Christianity and the Cosmos*

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I. Life on 'Exoplanets' ?

'God', as the late Herbert McCabe OP used to say, is simply the answer to: 'How come there is anything out there, rather than nothing?' This being so, it matters a good deal to know what there is out there. For we now know that the world the New Testament thought God had made has never existed.

Let me explain. What Paul (and the other New Testament writers) thought God had made was a world of which this earth was the centre.[1] It was probably a sphere, but was anyhow the focus of everything.[2] The moon went round it in a perfect circle, but with a constantly changing face. The planets Mercury, Venus, Mars, Jupiter and Saturn also went round it, but wandered in complicated circles within circles. (These five were the only known planets[3]) Finally the sun also went round the earth, in another circle. But the sun was different. It had never undergone any change, and never would: for it was not made of the same stuff as the earth, moon and planets. Like the stars, it was made of utterly unchangeable material, although it could cause changes on earth. For example, while it was not itself hot it made things on earth hot; and while it was not alive, it made things on earth come to life.[4]

This then was the universe that Christ was to be King of (as Colossians Chapter 1:15–20 says). But it has never existed. The truth is that the earth is a tiny, apparently insignificant speck that goes round a very ordinary object, the sun; which is only one of something like a hundred billion stars in the Milky Way, many of

* Las Casas Lecture, Blackfriars, Oxford, 24.11.04 (abridged).

[1] I am assuming here that the New Testament writers shared the general acceptance of what later became known as the 'ptolemaic' conception of the universe. For a brief readable account of this see Simon Singh *The Big Bang* (London, Harper Collins, 2004) pp. 24–33.

[2] Singh describes how a few Greek mathematicians thought differently, see op.cit. pp. 10–20.

[3] Uranus was discovered by Hershel in 1781, Neptune by Couch-Adams and Leverrier in 1846 and Pluto by Tombaugh in 1930.

[4] This is a point made by Aquinas in his presentation of his third argument for God's existence, in *Summa Theologiae* Ia, Q. 13 Art 5:1. See also Peter Geach in *Philosophical Quarterly* July 1970 pp. 311–12, reviewing Anthony Kenny's *The Five Ways* (Routledge and Kegan Paul, London, 1969).

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https://doi.org/10.1111/j.0028-4289.2005.00113.x Published online by Cambridge University Press

which are far bigger and more impressive that the sun is. What is worse, from Paul's point of view, the sun is not the unchanging source of the changes that happen on earth. On the contrary it is itself in a constant process of flux. The only thing that stops it from exploding, and completely destroying us, is the gravity of its own unimaginably enormous (but cosmologically very average) mass, perpetually stifling its otherwise explosive potential. For it is just a great big hydrogen bomb, made of the same stuff that everything else in the universe is made of: 99.9% hydrogen and helium.[5] Worse still, for the New Testament writers, the Milky Way, which is all of the universe the ancients could see, is only one out of something like one-hundred billion galaxies. All of these are made up of stars roughly like ours, plus a lot of 'dark matter' that theorists tell us must exist to account for the total mass of 'creation'. Some of these stars, many of them with planets round them, are already dead or dying. Others are waiting to be born billions of years in the future. But one thing is certain: nothing stands still in the world that actually exists. And in a few billion years, if we have not already blown ourselves to smithereens with our own hydrogen bombs, the sun will do the job for us, as it puffs itself up into a red giant like Betelgeuse, killing the inner planets like ours without a second thought.

Yet the world had a beginning, in a 'big bang', about fifteen billion years ago. But that beginning must not be understood as an event in time, since it initiated time as well as matter. Inevitably therefore, its cause, namely God, is completely outside the dimension of time. No events can happen in or to God.

Last June's transit of Venus blocked out some of the sun's light. This is just the most accessible example of a phenomenon which occurs all over our galaxy. Stars have their light regularly diminished because planets pass in front of them. In 2002 astronomers from Warsaw announced 46 transits, after having observed thousands of stars close to the centre of our galaxy.[6] By April of this year astronomers were able to claim, with a high degree of confidence, that there exist more than one hundred planetary systems in our galaxy, containing 120 planets.[7] By October 22nd 2004 the tally had risen to 117 systems, with a total of 133 planets.[8] God knows how many others there are altogether. There could be millions.[9]

[5] Singh, op. cit. p. 284.

[6] Michel Mayor and Pierre-Yves Frei, *New Worlds in the Cosmos: the Discovery of Exoplanets*, (Cambridge University Press, 2003) p. 192.

[7] Royal Astronomical Society press release, 1st. April 2004. By 19th February 2005 the total had risen to 145 (www.universetoday.com 19.2.05).

[8] www.obspm.fr/encycl/catalog.html.

[9] Martin Rees, *Our Final Century* (London, Arrow Books, 2004) says so on p. 159. But on the next page he gives a number more in line with what was said immediately above.

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Most of them seemed to be gas giants like Jupiter. But an April press release from the Royal Astronomical Society said that computer simulations pointed to the likelihood of rocky planets like the earth in some of these systems. A proportion of these 'exoplanets' would be in 'habitable zones' where there could be liquid water, carbon and the other basic necessities of life. More recent research with instruments able to study the composition of the dust discs round young stars has shown that 'planets of the terrestrial (rocky) type like the Earth are most probably quite common in planetary systems'. Furthermore, they are not recent additions, but have been there from the very beginning of such systems.[10]

Given the one hundred billion stars in the Milky Way, the chances must be that there are huge numbers of planetary systems in our galaxy. And that is only the number in our little corner of the universe: think of the billions of galaxies that exist out there beyond our private parking lot! And the billions of stars in each of those![11] The implications of these facts are mind-boggling not just to scientists but also, I hope, to theologians. Statistically-speaking it must be possible, perhaps probable that in some other places in the cosmos, God has loved into existence living species somewhat like us: with conscious intelligence, language, rationality and emotions. If it has happened on the earth it can surely have happened elsewhere.[12] Yet most theologians still talk, like St. Paul, as if we were the centre of everything, and that our human concerns were all that mattered to them.

II. Christianity and the Cosmos

Does it matter that they are wrong? What would be the theological implications of intelligent life on other planets, in other parts of the cosmos? Well, we have to begin with the *cosmic* reality of sin. Sin is not just what we do: it is what we are. Sin is the description of our disordered relation to the God who made the heaven and the earth, visible and invisible. It is the disorder Jesus came to unravel, letting us out of its snare. Now if intelligent language-users exist on other planets, it seems to me they must also share our need to be 'saved'. St. Paul implies as much in the passage from Colossians that I mentioned earlier. The Jerusalem bible explains Paul's poem as meaning a) that Christ is 'the head of creation, of all that exists naturally', and b) 'is head of the new creation, and of all that exists supernaturally

[10] *Ingredients are There to Make Rocky Planets*, from *Universe Today #962: Space News from Around the Internet* (25.11.04 on *www.universetoday.com*).

[11] For the numbers see Simon Singh, *Big Bang* (London and New York, Fourth Estate, 2004) p. 3.

[12] Mayor and Frei, pp. 209–10.

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through having been saved'.[13] So what we have thought of as exclusive to us, the 'sin of the world', now needs to be put into a much larger context; something on the scale of the rebellion of the Angels which Milton depicts in *Paradise Lost*. For example, in Book X of that poem, Milton makes much of the widespread myth that the tilting of our planet's axis, away from its supposedly 'perfect' position at right angles to its orbit round the sun, is a result of our original sin. In a perfect, sinless world the planets would all spin upright. (Milton didn't know about Uranus, which spins flat on its back). Sin spoils this perfect geometry. So he supposes that following the fall of Adam and Eve, God commands his angels to 're-constitute' the otherwise orderly cosmos so that its imperfections can mirror those of our own.

> Some say he bid his Angels turn ascanse
> The Poles of Earth twice ten degrees and more
> From the Suns axle; they with labour push'd
> Oblique the Centric Globe . . .[14]

Of course today we know that the tilt of earth's rotation (and that of other planets) is the result of the many collisions with 'planetisimals' during the 100-million years when the main planets had become large enough for their gravity to attract the many bits of debris which had been left over from the original formation of the solar system. Furthermore, if it weren't for the moon, the earth's tilt might be even greater, and more unstable than it is.[15]

Despite all this, however, Milton (and his sources) certainly had a point. Sin is a cosmic matter. So it would be quite understandable for theologians to suggest that the earth's benevolent tilt, combined with the moon's gravity, is part of what Robert Murray SJ calls the 'cosmic covenant' between God and ourselves. On the other hand, at the micro level of matter and its interactions, which leads to the production of stars, gas-clouds and galaxies, things seem far from benign. Stars die, sometimes even as we watch, or new ones are born in the nebulae we can see. And presumably planets die or are born with them, together with the life (if any) that exists upon them. Yet perhaps at the same time (whatever that means in relativity terms) other kinds of intelligent life will be born on other planets, round other stars. For the birth of new stars is today a routine astronomical observation. How can we cope theologically with all this?

[13] Jerusalem Bible (London, Darton, Longman and Todd, 1966), Colossians, p. 345, note e.
[14] *Paradise Lost*, Book X, ll. 668ff.
[15] Mayor and Frei, p. 22.

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III. The Cosmic Covenant and the Angels

A long time ago I suggested that the 'cosmic covenant' might require resuscitation of the concept of angels.[16] Can we envisage a new development of this belief, now seeing them as God's means of instantaneous communication between language-users living in different parts of the cosmos?[17] Is it possible that the development of modern cosmology requires us to look further into this idea? For there is something queer, perhaps even self-contradictory, in the idea of a universal Christ saving a cosmic community of intelligent beings who can never be in communication with each other.[18] Does the idea of such a 'community' even make sense if mutual communication is impossible? Could there be a multitude of rational species dotted about the cosmos, utterly unable to make any sort of contact with each other, even though somehow the Christian truth has been set out as much for them as it has for us on earth? And think of the time problem. There are probably lots of such species which have not begun to evolve at all: their mother stars, let alone the planets on which they are destined to evolve out of the slime, have not yet begun to form from the gaseous clouds which we can detect through our telescopes.[19] How can Christ's work have meaning for those who do not yet exist, but will probably do so in a few thousand million years from now? What sort of sense can be made of communication between species separated by billions of years during which they will have been born, lived and died in some stellar conflagration?

Even more disturbing is the idea of the 'parousia' or second coming. This second coming of Christ has already been indefinitely postponed, as compared with the expectations of imminence which the New Testament writers mostly shared. But a postponement for (say)

[16] Brian Wicker, *The Story-Shaped World* (London, Athlone Press, 1975) Chap. 3 passim.

[17] 'For angels to change place takes time: continuous time for continuous movements, discontinuous for discontinuous movements. But not the time that measures the rotation of the heavens and all the bodily changes that result from it. In discontinuous movement, the angel is now here now there with no time-interval between'. Aquinas, *Summa Theologiae* Ia Q. 53 Art 3 in the concise translation edited by Timothy McDermott (London, Eyre and Spottiswoode, 1989) p. 96.

[18] Recent research suggests that even if intelligent beings from outside the solar system were trying to communicate with us by radio, their signals would probably be indistinguishable from the radiation ordinarily given out by stars. See *Universe Today #965: Would we mistake signals from ET?*.

[19] A very young galaxy, 1 Zwicky 18, only 500 millions years old (the Milky Way is about 12 billion years old) has recently been discovered. It will provide information about the way stars formed, and are still forming, out of clouds of hydrogen and helium. (*Universe Today #964*, 01.12.04). This issue of The Universe Today also reports the discovery of a 'cool accretion disc' round Vega (one of the brightest stars in the sky), suggesting the beginning of a solar system round that star.

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another few billion years, long after the earth has been swallowed up by the exploding sun, is a different thing altogether. What does it mean, this second coming, if and when we look at the doctrine in modern cosmological terms? Does it make sense?

True, the Christ-event, including of course the Eucharistic event, is more than a premonition: it is literally the beginning of the end. The 'eschaton' is already with us, if we can only grasp it. But I am not sure how much this picture of the second coming helps when we think of all those species of sinners, past present and future, which the cosmos may contain. How does the Christ who is God touch cosmic time? What does this idea of the fulfilment of all things at the end mean in the context of a cosmos created by God at the Big Bang and then allowed to spawn huge numbers of intelligent species quite unable to see, hear or speak to each other?

Equally problematic is the belief in the resurrection of the body. Herbert McCabe thought that if, *per impossibile*, the body of Jesus were found to have rotted away in Palestine this would put paid to the concept of resurrection.[20] If he was right, does this belief not raise the question of *where* His resurrected body is in cosmic space? What does this tell us about space-time? Can the doctrine make sense in the cosmos of Einstein and Hawking?

Finally, there are problems about 'natural rights'. Science fiction has commonly supposed that the aliens on other planets, if they exist, are somewhat like (say) the 'Indians' of Mexico or Peru as encountered by the Spanish *conquistadors*: that is, they are natural 'barbarians' incapable of civilised, let alone Christian existence. Just as the Spanish imperialists claimed to be entitled to wage 'just wars' of subjugation or even annihilation against the Indians, much science fiction is about similar wars fought by human beings against aliens. These Spanish imperialist claims were the targets of Las Casas's long campaign on behalf of the 'natural rights' of the Indians.[21] Similarly, may we not find ourselves having to wage a campaign on behalf of the natural rights of those living on other planets if we are to bring them into the sphere of Christian redemption?

I don't have answers to these mind-boggling questions. Perhaps nobody has, or can have. But I think they are questions we have to ponder if we are to understand God's purposes for us, and for the world as we are beginning to discover it. We have to be ready to consider dealing not just with a huge expansion of what it means to be part of the human world, but with a dramatic revision

[20] Herbert McCabe OP, *God Matters* (London, Geoffrey Chapman, 1987) p. 69.
[21] See Roger Ruston, *Human Rights and the Image of God* (SCM Press, London, 2004) passim.

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of what it means to be alive at all, and thus to be in need of redemption.

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