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## Explaining or Explaining Away?

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*A monolithic view of the concept of explanation has been responsible for what is, arguably, a cluster of misunderstandings about the interplay between science and theology. This is a chronic feature of science and theology disputes and, in the plethora of popular books on cosmology, appears to be on the increase. This paper takes the concept of explanation to be multiform and considers various types of explanation and explanatory type-errors which occur in the science–theology debate.*

*Examples from the cluster of misunderstandings are examined, including the ubiquitous ‘God-of-the-gaps’; Atkins’ ‘infinitely lazy creator’; Dawkins’ claim that ‘religion is a scientific theory’; the idea of ‘need’ and ‘room’ for God in science; the phenomenon of processes masquerading as ultimate causes; the alleged alternatives of Big Bang v. Creation and organic evolution v. Creation; the equating of naming with explaining and explaining with explaining away; reductionism; functionalism and psychological/ sociological/ sociobiological/ anthropological debunking of religion.<sup>1</sup>*

**Keywords:** explanation, science, theology, religion, God-of-the-gaps, reductionism.

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### Introduction

It appears to be necessary, from time to time, to revisit certain fundamental features of the science–theology debate, in order to highlight deeply entrenched misunderstandings about the relationships between these two disciplines. If there is one cluster of misunderstandings – for such I shall argue them to be – which is more ubiquitous than any other, it is that associated with the concept of explanation. The reason for singling out this cluster for special consideration at present is that misunderstandings about explanation currently appear to be endemic in much popular literature which comments adversely on science and religion. Despite the extensive treatment which the concept of explanation has received in the philosophical literature, such confusions still abound in popular writings about origins as well as in some academic ones. Examples of such confusions, taken over the last fifteen years, are:

The known laws of physics, operating in accordance with the observed behaviour of the universe on the largest and smallest scales, are alone suf-

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<sup>1</sup> A short version, from which this present paper has been developed, was presented at the International Conference ‘Science and Christianity into the New Millennium’ held at Churchill College Cambridge UK in August 1998, under the auspices of Christians in Science and the American Scientific Affiliation.

ficient to explain how everything came into being, spontaneously, at a definite moment of creation about 15 thousand million years ago. The ultimate question of metaphysics has indeed been answered. Is there, then, still a role for God? <sup>2</sup>

The kind of explanation we come up with must not contradict the laws of physics. Indeed it will make use of the laws of physics, *and nothing more than the laws of physics.*<sup>3</sup> [italics mine]

That such a universe as ours did emerge with exactly the right blend of forces may have the flavour of a miracle, and therefore seem to require some form of intervention. But nothing intrinsically lacks an explanation. We cannot yet see quite far enough to decide which is the right explanation, but we can be confident that intervention was not necessary.<sup>4</sup>

I believe that an orderly universe, one indifferent to preoccupations, in which everything has an explanation, even if we still have a long way to go before we find it, is a more beautiful, more wonderful place than a universe tricked out with capricious, *ad hoc* magic.<sup>5</sup> [The explanations referred to are scientific ones and the 'capricious, *ad hoc* magic' appears to include religious beliefs.]

In addition to revisiting some familiar ground, I would like to develop certain ideas further.

### **'The first moral' of explanation**

Anthony Flew's 'first moral' of explanation encapsulates the central theme of this paper:

... explanations answering different questions are not necessarily rivals ... The first moral, therefore, is that there is not just one single, *the* explanation for anything which we may wish to have explained. There may instead be as many, not necessarily exclusive, alternative explanations as there are legitimate explanation-demanding questions to be asked.<sup>6</sup>

Explanation is not a monolithic concept, but multiform. There are many different types of explanation, fulfilling different functions and serving different purposes. In exploring them, a number of different questions can appropriately be asked:

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2 Gribbin, J. 'In the beginning, perhaps there was God', *The Guardian* April 25, 1986, p. 16.

3 Dawkins, R. *The Blind Watchmaker*, Harlow: Longman (1986), p. 15.

4 Atkins, P. W. *Creation revisited*, Oxford: W.H. Freeman (1992), pp.153,155.

5 Dawkins, R. *Unweaving the Rainbow: Science, Delusion and the Appetite for Wonder*, Allen Lane: The Penguin Press (1998), p. xi.

6 Flew, A. *Thinking About Social Thinking: The Philosophy of the Social Sciences*, Oxford: Blackwell (1985), p.40.

1. Why look for explanations?
2. What constitutes an explanation?
3. What is an appropriate typology of explanation?
4. What misunderstandings about explanation feature in science–theology debates?

Answers to these questions will be explored in turn, numbers 1–3 preparing the way for the main thrust of this paper, which is developed in number 4.

## **1. Why look for explanations?**

The desire for explanations, in whatever form, may arise because ‘... it is likely that our thought processes are frustrated by the unique, the unexplained and the contradictory and that we have an impulse to resolve this state of frustration, whether or not there is any practical application.’<sup>7</sup> It could also be added ‘whether or not the explanation is known by the user to be a true one’ for the psychological need ‘to resolve this state of frustration’ often leads to a too-ready acceptance of *any* proffered ‘explanation’, as illustrated by the following true story from the early days of cash-dispensers: Whilst somebody was drawing out money from a machine, using his banker’s card, a puzzled passer-by stopped and asked for an explanation of what was going on. ‘Did somebody sit on the other side and feed the money through?’ he asked. No, was the reply, a computer was linked to the bank account and money was automatically ... at the word ‘computer’ the enquirer’s face lit up, apparently with instant understanding, and off he went, satisfied.

So, one answer to the question as to why we look for explanations is because we are curious to know why things happen the way they do. The fact that we want to *know* indicates that ‘explanation is an epistemological concept, but one which requires a metaphysical “backing”...Typical metaphysical questions include: ...does every event have a cause; is the concept of causation a deterministic concept?’<sup>8</sup> Even this preliminary look at the nature of explanation reveals a great deal of untidiness. Craik may be giving a pointer to some of the reasons for this untidiness when he comments that ‘It is possible that the meaning of “explanation” is different for different people; it may be one of those things which no one really understands, but which every scientist, or anyone else in a mood of curiosity, feels he desires.’<sup>9</sup> However, he adds, ‘there is a large field of explanation that is common to most men. Explanations are not purely subjective things.’<sup>10</sup> It is this commonality which raises our next question:

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7 Craik, K. *The Nature of Explanation*, Cambridge University Press (1967), p. 7.

8 Ruben, D. H. *Explaining Explanation*, London: Routledge (1992), pp. 2f.

9 Craik, *op. cit.* (7), p. 6.

10 *Ibid.*, p.7.

## 2. What constitutes an explanation?

It would be presumptuous to suggest that such a question could be answered in a few sentences, when numerous books and academic papers still leave a wide range of views for further debate. The act of explaining is to make things plain or clear and there are many ways of doing this. In greater depth, the nature of explanation includes such topics as the relationship between explanation and prediction, full and partial explanations, explanations of laws and generalisations, explanation as a process and explanation as a product, as well as explanations of human actions and explanations in history compared with explanations in science.

Two basic approaches to exploring the concept of explanation are commonly termed 'stipulative' and 'reportive'. At this juncture I simply want to offer a few general comments about the usefulness of these two approaches and then to confine the rest of my remarks to those aspects of explanation which have a close bearing on the interplay between science and theology.

### *The stipulative approach*

Stipulative definitions are useful when introducing new concepts and when trying to tighten up the ways in which words are used in a particular universe of discourse, such as science. Considerable efforts have been made to develop precise concepts of explanation in the sciences. Among the results are Hempel's Covering Law thesis which claims that genuine explanations are arguments which must embody empirical laws. His two versions are the *deductive-nomological* (D-N) model and the *inductive-statistical* (I-S) model. The latter is applicable to stochastic processes in which the general (whenever and wherever) laws of the D-N model are replaced by statistical laws.<sup>11</sup> Hempel also applies his Covering Law thesis to history, but this application is much more problematic.

A possible snag in the stipulative approach arises if stipulative definitions are shifted from their base in academic discourse into popular speech. A prime example is the stipulative definition of the word 'selfish' in the phrase 'the selfish gene', to which I have referred elsewhere.<sup>12</sup> I cite the passage in full:

In response to Midgley's criticism of his use of the word 'selfish', Dawkins says:

When biologists talk about 'selfishness' or 'altruism' we ...do not even mean the words in a *metaphorical* sense. We *define* altruism and selfishness in purely behaviouristic ways ... I assume that an oak tree has

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11 Hempel, C.G. 'Explanation in Science and History', in Colodny, R.G. *Frontiers of Science and Philosophy*, London/Pittsburgh: Allen & Unwin/ University of Pittsburgh Press (1962).

12 cited from my 'A Critique of Aspects of the Philosophy and Theology of Richard Dawkins', *Science and Christian Belief* (1994) 6(1), 54f.

no emotions and cannot calculate, yet I might describe an oak tree as altruistic if it grew fewer leaves than its physiological optimum, thereby sparing neighbouring saplings harmful overshadowing ...

...words may be redefined for technical purposes. In effect I am saying: 'Provided I define selfishness in a particular way an oak tree, or a gene, may legitimately be described as selfish'.<sup>13</sup>

But despite the disclaimer, the phrase 'selfish gene' *is* metaphorical since 'a word or phrase denoting one kind of object or action is used in place of another to suggest a likeness or analogy between them'. *Stipulative definitions* are, of course, legitimate explanatory devices. Their value, however, depends on their power to clarify rather than to confuse. But 'selfish', as Midgley points out has such a common meaning that

It is by no means enough, in such cases, simply to give a new definition and repeat it from time to time. When a term is drawn from everyday speech like this, the force of habitual usage is far too strong for that.<sup>14</sup>

...It is true that philosophers are used to special technical definitions. But that does not mean that no standards apply to their manufacture.<sup>15</sup>

Despite such possible pitfalls in using the stipulative approach, it is nevertheless helpful for refining certain concepts of explanation as well as for encouraging precision in articulating and using them in academic discourse.

### ***The reportive approach***

The *reportive approach* looks at the many ways in which words are generally employed. It is the more suitable of the two approaches to adopt here, since it reflects common usage of the ways in which explanations are customarily requested and given. A benefit of the approach is that it points up the oddity of taking a monolithic view of the nature of explanation, since common usage regularly employs different types of explanation. For example, a variety of commonly accepted explanations connected with the family car are possible. These include explanations of its components; explanations of the internal combustion engine which makes its movement possible; and explanations of Henry Ford's wishes to make a cheaply available form of transport as well as to make money for himself. Such multiple explanations are common. But, oddly, when we turn to the field of science and theology, different criteria often seem to be employed. For example, despite the plurality of what would generally be regarded as legitimate explanations of the family car and similar artefacts, much of the literature of popular cosmology presents – and often promotes – scientific explanations of the universe as necessarily ruling out explanations of

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13 Dawkins, R. 'In Defence of Selfish Genes', *Philosophy* (1981) **56**, 557.

14 Midgley, M. 'Selfish Genes and Social Darwinism', *Philosophy* (1983) **58**, 369

15 *Ibid.*, pp. 368f

the universe as the activity of a divine agent. Such a procedure would never be countenanced where human agents and artefacts were involved; indeed, it would be transparently nonsensical.

Both the stipulative approach and the reportive approach have at times been illegitimately employed to elevate scientific explanations to a superior position to other types of explanation. Scientific explanations have variously been taken to be the *best*, or even the *only* legitimate explanations. Such a practice draws upon an imperialistic view of scientific knowledge left over from the heyday of positivism in science and logical positivism, its philosophical partner. The history of the downfall of these movements from philosophical grace and the weaknesses of the positions themselves are well known.<sup>16</sup> A problem for charting the relationships between science and theology, however, is the deep entrenchment of positivist views in popular thought, despite the many decades which have elapsed since they ceased to be a prime topic for philosophical debate.

### 3. What is an appropriate typology of explanation?

Most types of explanation, according to Ennis, can be subsumed under the three headings: *interpretive explanations*, *descriptive explanations* and *reason-giving explanations*.<sup>17</sup> In some cases an explanation may be appropriately given other type names than these.

A succinct typology of explanation which will serve the purposes of this paper is that offered by Brown and Atkins<sup>18</sup>, one which parallels Ennis' categorisation. It should be noted that not all these types of explanation are appropriate in any given situation. This typology

... consists of three main types of explanation. These may be labelled the Interpretive, the Descriptive and the Reason-Giving. They approximate to the questions, What?, How?, and Why? Interpretive explanations interpret or clarify an issue or specify the central meaning of a term or statement ... Descriptive explanations describe processes, structure and procedures ... Reason-giving explanations involve giving reasons based on principles or generalisations, motives, obligations or values.<sup>19</sup>

This typology can be illustrated – and extended – by the story of the cash-dispenser. The term 'explanation' could be applied to many different aspects of what might have happened in this story. A *descriptive explanation* had begun to take the form of a *causal* (though unfinished) account of the events and

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16 I have sketched them out in my *Beliefs and values in science education*, Buckingham: Open University Press (1995), pp. 36–8.

17 Ennis, R.H. *Logic in Teaching*, New Jersey: Prentice-Hall (1969), p. 255.

18 Brown, G.A. and Atkins, M.J. 'Explaining in professional contexts', *Research papers in Education*, (1986) 1 (1), 60–86.

19 *Ibid.*, p. 63.

processes involved, in which some ‘gap-filling’ was needed. This could have involved telling *how* pressing buttons would spell out a command which would call up the file that recorded the bank account. Following an IF-THEN procedure, which would check that there was enough money in the account, a returning signal would activate the machinery which would dispense the required £50.

Had the passer-by arrived before the cash-dispensation process began he might have asked for an explanation of what the device was and could have received the reply that it was a ‘cash-dispenser’. This would have been a *functional* (sometimes called a *teleological*) *explanation*.<sup>20</sup>

An inquisitive child standing by might have asked for an explanation of *what* ‘dispenser’ meant, which would have involved another type of explanation, the *clarification of words or phrases*, i.e. an *interpretative explanation*.<sup>21</sup> Yet again, the withdrawer might have explained to his wife *why* he had arrived home a little late. Since he was short of money for his train ticket the following day, he needed to visit the cash-dispenser. In that case the explanation would be a *justification of a course of action*, or *reason-giving explanation*.<sup>22</sup>

A fuller explanation of the events at the cash-dispenser might have taken the form of what is known as a *genetic explanation* (which has nothing to do with genes), in which ‘the task ... is to set out the sequence of major events through which some earlier system has been transformed into a later one’<sup>23</sup>, although it is questionable whether such an explanation constitutes a distinctive type. Thus a *genetic* explanation of how £50 came to be received by pushing a plastic card into a machine and pressing buttons could be given in terms of (i) an earlier realisation that people need to be able to withdraw money outside bank hours, (ii) the giving of contracts to machine manufacturers, (iii) the sending of letters of instruction to potential users and so forth, culminating in this particular man going to that particular cash-dispenser on this particular occasion. Genetic explanations are frequently offered in history and, at a trivial level, they are of the form expressed in Benjamin Franklin’s sequence: ‘... for want of a nail the shoe was lost; for want of a shoe the horse was lost; and for want of a horse the rider was lost’.<sup>24</sup>

‘Explain *why* money emerges from a cash-dispenser when a card is inserted and a number typed in’ is a request for a mechanistic, reason-giving explanation. ‘Explain *why* the bank has installed cash-dispensers’ calls for a reason-giving explanation of a different kind – one which involves agency and purpose.

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20 Nagel, E. *The Structure of Science*, London: Routledge & Kegan Paul (1961), p.23.

21 Ennis, *op.cit.* (17), p. 255; Martin, M. *Concepts of Science Education*, Illinois: Scott, Foresman and Co. (1972), p. 45.

22 Taylor, D.M. *Explanation and Meaning*, Cambridge University Press (1970), pp. 51f.

23 Nagel, *op.cit.* (20), pp. 25f

24 Franklin, B. ‘Maxims ... Prefixed to **Poor Richard’s Almanack**’ (1758), cited in *The Oxford Dictionary of Quotations* (3rd ed.) Oxford: OUP, p. 218.

Where a whole chain of reason-giving explanations for the bank's action is given, this constitutes a genetic explanation; hence my comment that it is doubtful whether genetic explanations constitute a distinctive type. Reason-giving explanations make up the class of explanations which feature most frequently in science–theology debates. Reason-giving explanations may be analytic and therefore tautologous, as in answering the question ‘Why has that stand got only three legs?’ with the reason-giving explanation ‘because it’s a tripod’. More commonly, reason-giving explanations are synthetic and informative. Synthetic explanations may be one of five types,<sup>25</sup> with numbers (ii) and (iii) in the following list being the most prevalent in discussions about science and theology:

- (i) empirical (but not causal), e.g. ‘The liquid did not burn because it was water.’
- (ii) causal, e.g. ‘The universe expanded on account of the force of the Big Bang.’
- (iii) reason-for-acting, e.g. ‘God made humans for a loving relationship with himself.’
- (iv) value, e.g. ‘She bought the costlier picture since she thought it was the better one.’
- (v) obligation, e.g. ‘He did the washing-up because he thought he ought to help in the home.’

When giving causal explanations, it needs to be made clear whether the causes in question are primary (ultimate) or secondary (immediate, proximate) ones and also whether they are to be given in terms of an agent or a process. There is no logical blunder being committed if it is claimed both that ‘God made the universe’ and ‘the universe was the result of a “Big Bang”’. It is a logical error to hold that an explanation of the cosmological mechanisms involved necessarily excludes divine agency. It certainly appears to be a common error to regard explanations of agency and explanations of processes as alternatives. Perhaps the form of this mistake which generates most heat and least light is the claim that one has to choose between ‘God created humankind’ and ‘humankind was the result of an evolutionary process’.

It is possible that there is a connection between the failure to distinguish between different types of explanations and the tendency to be satisfied with one type, be it interpretive, reason-giving, or descriptive, where other types are possible. Exemplifying Craik’s comment about being satisfied with one type of explanation where others are possible, this tendency may arise because the sense of frustration he refers to is reduced by one explanation of *any* type. This tendency sometimes manifests itself over science–theology issues, not simply as contentment with one type of explanation, but in active denial by religious

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<sup>25</sup> Ennis, *op. cit.*, p. 304.



detractors of the need or the validity of other types of explanation.

Reason-giving explanations, answering the question ‘Why?’ about the existence of the universe, can be scientific ones (‘principles or generalisations’) setting out the well-known account of the Big Bang; or they may be religious ones concerning God’s agency and purpose (‘motives’). Hence it is unwise to subscribe to the frequently claimed distinction between science and theology that ‘science is concerned with ‘how?’ questions while theology is concerned with ‘Why?’ questions’. ‘Why?’ is ambiguous and the question ‘Why is there a universe?’ is appropriate both in scientific and in religious discourse.

#### **4. What misunderstandings about explanation feature in science–theology debates?**

Misunderstandings about explanation which are of particular interest to the science–theology debates may involve:

- 4.1 Offering pseudo-explanations in place of genuine ones
- 4.2 Preoccupation with only one type of explanation (e.g. scientific)
- 4.3 Type-errors

Taking these three in order:

##### **4.1 Offering pseudo-explanations in place of genuine ones**

###### *4.1.1 The naming / explaining fallacy<sup>26</sup>*

A prime example of a pseudo-explanation is the naming/explaining fallacy, in which a label is offered or accepted to do service for an explanation. The naming/explaining fallacy is an interpretive explanation in reverse. In an interpretive explanation, such as a definition, a term or phrase is clarified or interpreted. For example, if the meaning of ‘gravity’ is asked for, an interpretive explanation would include statements about the earth’s attraction of other bodies. The procedure is reversed if, in answer to a question as to why bodies fall to the ground when released, the reply ‘gravity’ is given. This is naming, rather than explaining. The offering and accepting of mere labels as though they were explanations is a pseudo-explanatory device of long standing, and one to the fallaciousness of which Galileo drew attention.

SIMP[LICIO] The cause of this effect is well known; everybody is aware that it is gravity.

SALV[IATI] You are wrong, Simplicio; what you ought to say is that everyone knows that it is called ‘gravity’. What I am asking you is not the name

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<sup>26</sup> I am using the term ‘fallacy’ in its common sense of ‘error’, rather than in its technical meaning in philosophical discourse for an invalid argument.

of the thing, but its essence, of which essence you know not a bit more than you know about the essence of whatever moves the stars around.<sup>27</sup>

In the story of the cash-dispenser, the passer-by appeared to know nothing of the mechanisms involved and went away satisfied after being told that it was done by a 'computer'. Psychological needs for explanations are sometimes met, as in this case, by supplying no more than a label to the phenomenon – a 'computer' – the device of naming-instead-of-explaining. Such psychological aspects of explanation are not to be confused with logical ones. The logic of explanation is concerned with issues such as completeness, i.e. whether there is adequate evidence for a valid deductive argument to lead to the explicandum. This, of course, is a very tight requirement, which is often not met in everyday life by what are commonly counted as satisfactory explanations.

With reference to earlier comments about our thought-processes being frustrated until we can find explanations, the popularity of such a device as naming-instead-of-explaining may find its appeal as a means (albeit illegitimate) of alleviating these feelings of tension.

#### 4.1.2 *The reification fallacy*

Reification<sup>28</sup> or 'confusing a concept with a real object or cause' is closely allied with the naming/explaining fallacy. In reification, the 'labels' take on a life of their own and get attributed with the properties of purposive agents and causes, both immediate and ultimate. 'Evolution', 'natural selection', 'the laws of physics', 'chance', 'gravity' and 'nature' are prime examples of slippery words which are used carelessly – and sometimes, it appears, deliberately to confuse. They get vested with the abilities to *create, build, choose, make, organise*, etc. 'Acts' and 'processes' are regularly muddled up and treated as alternatives, along with 'processes' masquerading as 'causes'. The 'creation v. evolution' literature of Judeo-Christianity and Islam exemplifies this confusion, as does atheistic literature which claims that accepting an evolutionary paradigm denies divine creation. Certainly organic evolution is incompatible with what is termed Special Creation – the alleged bringing-into-being of ready-formed creatures in a series of separate acts. But the concept 'evolution' does not stand in necessary opposition to 'creation by God'.

Because the reification of the concepts listed invests them with properties and activities formerly ascribed to God, it appears to do away with divine activity. This pseudo-explanation is thus taken as not only explaining, but also as

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27 Galilei, G. [1632] (1967) *Dialogue Concerning the Two Chief World Systems*, (2nd ed.) (trans Stillman Drake), p. 234, London: University of California Press

28 '...“fallacy of reification”...confusing a concept with a real object or cause.' Beck, L W (1952) *Philosophic Enquiry*, p. 35, Englewood Cliffs, N.J.: Prentice-Hall, Inc.; *L. res* — a thing; 'to regard (as an abstraction, a mental construction) as a thing: convert mentally into something concrete or objective ... MATERIALIZE' [Webster's Third International Dictionary, 1971]; hypostasize. A variety of other words, such as personification are met with in the literature to describe something similar.

‘explaining away’ — about which more will be said later. An example of this is the expression ‘we used to believe it was God who kept the planets in their orbits but now we know it’s gravity’. Here, not only is the naming/explaining fallacy in evidence but the implication is that some natural attribute such as gravity explains away divine activity. Similar implications are made about natural processes such as evolution, on which I have commented elsewhere, comments which I reproduce here:<sup>29</sup>

The fact that such processes can be described – as Dawkins does – by words like *automatic*, does not eliminate divine agency. It is all very well to say that

A designoid object is an object that LOOKS good enough for it to have been designed, but which in fact has grown up by an entirely different process, an automatic, unguided and wholly unthought-out process.

– but ‘automatic’ is not a word which entails ‘unguided and wholly unthought-out’. In the second Gospel, Mark himself refers to a process which works ‘all by itself’:

A man scatters seed on the ground...the seed sprouts and grows, though he does not know how. All by itself [αυτοματος – Eng. *automatic*] the soil produces corn – first the stalk, then the ear, then the full grain in the ear. [4:27f, NIV]

This is not to claim that because our English word ‘automatic’ is a transliteration of the Greek word *automatos* the two words necessarily have the same meaning. That does not follow. But the sense of what Mark is saying indicates that he does recognise that a process, which he of all people would presumably attribute to God’s activity, can take place – in one of the meanings of the English word ‘automatic’ – ‘All by itself’. Triggered by light, heat and moisture, the seed contains within itself all that is needed to grow. But that does not mean the process is ‘unguided and wholly unthought-out’.

#### **4.2 Preoccupation with only one type of explanation (e.g. scientific)**

Those who tread this path usually take the ‘one type’ to be a scientific explanation, ‘science’ being taken to include the social and behavioural sciences as well as the physical and life sciences. Preoccupation with only one type of explanation may lead to claiming that scientific explanations are the only valid ones, or that they are the ‘best’ ones. Such a view may arise through elevating science to a higher status than it is able to bear, as did the early positivists and logical positivists.<sup>30</sup> Science then becomes like an overbearing cuckoo chick, ousting from the nest other legitimate contenders for the status of counting as

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<sup>29</sup> Cited from my (1994) ‘A Critique of Aspects of the Philosophy and Theology of Richard Dawkins’, *Science and Christian Belief*, 6 (1) 52.

<sup>30</sup> E.g. as in Ayer, A. J. (1974) *Language, Truth and Logic*, (2nd ed.), Harmondsworth: Penguin.

explanations. The position is rarely held consistently because, when confronted with other types of explanation than reason-giving (scientific) ones, people rarely deny that there can be reason-giving (agency and motives) explanations as well – except, it appears, in the case of God!

The idea that scientific explanations are the ‘best’ explanations begs the question, ‘best for what?’ Somebody who wished to update the oft-calculated worth of a human being at the current cost of the constituent chemicals would be bound to choose a scientific (descriptive) explanation as the best one. It would be labouring the point to say that the descriptive explanation offered by the lover would be rather different!

A variant of this preoccupation with scientific explanations is that one particular scientific explanation – such as that at the component level – is superior to other scientific explanations and to other types of explanations in general. Such a variant is reductionism.

#### 4.2.1 *Reductionism*

Briefly put, reductionism is taken to imply that religion is just psychology, psychology is basically biology, biology is the chemistry of large molecules, whose atoms obey the laws of physics, which will ultimately account for everything!<sup>31</sup>

It is necessary to be rather more precise about reductionism than this, as the writer, Barbour, is well aware. This is because the brief account does not distinguish between two<sup>32</sup> sorts of reductionism. One of these is benign as far as the science–theology debate is concerned and is the legitimate reduction of macro-phenomena to their molecular components – a standard and successful technique in certain areas of science. The gross behaviour of gases, for example, can be elegantly and fruitfully accounted for in terms of molecular constituents. Such a technique is known as *methodological reductionism*. It has no theistic or anti-theistic implications and is one of the useful tools-of-the-trade of the scientist.

However, the claim is sometimes made that the atom-and-molecule story is the *only* valid account of the phenomenon under review. This claim is variously known as *metaphysical reductionism* or *ontological reductionism* and is apparent in assertions of the form ‘humans are *nothing but* highly complex chemical mechanisms’. Humans are, of course, highly complex mechanisms. The giveaway words of ontological reductionism are ones like ‘just’, ‘simply’, ‘only’ and ‘nothing but’. For obvious reasons this has been dubbed ‘nothing-buttery’.<sup>33</sup>

Because of the cumbersome nature of the expression ‘ontological reduction-

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31 Barbour, I.G. (1966) *Issues in Science and Religion*, p. 7, London: SCM Press.

32 There is a third sort of reductionism: ‘Epistemological reductionism claims that the laws and theories of all the sciences are in principle reducible to the laws of physics and chemistry.’ — Barbour, I. (2000) *When Science Meets Religion*, p. 11, London: SPCK.

33 MacKay, D. M. (1960) ‘Man as a Mechanism’, *Faith and Thought*, 91 (3) 149.

ism', it is customary to abbreviate it to 'reductionism'. Such a practice, which will follow from this point, does not usually generate difficulties since methodological reductionism is not a metaphysical issue. A contemporary example of a reductionist claim is found in Francis Crick's book, *The Astonishing Hypothesis*:

The Astonishing Hypothesis is that "You," your joys and your sorrows, your memories and your ambitions, your sense of personal identity and free will, are in fact no more than the behaviour of a vast assembly of nerve cells and their associated molecules.<sup>34</sup>

A phenomenon which is associated with the converse of reductionism is *emergence*.<sup>35</sup> When going up rather than down the scale of complexity, a system may, by virtue of the organisation of its constituent parts, come to possess properties which are not characteristics of the components themselves. For example, if hydrogen is burnt in oxygen, water results, having a new emergent property, 'wetness', which is not possessed by either of the two constituents.

In imprecise, everyday language 'emergence' means 'the whole is greater than the sum of the parts'. In more precise terms 'emergence' means that there is more to be said than appears at the component level. The organisational level also needs to be considered.

'Emergent' arguments have a bearing on both types of reductionism. With respect to methodological reductionism they serve as a caution that significant information may be overlooked if the system is scrutinised only at the component level. With respect to ontological reductionism they act as a warning that, on account of the incompleteness of methodological reductionism, there are no grounds for confident assertions that physical accounts rule out a spiritual dimension to human experience. The inadequacy of ontological reductionism remains, even though attempts have been made by panpsychists like Teilhard de Chardin to reverse the 'emergence hierarchy' and to ascribe the arguably emergent property of consciousness to pre-biotic molecular constituents.<sup>36</sup>

Another manifestation of the idea that scientific explanations are superior to other types of explanation is that scientific explanations *explain away* other types of explanations such as religious ones — the explaining/explaining away fallacy — to which we now turn.

#### 4.2.2 *The explaining / explaining-away fallacy*

The explaining/explaining-away fallacy is close cousin to the naming/explaining fallacy. The atheist who dismisses the theist's beliefs as 'psychological' illustrates both points. Using the label 'psychological' is naming rather than

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34 Crick, F. (1994) *The Astonishing Hypothesis*, p. 3, London: Simon & Schuster.

35 Polanyi, M. (1967) *The Tacit Dimension*, pp 29-52, London: Routledge & Kegan Paul.

36 Teilhard de Chardin, P. (1970) *The Phenomenon of Man* (2nd ed.), p. 98, London: Collins/Fontana.

explaining. Also, when the label ‘psychological’ is used in this way it subtly implies that a psychological explanation of the reasons for holding religious beliefs explains *away* the truth content of the beliefs themselves. For example, someone may say, ‘Oh, he just believes in God because he needs a crutch!’, thereby betraying a wholly instrumentalist view of religious belief by focusing on what religious belief may *do* for the believer and discounting the truth or falsity of the belief itself.

But even if a religious belief were held for purely instrumentalist reasons, *the belief might still be true*. It is perfectly possible to hold true beliefs on inappropriate grounds. Copernicus believed in a central sun because it seemed more fitting to him for everything to be lit up from a central position; and he cited a legendary Egyptian mystic, Hermes Trismegistus, in support. His belief in a heliocentric system was true, but his grounds for believing were inappropriate. So a number of distinct questions emerge:

- What are the grounds for holding beliefs?
- Can holding these beliefs be justified?
- Are the beliefs true?
- Do the beliefs constitute knowledge?

This last question arises out of Copernicus’ belief, referred to above, because it is clearly unsatisfactory for a true belief to be held on inappropriate grounds. The matter merits the briefest of excursions into epistemology.

The epistemological matter of the justification of, and warrant for beliefs, including religious ones, was raised acutely in 1963 through a short paper by Edmund Gettier.<sup>37</sup> Knowledge has been defined as ‘justified true belief’ but the definition was challenged in Gettier’s paper. Gettier constructed two situations in which it was possible to have ‘justified true belief’, but about which one would not wish to use the word ‘know’, since there was no causal connection between the belief itself and the evidence on which that belief was based.

In one of the situations Gettier constructed, two people, Smith and Jones are after the same job. Smith has evidence that Jones will get the job and also that Jones has ten coins in his pocket, so he combines these two propositions and says that Jones will get the job and Jones has ten coins in his pocket. From this Smith infers that the man who will get the job has ten coins in his pocket. Since Smith arrived at this conclusion from evidence, it counts as a *justified belief*. A problem arises when it turns out that Smith, rather than Jones, gets the job and it also turns out that Smith has ten coins in his pocket. The problem is that we would not wish to call this example of *justified true belief*, ‘knowledge’, because it is accidentally true, even though there is justified belief in a true proposition. The possibility of beliefs being accidentally true needs to be ruled

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37 Gettier, E. (1963) ‘Is Justified True Belief Knowledge?’, *Analysis* 23,121-3.

out before the diploma title of 'knowledge' is awarded. Following Gettier's paper there have been many philosophical attempts to find some extra factor for 'knowledge', other than that a belief should be both 'justified' and 'true'.

There appear, then, to be a number of strands to the epistemological goal of maximising true beliefs and minimising false ones:

- one is the justification of the beliefs held, which requires the issue of rationality to be addressed;
- another involves the truth or falsity of the beliefs themselves;
- a third concerns the conditions which elevate 'true beliefs' to the status of 'knowledge'.

Having sketched out the importance of the truth-content of beliefs in rebutting the *explaining/explaining away* fallacy, we are in a position to answer the question, 'Can a psychological account of religious behaviour "explain-away" the beliefs which are held?' A psychologist may study why a subject holds religious beliefs, but an account of the subject's psychological state does not address the issue of the truth or falsity of the beliefs themselves. This is a matter which is left untouched by any explanations of the origins, continuance and effects of the beliefs themselves. It is only by failing to take into account the truth-content of beliefs that 'crutch' accusations gain their plausibility. It should of course be borne in mind that if psychological explanations of theism did explain those beliefs away then psychological explanations of atheism would have a similar result. If religious belief is indeed a *mental virus*, then religious disbelief falls into the same category.

#### 4.2.3 'Need' or 'room' for God

Those who concentrate on one type of explanation (scientific) to the exclusion of others – thereby violating Flew's 'first moral' of explanation – often seek justification by claiming a lack of 'need of', or 'room for', other types of explanations. Our first example comes from the physical sciences. In Peter Atkins' books, *The Creation* and the revised edition, *Creation Revisited*, the author's intention in writing is clearly stated on the first page of the preface:

My aim is to argue that the universe can come into existence without intervention, and that there is no need to invoke the idea of a Supreme Being ...<sup>38</sup>

The alleged lack of 'need to invoke the idea of a Supreme Being' is claimed to be because there are scientific accounts of the origin of the universe. Curiously, Atkins chooses, as a quotation to head up these books...

For nature is pleased with simplicity, and affects not the pomp of superfluous causes.

Isaac Newton *Principia*, Book III.

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38 Atkins, P. W. (1992) *Creation Revisited*, p. vii, Oxford, W. H. Freeman

... presumably thinking it would support his case. But it is a most inappropriate choice, for Isaac Newton was a man who considered his theological writings of more importance than his scientific ones and spoke of science as an importunate mistress dragging him away from the things he loved the most! Perhaps Newton's comment to Dr Bentley about the *Principia* should be cited as an antidote to this misapplication of Newton's words:

When I wrote my Treatise about our System, I had an Eye upon such Principles as might work with considering Men, for the Belief of a Deity, and nothing can rejoice me more than to find it useful for that Purpose.<sup>39</sup>

Newton saw no such difficulty in having both scientific and religious accounts of the universe.

Our second example comes from evolutionary biology:

... in the evolutionary pattern of thought there is no longer either need or room for the supernatural<sup>40</sup>

So wrote Sir Julian Huxley, implying that God is displaced by evolutionary theory. But this is a *non-sequitur*. It is possible for evolution by natural selection to be God's chosen mechanism for 'bringing-into-being', just as it would have been for there to have been separate creative acts. Despite this, it is commonly imagined necessary to choose between evolution and creation-by-God, or between creation-by-God and the Big Bang. But the concepts of the divine *act* of creation, of bringing-into-being, and the processes by which that may be accomplished belong to different *categories*. To confuse the two is to commit some kind of category mistake.<sup>41</sup>

However, there is residual truth in Huxley's statement, for there is no 'need' for talk-about-God in a comprehensive evolutionary account of origins, any more than there is 'need' for talk-about-Ford in a comprehensive scientific account of a popular make of car. Similarly, if scientific accounts, by convention, only refer to secondary causes, neither is there 'room' for talk-about-God in such an account. Talk-about-God is simply inappropriate. No threat is posed to theology by this.

It is important to be clear what it is we wish to defend and upon what we can agree, along with atheists, agnostics and those of other faiths, as part of the methodological convention of science, a convention which enables people holding a wide range of world-views to engage in a common enterprise.

I have avoided the dubious, but increasingly common phrase 'methodological naturalism' as a label for this pragmatic position. 'Naturalism' is usually

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39 Newton, I. to Dr Richard Bentley, 10th December 1692, opening paragraph.

40 Huxley, J. (1964) *Essays of a Humanist*, p. 82, London: Chatto & Windus.

41 A *category mistake* is made if what can only appropriately be said about something in one category is said about something in another. For the original use of Gilbert Ryle's term, see his (1963) *The Concept of Mind*, pp. 17ff, Harmondsworth: Penguin.



understood to mean that ‘ultimately nothing resists explanation by the methods characteristic of the natural sciences’<sup>42</sup>, and I would not wish to assert *that*. That goes well beyond being a methodological principle and, in the interest of accuracy, the term ‘methodological naturalism’ should be scrapped.

Assertions about having ‘no need for God’ on account of scientific explanations may be prompted by a number of factors other than that of one explanation of *any* type satisfying the curiosity and cutting short the quest for answers to other ‘legitimate explanation-demanding questions’. One such additional factor may be that of a scientist having a methodological commitment to one type of explanation which is so professionally engrossing that it results in a kind of ‘tunnel-vision’ rendering that scientist blinkered to the existence of other valid types of explanation. For example, sociological and anthropological explanations of religion might only concern themselves with explaining the factors and conditions which promote or hinder religious belief within a community and the functions which religion serves within societies. They might pay no attention to whether the beliefs are true or not, treating true and false beliefs symmetrically. *Functionalism* is a perfectly acceptable methodological procedure *provided* it is not denied – as it often is – that the truth or falsity of the beliefs themselves are important and constitute a legitimate locus of study.

A parallel example to the anthropological one, which often neglects the truth-claims of religious beliefs, is the sociobiological one. Sociobiology, particularly associated with the work of E.O. Wilson, looks to genetics for explanations of all social behaviour. In an attempt to subsume all behaviour under this grand theory, religious behaviour needs to be fitted in. Wilson asserts that ‘The highest forms of religious practice, when examined more closely, can be seen to confer biological advantage.’<sup>43</sup> However, he also claims that ‘The final decisive edge enjoyed by scientific naturalism will come from its capacity to explain traditional religion, its chief competitor, as a wholly material phenomenon’.<sup>44</sup> So an apparently benign first statement, offering a sociobiological explanation of religion, is belied by the second, imperialistic claim that sociobiology explains *away* the content of religious beliefs. Trigg, who furnishes these quotations, identifies the following paradox: ‘The sociobiological explanation of religion seems to try to show why religious belief is held even though it is false.’ But, ‘If Wilson’s view of religion is correct, a major decline in religious commitment would be biologically harmful, and yet it appears that sociobiology is encouraging this.’<sup>45</sup>

### 4.3 Type-errors

A third class of misunderstandings about explanation, which is of particular interest to the science–theology debate, acknowledges that there are different

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42 Blackburn, S. (1994) *The Oxford Dictionary of Philosophy*, ‘Naturalism’, Oxford: OUP.

43 Wilson, E.O. (1978) *On Human Nature*, p. 188, Cambridge, Mass: Harvard U.P.

44 Wilson, *op. cit.*, cited in Trigg, R. (1982) *The Shaping of Man*, p. 130, Oxford: Blackwell

45 Trigg, R. (1982) *The Shaping of Man*, p. 131, Oxford: Blackwell.

types of explanation but muddles up the different types, resulting in explanatory *type-errors*. This class of misunderstandings is probably the most widespread and persistent of any.

Among the criteria for evaluating explanations, criteria which include truth, non-circularity and a proper level of sophistication, is the requirement that the explanation should serve the correct function (justification or accounting for) and should be of the proper type.<sup>46</sup>

Thus if an astronomical explanation of a sunset is requested it would be inappropriate to refer to the scattering of blue light by dust particles when light from the sun enters the atmosphere obliquely and so traces out an extended path. Astronomy furnishes an explanation of a sunset in terms of the earth's rotation. Explanations in terms of the scattering of light are of a type appropriate to physical optics. Both of the above answers to the request are correct, in that they are both true explanations of different features of what is termed a 'sunset'. But to give an answer with reference to the scattering of light, when an astronomical answer is requested, is to be guilty of an explanatory *type-error*.

Another example of a type-error, this time concerning science and theology, is provided by the tongue-in-cheek reply of a zoology lecturer to a student's question, 'Why is the dog-fish like this?' The lecturer replied, 'Because God made it that way; but I don't suppose that was what you meant!' The lecturer was, of course, perfectly well aware of the provocative nature of what he was saying, but had he not been so aware and had offered 'because God made it that way' as a straight-forward explanation of the dogfish to the student, he would have been guilty of a type-error. He was giving a reason-giving (divine agency) explanation whereas the student wanted a reason-giving (scientific) explanation which referred to evolution by natural selection.

Type-errors occur when explanations of different types are used interchangeably. Dawkins' unusual assertion that 'religion is a scientific theory' is of this kind:

... until recently one of religion's main functions was scientific; the explanation of existence, of the universe, of life ... So the most basic claims of religion are scientific. Religion is a scientific theory.<sup>47</sup>

The claim seems to arise from failing to distinguish between 'the explanation of existence, of the universe, of life' presented as scientific accounts of a Big Bang, stellar and organic evolution and that presented by theology with reference to divine agency in creation and associated purposefulness.

The classic example of an explanatory type-error is what the late C. A. Coulson termed the 'God-of-the-gaps':

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<sup>46</sup> Ennis, *op.cit.*, pp. 281, 295.

<sup>47</sup> 'A scientist's case against God' — an edited version of Dr Dawkins' speech at the Edinburgh International Science Festival on 15 April 1992, published in *The Independent*, 20 April 1992.

#### 4.3.1 'God-of-the-gaps'

For the religious believer who feels under threat from science, quite a common approach is to make a mental separation between the mechanisms which are understood and those that are not, allocating the former to the province of science and the latter to the domain of God – the notion of the 'God-of-the-gaps'. It is always possible to point out areas of scientific ignorance and thereby to imagine one is reserving a place for God. But the position is philosophically muddled and apologetically counterproductive. It is philosophically muddled because it uses reason-giving (scientific) explanations and reason-giving (agency and motives) explanations interchangeably, without distinction, thus constituting an explanatory *type-error*. It is apologetically counterproductive because, as the gaps close, the perceived sphere of God's action diminishes and God is progressively squeezed out. Indeed, Goodlad, referring to science-and-theology in the context of 'science education for non-scientists' takes the view that 'the theological position of the "God-of-the-gaps" has probably done more damage to theology than anything else'.<sup>48</sup>

Originally, the 'God-of-the-gaps' strategy was a response by anxious theologians to a feeling of threat that, somehow, new discoveries in the sciences were undermining God's position as the maker of all things. There do not appear to be any biblical grounds for belief in a 'God-of-the-gaps', even though the viewpoint is held by some adherents of biblical theism. This perception of God is far too small. Biblically, God is portrayed as creating and sustaining the whole universe, the parts we understand scientifically as well as what is currently mysterious.

The latest appearance of the 'God-of-the-gaps' on the apologetic scene appears to be the Intelligent Design Argument. It is a central tenet of the Intelligent Design Movement that certain biological structures show an *irreducible complexity* which cannot be explained by a natural process like evolution, but necessitates divine intervention.

The non-believer's response to 'God-of-the-gaps' talk may be to say that this is just another example of what I have called the 'naming/explaining fallacy'. The believer, it might be claimed, is just attaching a label to what he does not yet understand. Of course, if there is no Being who is correctly spoken of in terms of transcendent, conscious agency, then the non-believer is quite correct; 'God' is a label and no more. However, if there *is* such a Being, then it needs to be recognised that the explanation of a phenomenon, be it gravity, light or electromagnetic radiation, does not stand in logical contrast to any Ultimate Cause of that phenomenon's existence. Even if a satisfactory and exhaustive mechanistic explanation of the phenomenon of gravity were available, it would not form a rival account to the claim that God had made matter to function in that way. To *explain* the mechanisms is not to *explain away* divine agency, plan or purpose.

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48 Goodlad, J. S. R. (1973) *Science for non-scientists*, p.24, Oxford University Press.

Another response of the non-believer to the 'God-of-the-gaps' may be to take the believer's concept of God as necessarily involving the idea of a 'God-of-the-gaps' and then to pursue science with added zeal in the hope of finally laying God to rest. This is the declared strategy of Atkins with his notion of an 'infinitely lazy creator':

I am developing the opinion that the only way of explaining the creation is to show that the creator had absolutely no job at all to do, and so might as well not have existed. We can track down the infinitely lazy creator, the creator totally free of any labour of creation, by resolving apparent complexities into simplicities, and I hope to find a way of expressing, at the end of the journey, how a non-existent creator can be allowed to evaporate into nothing and to disappear from the scene.<sup>49</sup>

Leaving aside the logical difficulty of how a non-existent entity can 'evaporate into nothing and to disappear', Atkins' 'infinitely lazy creator' turns out, on inspection, to be simply an *alias* for the 'God-of-the-gaps'.

But attempts by both believers and non-believers alike to envisage such a 'God-of-the-gaps' rest on insecure foundations. The best antidote to the 'God-of-the-gaps' comes from C.A. Coulson himself. Writing from his Christian standpoint, he said

'If He is in nature at all, He must be there right from the start, and all the way through it.'<sup>50</sup>

'I believe that the limits of science are only those which are presented by the following words: if a question about nature can be posed in scientific terms, then ultimately it will be susceptible of a scientific answer. Science does not lead us through its own country to the boundary of the scientifically unknown, explaining to us that this is where we have to deal with God. When we come to the scientifically unknown, our correct policy is not to rejoice because we have found God: it is to become better scientists.'<sup>51</sup>

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<sup>49</sup> Atkins, *op. cit.*, p. 17.

<sup>50</sup> Coulson, C. A. (1955) *Science and Religion: A Changing Relationship*, p. 9, Cambridge University Press.

<sup>51</sup> *Ibid.*, p. 7.