus called on his disciples to learn from him, as he was humble in heart (Matt. 11: 29), and exhibited this humility perhaps most poignantly in his action of washing his disciples feet (John 13: 1-17). He also makes clear that his disciples need to humble themselves (Matt. 23:12 || Luke 14: 11). Paul calls on the Philippians to have the same attitude that Jesus had, who humbled himself and became a servant (Phil. 2: 5-11). Peter too calls on his readers to be humble (1 Pet. 3: 8; 5: 5-7), as does James (Jas 4: 6, 10). It is clear that humility does not mean becoming a doormat for other people to walk over – Jesus certainly wasn't. In fact, becoming a doormat will fail to serve God's purposes as, at times, a robust response to others is required. This robustness can be seen in Paul's challenge to Peter over not eating with the Gentiles (Gal. 2: 11-14) and in Jesus's response to his opponents on many occasions (e.g. Matt. 12: 34; 15: 7, 12; 21:12). Witherington notes that 'Humility comes not from a low opinion of self but rather from a high opinion of God' and that 'real humility, not false modesty, that Christ calls believers to...involves deeds of service'.<sup>24</sup>

This brief biblical excursion shows that humility is exemplified in two key people in the bible – Moses and Jesus – and should be a characteristic of Jesus's disciples, including those of us who are scientists.

### **Temptations and hubris**

As scientists in our work we face temptations that are common to all believers (1 Cor. 10: 13), but there are particular instances that are peculiar to the scientific life. Some specific ones that come to mind are:

- the desire for priority in publication;
- the certainty that our theory or observations or experimental results must be right;

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<sup>23</sup> Wright *op. cit.* p.112.

<sup>24</sup> Witherington (2009) *op. cit.* p.385.

- enjoying seeing someone we disagree with scientifically proved wrong;
- failing to give credit for results to the junior or technical staff who did the majority of the work that led to the results we are publishing;

The motivation behind these is often our need or desire to be recognised scientifically, which is to do with our pride, and for which humility is the known antidote. Scientific hubris<sup>25</sup> is a theme explored in films and literature; for example, Mary Shelley's *Frankenstein*<sup>26</sup> and Robert Louis Stevenson's *The Strange Case of Dr. Jekyll and Mr. Hyde*. Here the arrogance of the scientist (hubris) leads to disaster. Unfortunately, such hubris is not restricted to works of fiction. One real-life example is the use of DDT (dichlorodiphenyltrichloroethane) as an insecticide. The Nobel Prize in Physiology or Medicine 1948 was awarded to Paul Müller 'for his discovery of the high efficiency of DDT as a contact poison against several arthropods'.<sup>27</sup> DDT provided a 'magic solution' to controlling insect populations, particularly those carrying diseases affecting human health (e.g. typhus, malaria). It was assumed (hubris) that it had no deleterious effects on humans or wildlife. However, the unintended consequence of its use was the destruction of wildlife, particularly birds, highlighted in Rachel Carson's famous book *Silent Spring* (published in 1962). The use of DDT was eventually banned.

Another example would be the use of the drug thalidomide. Originally employed as a tranquiliser, it was found to reduce the effects of morning sickness in pregnant women, so it was then prescribed for that condition. This was done despite that fact that the drug had not been tested for its effects during pregnancy. The assumption (hubris) was made that it was safe. However, it turned out that the drug caused significant numbers of children to be born with substantial physical impairments. This led to the use of the drug being banned in pregnancy and for that purpose. In both cases solving one problem caused another more major one, an example of the law of unintended consequences.

A more up-to-date example of potential hubris is the proposed use of geoengineering to overcome the problem and impact of human-induced climate change.<sup>28</sup> The consequences of the various solutions proposed are unclear and some are potentially disastrous. The safest answer to amelio-

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25 Hubris being defined as arrogance or over-confidence that is likely to result in disaster or ruin.

26 Subtitled *The modern Prometheus* – Prometheus being a figure from classical mythology who stole fire from the gods and suffered punishment for it, thus becoming an example of someone who overreached himself.

27 [http://www.nobelprize.org/nobel\\_prizes/medicine/laureates/1948/](http://www.nobelprize.org/nobel_prizes/medicine/laureates/1948/) – accessed 04-06-12.

28 See the Royal Society report on *Geoengineering the climate: science, governance and uncertainty*, Royal Society, London, 82pp, 2009. An alternative terminology that perhaps emphasizes human limitations with respect to geoengineering is "planet hacking." Of course, such terminology is emotive, but rhetorically effective.

rating human-induced climate change is to cut back human emissions of greenhouse gases, but perhaps this is a solution that Western society finds hard to accept.<sup>29</sup>

Perhaps the most recent ‘Frankenstein-like’ example is the whole question of so-called ‘human moral enhancement’ by biomedical or genetic means.<sup>30</sup> This is the idea that people can be made to behave more morally by the use of drugs or through genetic engineering.<sup>31</sup> This is not yet feasible practically, though the enhancement of cognitive facilities through drugs is being seriously looked at and this too raises issues of hubris and unintended consequences.<sup>32</sup> Some of the discussion of such possibilities suggests a lack of humility, based on an underlying assumption that we (humans) can make ourselves morally ‘better’. Of course, this raises the question of whose morality and so on, which I will not pursue here.<sup>33</sup>

These examples<sup>34</sup> serve to underline that the confidence that scientists sometimes have in their solutions to particular problems can be significantly misplaced and, worse still, that the unintended consequences of that confidence can be severe. However, overall the temptations facing most scientists are usually on the level of the day-to-day kind noted above, rather than the more major dangers of hubris. Nevertheless, humility is a good antidote to the dangers of hubris too.

### **The virtue of humility**

At the heart of the virtue of humility lies an apparent paradox – can you know that you are humble, if you truly are? Or, does knowledge of your own humility actually engender pride – its antithesis? Philosophers have addressed this and related issues in recent times, mainly from a non-Christian perspective.<sup>35</sup> I will not rehearse their arguments here, but will

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29 *ibid* Headline messages p.ix.

30 See, for example, Harris J. 2011 Moral enhancement and freedom, *Bioethics*, 25, 102-111 and Persson I. & Savulescu J. 2011 Getting moral enhancement right: the desirability of moral bioenhancement, *Bioethics*, published on-line, doi 10.1111/j.1467-8519.2011.01907.x

31 Somewhat tongue-in-cheek, one might suggest that we can engineer out the selfish gene.

32 See, for example, the exchange between Heinz A., Kipke R., Heimann H. & Wiesing U. 2012 Cognitive neuroenhancement: false assumptions in the ethical debate, *J Med Ethics*, 38:372-375 and Shaw D.M. 2012 Neuroenhancers, addiction and research ethics, *J Med Ethics*, doi:10.1136/medethics-2012-100616 on the potential addictive effects of neuroenhancing drugs and the ethical implications of researching and using them.

33 On which see MacIntyre 2007 *op. cit.*

34 Other examples might include: the provision of sophisticated and expensive technological solutions for the problems of the poorer peoples of the world, rather than simpler, cheaper and more sustainable ones – such as, the provision of tractors (prone to break down in harsh conditions and expensive to fix, even if spare parts are available) for ploughing, rather than oxen; or GM crops that do not produce seeds, forcing the poor farmer to be dependent on the multinational companies in order to buy seeds.

35 See, for example: Gracia J.L.A. 2006 Being unimpressed with ourselves: reconceiving hu-

pursue a Christian perspective on this issue. Kupfer<sup>36</sup> begins his paper by posing the question, 'Can a scientist discover DNA or the moons of Jupiter and retain her humility?' Richards<sup>37</sup> quotes Luther 'True humility, therefore, never knows that it is humble, as I have said; for if it knew this, it would turn proud from contemplation of so fine a virtue.' Rather than interact with the erudite discussion of philosophers on these points, I choose to focus on Jesus who exemplifies the virtue of humility for the Christian.

Two things are immediately apparent about Jesus; first, he knew who he was, what his mission was and was secure in his relationship with God (John 13: 1, 3); secondly, that self-knowledge did not prevent his being humble, as exemplified in his washing of the disciples' feet (John 13:3-17), and was the basis of his ability to express humility in this way. This shows that lowly acts of service did not pose a threat to Jesus's self identity and security (see Phil 2: 6-8). Thus, given Jesus's humanity, it seems possible to be aware of the gifts that God has given you and your achievements and yet retain your humility. This suggests that even if you are an outstanding scientist (to answer Kupfer's question above) then being humble is feasible, though continuous reliance on the Holy Spirit is required.<sup>38</sup> By walking in the Spirit (Gal. 5:16, 25) we do not fall prey to the traits of character that oppose the virtue of humility – arrogance, hubris, pride.<sup>39</sup>

Jesus's self-knowledge clearly extended to an awareness of his own humility (Matt. 11: 29 'for I am gentle and humble in heart'). Jesus both possessed true humility and knew that he was humble (*contra* Luther). Paul encourages the Romans (12: 3) by saying 'to every person among you not to think more highly of themselves than they ought to think; but to think so as to have sound judgment', which suggests that as Christians we should be able both to be humble and realistic about the gifts that God has given us.

The challenge is how to cultivate the virtue of humility. One thing that stands out from the examples of both Moses and Jesus is that they were focused not on themselves but on serving others and serving God. For the Christian it is not a question of trying to be humble, which is probably self-defeating due to the focus on self. Rather focusing on how to serve others and how to serve God, to the best of one's ability as a scientist,<sup>40</sup> seems the

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mility, *Philosophia*, 34, 417-435; Button M. 2005 "A monkish kind of virtue?" For and against humility, *Political theory*, 33, 840-868; Kupfer J. 2003 The moral perspective of humility, *Pacific Philosophical Quarterly*, 84, 249-269.

36 Kupfer *op. cit.* p.249; and references therein.

37 n.2 in Richards N. 1988, Is humility a virtue? *American Philosophical Quarterly*, 25, 253-259.

38 Just as reliance on the Spirit is necessary to manifest the Christ-like fruit of the Spirit (Gal. 5:22) – some aspects of which are also regarded as virtues.

39 Captured in Paul's phrase "...and the like" after listing many different acts of the sinful nature (Gal. 5:19-21).

40 Working as if for the Lord not men Col. 3:23-24.

path most likely to lead to true humility. Perhaps this is best summarised by Wright, who states, 'Is it paradoxical to say that cultivating virtue is a matter of looking away from yourself?'<sup>41</sup>

## **SET or SETH?**

In our society today there is a desire among scientists to promote science, engineering and technology, often denoted by the acronym SET. In the light of the above discussion, perhaps as Christians, who are also scientists, we should be promoting SETH – science, engineering, technology, and humility? Seth after all was the descendant of Adam who, unlike his elder brother Cain, did not resort to violence and misuse of the gifts God had given him (see Genesis 3 & 4). As we approach our research in a spirit of humility, exercising discernment as to how to use the scientific gifts God has given us to the benefit of others, we exhibit the character of God as revealed in Jesus, who came not to be served but to serve (Mark 10: 45).

What does this mean in practice for us as scientists? It is undoubtedly the case that any scientific ability that we possess is a gift from God (e.g. Rom. 12: 3, 6) and that any success that we achieve in our scientific career is an example of God's blessing in our lives (e.g. Gen. 39: 2-3, 21-23; 1 Sam. 18:14). Success leads to recognition by one's scientific peers and, in some areas of research, to public recognition too. The danger of such success is that we forget its origin is in God, a problem God's people have suffered from on a regular basis (and are warned about; Deut. 8: 17-18). This can lead to pride in our achievements, the very opposite of humility. Holding in tension a realistic acknowledgment of our God given abilities and achievements with the need to be humble is the challenge. How is this holding in tension to be achieved? First and foremost is the example of Jesus, we need to keep him in mind continually (Heb. 12: 2); secondly, we need to be open to being challenged by others about the existence of pride or arrogance in our lives (Eph. 5: 21; Prov. 27: 17); finally, we need to acknowledge our reliance on the Holy Spirit to live in this way (Gal. 5: 16, 22).

How might this work practically in our day-to-day lives as scientists? A first step might be to pray about our work and to discern, with the help of the Spirit, where we lack humility. A further step would be to take seriously any criticism of our behaviour as scientists or of our science, rather than reacting defensively. If we are senior scientists perhaps we need to encourage our Ph.D. student or post-doctoral researcher to be first author on the paper we are writing with them? In communicating our science, are people left with the impression of how clever we are or how interesting and exciting the science we are doing is? How do people feel at the end of a

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<sup>41</sup> Wright *op. cit.* p.176.

discussion with us on a scientific issue – belittled, intimidated or enlightened? How do we go about challenging the results or conclusions of other scientists that we might disagree with? Are we gracious and willing to admit they might be right and we might be wrong? These examples suffice to show that humility at the personal level is necessary.<sup>42</sup>

While at a personal level we might acknowledge the importance of the virtue of humility and seek to incorporate it into our work and lives as scientists, how does this relate to our wider role in society, such as in the areas of policy making or public good? Jesus spoke prophetically and was recognised as prophet (Matt. 21: 11; Luke 24: 19) and the church is to have a prophetic voice (Acts 2: 17-18),<sup>43</sup> so as scientists and Christians we too may need to speak out publicly in a ‘prophetic’ way. Based on our best understanding of the scientific evidence, we may need to question the wisdom of some policy decisions, if they have an element of hubris. Of course, this needs to be done with humility, if we hope to be heard, and there may be a cost to our reputation in speaking out. More positively, again based on scientific evidence, we may want to encourage government and policy makers to pursue a particular course of action for the public good, but we must be honest about any possible drawbacks of what we are proposing. This too requires humility.<sup>44</sup> Similarly we may need to speak to the church prophetically, in order to encourage it to take a prophetic stance.<sup>45</sup>

As noted above, there are plenty of examples of scientific arrogance, often stemming from the mistaken idea that we as scientists know best. Some scientists are tempted to look for a ‘quick fix’ scientific solution rather than, with humility, to accept that the solution they propose might be far worse than the problem. In the example of geoengineering discussed above, our understanding of the complex feedbacks in the Earth’s climate system is inadequate to predict with a reasonable degree of certainty the impacts of many (if not all) of the geoengineering solutions. Perhaps in seeking to care for God’s creation, as humans are mandated to do in Genesis 1 & 2, an approach based on humility, in addition to scientific understanding and engineering and technological expertise, may be the prerequisite? SETH rather than SET?

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42 Some other examples relating to personal humility are given in section 3 (above) and section 6 (below).

43 On Jesus as a prophet see Witherington B. 1999 *Jesus the seer*, Hendrickson Publishers Inc., Peabody, Mass. On the church as prophetic see Johnson L.T. 2011 *Prophetic Jesus, prophetic church*, William B. Eerdmans Publishing Co., Grand Rapids, Michigan.

44 There is an interesting case study that could be done on Daniel, as he operated at the highest levels of Babylonian political power, yet was able to speak prophetically to those in power. At times this was done with politeness (4:19ff), at other times very bluntly (5:17ff). Humility does not mean that we can’t be blunt.

45 One thinks of Sir John Houghton’s interactions with evangelicals in the United States on the issue of climate change; see Nature Special Report 2006 Church joins crusade over climate change, *Nature*, 440, 136-137; The man who preaches science, *Nature*, 440, 136.

## Conclusions and challenges

In some ways the points made in this brief paper may seem obvious, but I have rarely heard them raised in discussions of how Christians should behave in their professional lives as scientists. It seems to be assumed that either our Christian faith will automatically spill over into our professional lives, leading to ethical behaviour, or that the scientific world has its own ethical standards, which will be somehow inculcated into the practising scientist's behaviour. The former assumption is naïve, as sadly there is often a mismatch between how we as Christians behave in our professional lives (whether we are scientists or in other professions) and how we behave in a church setting. The latter assumption might once have been valid, when there was a common ethical standard originally based on Christian belief (at least in the Western world), but in our increasingly pluralistic and secular Western society any common ethical standard among scientists regarding behaviour seems to be eroding very quickly. This erosion is evidenced by the increasing numbers of scientific frauds and misdemeanours that are being reported, such as, falsification of results and plagiarism.<sup>46</sup> However, humility is beginning to be recognised as a potentially important virtue in leadership,<sup>47</sup> policy making<sup>48</sup> and in medicine,<sup>49</sup> so perhaps as scientists we need to give it similar recognition.

Developing the virtue of humility poses us a number of challenges in how we live as Christians and scientists in our interactions with other scientists in the scientific community:<sup>50</sup>

- are we prepared to admit that we might be wrong?
- do we speak the truth in love<sup>51</sup> or because we want to be proved right?
- are we more concerned with our own scientific success and recognition<sup>52</sup> than with maintaining good relationships with other scientists and forwarding scientific understanding together with them?

As a final challenge, consider the following (adapted) quotation:

*There are many who seek knowledge for the sake of knowledge: that is curiosity.*

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46 See, for example, Gewin V. 2012 Uncovering misconduct, *Nature*, 485, 137-139; and Steen 2012 *op. cit.*

47 See, for example, Collin J. 2001 Level 5 leadership: the triumph of humility and fierce resolve, *Harvard Business Review*, Jan. 2001, 67-76.

48 See, for example, Jasanoff S. 2007 Technologies of humility, *Nature*, 450, 33.

49 See, for example, Coulehan J. 2010 On humility, *Annals of Internal Medicine*, 153, 200-201.

50 I will not pursue here the parallels that could be drawn between the Christian community and the scientific one – they are numerous.

51 Eph. 4:15, 25.

52 Phil. 2:3.

*There are others who desire to know in order that they may themselves  
be known: that is vanity.  
But there are some who seek knowledge in order to serve and edify  
others: and that is humility.'*

Adapted from a saying of St Bernard of Clairvaux.<sup>53</sup>

### **Acknowledgements**

The thinking for this brief paper was stimulated by remarks made by Sir John Houghton FRS during a Christians in Science Central-South public lecture in Southampton in November 2007, when he spoke on: 'Global warming: a global challenge.'

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<sup>53</sup> The adaptation has been to replace the final word, which was love, with humility. Of course, from a Christian perspective the two are closely related as exemplified in Jesus. Unfortunately, I have been unable to locate the original source of this saying.