

Dr Edward Fackerell

## INTRODUCTION

For those who teach from a self-consciously Christian worldview, an important question to keep constantly in mind is "What is the origin of the subject matter that we are teaching?" In the case of mathematics, the answer to this question has been dominated by two main non-Christian views: those of (1) Platonism, which in all of its variations, asserts that mathematics is timeless and uncreated, part of the eternal order of things, and (2) modern humanism, which asserts that mathematics is the free creation of the human mind, and that it therefore is *invented*, not *discovered*. The significant thing about both of these positions is that they both deny that mathematics is part of the *all things* that according to Colossians 1:15-17, 1 Corinthians 8:6 and Hebrews 1:1-3 belong to the creation mediatorship of Jesus Christ.

To see that Platonism is not a dead issue, let us look at the view of the Rouse Ball Professor of Mathematics at the University of Oxford, Sir Roger Penrose OM, who wrote in his book *Shadows of the Mind* (OUP 1994 p 50):

*We shall find ourselves driven towards a Platonic view of things. According to Plato, mathematical concepts and mathematical truths inhabit an actual world of their own that is timeless and without physical location. Plato's world is an ideal world of perfect forms, distinct from the real world, but in terms of which the physical world must be understood. It also lies beyond our mental constructions; yet, our minds do have some access to this Platonic realm through an 'awareness' of mathematical forms and our ability to reason about them.*

A coherent and readable recent non-Christian philosophy of mathematics is given in the fascinating book *What is MATHEMATICS, Really?* by Reuben Hersh (Jonathan Cape, London, 1997). A special feature of Hersh's book is that he clearly sees the religious nature of all those writers, including Bertrand Russell, who believe in anything like the Platonic view of mathematics (though Hersh seems to be blind to the religious nature of his own view, which he calls humanist, meaning that mathematics is a purely human activity, without any dependence upon God's creative work). One feature that Hersh draws attention to is that a number of mathematicians and philosophers of mathematics of recent times (eg Russell) were driven by the search for certainty and sure knowledge, having previously rejected the Christian faith.

Both Platonism and the modern humanism position of Hersh are in fact distortions of the true state of affairs. Platonism (a position held by the pagan Greeks who did not have the benefit of the revelation of God in the OT

concerning either the creation or Yahweh's lordship over all things) recognised in a distorted way that mathematics is not arbitrary but in fact has a law structure. The Greeks mistakenly thought that this law structure was eternal. Modern humanism, which has decisively rejected both the OT and the NT revelation of Jesus Christ, wants to create all things in the image of autonomous human beings. This is a complete secularisation of the task that God gave humans when he spoke to Adam and Eve in the garden giving them dominion over the whole creation. Part of that dominion involves developing mathematical thought and using it for his service in the creation.

So there are a number of interesting questions that we should ask about the nature of mathematical objects. Do they exist from all eternity or are they created? If they are eternal, are they independent of God? If they are created, are they created by God or are they purely human constructions, ie, 'created' by the human mind? A few more questions that will have to be asked are:

- **What is mathematics?**
- **Who sets the law for mathematical entities?**
- **How is mathematics related to the other fields of knowledge, such as physics, biology, logic, music - just to name a few?**
- **How is mathematics related to everyday life?**

#### A FRAMEWORK FOR A BIBLICAL WORLDVIEW

Before we attempt to answer the questions just listed, we need to look at the biblical revelation in order to attempt to sketch out a framework for a biblical worldview. (My choice of language here is deliberate: I do not wish to give the impression that my attempt at delineating a biblical worldview is definitive. You may see something of importance that I have left out.) To do this, I'd like first of all to draw your attention to a very important text that speaks to us about God the Father, Jesus Christ our Lord, and the whole of created reality, including ourselves. I think that you will agree that this is a comprehensive range, and a highly appropriate starting point for formulating a biblical worldview!

The text is 1 Corinthians 8:6, which in the RSV reads:

*Yet for us there is one God, the Father, from whom are all things and for whom we exist, and one Lord, Jesus Christ, through whom are all things and through whom we exist.*

Paul is asserting in a very clear way that the whole of created reality has its origin and meaning only in God through Jesus Christ. This is asserted even more strongly in the magnificent passage Colossians 1:15-20 where Paul, speaking of the Son of God, the Lord Jesus Christ, says:

*He is the image of the invisible God,*

*the first-born of all creation,  
for in him all things were created,  
in heaven and on earth,  
visible and invisible,  
whether thrones or dominions  
or principalities or authorities-  
all things were created through him and for him  
He is before all things,  
and in him all things hold together.  
He is the head of the body, the church;  
he is the beginning, the first-born from the dead,  
that in everything he might be pre-eminent.  
For in him all the fullness of God was pleased to dwell,  
and through him to reconcile to himself all things,  
whether on earth or in heaven, making peace by the blood of his cross.*

In both of these quotations you will have noticed the frequent phrase 'all things' and you will have noticed the use of the prepositions 'from', 'through', 'before' and 'to' relating 'all things' to either God the Father or the Lord Jesus Christ. These are not the only verses in the New Testament which relate 'all things' to the Lord Jesus Christ. Another one is Hebrews 1:1-3:

*In many and various ways God spoke of old to our fathers by the prophets; but in these last days he has spoken to us by a Son, whom he has appointed the heir of all things, through whom he created the world. He reflects the glory of God and bears the very stamp of his nature, upholding the universe by his word of power.*

Note that the phrase 'the universe' translates exactly the same Greek words that were translated 'all things' in the other verses.

From all this it is clear that the New Testament teaches that Jesus Christ is Lord of creation and Lord of redemption, there is nothing in the created universe over which he does not have full rights by virtue of his role in creation and his unique role in redemption. All things have their origin in him, he sustains all things and all things find their ultimate meaning in him.

This means that there is no area which is autonomous with respect to his claims; every area of the creation is dependent upon him. In particular, this applies to human beings and to mathematics.

From other parts of Holy Scripture, especially Genesis 1, we learn that humans were created by God as his image-bearers, who were placed in the Garden of Eden and given a task by God, namely, (Genesis 1:28):

*Be fruitful and increase in number; fill the earth and subdue it. Rule over the fish of the sea and over the birds of the air and over every living creature that moves on the ground.*

Unhappily, the first humans did not obey the word of the LORD but instead listened to the false insinuation of Satan that if they ate of the fruit of the tree of the knowledge of good and evil, they would be like God, knowing good and evil. This disobedience by the first humans has had the most profound consequences. One of them is that since the fall into sin, humans have tried to be autonomous, that is, self-sufficient and independent of God. Because of this, humans have tried to find certainty apart from the living God. One of the places where they sought to find this certainty has been Plato's world of Ideal Forms. Closely connected with this is the belief that absolute certainty was to be found in the geometrical demonstrations of Euclid. Another place where certainty was sought was in human reason, regarded as the arbiter of reality. All of these quests for certainty involved the setting up of idols, because in all of these quests for certainty outside of God a part of the creation was deified and put in the place of God.

In order to *redeem the whole creation* from the grip of Satan, it was necessary for the Son of God to become a man and to suffer in our place. There are some passages that are often overlooked, yet which are pregnant with meaning in this regard. The first is Matthew 19:28 (NASB):

*And Jesus said to them, "Truly I say to you, that you who have followed me, in the regeneration when the Son of Man will sit on his glorious throne, you shall also sit upon twelve thrones, judging the twelve tribes of Israel".*

Christ's summary of the law, namely: (Matthew 22:37):

*You shall love the Lord your God with all your heart, and with all your soul, and with all your mind*

tells us that there is no part of our existence that may be withdrawn from God's total demand of obedience and service. If we were to withdraw an area of life from obedience to Christ, we would thereby deny that he is pre-eminent in that area.

To complete our sketch of a biblical worldview, we have to say something about the nature of created things in the universe. Since we are concerned with mathematics, we must say something at least about its nature, its structure, and the laws to which it is subjected. All of these are completely dependent upon the will of the Creator for the creation.

As we stated earlier, no part of created reality, including mathematics, possesses an autonomous existence. Now with regard to laws, it is important to realise in the first place that God orders the creation by his Word, as we clearly see in Job 37:5-13; Psalm 33:6; Psalm 147:15-19, Jeremiah 31:36. In Job 38:33 these regularities are called the 'ordinances (in the NIV, 'laws') of the heavens'. We have already noted that in Hebrews 1:3 the Son of God is said to uphold all things by his word of power. Because God is the faithful covenant God, he is not fickle or capricious in the way in which he upholds all things. Accordingly, in Jeremiah 33:20, the regularities of night and day are explicitly stated to originate in God's covenantal faithfulness.

So we see that there is another essential component of a biblically based ontology, namely, the fact that God has ordered the creation by his word. We do not live in a chaotic world; we live in a cosmos that has been given order and structure directly by God, who is the Faithful One. This ordering is a multidimensional ordering, with law-words from God for its numerical, geometrical, physical, biological, logical and ethical aspects, just to name a few. The investigation of this ordered creation is a task given originally by God for human beings to carry out (creation mandate). Part of that task for humans is the work of examining the numerical and geometrical aspects of created reality. Another name for this work is 'mathematics'. So mathematics is a human activity which presupposes the order given to the creation by God. Obviously such a view has great significance for the teaching of mathematics.

## AN ATTEMPT AT A CHRISTIAN VIEW OF MATHEMATICS

The time has now come to put down some answers to the four questions that were formulated at the end of the introduction.

A Christian view of mathematics will recognise that concrete things in the creation such as tables, chairs, computer chips, paintings, plants, animals and humans function in a multiplicity of ways, two of which involve answering the questions 'how many?' and 'how extended?'

In answer to the question, 'what is mathematics?', our conclusion is that mathematics is a human activity which seeks, by a process of abstraction and introduction of theoretical concepts (such as integers, fractions, real numbers; lines, triangles, circles, conic sections, Cartesian coordinate systems, planes, spheres, etc), together with appropriate symbolism (algebra), to build up a logically related framework that will be fruitful for the investigation of some of the diversity that exists in the creation.

We then have to answer the second question, 'who sets the law for mathematical entities?' From our section on a framework for a biblical worldview we answer this question with a clear affirmation that the Lord God has set the law for mathematical entities in his ordering of the creation. Thus it is clear that a view of

mathematics that aims to be consistent with a biblical worldview will reject both the Platonist view that mathematics is the study of timeless ideal forms which are independent of God and it will likewise reject the view that mathematical objects are purely human constructs (eg Hersh). At the same time, because all our human efforts at investigating and formulating God's structuring and ordering of the creation are fallible and open to reappraisal, we will not claim any finality for our mathematical theories.

The third question 'how is mathematics related to other fields of knowledge?', has been answered by the assertion that God has structured the creation in a multidimensional or multilayered way, so that there is a hierarchy of sciences, which proceeds in a direction of increasing complexity, in which later sciences depend upon all of the preceding sciences. The first few of these hierarchically listed sciences are arithmetic, geometry, kinematics, physics and biology. I haven't included chemistry as a separate discipline, since I believe that it is reducible to physics (very good theoretical chemists spend a lot of their time solving Schroedinger's wave equation, which is something belonging essentially to physics). Because God created all of the ways in which the creation functions, and wove all of these aspects together in a marvellously rich way, mathematics has applicability in all of these diverse other sciences.

The last question, 'how is mathematics related to everyday life?', is one which might seem simple, but actually has profound implications. If mathematics were developed and applied in harmony with God's desire for the creation, it would enrich everyday life and be a blessing. However, the distinct possibility exists that mathematics could be used in a way that not only impoverishes life but actually is a curse. Specifically I refer to the so-called digital revolution and the all-pervasive presence of high-powered digital computers. Most of us greatly enjoy the use of the digital revolution in music CDs with high quality reproduction of our favourite music. We may also have used CD ROMs with a digital computer (eg, an encyclopaedia on a CD ROM, or a language course with sound, text and vision on a CD ROM). But at the same time, we all know that a great deal of information about us can be reduced to a long set of numbers, eg, our buying habits, our travelling habits as disclosed by our use of credit cards and the new generation of 'smart cards' that are going to be let loose among us willy-nilly. Similarly our characteristic identifying features such as our fingerprints and the details of our eyes can also be reduced to numbers. The federal government is very interested in the details of our use of the health system and the welfare system. Perhaps one of the most complex things about us that is amenable to the methods of the digital revolution is our genetic makeup. The human genome project has the aim of completely mapping the whole of the human genome. Insurance companies would be very interested in knowing a great deal more about the genetic makeup of their clients. All of this information about us and much more can be put into computer data banks and used without our knowledge in ways of which we may not approve. Developments in this area are going on at an ever increasing pace. From this it is clear that the use of mathematics is very far from being morally

neutral and may have a great impact on the way in which the world of the 21st century is going to unfold.

Indeed, the digital revolution is one of the prime means whereby technology has become a major power in the transformation of the whole world, according to 'scientific principles'. For many, the aim of using technology and science is to have mastery over the future, without any dependence upon God or upon the redemption that he has provided in Jesus Christ. Technology then becomes a substitute for God's redemption in Jesus Christ. If we are not aware of this there is a serious danger that we may be swept up in non-Christian views. It is clear that people who work in the area of the digital revolution are going to have a significant impact upon the way in which human society is going to develop, and the Christian school should have something to say about the choices involved here, giving a clear Christian vision. Obviously the answer involves a Christian perspective on both science and technology, but that must be the subject of another paper.

Edward Fackerell has earned his PhD in the Applied Mathematics Department at the University of Sydney and carried post doctoral work on black holes at the California Institute of Technology. He was greatly influenced by the book *The Relation of the Bible to Learning* by Evan Runner and has developed a long term interest in the relationship between faith and learning.

[tedf@maths.usyd.edu.au](mailto:tedf@maths.usyd.edu.au)