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acts inspired by the Jubilee cannot be announced and brought about except by the Jubilee community.

What does the Jubilee mean today? Perhaps we can summarize like this: it is to live *believing* in the Lord of the Jubilee, to live *acting* in the spirit of the Jubilee and to *live* with a Jubilee perspective.

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A New Immortality?

Brian Edgar

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One of the theological challenges of the twentieth century has been to respond to those issues relating to the *creation* of human life. Whether theology has adequately met the challenge or not, birth control and enhancement techniques must rank as one of the major social developments of the century. The contraceptive pill and abortion have had an enormous impact on social structures, family relations, female and male roles, sexual attitudes, work patterns and global economics. Birth enhancement techniques, including the various reproductive technologies, in vitro fertilisation, genetic engineering, cloning, genetic screening and gene therapy are set to have a similar impact. All of these developments require a theological understanding of the nature of the person and of the way in which humanity reflects the image of God both individually and socially and it is probable that the twenty first century will not see any easing of the imperative to describe the nature of the human person in theological terms. In fact, it is more likely that an even more intense scrutiny of theoanthropology[1] (the theology of the human person) will be needed due to developments concerning the *extension* and then the *ending* of human life. This will come about because of the probability that we are soon to be presented with the prospect of medical technology, known as telomere therapy, which will enable human life to be extended by hundreds of years and perhaps indefinitely. This paper will focus on the theological implications for the understanding of immortality in the context of this possible development in the third millennium.

[1] 1. Theoanthropology is simply a conflation of 'theological anthropology'. It is a convenient way of referring to the theological understanding of humanity which avoids the non-inclusiveness of 'doctrine of man' and the absence of convenient nouns and adjectives relating to the 'doctrine of humanity'. It is, of course, possible to use 'anthropology' and 'anthropological' but these refer to the study of humanity in the widest possible sense and when used without qualification are usually taken to refer to what is more properly called 'cultural anthropology'.

TELOMERE THERAPY[2]

It is a serious possibility that telomere therapy will be available for extending the life span between 2005 and 2015.[3] The technology involved goes beyond attempting to establish optimum standards of good health in order to achieve greater longevity, and well beyond attempts to eliminate individual diseases. Telomere therapy is aimed at investigating and manipulating the most fundamental aging mechanisms of the human body so that there can be an almost unlimited extension of human life. One of the simplest ways for anyone to gauge the social significance of such a discovery is to ask happily married people what they think it would be like to be married 'till death us do part' if both partners are going to live four hundred years. There are enough significant implications for career and work patterns, global population, marriage and family structures and social relationships to guarantee a large-scale social transformation.

The various component organs of the body have different cells which function in a variety of ways according to the needs of the particular organ and they reproduce themselves at different rates. The life of the whole organism is longer than that of any of the individual cells of the body but the life span of the organism as a whole is restricted if the various organs are not able to reproduce cells. Until the early 1960s it was generally assumed that cells could, theoretically, perpetually reproduce themselves and that the failure of cells to do so was simply the result of an accumulation of degenerating conditions. In 1961 Leonard Hayflick and Paul Moorhead demonstrated the falsity of this and showed that even under optimal conditions cells would reproduce only a finite number of times.[4] Each cell type has its own reproductive limit, now known as the Hayflick limit. Some cells however, do not seem to have this limitation. The very problem with cancer cells is that they reproduce indefinitely, to the point where the sheer number of cells overwhelms the normal functioning of the host. If the processes which control this can be discovered and manipulated might it not be possible to find a way to cause cancer cells to reach a reproductive limit and also to persuade normal bodily cells to reproduce indefinitely and thus extend the lifespan of the organism as a whole?

Telomeres are structures found at the ends of eukaryotic linear chromosomes and consist of thousands of tandem repeats of the DNA sequence TTAGGG. These terminal repeats are highly conserved among all vertebrates. Every time a cell divides the chromosome is duplicated and its telomeres get shorter. In 1986 Howard Cooke of the Medical Research Council in Edinburgh noticed that telomeres in reproductive cells were longer than those in shorter lived somatic cells such as those found in skin and muscle. Most normal somatic cells have Hayflick limits which are comparable but some cells, including the reproductive cells, need to divide more than would normally be the case. Cooke speculated that the somatic cells might not be able to make an enzyme to repair their telomeres and that this would account for their reaching their Hayflick limit after less replications than reproductive cells. And it seems that he is right—it is likely that the telomeres are the molecular clock that triggers replicative senescence. Once a threshold number of TTAGGG repeats is reached cells become unable to divide. Some cells, however, produce an enzyme called telomerase which rebuilds and maintains the telomeres and thus extends their replicative life. Telomerase has now been found in a number of classes

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[2] 2. Acknowledgment is made of the assistance of Edmund Sim of the University of Queensland who read the paper and made valuable suggestions regarding some of the scientific details.

[3] 3. M. Fossel, *Reversing Human Aging* (New York: William Morrow and Co., 1996), p. 222.

[4] 4. L. Hayflick and P.S. Moorhead, *Experimental Cell Research*, 25, pp. 585–621.

of normal cells (including, stem cells, gonadal germ cells, skin fibroblast cells) and all of them are cells with a high turnover rate or which are in a continuously replicating pool of differentiating cells. It seems that an extended replicative life is made possible by the presence of telomerese. It is also significant that the level of telomerase in these cells is still significantly less than that found in cancer cells which are virtually 'immortal'.[5]

In 1998 several studies were conducted in which human cells were cloned. Some were telomerase negative and they exhibited telomere shortening and normal cell senescence. In one study those cells which were telomerase positive exhibited both elongated telomeres and delayed senescence, exceeding their normal life span by at least 20 doublings, thus indicating that perhaps telomere loss is the intrinsic timing mechanism in human cells. To be able to treat human cells with telomerase in this way is thus a significant step forward not only in the search for significantly extended life span but also, more immediately, in the treatment of certain aging problems including atrophy of the skin, muscular degeneration, atherosclerosis.[6] Down's syndrome and failed bone marrow transplants could also benefit from telomerase treatment[7] and it may be an answer for those with Hutchinson-Gilford syndrome[8] who have an average life-span of 12.7 years (and, significantly, skin fibroblasts with telomere lengths characteristic of cells from far older patients.[9])

The role of the telomeres in this is only one part of a broader theory. Human aging is controlled by gene expression and operates though free radical damage to the cell. Senescent cells have altered function (through gene expression changes such as altered patterns of collagen production) and increased damage (as a result of poorer control of free radical metabolism). Such senescent cells introduce dysfunction at the cell and organ levels of operation. Altogether, the process is a complex picture of senescent gene expression regulated by telomeres and the telomeres are only one part of the picture. They are, though, the part of the process which has had the focus. Fossel says that 'shortly after the year 2000 telomere therapy will be available for treating cancer and telomere therapy will be available for extending your life span between 2005 and 2015'.[10]

This is not to say that even the greatest success with telomere therapy would eliminate death. Even if this scenario turns out to be right people will still be able to wear out and die and no one will be immune from other diseases and accidents. Perhaps talking in terms of an indefinite lifespan is more accurate as it leaves open the question of the ultimate human life expectancy.

Even though in relatively recent times there have been significant changes to mortality rates it seems that over the past forty thousand years at least there has not been any significant change in potential life span. The fact that no Neanderthal skeletal remains have been discovered which give any indication of a life span of more than thirty or forty years simply indicates that this was the maximum possible given the very significant

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[5] 5. W. Wright, M. Piatszek, M. Rainey, W. Byrd, J. Shay, *Developmental Genetics* 18, pp. 173–179.

[6] 6. A. Bodnar et al, 'Extension of Life-span by Introduction of Telomerase into Normal Human Cells', *Science*, (January 16 1998), pp. 349ff.

[7] 7. L. DeFrancesco, 'Looking into longevity with telomere detection kits', *The Scientist*, Vol. 12:7 (March 30 1998).

[8] 8. Juvenile progeria—an aging disorder.

[9] 9. M. Fossel, Senescent Gene expression, telomeres and aging, http://faculty.ucr.edu/~browley/telomere.htm.

[10] 10. Fossel, *Reversing Human Aging*, p. 222.

environmental dangers that were faced. Even two to three thousand years ago, environmental conditions meant that the average life expectancy was low, but evidence from ancient Egyptian, Hebrew, Greek and other cultures point to a reasonably consistent picture in which the maximum human life span in optimum conditions is 70 to 100 years.[11]

Nor is the general constancy of the maximum human life span negated by great changes to mortality rates in the twentieth century. In this century in western society there has been an increase in average life span of around 25 years. For example, in Australia in the 1990s the average life expectancy was around 80.5 years for females and around 74.5 years for males instead of about 48 and 51 years respectively at the turn of the century. But this average increase is obviously achieved by keeping people alive longer, especially by reducing infant mortality, rather than by extending the maximum possible life span which has not significantly changed. To illustrate this one may ask how much longer a person can expect to live, assuming a person avoids disease and accident and survives to 65. In the USA in 1900 it was a further 11.5 years (male) or 12.2 years (female). Today it is only three to five years more than that. In short, medical science has had significant success in increasing the average life expectancy but so far has managed only a modest improvement in the normal maximum lifespan.

COMPETING THEORIES OF AGING

Is this likely to change? Or is telomere therapy one more scientific theory which has suffered from over optimism? Steven Austad[12] puts the case against telomere therapy as the overall solution to human aging. While telomere research is extremely important Austad thinks that the study of the growth of cells since Hayflick has been mistaken to the extent that it assumes that it is a study of aging as such. Austad argues that cell research is very relevant to aging but is not aging itself. He distinguishes between *mechanisms* and causes and argues that senescent gene expression, even if controlled by the telomeres, is a mechanistic theory of how a certain part of the aging process takes place rather than a causal theory of why humans age. Austad reviews the three present causal theories of aging: the 'good-of-the-species' theory; the 'rate of living' theory and the 'evolutionary

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[11] 11. In Ancient Egypt it was not considered completely inappropriate to aspire to live 110 years and the reign of 67 years of Ramses II points to a death at around 90 years of age. Plato and Sophocles were considered old when they died at about 80 and 90 and of course there is the biblical 'three score years and ten'. (Bromley, *The Psychology of Human Aging*, 37: S. Austad, *Why we age: what science is discovering about the body's journey through life* [New York: John Wiley, 1997] 37.) Nor does the evidence of Genesis 5 run counter to this general picture. Prior to the eighteenth century the long lives attributed to Adam, Seth, Methuselah and others were generally accepted as real descriptions of life span. However, the combined effect of biblical criticism and biological evolution led to them being more generally reckoned to be artificially exaggerated lifespans. It is important to note that large figures such as these are not only a Hebraic phenomenon but are consistent with certain Sumerian king lists of about 2000 BC. R.K. Harrison sees the apparent lifespans of Genesis as the result of some combination of an enhanced reckoning by the family and a mathematical manipulation by an archivist with the intention of honouring significant people—in accord with a broader ancient near eastern tradition which also influenced the form of the Sumerian king list material. (R.K. Harrison, 'From Adam to Noah: a reconsideration of the antediluvian patriarchs' ages', in *Journal of the Evangelical Theological Society* 37:2, [June 1994], pp. 161–168.) Other interpreters find somewhat different versions of this answer but whatever the nature of the precise solution, it would seem that these figures are best taken as cultural phenomenon rather than as biological data.

[12] 12. S. Austad, *Why we age: what science is discovering about the body's journey through life* (New York: John Wiley, 1997)

aging theory'. Each will attribute to telomere therapy a different role and status in the aging process.

The 'good-of-the-species' understanding of cellular behaviour argues that evolutionary theory requires that any process as ubiquitous as aging must benefit the population as a whole apart from any benefit to the individual entity or its immediate offspring. Therefore cellular senescence should not be equated with human aging per se but rather should be seen as a normal part of bodily development by which the body avoids its own destruction through unlimited cell reproduction. Without a limitation on cell reproduction it would not be possible for the body to survive. The Hayflick Limit is therefore a part of the normal growth and development of the body, a necessary protective device against cancer and an important mechanism in the cell processes of the body. It is neither a pathological disorder nor an overall causal explanation of aging. If this interpretation is correct then the search goes on for a broader causal understanding of the aging process.

Austad rejects this theory however, arguing that it emerges from a misunderstanding of evolutionary theory when it requires a benefit to the population as a whole. Most traits or processes which are beneficial to an individual or their immediate offspring will also be beneficial to the species as a whole, but not all. For example, a propensity to reproduce more offspring can certainly be beneficial to the individual entity and immediate offspring but it may not be beneficial to the species as a whole if, say, food supplies are limited. Where there is a conflict will the interests of the individual or that of the species prevail? There is an analogy with the reproduction of cancer cells where there is a conflict between reproduction of the cancer cells—reproduction is certainly advantageous for the cells and their 'offspring' but it is not advantageous for the host organism or the overall population of cells which constitute the organ. Just as the individual cancer cell wins out at the expense of the whole, so too must we say the same about aging. That is to say, that we should not assume, along with the 'good-of-the species' theory, that aging is a process which is necessarily beneficial to the species as a whole. The implications of this for understanding the aging process and the telomere theory of replicative control are that these processes need not be presumed to be best understood as a theory or cause of aging of the organism as a whole but need be seen only as having their purpose in the basic requirements for the proper development of the individual entity alone.

Austad discusses two other possible causal explanations of aging—the 'rate of living' or metabolism theory in which the rate of energy use is seen as causing aging via the collateral damage of biomechanical processes through the production of toxic by-products or by oxygen free radicals (oxidants). However, he declares it to be a theory which is now 'as dead as the proverbial doornail'.[13] Like cell senescence these process may play a part in the aging mechanism but the scientific evidence for elongated life span based upon, for example, antioxidant vitamins is not convincing, despite popular support. In the search for a causal theory one would be better to revert to the investigation of telomerase or to move to a broader 'evolutionary aging theory'. Austad prefers the latter.

He notes that a reduced vulnerability to environmental accidents leads to slower aging. This is seen experimentally in research with certain insect and animal populations and is consistent with the general trend for larger animals to live longer— because they are less susceptible to external threats. In the context of reduced danger the imperative to move through the life cycle rapidly is diminished. The theory is a general one and the processes by which it is implemented can include a variety of mechanisms, including cellular behaviour. The point Austad makes is that discovering a mechanism is not the

[13] 13. Austad, *Why we age*, p. 93.

same as discovering an overall theory and telomerase therapy is, in principle, not going to provide the answers that some people expect.

'TOP DOWN' VERSUS 'BOTTOM UP'

How does the theologian or other lay-scientist assess the value of these competing views? In terms developed by Arthur Peacocke the conflict is between 'top down' and 'bottom up' approaches to explaining causes.[14] Generally, scientific explanations are tightly locked into the concept of causality and any detection of a causal sequence of the kind that event 'x' causes event 'y' is frequently taken to be a sufficient explanation of the process and sometimes also a predictor of event 'z'. The final value of such inductive reasoning has been the subject of philosophical debate (concerning the extent to which a sequence of events can be logically predictive) and it ultimately requires some intelligible explanation in terms of underlying relationships. Yet despite the problems which exist with the fundamental uncertainty of complex systems, the overall effectiveness of simple induction cannot be denied. Methodologically, scientific reductionism, whereby complex situations are broken down into simple units for analysis has been responsible for scientific progress to the point where 'bottom up' causality has frequently been perceived as the *only* form of causation. Telomere theory as an explanation of aging is a form of 'bottom up' causation.

'Top down' causation on the other hand refers to the influence of the state of the system as a whole on the behaviour of its components so that changes occur to the components of a system because of their incorporation in the system.[15] Recognition of 'top down' causation is important, not least because science is typically reductionist and never fails to look for 'bottom up' causation whereas recognition of 'top down' is less frequent. Properly understood, the processes of causation have a dual character—an 'up and down' interaction. Peacocke identifies four levels which are able to interact in terms of causation.[16] The first level is that of the *physical world* of matter and energy existing in space-time. The physical sciences typically focus on this level. The second level is that of *living organisms* of cells and bodies and so forth which is the interest of the biological sciences. Level 3 concerns the *behaviour of living organisms* and is attended to by the behavioural sciences including psychology. Finally, the fourth level is the domain of *human culture* including art, economics, literature and science. These levels interact and it is quite appropriate, for example, for the level 1 physical sciences to indicate to level 2 researchers those systems of causation which influence events in the realm of level 2. But it is also right to reflect on the influence of the system as a whole and to seek downward influences as well. Indeed Peacocke argues that ' "top down" causation has increasing significance in those kind of complex systems that are living'.[17]

The recognition of the role of such 'top down' causation in no way detracts from that of 'bottom up' theories. The two are able to exist harmoniously. In the present case cellular theory is intrinsically a 'bottom up' mechanistic explanation which need not be in competition with 'top down' causal theories. If a conflict does occur then one or other or both theories must be modified. But it is not impossible for such conflicts to be more

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[14] 14. A. Peacocke, *Theology for a Scientific Age* (Minneapolis: Fortress, 1993), esp. pp. 44–45.

[15] 15. Peacocke, *Theology*, pp. 53–54.

[16] 16. Peacocke, *Theology*, pp. 213–144.

[17] 17. Peacocke, *Theology*, p. 55.

apparent than real. Conflict is expressed in the present case when Fossel sees the limitation on the reproduction of cells according to the Hayflick Limit as problematic and the fundamental reason for aging. Cellular senescence is pathological and degenerative. He interprets this as a problem to be overcome in the search for longevity.

From a different point of view Austad sees the Hayflick limit and the behaviour of cells with limited life as being a necessary and normal part of life which enables normal bodily development. He sees Fossel's pathological interpretation of this cellular behaviour as misleading and argues that cellular behaviour is mechanistic rather than causal in that it might explain *how* aging takes place but not *why*. He prefers an explanation at a higher level. This is not to say that he repudiates the value or even the findings of telomere research but he does have a different assessment of the primary purpose of the Hayflick limit (which is not so much to do with aging as it is to do with a necessary defence against cancer); he also has a different view of the overall cause of aging.

Our assessment of this situation and its various interpretations needs to include the following observations. Both are agreed that serious progress can be made in the next 20–50 years (at the most) concerning the aging processes and the possibility of significantly extending the human lifespan. There is agreement that the examination of cellular behaviour is very relevant and will play a part in understanding the process. The reductionist, 'bottom up' approaches tend to be more optimistic, but ultimately those who require a 'top down' approach will have to be satisfied—an holistic explanation will be needed in order to fully comprehend the situation. With regard to the debate concerning the role of telomeres in cell behaviour, there is no fundamental reason why the process of cellular senescence cannot be *both* normal and developmental as well as ultimately pathological and degenerative.

Finally, we note that reductionist 'bottom up' approaches have been enormously successful and it would be unwise to rule out some of the possibilities envisaged by some of its advocates. Nor is it simply wishful thinking to put a time scale on the likely developments. It is true that many revolutionary scientific discoveries have been quite unpredictable not only as to the timing of their discovery but also as to the very idea. For instance no one said, 'I think that today I'll invent a machine which will allow us to look through a person's skin and muscle so that we can see their bones and other internal organs.' Such an idea would rightly have been considered extremely improbable but it came about, quite unpredictably, as the by-product of research of a different nature. At other times though, the progress of scientific discovery is much more predictable—though never certain— as science moves along generally predictable lines once fundamental principles have been established. Telomere therapy may be one such development and even if it is not the final answer, it will still constitute a major step forward in understanding the mechanisms of the aging process and the focus of research will simply move on to another area with the advantage of a greater understanding of cellular aging processes.

IMMORTALITY: CONFLICT, INTEGRATION AND DIALOGUE

If a 21st century theology of the person is likely to focus on the *ending or non-ending nature* of human life, then the theology of death and immortality will need to be re-examined. Given the propensity of human nature to repeat itself, it is likely that the exploration of these new issues will follow a pattern similar to that of earlier science-faith interactions which have frequently been characterized in terms of 'conflict', 'dialogue' and

'integration'.[18] It would be tempting to hope that there will be no such conflict when the general discussion about increased life-spans comes to the fore and, no doubt, many will easily assume that the two 'immortalities'— extended temporal life and the eschatological 'life everlasting' of the Apostles' Creed need not be played off against each other in any way. Nonetheless a conflict is likely, not only because there have been similar confrontations, but also because a debate over immortality would in fact simply be a repetition of a conflict extending back to the earliest days of modern medicine.

Hans Küng observes that it was no coincidence that it was after a surge of materialism that Antoine de Concordat, in a mood of medical optimism, described in his *Outline of an Historical Presentation of the Progress of the Human Mind* (1794) the ultimate goal of modern medicine as being the abolition, or at least the considerable postponement, of death. This was an expression of the agenda which medical science has pursued vigorously ever since. In the context of a reductionist scientific world-view, everything can be explained by physical and chemical processes; when it comes to the threat of death, medical science provides an alternate form of salvation and as a consequence 'atheism went hand in hand with the Utopia of an earthly immortality'.[19] However, de Concordats's vision has not been fully realized because, despite the incredible success of modern medicine, in the absence of any final solution to the problems of sickness and death, it is difficult for a scientifically reductionist point of view to persuade everyone that religious faith in the resurrection is superfluous. But the closer science comes to understanding human aging the more tempting—though not necessarily the more valid—that proposition becomes and the greater is the possibility of confusion concerning the meaning of 'immortality'. It is used in a number of different ways and some clarification is needed.

The first immortality might best be called *genetic immortality* and it is found in writings such as those of Richard Dawkins who proposed that the aspect of human behaviour normally referred to as altruism was, in fact, the outcome of a genetic selfishness aimed at maximising the chance of an entity's own genetic material surviving into the future. The aim is genetic immortality. Despite the metaphorically personal terminology frequently used of the genes, in which deliberate intention is attributed to them, this form of immortality does not include personal survival of any kind. It is simply the continuous replication of the genetic code.

The second form of immortality is *cellular immortality* which is the process whereby a population of cells is able to keep reproducing indefinitely. In no situation can individual cells be immortal. It is only certain cell populations as a whole which can be 'immortal', that is, exist indefinitely by replication. It is therefore properly a 'corporate' or 'cell population' immortality.[20]

At the third level there is *organismal immortality* which refers to the possibility of certain more complex organs having an indefinite life. This is predicated on the possibility of cellular or cell population immortality and is distinguished from it only by the fact that it refers to a more complex, functioning, interactive bodily organ or set of organs such as an animal or human person which is able to survive indefinitely because of the continual replication of various types of cells. The indefinitely replicating organism (or person) is

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[18] 18. E.g., as in I. Barbour, *Religion in an Age of Science* (London: SCM, 1990), pp. 3–31.

[19] 19. H. Küng, *Eternal Life?* (London: Collins, 1984), pp. 7–8.

[20] 20. As discussed earlier it was Hayflick who first showed that 'cell populations could be classified into two distinct categories characterized chiefly by whether they were mortal or immortal.' L. Hayflick, 'Mortality and Immortality at the Cellular Level: A Review' in *Biochemistry* Vol. 62 No 11 (1997).

still subject to illness, disease, accident and is a form of life which still has a guarantee of death.

In all cases the 'immortality' is temporal, relative, indefinite and corporate in nature. It is *temporal* in that any continued existence takes place in time. It is *relative* in the sense that immortality is not intrinsic to the entity in question and is dependent on suitable conditions including the absence of fatal accidents and so forth. The potential life span is therefore *indefinite* rather than infinite. Finally it is *corporate* in the sense that while the whole may be immortal the constituent parts are not, although they may be indefinitely replicated.

Of course, it is also necessary to include a fourth definition which is more theological than scientific in nature. It is that immortality which is primarily defined in terms of a qualitative relationship with God in Jesus Christ (Jn. 17:3). It is not an intrinsic quality of human life but a gracious gift of God, a sharing in the divine nature (2 Pet. 1:4). Now a definition expressed in biblical and theological terms such as these suggests that there is no necessary connection with any of the previous definitions of immortality. Therefore there can be no conflict if they are referring to different kinds of events. Indeed, treating theological immortality as something of a completely different order might be as useful as the recognition of the different orders of causation can be in eliminating the forced choice in the creation debate: Darwin *or* God. But it is not that simple; the problem that emerges is that any genuine dialogue can be expected not only to point to differences but also to look for similarities, especially methodological parallels in what are otherwise different areas. There is no doubt that the interpretation of the fourth level of 'theological immortality' is influenced by the way that the first three levels of 'scientific immortality' are understood as temporal, relative, indefinite and corporate. The temporal and corporate dimensions are of particular importance.

PARALLELS IN SCIENTIFIC AND THEOLOGICAL IMMORTALITIES

(a) Temporality. All three of the definitions noted above assume an understanding of immortality which is temporal. In contrast to this, classic theology understands immortality as a-temporal. But there have been philosophical problems with the concept of a-temporality. Karl Barth objects to 'the Babylonian captivity of an abstract opposite to the concept of time'.[21] Clark Pinnock objects to its apparent determinism.[22] J.W. Cooper rejects the notion of timeless eternity; as part of his defence of anthropological dualism and the concept of the intermediate state, he argues that on death the person does not move out of spatio-temporal conditions[23] J.R. Lucas claims that the temporality of God is essential because 'to deny that God is temporal is to deny that he is personal in any sense

[21] 21. Karl Barth, *Church Dogmatics* II/I, ed. G.W. Bromily and T.F. Torrance (Edinburgh: T & T Clark, 1957), p. 611.

[22] 22. For example, as Clark Pinnock has said, 'We are not impressed when classical theism tells us that God takes in the whole of history in a single glance, because what that means to us is that history is meaningless. If the day after tomorrow is as fixed in God's timeless present as the day before yesterday, then there is no meaning to our freedom and power to shape what will be in the future.' 'Between Classical and Process Theism' in R. Nash (ed), *On Process Theology* (Grand Rapids: Baker, 1987), pp. 309–328.

[23] 23. J.W. Cooper, *Body, Soul and Life Everlasting* (Grand Rapids: Eerdmans, 1989), p. 210.

in which we can understand personality'.[24] The consequence of this is that, while an identification of the theological concept of immortality with the temporal 'immortality' of scientific endeavour is not automatic, at least one of the one of the previously essential differences has been minimized.

(b) Personality. It was also noted that scientific versions of immortality are fundamentally corporate in nature. It is cell populations, genetic codes and whole entities rather than constituent parts which are described as being 'immortal'. The focus is upon the continuation of the species or the population as a whole rather than any individual constituent. This stands in contrast to the classic picture of immortality which is essentially personal in nature. However, objections have been raised concerning the personal nature of immortality. It is argued that the general emphasis in eschatology has been too individualistic and anthropocentric and thus too subjective and selfish.[25] This common, anthropocentric approach, it is said, has distorted the construction of what ought to be a more directly theological framework built on the foundation of God. Thus, there is in process theology a stress on 'objective' forms of immortality. By this, it is meant that the symbols of 'resurrection' and 'immortality' are ways of saying that all experiences and all relationships which have been known and realized have been received by God into the divine life. The manner in which this history is conserved and guaranteed is not so important as the fact that their preservation illustrates the tremendous significance given to them.

Whitehead held to a neutral stance so that subjective immortality was neither definitely affirmed nor denied, even though it is obvious that Whitehead's own tendency was to deny the possibility of it. Others are quite clear that there is definitely no subjective immortality at all. It is, as Hartshorne says, an idea which is an invention[26] and as Ogden says, 'The only immortality or resurrection that is essential to Christian hope is not our own subjective survival of death, but our objective immortality or resurrection in God, our being finally accepted and judged by his love, and thus imperishably united with all creation into his own unending life.'[27]

From these two examples we can see that as science begins to consider seriously the possibility of an indefinite life span, the tendency is to describe this 'immortality' in temporal and corporate terms. It is no coincidence that at broadly the same time some theological definitions of immortality have shifted away from classic a-temporal and personal notions of immortality to a view which is more likely to lead to a fundamental agreement. There is likely to be a significant minimization of difference between scientific

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[24] 24. J.R. Lucas, 'The Temporality of God' in R.J. Russell, N. Murphy, C.J. Isham (eds) *Quantum Cosmology and the Laws of Nature: Scientific Perspectives on Divine Action*, (Vatican Observatory and Center for Theology and the Natural Sciences, 1993), p. 235.

[25] 25. 'Another factor which has tended to make talk about the "after-life" less than appealing may be found in the feeling that too much of that talk about it is highly self-centred—a matter of "glory for me" … men and women nowadays are uncomfortable with any position which would be so totally individualistic. … the presentation of the Christian gospel as purely individual "salvation" appears to be outrageous.' Norman Pittenger, *After Death: Life in God* (London: S.C.M., 1980), p. 13.

[26] 26. See Charles Hartshorne, 'Time, Death and Everlasting Life' in John Hick (ed.), *Classical and Contemporary Readings in the Philosophy of Religion* (Englewood Cliffs: Prentice Hall, 1970), pp. 357–369; *Omnipotence and Other Theological Mistakes* (Albany: State University of New York Press) pp. 36–37; 'Response to Debate' in T.L. Miethe (ed.), *Did Jesus Rise From the Dead?* (San Francisco: Harper and Row, 1984), pp. 137–142.

[27] 27. Schubert M. Ogden, 'The Meaning of Christian Hope', in H.J. Cargas and B. Lee (eds) *Religious Experience and Process Theology* (New York: Paulist, 1976), pp. 206.

and theological understandings where there is a commitment to the view that 'God is subject to the same principles which govern all reality', as in process theology.[28]

DEFINING IMMORTALITY THEOLOGICALLY

In this situation how are we to be more precise in the definition of the fourth, more theological, level of immortality? There are at least three possible interpretations, each of which relates the theological to the scientific to a different degree. The first possibility is to understand immortality as *personal and qualitative immortality* and therefore defined in terms of the survival of transformed, resurrected persons in an a-temporal context. This 'classic' understanding of immortality is unlikely to be equated or even loosely related to the 'immortality' of medical science.

The second possibility is that of immortality as *personal and quantitative*. This involves persons in an infinitely extended temporal lifespan. It is the quantitative extension of the physical, emotional, intellectual and spiritual life of a person. This view is held by those such as Cooper who says, 'eschatological time is historical time'.[29] This form of immortality which comes about as a result of the eschatological action of God through the resurrection of Christ does not have to be identified with the indefinitely extended lifespan sought by medical science but an identification or partial identification is less problematic than for the first definition and can occur.

The final option is *corporate and quantitative immortality* in which immortality is not a quality attributable to persons. People constitute a temporal event in the life of an organic whole and exist beyond death only as part of the history of the infinitely but temporally existing whole known as God. Once again, this immortality, found in various forms of process theology, is not necessarily to be identified with the immortality sought by medical science but some form of connection is probably inevitable, given the search for a thorough going integration of the religious and scientific levels of immortality.

In evaluating the merits of these three broad interpretations of immortality the critical questions revolve around the extent to which *temporality* and *personality* are essential constituents of immortality. So it is to these two issues that we now turn.

TEMPORALITY AND IMMORTALITY

The 'classic' Christian conviction is that immortality is a presence with Christ which is more than extended duration and so it can be described only as timelessness. This belief is protected by being tied very closely to the principal attributes of God. The notion of timelessness emerges from a belief in the immutability of God and, in turn, it provides a defence of divine omnipotence.

Timelessness emerges from the immutability of God because, as Aquinas says, 'the idea of eternity follows immutability, as the idea of time follows movement. … as God is supremely immutable, it supremely belongs to him to be eternal.' Divine eternity arises out of divine immutability because 'in a thing bereft of movement, which is always the same, there is no before and after'. In this, classic western Christian theism has followed Boethius' definition of eternity as the 'simultaneous possession of endless life'. This divine 'timelessness' enables God to avoid being subject to the changing events of the world and

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[28] 28. Hartshorne, 'Time, Death and Everlasting Life', p. 362.

[29] 29. J.W. Cooper, *Body, Soul*, p. 210.

by his simultaneous knowledge of all things, and by not being subject to time, God's omnipotence in his relationships with the world is preserved.

This understanding of time and eternity has been popular but it has not won universal theological approval because the linking of immutability with eternity in the classic tradition meant that God became a static entity. Hence the reservations of those such as Pinnock, Cooper, Lucas, Barth, Whitehead, Ogden and Hartshorne. In particular, A.N. Whitehead and process theology generally have specifically aimed to eliminate that 'vicious separation of the flux from the permanence' of classic theology which produced a changing world but an entirely static God with whom it seemed impossible to have any real relationship.

Scientifically, it has also been found wanting. In the modern era the classic Boethian-Anselmian-Thomistic tradition of eternity has been interpreted by reference to the Newtonian method of science. Newton identified space and time with the omnipresence and eternity of God which, together, constitute the infinite container of all creaturely existence. Space and time are thus considered absolutely, in themselves without relation to anything external. As attributes of an immutable God they are absolute and unchanging and they embrace all things within the universe and as such they are the ultimate reference system. However, it has been necessary to move forward beyond the classic notions of time and eternity. The theories of Newton have been superseded by those of Einstein, Bohr, Heisenberg and others. The *receptacle* concept of time and space was replaced by the *relational* theory of time and space so that instead of understanding time as a line or boundary it was understood as a succession of states of personal activity. Time is never given independently of a given situation. The theory of relativity has reminded us of this: that there is no absolute time. Just as there is no space without an object, so too there is no moment without an action and no person without a relation. Time is the form and shape of our actions. We now have to talk of time *for whom*. Once it was believed that there was a spatial centre to the universe and that all directions could be defined by reference to it. Now it is understood that position is defined in relation the observer. In fact, there is no fixed position, only relations between bodies. Similarly time is dependent on the observer.

Any contemporary view of immortality has to work with these changes to the understanding of time. The fundamental conviction of the classic view that immortality is more than extended duration need not be altered, but the description of this in terms of timelessness is soon shown to be less than helpful. What is required is an immortality which is defined neither in terms of time nor in terms of the opposition to time, but as an immortality which is trans-temporality—beyond temporality and yet embracing it. Such a relationship of temporality and eternity can be clarified by analogy with the relationship which exists in classic theism between the omnipresence (immensity) and the spirituality (a-spatiality) of God.

The notion of omnipresence asserts that there is no place in the universe where God is not. This attribute is actually *defended* (rather than negated) by the assertion that God is a 'spiritual' being, which is to say that there is a real sense in which God is, in fact, spaceless or in *no* space. If God were to be in space in the same way as other forms of reality then there is no 'space' for anything else. In other words, the assertion that God is in space and in every space *requires* as a corollary the statement that there is a sense in which God is in 'no space'. In a similar way, the assertion that God is in *every* time requires the assertion that God is, in a sense, in *no* time *in the same way that other things are*. This is an eternity of God which is not threatening to the 'timefulness' of God any more than the 'spirituality' of God threatens his omnipresence. In this way it is possible to come to the idea of eternity as *timelessness* by stressing the *temporality* of God.

This stands in opposition to the classic method of deducing the timelessness of God, which is by working from his immutability. What has happened in classic theism is that God's eternity has been primarily described in terms of the negative quality of timelessness *without sufficient recognition of his temporality*. But the method of reaching eternity via time does not run into the problem of relating time and eternity, as the classic method does, because it is clear from the start that *time and eternity are, asymmetrically, each the ground of the other*. We come to an understanding of eternity as supra-temporality (rather than a-temporality) not by denying involvement in time, but by stressing it. Eternity is understood positively, with its primary meaning being more than simply the absence of time. It is the positive description of God's time which is not external to God but included in his duration.

Given this, it is possible to see a direction forward. Earlier in our discussion, immortality was understood as *either* essentially temporal or as essentially a-temporal. Now we can see that, as far as God is concerned, the possession of temporality is not limiting, provided that time is not understood in an absolute, singular or non-relational manner. The temporality of the world is derived from the eternity of God which is, partially at least, understood as a relational multi-temporality. This understanding of eternity may exhibit a form of 'simultaneity' in that God is related to all times, but this does not imply 'temporal' simultaneity because time is not absolute, time is not the medium of association. Different events cannot be said to be 'simultaneous' *to each other* even though each one of them is present to God and all events are simultaneous *in him:* 'He is before all things, and in him all things hold together.' In this way it is possible to affirm an immortality which goes beyond those purely quantitative notions of immortality put forward as alternatives to what has been described as the classic view. However, the classic view must recognize the role that temporality plays in divine eternity in that the point of connection between eternity and time, between God and humanity, is found in the mystery of the incarnation. Here is one who is temporal and eternal, and time and eternity are united in each person as the person is united in Christ, as the image of God in the person is fulfilled.

PERSONALITY AND IMMORTALITY

The question of (a-)temporality is closely connected to that of personality. J.R. Lucas claims that the temporality of God is essential because 'to deny that God is temporal is to deny that he is personal in any sense in which we can understand personality'.[30] In a contrary move process theology uses a temporal understanding of immortality to *deny*[31] the possibility of personal immortality.[32] According to Hartshorne 'my everlastingness is neither more nor less than my entire earthly career as a contribution to the divine life'.[33] Eternity is not continued personal existence—it is purely God's enjoyment of our past life. This, says Hartshorne, does not mean that there is no immortality or that at death people

[30] 30. J.R. Lucas, 'The Temporality of God', pp. 235.

[31] 31. Or, at best, leave open the question of subjective immortality.

[32] 32. It is important to recognize that some process theologians do affirm subjective immortality, such as John Cobb and David Griffin. However, subjective immortality is not a necessary development of process principles and has to be based on other material, as Whitehead recognized.

[33] 33. Hartshorne, 'Response', p. 137.

become unreal. 'Once an individual is there to refer to, he continues to be there even after death, as object of reference, as a life which really has been lived.'[34]

There are obvious parallels with the relative, temporal, indefinite and corporate immortality of scientific speculation. In cellular immortality individual cells are not immortal but do participate in the ongoing life of the whole cell population and in organismal immortality, complex organisms survive indefinitely because of the continual replication of various types of cells. In a similar manner, process immortality is corporate in that the individual human person does not survive but does contribute to the continuing immortality of the whole God/cosmos. The person is no longer present as the subject of a life but only as 'an object of reference' in the experiences of many people.[35] God's continuing experience or memory of me is *my* immortality. But it is so only in the sense that it is an experience for God which is based on an experience involving me, although not in the sense that I am the subject of the experience.

For some people this is immediately problematic and the view is immediately repudiated as it constitutes the end of personal existence. Unfortunately, however disconcerting this thought may be, it is a possibility which cannot be ruled out simply because it is an unpleasant thought. It is possible however, to claim that it is a view presented using somewhat misleading terminology. If my personal immortality ('my everlastingness' according to Hartshorne,[36] or 'our objective immortality' according to Ogden[37]) consists in God's remembrance of me in a manner analogous to any person's remembrance of me[38] then I may protest that another person's memory is not normally seen as part of *my* reality and the same must apply with respect to God's remembrance of me. It is therefore misleading to suggest that God's remembrance of me can be spoken of as my immortality.

However, a linguistic correction such as this does not indicate that the proposition is essentially wrong. Consistency with biblical data is more of a problem though. The process view of immortality involves the conviction that there is no personal activity in immortal life. There will be no addition to the experiences of the person; death is understood as the affixing of the quantum of the reality of a life;[39] resurrection is simply the synthesizing of one's life in God. While Hartshorne claims that this view is superior to the traditional alternatives,[40] he certainly has difficulties establishing this by comparison with the biblical data concerning death and resurrection life.

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[34] 34. Hartshorne, 'Time, Death and Everlasting Life', p. 359.

[35] 35. The 'retained actuality' of a person is that which was part of his or her 'thoughts, feelings, decisions, perceptions' (Hartshorne, 'Time, Death and Everlasting Life', 361). In this context it is impossible to forget Woody Allen's comment, 'I don't want to live forever by having my art remembered, I want to live forever by not dying.'

[36] 36. Hartshorne, 'Response', p. 139.

[37] 37. Ogden, 'Christian Hope', p. 206.

[38] 38. For Hartshorne the only difference between a human remembrance of me and the divine remembrance is that no human person can perfectly remember me. 'In short, our adequate immortality can only be God's omniscience of us' (Hartshorne, 'Time, Death and Everlasting Life', p. 362). God alone really knows us and can recall us and only in him can we have what might be called immortality.

[39] 39. Hartshorne, 'Time, Death and Everlasting Life', p. 364.

[40] 40. He argues that this view is preferable because it transcends the present form of self-identity as human beings which is 'at best, an extremely partial preservation of the actual quality of life' (Hartshorne, 'Beyond Enlightened Self-Interest', p. 309).

(a) Death. In process thought death takes the individual person into a *total losing* of self, a losing of personal identity and the absorption of the total history of the person into the life of God for God's gain and benefit. The scriptural material indicates though, that the *ultimate* resolution of the transitoriness of life is not death *per se*, it is the final *gaining* of self in the next life through resurrection and transformation as the consummation of a life which is 'lost' in the present in the service of God in Christ. 'For those who want to save their life will lose it, and those who lose their life for my sake will find it' (Matt. 16:25). This is a finding of life, a gain which is to the benefit of the person as well as to God.

(b) Resurrection. Ironically, the process notion of eternal life is more like the biblical notion of death involving, as it does, a completely static, de-personalised and unchanging 'existence'. In contrast, the biblical picture, symbolic though it may be, is of a continued, dynamic, developed life lived in relationship with God (Titus 1:2; 1 Pet. 5:10; Rev. 3:20–5:14; 21–22).

Beyond linguistic clarity and biblical consistency a third approach is to question the rationality of the fundamental rationale behind the process approach to immortality. David Pailin, in discussing the claim that the Whiteheadian position is wrong because it does not involve the survival of the self, puts very simply the process belief that most modern expressions of immortality are hopelessly individualistic. 'The strength of this objection to objective immortality depends upon the credibility of holding that our individual lives are so important that their continuation is a requirement of rationality and meaningfullness of reality.'[41] Pailin therefore dismisses the objection on the basis that while it may be hurtful to our pride, there is in fact no absolute necessity for us to survive at all and that to assume so is to exaggerate our own importance. 'Our aim in life must be to enhance our contribution as much as we are able and our satisfaction lies in knowing that nothing we achieve will ever be lost. All will become part of the concrete reality of God.'[42] However unpalatable this may seem, the possibility must be faced. Ogden expresses the issue theologically by saying that the expectation of personal survival is nothing other than an idolatrous hope. He argues that historically such an individualistic view of immortality is the superimposition of a Gnostic hope on to a Jewish apocalypticism, and what is produced is 'nothing specifically Christian'.[43] In a similar vein Hartshorne says, 'my contention that wanting to be immortal in the specified sense is a form of wanting to be God'.[44] Such a claim could not be more serious. Is a belief in a personal after-life a form of idolatry? Is it appropriate to set oneself up as an 'object' or 'end'?

There is no doubt that biblical teaching is consistently opposed to self-centredness and it is opposed to those who seek to arrange their lives in a way that is focused on themselves. Positively, it stresses the need to direct life towards God's glory. What Hartshorne has overlooked is that, while any self-centred thought or action is idolatrous, a belief in immortality is not necessarily self-centred. It is not idolatrous if it arises from a belief that personal survival is a gracious act of God (a gift rather than a necessary action) arising out of his love (not the result of inexorable logic or self-love) and revealed as a possibility in which the person of faith can hope (not as a demonstrable fact).

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[41] 41. David A. Pailin, *Groundwork of Philosophy of Religion* (London: Epworth, 1986), p. 196.

[42] 42. Pailin, p. 197.

[43] 43. Ogden, 'Christian Hope', pp. 203–209.

[44] 44. Hartshorne, 'Response', p. 138.

If God says that the individual will be part of, and participant in, the eschatological future then it is not a 'setting up of oneself' but the reception of the gracious promise of God and the evidence for this lies in the incarnation, ministry, teaching, death and resurrection of Jesus and the ensuing tradition of the church. The fact, manner and effect of the incarnation is understood to teach, not only the existence of God but, above all else, his extraordinary love for the world. This demonstrates the value he attributes to the world and the particular esteem in which he holds people. This love is not the natural or inevitable result of some inherent value or of inexorable logic, it is purely a matter of grace. A belief in personal survival need not be idolatrous. Stressing, as process theology does, that the symbols of future life have a primary reference to the glory of God, does not require the elimination of continuing personal involvement in that life.

CONCLUSION: GOD AND IMMORTALITY

The indefinite and relative immortality which can be achieved by continuous replication of cells and which has no final solution for death is not the infinite immortality which is a final presence with Christ and not simply a continued presence in this world. This participation in the divine nature (2 Pet. 1:4) is an immortality which is not in conflict with the temporal, relative, impersonal, indefinite immortality of scientific expectation. But nor is it completely unrelated. It is an immortality which cannot be defined in temporal terms as it extends beyond temporality but nor is it a radical a-temporality as it does not exclude all elements of temporality. Rather it is the fulfilment of temporality. It is a transformation of this life rather than a rejection of it, a taking up of temporality into eternity. As such it is a genuinely personal immortality rather than the continuation of any genetic code or population. It is personal life emerging out of God's graciousness rather than from any fundamental anthropocentricity or genetic or personal selfishness.

There is nothing in a genuine theology of immortality which conflicts with the relative 'immortality' which is a radically extended life-span. Nor is there anything in this theology of life in Christ which makes a scientific search for this relative 'immortality' wrong. For God a thousand years is as a day (Ps. 90:4) and a life lived for two thousand years is one which can be lived in honour of God as much as one lived for three score and ten years or a life lived for only twenty minutes. A life lived for seventy years is a life lived 25,000 times longer than a life lived only for a day. Yet both can have their own completeness in God. If people were to be able to live a mere fifty times longer than at present and survive for 5000 years would that detract from the immortality of grace which is an eternity with Christ? I think not. Given the huge amount of time involved in God's work of creation prior to the presence of any human being it is hard to imagine him being concerned about a few thousand years! There is nothing in this scientific hope of extended life which causes concern to a genuinely theological understanding of immortality. The two 'immortalities' can live in dialogue rather than in conflict. This is not to say, however, that there are no problems at all with the search for an end to aging, simply that if there are problems they will emerge elsewhere. Extended life span is not a threat to God's immortality but it may well be a threat to significant aspects of human life and social relationships but these will have to be dealt with elsewhere.

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