THE IMPACT OF THE COPERNICAN REVOLUTION ON BIBLICAL INTERPRETATION

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INTRODUCTION

Biblical passages which refer to the Earth not being moved and the sun moving have helped to crystallise thinking on the interpretation of Scripture. For many centuries, these verses were interpreted in the context of the dominant philosophy of the time, which was geocentrist. A Polish scholar known as Copernicus published, on his deathbed, a radical challenge to the consensus - arguing a case for heliocentricity. This was the time of the Reformation, when the principles of biblical interpretation were being discussed, and the Copernican controversy provided a major test case for both the Roman Catholic and the Reformed community to show how they would handle such a "hot potato". It is a matter of history that Copernicanism spread far more rapidly among the Protestants than among the Catholics. We need to ask "why?" This article seeks to identify and discuss some of the issues surrounding these historical events.

The subject has contemporary relevance as the revival of creationism has been accompanied by a small but significant revival of geocentrism. For the new geocentrists, the two trends are very closely connected as both areas of belief are perceived to derive directly from Scripture. However, most of the major creationist organisations have distanced themselves from geocentrism - but not always convincingly. Many people still seem to believe that the Bible teaches geocentrism and critics such as Lerner (1994) assert that

> "the Bible is at least as explicit, and certainly more repetitive, in asserting that the universe is centred on the Earth".

Clearly, it is vital for Christians to know both what the Bible does teach and how to handle contrary claims. To assist these goals, historical studies (of which this is one) have a role to play.

BACKGROUND TO THE SCIENTIFIC REVOLUTION

The contribution of Greek philosophers to the rise of modern science is a much-discussed, and sometimes contentious, subject. In the disciplines of logic, mathematics and astronomy, their strengths are undeniable. Controversy concerns the role these intellectual skills had in promoting modern science. One consequence of their impressive achievements was that a synthesis of Greek thinking, notably Aristotelian philosophy, was incorporated into Catholic theology by Thomas Aquinas in the 12th century AD. It swiftly became the orthodoxy taught in universities across Europe - a situation which was to continue for many centuries. Geocentricity was an integral part of Aristotelianism.

The people who actually participated in the scientific revolution often felt that they were moving away from the principles of knowledge developed by Aristotle and his followers: in particular, the concept of logical necessity. The Greeks had a tremendous confidence in the power of reason and logic. They believed that their philosophical schemes were sufficiently robust for them to reach, by processes of deduction, an understanding of the true nature of the physical world. They developed mathematical techniques to support their deductive approach to intellectual activity. Their style of mathematics started with axioms and proceeded by a

series of proofs to conclusions. As an instrument in the hands of the philosophers, mathematics was highly prized. It was known as the "handmaiden" of philosophy. It is worth noting that the term "pure mathematics" is still used today in this Greek sense.

The prominence of the concept of logical necessity and the associated tendency to deductive styles of reasoning meant that the Greeks never developed the experimental method as a way of testing hypotheses and revising understanding of the physical world. Thus, as long as their methodology for knowledge acquisition was retained, their ideas could not be successfully challenged. Any real advance in knowledge had to be revolutionary.

COPERNICUS AND THE BIBLICAL TEXTS

Copernicus was a church administrator who belonged to a group of humanists in the pre-Reformation church which was heavily influenced by the theologian Erasmus. This group stood for unity, tolerance and reformation in the church. However, Copernicus devoted much time and effort to matters of astronomy. He came to his radical views of heliocentricity, not because he was a revolutionary at heart, nor because he had adopted the experimental method, but because he wanted to find a way of improving the calendar, particularly the dates of Easter and of Christmas. The Ptolemaic mathematical system for describing the movements of the heavenly bodies had become ever more complex in order to make it conform to observation. Copernicus shared the disquiet expressed by neoPlatonists in Italy that the simple grandeur of the original mathematical system (*i.e.* everything moves in circular paths) had been lost (Kaiser, 1991, p.100). According to his disciple Rheticus, he felt that the Ptolemaic advocates

> "fashioned their theories and devices for correcting the motion of the heavenly bodies with too little regard for the rule which reminds us that the order and motions of the heavenly spheres agree in an absolute system" (Rosen, 1971, p.138).

Copernicus claimed that his mathematical model of the movements of the astronomical bodies gave a better fit to data than the established Ptolemaic model - and he believed his model was closer to reality. Many others agreed with him. Some were prepared to use his mathematical model without committing themselves to the validity of the physical model. There were no significant objections on the grounds that his mathematics failed to improve the predictions of astronomical phenomena. The concept of exposing theoretical models of the world to empirical tests was grossly under-developed by the Greeks. Copernicus quietly adopted a methodological principle that was destined to change the world. This was a fundamental departure from Aristotelianism and the principle of logical necessity - earning Copernicus the right to be called a pioneer of the scientific revolution.

Without going into details, it is worth noting that Copernicus still faced substantial problems:
1. The central premise of heliocentricity was still not proven by the analysis. He could only claim that the resultant picture of the natural world was much simpler and more satisfying.
2. The strength of Copernicus' arguments rested in mathematics - a discipline widely regarded as lower in the "order" than the discipline being revolutionised.
3. Very few people were competent to evaluate Copernicus' thesis.
4. Nearly everyone who was deemed to be competent held to the existing orthodoxy of geocentricity, which was also the teaching of the Church and the universities.
5. There were biblical texts which were considered to teach geocentricity.
6. Common sense and experience suggested a stationary Earth and moving heavenly bodies.

These difficulties help to explain why Copernicanism was not an instant success. People were very slow to align themselves with these new ideas. The hard line approach of the Roman

Catholic Church (evidenced in the Counter-Reformation) meant that many Catholics were wary of radical ideas: despite the fact that Copernicus had been a canon (an administrator) in the pre-Reformation Church and that he had dedicated his book to the Pope.

In this article, the main concern is with the fifth of the problems facing Copernicus: the biblical texts which appear to teach geocentricity. Advocates of geocentricity claimed that there were biblical passages which taught (a) that the Earth is in a state of rest, and (b) that the Sun moves. These are the passages which concern us here, and we shall see that the main response to these ideas pointed out that the Bible uses the "language of appearance". Some of the advocates of heliocentricity maintained that the Bible teaches (c) that the Sun is in a state of rest, and (d) that the Earth moves. If the language of appearance argument is on the right lines, (c) and (d) have no place in biblical exegesis and are of historic interest only.

Examples of texts used to prove that the Earth is at rest are: Psalm 93:1 "The world is firmly established; it cannot be moved", and Ecclesiastes 1:4 "Generations come and generations go, but the Earth remains for ever". In both cases, the nature of the `movement' and the `remaining' was considered to be spatial. Other texts which were suggested to belong to this category are Psalm 102:25; 104:5; 119:90; Isaiah 42:5; 44:24; 48:13 and Zechariah 12:1.

Examples of texts used to prove that the Sun is in motion around the Earth are: Ecclesiastes 1:5 "The Sun rises and the Sun sets, and hurries back to where it rises", and Psalm 104:19 "The Sun knows when to go down". Again, the `rising', `setting' and `going down' were considered to have a spatial meaning. Other texts suggested to be in this category are Genesis 19:23; Joshua 10:12; Psalm 19:5; 136:6; Isaiah 38:8 and Habbakuk 3:11.

The traditional views were summarised thus by the Catholic philosopher Lodovico delle Colombe: "All theologians without a single exception say that when Scripture can be understood according to the literal sense, it must never be interpreted in any other way" (cited by Westman, 1986, p.99). These theologians saw no reason to doubt the literal sense; their own common sense view told them that the Earth did not move and that the traditions of the Church were soundly based.

THE PRINCIPLE OF ACCOMMODATION

The Copernicans followed one of two strategies. One option was to avoid conflict by playing down the physical reality of heliocentrism. What did it matter - as long as Copernican mathematics delivered good and useful results? This strategy was a compromise, but it did enjoy a time of dominance. It was inserted as an introductory comment in Copernicus' book *de Revolutionibus* by Osiander. It was also a key thought in the Wittenberg Interpretation, championed by the Reformer Melanchthon, discussed by Russell (1991).

Copernicus himself considered that his theory was physically true. Comments below relate only to some 16th Century Copernicans who advocated the language of appearance argument. This is expressed in a more general way by what has become known as the "principle of accommodation", namely, *that God has chosen to use words in Scripture which are an accommodation to the non-technical perspectives of the readers.*

Copernicus' zealous disciple Rheticus wrote about those Scriptures which appear to assist geocentrism. Rheticus was a Christian man in the Lutheran tradition, with a high view of the inspiration of the Bible.

> ". . . it may often be noticed in everyday speech and in writings as, when following the

judgment of our senses, while we sail from the harbour, we say that the land and the towns recede from us, and when navigating we say that the mountains and lands rise up out of the sea, and that the sun and stars sink into it, and in our speech we do not distinguish the truth from the appearances.

When, however, we think as [persons] who seek the truth about things, we distinguish in our minds between appearance and reality. As the saying goes: we will judge as the few, but speak as the many. Thus when right reason concludes that the sun is immobile, even though our eyes lead us to think it moves, we do not abandon the accepted way of speaking. We say that the sun rises and sets, establishes the day and the year by its motion, even though we hold this to be true only in appearance, as our reason concludes to its immobility. In fact, it is the same going north, when we say that the pole [star] rises, because so it seems to us. But reason knows well that it stays fixed, and only seems to grow higher as we see it, because of our moving towards it.

But it is too well-known to need further proof, that Holy Scripture uses common and received forms and figures of speech. Whence it is clear that, however much we insist on the many descriptions of the sun's movement adduced from Scripture, these are to be understood as referring to its apparent motion, without in any way going beyond the bounds set by St. Augustine, nor introducing anything from which something inconvenient might follow. Therefore the texts of Scripture concerning the Sun's movement, which seem to argue against us, will not turn out to be at variance with the best verified results of the recent restoration of astronomy." (translation by Hooykaas, 1984)

Giordano Bruno, a Dominican scholar, held the same views on the language of appearance, but presented them in a much more aggressive way. With reference to Ecclesiastes 1:5, he wrote:

"So if the Sage, instead of saying, "The sun riseth and goeth down, turneth toward the south and boweth to the north wind," had said: "The earth turns round to the east, leaving behind the sun and sets, bows to the two tropics, that of Cancer to the south and Capricorn to the north wind," his listeners would have stopped to think: "What does he say that the earth moves? What kind of fables are these?" In the end, they would have accounted him a madman, and he really would have been a madman". (Cited by Westman, 1984, pp.91-2).

Johannes Kepler, also a Lutheran, was fully committed to heliocentricity. His views on the biblical texts are found in his book *Astronomia Nova* (1609). The accommodation principle is prominent, as is also devotion to Scripture. The following paragraph comments on Psalm 104:5.

"But some men think Psalm 104 to be wholly concerned with physics, since it is wholly concerned with physical matters. And there God is said to have *laid the foundations of the earth so that it should not be moved*, and that stability will remain from age to age. Nevertheless the Psalmist is a very long way from speculation about physical causes. He rests utterly in the greatness of God who made all these things and is unfolding a hymn to God the Creator, a hymn in which he runs in order through the whole world as it appears to our eyes." (Goodman, 1973, p.23).

Calvin's influence must be regarded as highly significant among the Reformed churches. He did not address the issue of geocentricity, although he uses Aristotelian phraseology sufficiently often for us to infer he had, in some matters, absorbed the culture of the day. In the "Argument" of his Commentary on Genesis (1554), he wrote:

"We are not ignorant, that the circuit of the heavens is finite, and that the Earth, like a

little globe, is placed in the centre."

Nevertheless, Calvin did allow the principle of accommodation to apply in the resolution of various problems of interpretation. Commenting on Genesis 1:16, the greater and lesser lights, he tackled the objection that other objects (such as Saturn) might be brighter in absolute terms than the moon:

> "Moses wrote in a popular style things which, without instruction, all ordinary persons, endued with common sense, are able to understand; but astronomers investigate with great labour whatever the sagacity of the human mind can comprehend. Nevertheless, this study is not to be reprobated, nor this science to be condemned, because some frantic persons are wont boldly to reject whatever is unknown to them. For astronomy is not only pleasant, but also very useful to be known: it cannot be denied that this art unfolds the admirable wisdom of God. . .
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> Nor did Moses truly wish to withdraw us from this pursuit in omitting such things as are peculiar to the art; but because he was ordained a teacher as well of the unlearned and rude as of the learned, he could not otherwise fulfil his office than by descending to this grosser method of instruction. Had he spoken of things generally unknown, the uneducated might have pleaded in excuse that such subjects were beyond their capacity. Lastly, since the Spirit of God here opens a common school for all, it is not surprising that he should chiefly choose those subjects which would be intelligible to all. . . Moses, therefore, rather adapts his discourse to common usage. . . There is therefore no reason why janglers should deride the unskilfulness of Moses in making the moon the second luminary; for he does not call us up into heaven, he only proposes things which lie before our eyes" (Calvin, 1554).

Acceptance of Copernicanism was a slow process, as has already been noted. In addition, it should be remembered that Europe was in political and religious turmoil for several generations subsequent to the publication of *de Revolutionibus*. However, Protestant scholars were far more receptive than their Catholic counterparts. Hooykaas (1972) provides ample evidence to justify his assertion: "Undoubtedly, Calvin's accommodation theory had a considerable influence with Copernican astronomers in Protestant countries." (p.122) The Wittenberg School saw changes too: from using Copernican mathematics for its predictive power to acceptance of the model as accurately representing reality.

> "At first [the Wittenberg astronomers] were only pragmatically interested in the possibility of improved calculations, but gradually they came to accept the underlying hypothesis that the sun was really stationary at the centre of the planetary system" (Kaiser, 1991, p.140).

This article is not intended to provide a review of all the reactions to Copernicus. Many others have addressed this theme. Nor is it to imply that all the debate was at a high level - many of the protagonists showed very little evidence of allegiance to the Scriptures (Galileo, for example, had a real mixture of responses, and he is not the best place to start when looking for an understanding of these issues). Rather, it is to point out that the "language of appearance" was identified at the outset of the controversy as a positive, uncompromising approach to understanding the Scriptures.

DISCUSSION

In view of these historical developments, it is important that Christians today have clear ideas about what the "language of appearance" means and what it does not mean. Even more important, we need to assess whether the principle of accommodation is a faithful guide in the interpretation of Scripture.

This article is written with the conviction that the Bible is a-scientific or non-scientific in terms of understanding technical matters. Nevertheless, I consider that the Bible provides the principles necessary for science to develop, namely, the concept of natural law, the predictability of God's providential government of his creation, the rejection of "logical necessity" as a way of discovering the nature of the world, the sense of wonder and awe in discovery of God's handiwork, and the sense of duty and stewardship in undertaking scientific work.

The Bible transcends discussions of underlying science. It deals with **descriptions** of the natural world - what things look like. It provides us with a **theistic perspective on the physical world** - providing a conceptual framework which is a foundation for scientific work. It is concerned with real **events** in the world - there is a strong sense of history. It deals with **mankind** - his relation to God and to his fellows. It deals with **God** - his mighty acts in history, his revelation of himself in word and in Christ. At the same time, this revelation comes from the infinite God to finite man. Though God has created us to understand spiritual truth, he has constrained us by space and time. Understanding can therefore only be partial. So, for example, when God speaks to us about the afterlife, we can understand, but we know we are out of our depth. The reality of our finiteness necessitates revelation being adapted to our condition. No discussion of the principle of accommodation can be acceptable which does not address this point.

The Copernican Revolution brought a very important contribution which is not often clarified in the literature. It helped to trigger change in the attitude of Christians towards biblical interpretation. True, people like Calvin were developing the hermeneutic principle of accommodation before Copernicanism became an issue. But it certainly helped to see this clear example of what the teaching means. In the context in which the principle was first developed, accommodation is not liberalism, nor does it sacrifice a high view of biblical inspiration. It reminds us that the Bible is a book for all generations - with principles to guide our studies of God's world, but not with divinely-revealed answers to our technical questions. This is the spirit of the quotations emerging from the Reformers and from some of the early scientists.

The fallacy of "literalism" is that each age brings its own "intellectual baggage" to the reading of God's Word. Literalism has no consistent approach to hermeneutics, but picks what it wants and accommodates the rest. This is not a satisfying way of handling God's Word! At its best, "literalism" can only point to veiled references to modern ideas.

APPLICATIONS

1. A principle of interpretation

The principle of accommodation, if it is accepted as a basic principle of biblical interpretation, needs to be explored in greater detail than it has been to date. It has been described as a principle of literary relativity. Examples of the way the principle can be applied are as follows.

(a) Aspects related to words used in Scripture. Language itself is an accommodation. God is using human language to communicate with us. The first chapter of the Bible gives us important instruction on the types of words God uses. In this chapter, God names various things he makes. He gives the names "day" and "night"; and in verse 8 he names the "sky".

This is a word describing appearance rather than physical nature. The word is phenomenological, not technical. "Atmosphere" would be a possible technical word - but a technical word here would have all sorts of ramifications. For example, birds fly in, not across, the atmosphere (compare with verse 20). Technical words require a precision of usage which God could easily have employed - but he chose not to do so. Instead, he chose words which are adapted to human limitations and which are based on perception. Such words introduce no errors and do not deceive - and they are meaningful throughout human history.

(b) Aspects related to the appearance of things. The geocentricity/heliocentricity controversy is the most notable example of accommodation relating to appearances. But others will be found. For example: do rabbits "chew the cud"? (Leviticus 11:6). This has created problems for those who know that rabbits appear to chew the cud but are not actually ruminants! We know today that rabbits are chewing partly digested food - but it is not cud from a rumen. (Even if the translation "rabbit" is questionable (Melnick, 1994), the point made about the appearance of things still stands). Another example concerns the classification of bats: both Leviticus 11:19 and Deuteronomy 14:18 refer to bats at the end of a long list of undoubted birds. This raises the question: why associate bats with birds - when they are taxonomically so different? If we look for technical precision here, we are liable to struggle. The reason the bat is in the list is that it shares with birds the ability to fly. Both these examples draw attention to shared behavioural features which transcend biological differences.

(c) Aspects related to purpose and meaning. It is not rare to find passages of Scripture referring to God's purpose apparently being frustrated, and this must be considered in the light of clear teaching that nothing can frustrate God's will. Similar tensions may emerge when we read of God "repenting" of something he did - when we know that God's omniscience is such that he never needs to change his mind about anything. Such examples are best approached with the principle of accommodation to hand.

(d) Aspects related to perspicuity. The point was well made by Calvin that the Scriptures are for the unlearned as well as the learned. Discourse is adapted to common usage. If the principle is valid, our reading of Scripture must do it justice! Too often, there have been zealous attempts to find scientifically advanced concepts in the Scriptures - which lack any consideration of accommodation. This point has a direct bearing on the "partial accommodationists" discussed below.

2. Accommodation and evolution

Many Christians have argued that accommodation requires an acceptance of the theory of evolution as an explanation of the origin of living things. "The battle was fought on geocentrism - let us learn the lessons of history". But have the lessons been learned? Is the geocentrism/heliocentrism controversy equivalent to the special creation/evolution controversy? This is a subject that deserves detailed treatment - and it is intended to address this topic in a subsequent article. However, the key points of difference can be summarised:

1. The accommodation associated with Copernicanism relates to the appearance of things, which does not apply in the case of Darwinism.
2. The Copernican accommodation has no bearing on issues of purpose, meaning or design.
3. The Copernican revolution does not touch on historical aspects of biblical revelation, whereas Darwinism requires a radical review of the history of origins.
4. Accommodation in the context of the Copernican revolution is not an accommodation to "primitive" cosmological views. Rather, the Copernican Revolution freed people's minds from scholastic philosophy. By contrast, the Darwinian Revolution had the practical effect of

enslaving people's minds to naturalism.

3. Contemporary issues related to "non-accommodationists"

The principle of accommodation is rejected outright by some. This is best illustrated by reference to the advocates of geocentricity. These people consider that accommodation is an attack on the veracity of God. Thus Bouw (1992) writes, in the context of the sun "standing still" in the day of Joshua:

> "Thus when one claims that Joshua 10:13 is *phenomenological*, one effectively claims that God is not presenting the situation as it *actually* is but only presents it as it *appears to be*. If the appearance is not the same as actual fact, then in the final analysis God is not relaying accurate information about the situation. For the sake of "convenience" God wrote an untruth. God presented the appearance of the situation as the truth rather than presenting the truth as the truth: this is what one means when one says that the Bible speaks phenomenologically.
>
> Phenomenological or anthropocentric: either the sun stood still or the earth stood still; either God inerrantly inspired the wording or He did not; either the Bible is trustworthy or it is not. There is no middle ground. There is no room for compromise. . . . Good though it may sound on the surface, accommodation still maintains that God goes along with the accepted story even though he really does not believe it." (page 75).

Bouw's summary of the issues makes the concept entirely negative and destructive. Historically, however, accommodation was not an attempt to twist God's words, and it was used by people who felt that the principle helps in rightly understanding the Word of God. This is not a controversy about inerrancy - the concern is with hermeneutics.

It is necessary to respond to Bouw's claim that accommodation makes God go along with the accepted story even though he really does not believe it. It is worth returning to a comment from Rheticus quoted earlier: "We distinguish in our minds between appearance and reality". In our scientific culture, we have grown accustomed to the idea that appearance and reality are two different things. We treat the appearance as something superficial and say that it is necessary to get beneath the surface and find out what's really going on! If someone then refers to the Bible using the language of appearance, we tend to think that the motive is to justify erroneous or primitive ideas in the Bible. The problem is that our cultural norms are inhibiting understanding. It is important to come back again to the thought that the culture of the Bible is a-scientific or non-scientific. Within this culture, the appearance is not to be regarded as something which conceals reality. On the contrary, the appearance is the reality. So, for example, it is entirely legitimate for such a person to describe the sun as rising in the east and setting in the west - this is reality!

4. Contemporary issues related to "partial accommodationists"

Partial accommodationists accept the principle of accommodation when addressing the issue of geocentricity, and may also use it in other contexts, but at the same time find various "literal" readings of Scripture remarkably suggestive of contemporary scientific concepts (Westman, 1984, p.91). The partial accommodationists like to think that because God is the author of the words, evidences of inspiration are seen in the glimpses given of advanced understanding.

A recent example of this approach is to be found in Humphreys' (1994) "biblically-based" cosmology. He has constructed an exciting scenario of origins using guidelines drawn from

the Bible including: the Earth is at/near the centre of the universe, and the "deep" of Genesis 1:2 comprised all the matter of the universe. Without wishing to be negative about Humphreys' reconstruction of the events during creation week, the two guidelines noted in the previous sentence do appear to me to be inconsistent with the principle of accommodation. The Earth is central both from our perspective and according to God's purpose, but this does not mean that it is spatially central in the created universe. Humphreys' new interpretation of the "deep" requires a level of conceptual ability (involving relativistic physics) which is more appropriate to the late 20th century than to the time of Moses.

Other examples are not difficult to find. One concerns the discovery of the oceanic currents by Maury in the last century (Meyer, 1982). Maury was stimulated by a phrase in Psalm 8: the "paths of the seas", and concluded that there were natural paths through the seas, even as there were natural paths through mountain passes. As he developed his thinking, he contributed much to the discipline of oceanography. It is a pleasing incident in the history of navigation - but this does not justify the biblical interpretation. The movements of sea animals, rather than the movements of water, might be expected to identify the paths of the sea referred to in the Psalm.

Perhaps the most pressing concept needing clarification concerns the created "kinds". In a helpful review of the historical aspects of "kinds" and "species", Landgren (1993) has shown that attempts to read a technical meaning into the Hebrew *min* have created considerable confusion in the past. Jones (1972a, 1972b) has argued convincingly that the scriptural meaning most closely corresponds to today's `family' level of classification. The important question is: do we expect the Bible to give us a technical statement about the created "kinds"? Jones (1972a) argues that "*min* is a strict classificatory term" and (1972b) that "*min* is a precise technical term". If the principle of accommodation is valid, a different answer might be expected. The Scripture is using the language of appearance expressing what we perceive routinely: we see many different types of living things (all the groups which, in general, we call "families"). Scripture declares that God is the Creator of these groups. Creationists have often been challenged to define the "kind" - but we should respond by explaining that the word is non-scientific in meaning. The technical details must be determined by observation, experiment and analysis.

5. Accommodation and "modernist" approaches to the Bible

Some have made the mental leap that the "language of appearance" is equivalent to "primitive" and even "erroneous". It should be noted that none of the early advocates of the principle of accommodation made this link. Such an association of ideas is unwarranted: non-technical language is not to be equated with misinformation, but with universality and accessibility. There is no justification for using the principle of accommodation to argue that the Bible contains falsehoods. We recognise that the words of Scripture are set in a human context and the culture is not uniform throughout the Bible - and sometimes we are not sure what is contextual and what is for today. However, this is to be addressed by spiritual minds using the tools of biblical hermeneutics - not by adopting the stance of unbelief evidenced by modernists and liberals.

Accommodation can be treated as a dangerous concept - because of its misuse by those who do not show a submissive spirit to the Word of God. Hasel (1994) expresses something of this concern when he writes:

> "Scripture, if it is to maintain its own integrity, can hardly be interpreted in such a way as to be accommodated time and again to any kind of interpretation derived from

> science, sociology, history, etc. Scripture, based on its own nature and authority, has its own integrity of meaning and its inherent truth claims". (p.10)

It may be that the word "accommodation" is not the best way to express this principle of interpretation as it can so easily be abused by compromise. It is possible that Hooykaas' (1972) suggestion is a way forward: that it is useful to distinguish between a "world picture" and a "world view". In the introduction to his book, he suggests that the Greeks had a very well worked out world picture - which proved to be wrong. The Hebrew Bible, by contrast, has no such world picture, but it does have a world view which has helped the development of science. However, it seems to me that even with this terminology, the opportunities for compromise are substantial. The phrase "language of appearance" has not been significantly misused, so it is to be preferred wherever possible. However, for the more general principle, I will live with the word "accommodation" until better terminology is found. The retention is primarily because of its constructive original use in biblical interpretation.

CONCLUDING COMMENTS

This article has considered the impact of the Copernican Revolution on biblical interpretation. The early Copernicans suggested that the Biblical texts are rightly understood when it is read, not as a source of knowledge about the way creation works, but when they are understood as describing the appearance of things. The "language of appearance" argument was of great importance in the history of biblical interpretation. It was articulated independently by Calvin (who remained a geocentrist) who also broadened the concept. This became known as the "principle of accommodation". The subsequent history of these ideas reveals a picture of misunderstandings and abuse which have brought the principle into disrepute. This article attempts to clarify the implications of the original concepts and to discuss several issues of contemporary relevance.

In my view, the "language of appearance" argument and the "principle of accommodation" are positive, helpful and valid. However, this is a historical study, intended to stimulate thought. The basis for saying that these concepts are biblical deserves a separate treatment.

As a consequence of the abuse, I have suggested that an alternative term for the "principle of accommodation" would be desirable. However, to get things in perspective, it seems to me that there are far more urgent matters to address than this. There was an alternative defence of heliocentricity which I consider to be the main entry point for erroneous interpretations. I am referring to "the two-book approach" to knowledge. In my opinion, this approach has done great harm in promoting compartmentalisation of knowledge and making it appear that scientists can proceed with their work without reference to revealed truth. Those who imbibe this approach appear to have opened themselves to absorbing the spirit of their age. This topic is the theme of a subsequent article.

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