

Quantum Unbelief

Michael Davenport, April 2005

Michael Ingham, the current Bishop of NewWestminster in the Anglican Church of Canada, published this month his Easter Message for 2005 (*Topic*, Vol 36, No. 4, and [Diocesan Website](#)¹). His message looks at the impact of the “new physics” on theology, and concludes that Easter can no

Ingham concludes that Easter can no longer be viewed as “something understandable”

longer be viewed as “something understandable” but rather must be seen as a “divine uncertainty principle inserted into our world.” While developing this theme, he manages to aim a couple of barbed comments at orthodox Christians who are less enlightened than he is. I am responding to that Easter Message because I am one of those orthodox Anglicans, because I have a PhD in theoretical physics, and because I fear that someone might take him seriously.

Ingham’s first mistake is to think that this “new physics” is new. The two components that he refers to – quantum mechanics and general relativity – were well established by the time of the fifth Solvay conference in 1927, so they certainly do not represent a paradigm shift in science “in our lifetime”. I was introduced to them in high school in the 1970s, so I doubt Ingham’s assertion that “most Christians have not even begun to think about” them. And by the way, when physicists mention “new physics” these days, they are more likely to be discussing SuperString theory than quantum mechanics.

Ingham’s Easter Message also seems to be taking a kick at the idea that the universe was “created”. It attributes such ideas to the “old science” of Copernicus and Newton, which has been replaced by models of expanding and exploding universes. Ingham is trying to summarize 400 years of progress in a very small space, so I’m willing to cut him some slack on the “old science / new science” oversimplification, but if he is implying that the idea of a “creator” is incompatible with the “new science”, then he is seriously wrong. Over the past century physicists have continued to seek and find simplicity and beauty in the fundamental laws of physics, including the “new physics”, and for many of us this only affirms our conviction that we are uncovering the work of an intelligent creator.

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The “New Physics” is not very new.

General Relativity was proven experimentally in 1919, and the main concepts of Quantum Mechanics were fully agreed upon before the Solvay Conference in 1927, shown here.

1. <http://www.vancouver.anglican.ca/Portal/Default.aspx?tabid=1&mode=Story&StoryId=138>

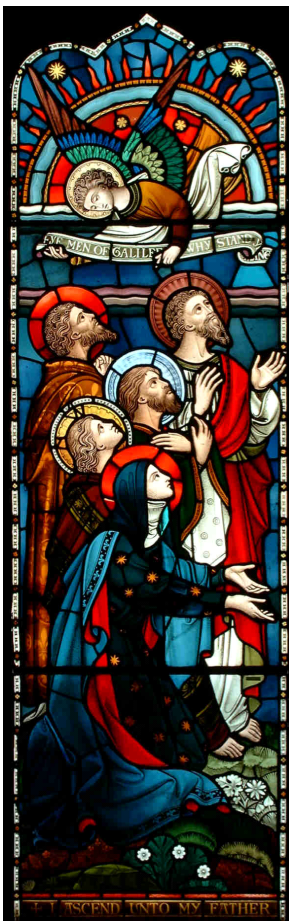
Paragraphs five and six toss around apparently random and sometimes exotic examples of modern cosmology. When Ingham quotes “Sir Herbert Wilkinson” as saying that he can “no longer imagine there is only one universe,” I think he is referring to a book called “Our Universes” (1991) by Sir Denys Wilkinson. I Googled “Herbert Wilkinson” and “physics” and turned up only “Jane Herbert Wilkinson Long” (b. 1798) who was known as “the mother of Texas.” Please be reassured that there is no more physical evidence for exploding universes or cosmic annihilation than for a physicist named Sir Herbert Wilkinson.

Paragraph eight is the low point of the text. Ingham sets up an absurd strawman argument, then uses incorrect calculations to ridicule it. The argument (which he attributes to the Astronomer Carl Sagan) focuses on the biblical descriptions of Jesus’ Ascension (e.g. Acts 1:9-11).

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A literal reading of this passage, Ingham asserts, requires that Jesus must rise up out of our universe in order to get to heaven. Assuming that Jesus travels at the speed of light, he calculates that it would have taken him a year to pass Pluto and more than two thousand years to escape the solar system,

from which we must conclude that “he is not yet in heaven”. “A few brave Christians,” Ingham tells us proudly, “have taken up the challenge of these new ideas” that perhaps heaven is not somewhere just beyond Pluto.



The Ascension
Ingham uses the ascension story to argue that the bible is unreliable.
(image from <http://www.sgm.abelgratis.com/collections/7603g.htm>)

Does Ingham really believe that there are conservative Christians somewhere tracking Jesus’s progress toward heaven at the speed of light? Should I even point out that light travels from the Earth to Pluto in less than six hours? And that after 2000 years, a beam of light travelling at right angles to the galactic disk would be well clear of the Milky Way by now? Should I tell the bishop that this bizarre analysis of the Ascension has nothing to do with “the new science,” and that Olaf Roemer in 1676 had a far better sense of the speed of light than he has? If I told him all this, would it just confirm his suspicion that we orthodox Anglicans even now have telescopes searching for heaven somewhere near the Andromeda Galaxy?

Of course Ingham doesn’t think we’re that stupid – his condescension is aimed at spreading mistrust of the bible, and of those who trust it. Liberals are taught to mistrust the biblical account of the Ascension, and to believe that the story was invented by later writers. They are thus inclined to interpret the details of the story as indications of the cosmology of those who made it up (hell below, heaven above, and earth in between) and roll their eyes at how primitive that cosmology was. The orthodox position is simpler: the story in Acts 1 is an eyewitness account of the actual event rather than a statement about cosmologies. And quite frankly, if God chose to lift Jesus up into a cloud, who is Michael Ingham to find fault with that?

This cynical paragraph attempts to ridicule what the vast majority of Christians today believe, with the small exception of an enlightened elite enclave, which includes the Bishop. By painting the orthodox as irredeemably narrow-minded and foolish, he exerts peer pressure on his remaining parishes to mistrust that majority.

After mocking the Ascension story, Ingham begins a meandering pseudo-poetic meditation using terms borrowed from quantum theory. As a physicist I read it and sigh. People seem to think that because quantum mechanics has an “uncertainty principle,” it must be a fundamentally vague discipline. On the contrary, quantum mechanics is renowned as the most precise and accurate scientific model ever developed. Not only can we predict the probability of quantum events with extraordinary accuracy, we can precisely describe the limits of that accuracy. There is nothing vague about how quantum mechanics describes the world.

Quantum mechanics is the most precise and accurate scientific model ever developed

Serious philosophers and quacks alike are drawn to two aspects of quantum mechanics in particular: the “role of the observer” and the “uncertainty principle.”

Let’s discuss the “role of the observer” problem first. In everyday operations, we know that we must use instruments that are smaller and gentler than the object being operated on. A wrench is an appropriate tool for repairing a brake drum, but not an eardrum. Quantum mechanics operates on the smallest objects in the universe, so it is not possible to find instruments that are smaller. Physicists thus realized early on that they could not make “surreptitious” measurements in the quantum domain – they had to include the observation mechanism in their model of the process. Postmodernists heralded this as “the death of objectivity” and concluded that there can be no underlying truths, only points of view. Such an interpretation is not compatible with the physics even at the quantum scale – where the “wave function” is the underlying absolute truth – much less at the macroscopic scale of human society.

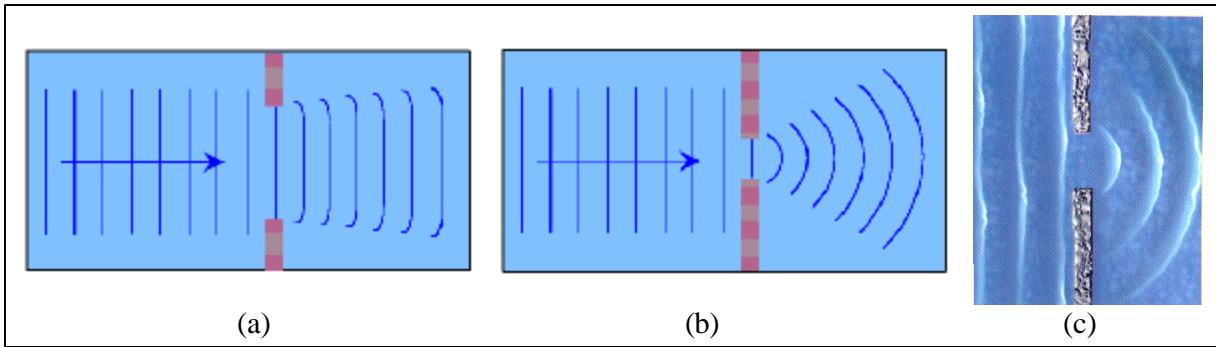
You can’t use physics as “proof” that all truth is provisional

My point is that you can’t use physics as “proof” that all truth is provisional. Physics sides with Plato and *The X-Files* in believing that “the truth is out there.” If in many cases we cannot see the whole truth, that is only because our vision is limited, not because the truth is contingent. But don’t base your theology on physics—base it on the Word of God.

Now what of Heisenberg’s uncertainty principle? Heisenberg knew that a quantum-scale object acts in some ways like a wave, where the amplitude of the wave at each position describes the probability that the object is at that position. When a wave goes through a narrow opening, it starts to spread out, and the narrower the opening, the wider it spreads. Heisenberg asked “what does it mean for a probability wave to spread out?” and concluded that it means “an increased uncertainty in the sideways speed of the particle.” A narrower opening, he said, means less uncertainty in the *position* of the particle but it causes more uncertainty in the *speed* of the particle. In mathematical terms, Heisenberg’s principle says that “the position uncertainty (in meters) times the speed uncertainty (in m/s) will be no smaller than $(6.6 \times 10^{-34}$ Joule sec) divided by the mass of the object (in kg)”. The extraordinarily small size of that number reflects how very little uncertainty there is in most objects.

What we really have is “Heisenberg’s Certainty Principle.” An object needs to be small like an atom for uncertainty to be important – large objects don’t inherit quantum behaviour from their constituent atoms. Apply the above equation to the position of a one milligram mustard seed for example, and the uncertainty is 0.000000000002 mm (one billionth of a percent of its width), when the uncertainty in its speed is 0.000000007 mm per hour (one thousandth of the speed that Australia is drifting away from Antarctica). There is, effectively, no quantum uncertainty in large objects like mustard seeds or stones blocking tomb entrances.

What we really have is “Heisenberg’s Certainty Principle.”



Heisenberg's Uncertainty Principle

Quantum mechanics says that very small objects behave like waves, with wavelengths that get smaller as the mass of the object increases. When waves encounter a small opening they spread out, as in (a).

The smaller the opening (b) the more they spread out. Heisenberg noted that such a spreading quantum wave means increased uncertainty in the speed of the object. Making the opening smaller, he said, reduced the *positional* uncertainty but increased the *speed* uncertainty, and it was impossible to reduce both at the same time. You can try this in your bath at home (c).

So when Ingham says that Easter is a “divine uncertainty principle,” please don’t interpret this as having anything to do with physics. The best sense we can make of it is that Ingham wants us to ponder the patterns in God’s quantum mechanics in order to gain insights into God’s redemptive work on Earth. I’m not sure that I see why one should illuminate the other, but I’m willing to have a try. Quantum mechanics tells us that there is no fuzziness or uncertainty in large objects and large events. Metaphorically, I suppose, we could infer that there is no fuzziness or uncertainty in the

There is no fuzziness or uncertainty in the huge event we call “Easter”

huge event we call “Easter”. Despite Ingham’s protests, Easter is indeed “something neat and coherent” – the resurrection either happened or it didn’t. People of faith throughout the ages have found certainty in the resurrection, and certainty in the doctrines drawn from it by the Apostles. Their faith and our faith, like the mustard seed, are not subject to an Uncertainty Principle.

I have searched without success for some connection between modern physics and Ingham’s statements that we should stop “thinking of ourselves as created beings” and “stop thinking of God as a supernatural Being located outside the universe.” Ingham credits O’Murchu’s book *Quantum Theology* for these ideas, so I went in search of a copy. It was not listed in the catalogues of British Columbia’s two largest libraries, nor was it at any local store of Canada’s big-box booksellers. When I called our local new-age bookshop however, they didn’t even have to check their inventory to tell me that they had it. So I went with my two pre-school sons to pick it up, and they admired the four-foot tall Buddha and goddess statues by the door while I plunked down my twenty nine dollars. The store is near Jericho beach, so they played in the sand while I quickly found the relevant sections in O’Murchu’s book.

The absurdity is, O’Murchu doesn’t base “quantum theology” in any meaningful way on quantum physics. He apparently invented the term, and thus freely and unapologetically defines it to mean whatever he likes, picking and choosing from non-scientific descriptions of the “quantum worldview” for inspiration. His statement, for example, that “quantum theology abhors the human tendency to attribute literal significance to the sacred writings of the various religions” (pg 57) has not, and could never have, any basis in quantum mechanics. “Quantum theology,” I realized, is based solely on the author’s personal beliefs and biases and, as you might expect from that quotation, pays absolutely no attention to what the Bible says – it’s “Make Up Your Own Religion Day” in O’Murchu Land, folks.

“Quantum theology” is based on neither physics nor scripture

Science can become
“the god of this age”

Ingham admits that he is “not very good at science” and I agree, but my greater concern is that he is not very good at theology. He worries that we might “find ourselves as Christians completely out of touch with modern knowledge”, and that

certainly seems to describe this Easter message, but a much more grave concern is that the message is “completely out of touch with the Word of God.” He warns that “we need to be very careful here,” in a message where he makes at least four careless errors of fact, but then wantonly promotes a “quantum theology” that does not even attempt to link itself to Christian theology. I wish he *would* be careful – he is not just exploring ideas here, he is in dangerous life-and-death territory. The danger is that “those who are perishing” will make science the “god of this age” (2 Cor 4:3-4) and the result will be a form of “Easter Blindness,” an inability to know what Easter means.

Remarkably, the last five paragraphs of Ingham’s message seem to *promote* Easter Blindness. They are a crescendo of increasingly abstract metaphors for Easter – “irrational obstacle”, “intellectual scandal”, “only still point”, “essential mystery”, “God’s laughter” – coupled with increasingly apocalyptic settings – “everything unstable”, “over-wrought projection of grief”, “the boundaries and limits we know are torn apart”, “universe crumbles to dust”, “everything we understand dissolves around us”. They remind me of the final climax of a fireworks display, where bigger and bigger shells are fired higher and higher. When Ingham first used this ending in his 2003 Easter Message, it followed a meditation on Mary’s sense of loss and confusion after the crucifixion, and hence had some biblical context. This year, it follows a message that has no reference to scripture and it denounces people who “claim to know what Easter means.” The firework shells, if you like, are now aimed at the audience.

What is the message in the fireworks? It seems to be: “quantum mechanics has shown us that everything is uncertain... Easter is uncertain... don’t try to understand it... embrace the uncertainty... God is unpredictable but reliable.” There are fragments of truth in this: God does break into our world and into our complacency, God is a Person not a principle, and God is thus neither predictable nor reducible to a set of laws.

But Ingham is wrong to suggest that everything, including Easter, is a mystery. We have learned from Heisenberg’s Certainty Principle that the vast majority of the objects we encounter in the physical world are firmly in the classical domain, where they can be objectively observed and

measured. Similarly in Christian theology, the core “truths” of the Christian faith are clearly and objectively laid out for us in scripture – we are a “People of the Book” rather than a mystery sect. That is not to say that we have nothing more to learn about them when we meet God in heaven. “Now” the apostle tells us “we see through a glass darkly; but then face to face: now we know in part; but then we shall know even as we are known” (1 Cor 13:12). Yes our mortal vision is limited, but at the core of the Gospel is the good news that God, recognizing our veiled eyes, has revealed Himself in Jesus in such a way that even veiled eyes can understand the essential truths (2 Cor 4:6).

Easter is neither a mystery nor a “divine uncertainty principle”. On the contrary, Peter assures us in the earliest recorded sermon that Easter is our “certainty” (ασφαλως) that Jesus is Lord and Messiah (Acts 2:36). That word means “all locked up” (as in Acts 16:23) so you can’t wiggle out of it with talk of “uncertainty principles.”

The earliest recorded
sermon says that
Easter is “certainty”

Despite what the bishop says, we do “know what happened there”, and we do “know what it means”, and you don’t have to be a rocket scientist to figure it out.

The core “truths” are
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