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Book review

The Language of God: a Scientist Presents Evidence for Belief
Francis Collins
New York: Free Press (Simon & Schuster), 2006

HUB ZWART

Francis Collins, director of the Human Genome Project (HGP), needs no further introduction I suppose. For more than a decade (from 1993 onwards) he has headed the HGP as director of the National Human Genome Research Institute (NHGRI) at the National Institutes of Health (NIH). One of the highlights in his career was the moment when, on June 26 2000, together with President Clinton and Craig Venter, he announced that the deciphering of the human genome was rapidly approaching its completion. On this occasion, Clinton stated that "today, we are learning the language in which God created life". In *The language of God*, Collins not only discloses the fact that he acted as Clinton's ghost-writer, urging the latter to include these lines (p.3), but he also explains his reasons for doing so. For him, DNA really *is* the language of God. The book is his "coming out", so to speak, as a Christian. For Collins, the famous announcement on June 26 of the year 2000 was not only a highlight in the history of the life sciences. It was also a moment of religious significance, a religious "celebration", an "occasion of worship".

Collins refers to the HGP project as "one of the most historic undertakings of mankind" (p.19). And indeed, in many ways, the HGP has become a model or paradigm for organizing large-scale research endeavours, notably in the life sciences. It was a highly visible program involving more than 2,000 researchers from various disciplines, working at twenty research institutes in 6 different countries. It was in many ways both a converging program (bringing together various lines and types of research) and an enabling program (constituting a starting point for many subsequent research endeavours). Its societal impact is bound to be substantial. Last but not least, the HGP constituted the birthplace, more or less, for what we nowadays call ELSA genomics research (research into ethical, legal and societal aspects as an integral part of major research enterprises). *The language of God* is an effort by one of its key players to put the HGP in a broader historical and philosophical perspective. What is the *meaning* of the HGP? In his book, Collins provides us with a religious version of an answer.

From the beginning, HGP has been regarded as an important step on the way to self-knowledge (γνώθι σεαυτόν). In his address at the White House, Collins cited the following lines, borrowed from Alexander Pope's *Essay on Man*: "Know then thyself, presume not God to scan / The proper study of mankind is man". In *The language of God* it becomes clear that for Collins, the quest for self-knowledge has a religious dimension. The HGP is an important step in the process of religious self-enlightenment. The human genome contains important clues concerning our past and future. Collins sets out to explain, moreover, that in his view, a scientific and a religious world-view are perfectly compatible.[1] Notably in the U.S.A., this is not an

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obvious view today, as scientific and religious views tend to conflict over issues such as evolution. Collins deeply deplores this fact, and an important reason for writing his book was his desire to show that intermediate positions are tenable. Although the debate tends to be dominated by "high decibel pronouncements of those who occupy the poles of the debate" (p.4), Collins reminds his readers that, according to surveys, something like 40 percent of all individuals involved in scientific research regard themselves as believers, a number that has remained remarkably stable during recent decades (p.4). The book is structured as an autobiographical account, describing the stepwise conversion of Collins from a more or less agnostic position (with no strong opinions on religious matters), to Christianity. The greater part of the book is devoted to three key issues: (a) evolution, (b) the openness of human beings to what he refers to as the Moral Law and (c) the special status of the DNA code. I will start with the latter.

Genomics Divine

It is remarkable, from the outset, how Collins regards the human DNA code more or less as sacred Scripture. He sees the human genome as "the book written in the DNA language by which God spoke life into being" (p.123). For Collins, the experience of sequencing the human genome, "uncovering this most remarkable of all texts, was both a stunning scientific achievement and an occasion of worship". The human genome, he assures us, is our "instruction book" (p.111). It is the "parts list" for human biology, the "most wonderful textbook of medicine". Moreover, it cannot be the outcome of anonymous natural processes only: "DNA…seems an utterly improbable molecule to have 'just happened'" (p.91). Indeed, Collins confesses that he is "in awe of this molecule" (p.102). He regards the digital elegance of DNA as "deeply satisfying" (p.107). The human genome (the text of texts as it were) is compared, on various occasions (and through overtly religious word-play) to the Scriptures. But how can such an understanding of the human genome concord with a scientific view on life? In order to answer this question, Collins first of all joins the debate over evolution.

Theistic evolution

From the outset Collins makes it clear that, in the context of this debate, he unequivocally sides with the Darwinian point of view, rejecting creationism. According to Collins, Darwin's framework of variation and natural selection is "unquestionably correct". Indeed, "nothing in biology makes sense except in the light of evolution" (p.141). He agrees that there is an overwhelming weight of data supporting this view. At the same time he seems to suggest that, on two or three occasions, God did intervene. He was involved in the Big Bang in such a way that he assured that, on our planet at least, conditions would allow for the emergence of life. Subsequently, he was somehow present when, in an early stage in the history of life, DNA emerged. Yet, once the process of genetic development began to evolve, there were no further interventions. For Collins, the process of evolution itself permits the development of natural diversity and complexity, and humans are part of this process. Yet, humans are also unique. Some 100,000 years ago something extraordinary happened: mankind emerged, the only living beings that are really open to the Moral Law, the awareness of right and wrong, the voice of conscience. According to Collins,

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this openness to the Moral Law, this experience of being summoned or called, is without precedent in nature. God somehow anticipated this. Evolution somehow prepared human beings for this event, the dawning of conscience. In this manner, Collins tries to maintain an intermediary position between godless evolutionism on the one hand and creationism and the Intelligent Design theory on the other.

Yet, such a position seems to raise more questions than it answers. At crucial moments in his book, Collins tends to be somewhat vague. To the extent that his theory is *almost* identical with evolutionism, God seems abundant. And to the extent that God somehow *is* involved, it is not so clear to what extent "theistic evolution", as he calls it, really differs from an Intelligent Design perspective. Collins replies more or less come down to the following. The starting point for developing a religious worldview is not DNA or life as such, but rather the susceptibility of human beings to moral experience. Evidence for the existence of God is not found in evolution. In principle, it can be seen as a completely autonomous process. There is no argument from design. Evidence for the existence of God comes from our openness to the Moral Law. It is only *subsequently* that the question emerges how this experience can be harmonized in a convincing manner with the facts of evolution and a scientific worldview.

A Scientific Calling

This concept of our openness to the Moral Law is fleshed out in Collins's book in an autobiographical manner. In 1992, James Watson stepped down as the first director of the HGP after a conflict over valorisation (Watson was rigidly opposed to the idea of patenting genes) and Collins was invited to become his successor. The latter was taken completely by surprise. He found the idea of being entrusted with the task of leading such a complicated research endeavour as absurd. It seemed much too big for him, something far beyond his capacities and abilities. But then, he had his second thoughts. Could it be a divine assignment, a moment of calling? Could it be that this was "one of those moments where I was somehow being called to take on a larger role in a project that would have profound consequences for our understanding of ourselves? Here was a chance to read the language of God, to determine the intimate details of how humans had come to be" (p.118/119). Collins describes how, in November 1992, he spent a long afternoon praying in a little chapel, seeking guidance about this decision. During those hours, "ending in an evensong service that I had not expected, a peace settled over me. A few days later, I accepted the offer" (p. 119). In other words, it is through moral experiences of this kind that the presence of God manifests itself to us. God is not obviously present in the universe. On the contrary, inserting the existence of God into a scientific worldview is a difficult task, but, according to Collins, not an impossible one.

Short stories

A difficult question, notably for a biologist like Collins, is the extent to which the uniqueness of human beings, their openness to the moral dimension of life, their ability to make existential decisions, is reflected in their genome, their "instruction book." It is in this precise respect that the results of the HGP seemed highly disappointing at first. Notably, Collins addresses the issue of the disappointingly small

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number of protein-coding genes in the human genome. In the course of the HGP, estimates of the number of genes in the human genome gradually decreased from ~100,000 or even ~140.000 genes in 1989 to ~40.000 genes (2000), ~36.000 genes (2002) and finally ~22.500 genes (2004). Indeed, Collins acknowledges that "many of us were stunned to discover that God writes such *short stories* about humankind" (p. 125, my italics). The number seems especially disappointing on comparison with other (apparently much less complex) model organisms such as *Drosophila* (~14.000 genes), *C. Elegans* (~19.000 genes) and *Arabidopsis thaliana* (~25.000 genes). Indeed, Collins notes, "some observers have taken this as a real *insult* to human complexity" (p.125, my italics). The human genome seems to contain no indication whatsoever of the uniqueness of mankind. Collins's reply to this objection is concise, but telling. It is a personal version of an argument that emerges more often in deliberations over whether it is reasonable to endorse a religious worldview, namely the "And yet" argument. And yet, we are special. The number of genes in our genome may be surprisingly small, he argues, but certainly, "no other organism has sequenced its own genome!" (p.125). Let me place this answer in a somewhat broader perspective.

The HGP as a narcissistic offence

The HGP is not the first scientific event that forces us to revise our self-image as human beings in the face of unexpected scientific findings. As Sigmund Freud has argued in *Eine Schwierigkeit der Psychoanalayse*[2] all scientific revolutions (or "disruptions" as Collins calls them, p.59) will entail narcissistic offences: they challenge self-indulgent understandings of ourselves. The Copernican revolution made it clear that we do not occupy a solid and central position in the universe, but live on a lonely, blue planet floating around in godless, silent and infinite immensities. The Darwinian revolution showed that, biologically speaking, we are not a special kind of entity, but simply a species among others, the outcome of a process of evolution that will continue to shape and change us. One could argue that the HGP entails yet another narcissistic offence: our genome is not that different compared to other species.

At the same time it is clear that there is another side to the story. In the case of the Copernican revolution, for example, although we were forced to abandon our position at the centre of the universe, we received something in return. Heliocentrism reinforces the uniqueness of our position as an *epistemological subject* that is unraveling the structure of the universe in all its astronomical complexities. And in this sense we are special. Whereas other species seem to know nothing at all about heliocentrism and remain confined in the closed world of immediate sense perceptions, human beings have the ability to challenge appearances and flesh out rival theories about the world. Thus, our narcissistic self-image is replaced by something much more fascinating and promising, namely our position (without precedent) as an epistemological subject. The same goes more or less for evolution. Although evolution theory reveals that we are merely one species among others, our uniqueness is at the same time reinforced. We are the only species able and willing to formulate questions concerning our descent, our biological past and future. This uniqueness is not an "eternal" metaphysical one. On the contrary: in principle it is perfectly possible that, if evolution continues, other species (primates for example)

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may develop their own pathways towards a more intellectual understanding of the world. And even dinosaurs would perhaps have evolved into more intelligent beings had they not become extinct sixty-five million years ago. So far, however, we seem to stand alone in this respect and our epistemological performance remains without precedent.

The same argument applies to the human genome project. It challenges our narcissistic self-image (as it expressed itself for instance in our biased estimates concerning the number of protein-coding genes), but at the same time the HGP reinforces our unique position as the only species that is able and willing to sequence its genome, another step on our evolving pathway towards increased self-knowledge. To put it somewhat paradoxically: we are unique precisely *because* we are the only living beings that can be offended. Human beings occupy a position of openness towards the world, an openness that allows us to address epistemological issues and to challenge appearances. Our privilege is not the metaphysical privilege of occupying a central position, as the τελος of creation. Rather, it is the epistemological privilege of being intellectually challenged and offended.

Collins's comments on the HGP fit with a broader discourse. A similar position was taken by Pierre Teilhard de Chardin, for example, a French author (once highly influential, but now more or less forgotten), a scientist and, moreover, a priest. In his book *The Human Phenomenon*[3], he argued that, while geological and anthropological findings may urge us to question some of our self-indulgent beliefs, they simultaneously reinforce the idea that we are involved in a unique process of self-enlightenment, and encourage us to continue in this direction.

According to Kant, the whole of creation would be a mere wilderness without human beings. We are the entities that give it a meaning, so to speak. We should not read this, however, in a narcissistic fashion. We are not the centre or final goal of natural development as such. Indeed, Carl Sagan is certainly right: we have not been given the lead in the cosmic drama. It began to evolve long before human beings emerged and will continue to develop long after we have disappeared.[4] Still, it is our strange privilege that we *know* this. It is our unique possibility to be open to such an insight. We have the unique ability to adapt our self-images to science-based discoveries and disclosures. This epistemological privilege is not something that should make us self-indulgent. Rather, it is something like an epistemological responsibility or calling.

As Collins phrases it, "the comparison of chimp and human sequences, interesting as it is, does not tell us what it means to be human. DNA sequence alone will never explain certain special human attributes, such as knowledge of the Moral Law and the universal search for God". His book demonstrates, however, that our uniqueness also resides in our epistemological sensitivity: a will to knowledge, a willingness to accept and understand the significance of narcissistic offences.

What is somewhat neglected in Collins book, however, is the importance of cultural and historical factors in the process of anthropogenesis (the process of becoming human). As a biologist and geneticist, he tends to focus on human DNA as our "instruction book". But although our evolution as a biological species has more or less prepared us for this event, the emergence of the spiritual dimension in human

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existence was an event that took place through our cultural and technological evolutions, as complementary pathways to our biological evolution. Epistemology and morality is evolving in our minds and in our cultural networks, rather than in our genomes.

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[1] Several key players in the history of genetics were religious persons, starting with Mendel, an abbot and a priest who never seems to have felt any basic differences between science and religion, who functioned both as a scientist and as a priest apparently without conflict. The monastery in which he spent his adult life was a research department hosting various prominent scholars. He belonged to an order that regarded research - even experimental research - as a perfectly legitimate vocation for a priest.

[2] Sigmund Freud. 1917/1947. Eine Schwierigkeit der Psychoanalyse. Gesammelte Werke XII. London: Imago: 3-12.

[3] Pierre Teilhard de Chardin. 1955. Le phénomène humain. Paris: Seuil.

[4] Carl Sagan. 1994. Pale Blue Dot. A Vision of the Human Future in space. New York: Ballantine Books.

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