

## THE GOD PARTICLE?

"[D]o you have... er, that is..."

"An answer for you?" interrupted Deep Thought majestically. "Yes I have."

"There really is one... to the great Question of *Life, the Universe and Everything?*"

"Yes... Though I don't think... you're going to like it."

*The Hitchhiker's Guide to the Galaxy*<sup>1</sup>

It is hard to know whether to laugh or cry at the latest fatuity from the scientific community. So, they've found 'the God particle', have they? the latest and 'minutest' of the material elements, the answer to the question how it is that things have mass and—wait for it—how things were created. God bless 'em in their naivety! With his preoccupation with the material to the exclusion of every other cause, the modern scientist resembles nothing so much as a man walking in a field who, narrowly overtaken by a bouncing ball, declines to investigate its trajectory to discover the responsible agent and the agent's intent in favour of dissecting the ball.<sup>2</sup>

This elaboration on the discovery appeared in *The Australian*.

### HOW THE HIGGS BOSON CREATED MATTER

1. *The cosmic explosion 13.7 billion years ago results in the universe expanding in a matter of microseconds.*
2. *Particles are created and the Higgs field is switched on. The field manifests as Higgs bosons.*
3. *The Higgs field acts as a drag on the particles slowing them down like a swimmer in water.*
4. *This interaction gives mass to particles which slows them from whizzing around the universe at light speed.*
5. *These particles then form into protons and neutrons which bind together to form the nuclei of atoms, the basis of all matter.*<sup>3</sup>

1. This argument, if it could be dignified with the title, demonstrates the penchant of the modern scientist to exercise his imagination in lieu of his intellect. Of greater concern, however, it demonstrates a rooted inability to conform thought to reality. Hypothesis is built on hypothesis built on hypothesis. That each hypothesis is problematic does not seem to trouble him. The presumptions relied on are facile, the contradictions demonstrable. Let us examine a few of them.

<sup>1</sup> *The Hitchhiker's Guide to the Galaxy*, Douglas Adams, London, 1979, chapter 27.

<sup>2</sup> In this parable the trajectory stands for the *formal* cause of the ball's flight, the agent the *efficient* cause, and his intent, the *final* cause.

<sup>3</sup> *The Australian*, Thursday, July 5, 2012, page 11

2. A man and his shadow exist together in time. In reality, i.e., in the ontological order, however, the man is prior. The man can exist without a shadow: his shadow cannot exist without the man. An explosion involves two realities, a material substance (or substances) and the act of exploding. They exist together in time but in the ontological order the material substance is prior. You can have a material substance without an explosion, but not an explosion without a material substance. Therefore? Therefore, there could have been no 'big bang' (if it did occur) without a pre-existing material substance, or substances.

But even more fundamentally, you cannot have an explosion unless first there is a *place* in which the explosion is to occur: and there can be no place without the surrounding presence of a material body or bodies. This surrounding body (or bodies) must, accordingly, pre-exist the material substance or substances that suffer the explosion. The 'big bang' (if it did occur) was therefore not responsible for the creation of material being and, *a fortiori*, neither was the 'boson'!

Science's facile analyses have an even more fundamental problem.

3. The reader will note that the theorist cited above assumes that matter is the first element in creation. Let us look at what happens in the order of human making, the real world, rather than in the world of the scientific mind.

A builder proposes to build a house. What is the first thing he does? It is not to obtain the materials. He drafts a plan or he gets an architect to do it for him. Only after he has the plan in his hands does he apply his mind to the materials. He does this because it is a universal principle of nature and of human art that *form* is prior to *matter*. The form of something can exist without matter—e.g., in the mind of an architect or in his detailed drawings—but matter cannot exist without form.<sup>4</sup>

Our scientific theorist makes a further assumption contradicting reality. He treats matter as if, somehow, it is capable of existing independently of the formality of one or other of the 118 elements in the periodic table or of that of one of the almost infinite variety of their compounds. Matter, *prime matter*, can be any body, any element or compound, but it cannot exist without a determining form.<sup>5</sup> Indeed, *prime matter* does not exist in the real world; it can only be conceptualised.

The critical issue in material creation, then, is not matter but *the formality or formalities* under which matter is manifested. Now formality, as we show hereafter, can be substantial or accidental.

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<sup>4</sup> In the order of human making, the artificial order, the builder starts with the advantage that his materials already have a fixed formality whether as wood, glue, nails, concrete, bricks, steel etc.

<sup>5</sup> The *Principle of Indeterminacy* applies. *That which can be many, from itself is not one of the many.* Water can be hot or cold; of itself it is neither. Therefore there has to be another cause, a cause other than water, that makes it be hot or cold.

4. It will pay the reader unfamiliar with the abstruseness of the scientific arguments about the 'boson' to study the article on the *Wikipedia* website.<sup>6</sup> He will see that an understanding of the discovery is confined to a specialist group possessed of the necessary qualifications in physics and mathematics, a sort of priesthood whose members convey the truths revealed to the rest of mankind, 'the faithful'.

Science's theorising is primarily mathematical, only derivatively based in the real. A machine produces a result, the reality it represents is conceptualised as rooted (if it were possible) in matter *simpliciter*, and the scientific imagination grows wings!

5. What, pray tell, is mass? It has something to do with force, something to do with inertia, something to do with velocity and something to do with gravitational effect, but the inter-relationship is obscure. Each category seems to be defined by one or more of the others in a bemusing circularity.

Science's preoccupation with matter leads its exponents to try to discover the secret of mass by looking for a lowest common material denominator. So they divide and subdivide material particles. Their theory assumes that the simplest particles are without mass and acquire mass by interaction with some undetectable entity. In furtherance of this thesis they propose 'the Higgs field', a hypothetical reality perilously close (for materialists!) to the immaterial, arrived at by a process of induction from conclusions grounded in the standard model of particle physics.

That the source of mass might be found *outside* the limitations of matter never occurs to them. Indeed, given their prejudice against anything that cannot be measured or scientifically detected, they would think the assertion ridiculous. But it could not be more ridiculous than the contention, which inverts logic, that mass is "something particles acquire by passing through a field". Mass is not a consequence of drag; drag is a consequence of mass.<sup>7</sup>

A similar fatuousness is to be found in the reasoning that life arises out of matter. Here again scientists reverse the ontological order. The living thing is not an effect of matter; rather matter (a body) is an effect of the living thing. *Form is prior to matter*. The form of a living thing, its soul (the influence that gives it life), from the very first moment of its existence subsumes matter to serve its sustenance, development and maturing.

Even sillier is the scientific contention that the day will come man when man will create life. As Aristotle said "[f]or living things to live is the same as to be". Whatever it is that gives life to a living thing gives it existence (*esse, be*). However extensive man's talents may be, they do not include creating something out of nothing.

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<sup>6</sup> <http://en.wikipedia.org/wiki/Boson>

<sup>7</sup> Indirectly, for it affects surface area one of the prime determinants of drag.

Our knowledge of what it is that constitutes life is, and will ever be, limited: we can only know it via its abstruse definition as 'the automotive', conforming our concepts to the reality that this automotion occurs in three categories: 1. as to execution only (plants); 2. as to execution and form (animal, or sensitive, life); and, 3. as to execution, form and end (the rational animal, man).

6. Some material realities, such as light, have no mass. Science tells us that light is constituted of particles, or waves, or (for heaven's sake!) both. We know it is something vital. Without it little of life could exist, but what sort of something is it?

Some 450 years ago the scientific world embraced Descartes' mechanicism and in doing so abandoned Aristotle's profound analyses of reality. We have suffered from materialism's banal and simplistic explanations ever since.

Let us try a little Aristotelian realism.

7. The Philosopher divides material reality into two basic categories—categories that a little thought will demonstrate accord with common sense—*substance* and *accident*. What Aristotle means by *substance* is *not* what the scientist means by that term. Aristotle means the *formal*, the constitutive, element which makes the material thing to be what it is; its substantial form. Though the two, form and matter, exist together in time in any material thing *form is ontologically prior* for form determines; matter is only what is determined. Precisely because it is immaterial, substance (*substantial form*) is immutable.<sup>8</sup>

A substance is something that exists in itself (*be-in-self*) not in something else.<sup>9</sup> An *accident*, in contrast, is something that exists only in some substance (*be-in-other*), literally something that *befalls* a substance. Aristotle lists nine species of accident the first two of which, *quantity* and *quality*, are intimately involved in a substance's exercise of existence.<sup>10</sup> *Quantity* extends substance, gives it a body and individualises it. *Quality* determines it in innumerable ways giving it colour, density, texture, temperature, and so on. The remaining seven accidents, *relation*, *when*, *where*, *action* *passion*, *habitus* and *situs* comprehend everything else that can possibly befall it.

To illustrate: The sea is a *substance* (or a vast collection of substances) its colour blue is an *accident*. Granite is a *substance*; its density is an *accident*, as is its hardness. A horse is a *substance*; the heat of its body is an *accident*. A tree is a *substance*; its location on a hillside is an *accident*. A boy is a *substance*; that he is hanging upside down from a cross bar is an *accident*. The man speaking to me now in this room is affected by two accidents, *when* and *where*.

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<sup>8</sup> This immutability is the reason the sciences are fixed and certain; their objects are fixed and certain.

<sup>9</sup> Aristotle's usage of the term reflects better than that of science the word's derivation in the Latin, as anyone can discover by checking a dictionary.

<sup>10</sup> Again, let the reader check the Latin derivations

You will never find any of these—colour, density, hardness, heat, location, ‘upside-down-ness’, ‘when-ness’ or ‘where-ness’—existing by itself. Each exists only in, or in association with, a *substance*.<sup>11</sup>

With Aristotle’s help let us look at that mysterious reality, light.

8. He teaches that light, like colour, is a *quality*. In other words, light does not exist in itself, *only in something else*. This accords with experience. Though we may think we do, in fact we never see light itself; we only ever see something lit, whether in its source, or the atmosphere, or some object on which it falls.<sup>12</sup>

Why does light have no mass? Not because it is composed of what science is pleased to call ‘photons’, but because it is an accident, a *quality*, and accidents do not have mass, only substances. This raises the question of the identity of the substance of which light is the proper quality. It raises another, and critical, issue. How can light, a *quality*, be said to have a ‘speed’? A quality does not move; it inheres in—it *qualifies*—its proper substance. Accordingly, *C*, the ‘speed of light’, is a property not of light but of this proper substance; it is *the speed at which this substance allows light to propagate*. That is why *C* is not infinite, but limited to 299,792,458 mps *in vacuo*.

9. Aristotle teaches in his *De Caelo* and elsewhere that it is impossible for void, i.e., *a place where there is nothing*, to exist. Again, this is simply common sense for void implies that *nothing* could somehow exist, which is impossible. He concludes that the heavens are constituted by some substance which he calls ‘the heavenly body’, or *aether*. Consistent with this what we call ‘space’ or ‘void’, wherever it occurs, must be replete with some material body.<sup>13</sup>

10. In 1887 scientists decided, after the Michelson-Morley experiment, that Aristotle could not possibly be right about *aether* because they could detect no typical material characteristics in the asserted substance. Implicit in this conclusion is the pre-supposition that if something cannot be detected experimentally it does not exist. As Chesterton remarked in *Orthodoxy*: “if the cosmos of the materialist is the real cosmos it is not much of a cosmos. The thing has shrunk.”<sup>14</sup> If these scientists had only bothered to give credence to Aristotle’s reasonings they would have discovered that their experiment had not contradicted but confirmed what he had maintained: *aether* is superior to ordinary matter; it has no mass, no mensurability; it is perfectly pervious to all impression: you cannot detect it experimentally!

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<sup>11</sup> Or, to be more precise, *primarily* in or with a substance. The light in the sky exists here and now (the accidents *when* and *where*). But it does so not from itself, but as a quality of its proper substance, the transparent, activated by the sun and falling upon a combination of substances above the earth’s surface, nitrogen, oxygen, carbon dioxide, water vapour and local impurities.

<sup>12</sup> A good argument could be mounted that, like every other instance of electro-magnetic energy, light is *per se* invisible.

<sup>13</sup> There are radio operators today who still speak of ‘the ether’ as the vehicle through which they send their transmissions, giving linguistic recognition to the reality that serves their operations.

<sup>14</sup> *Orthodoxy*, London, 1908, ch. II.

11. What, then, in Aristotelian terms, is mass? It is a blend of *substance* (its subject), *quantity* (which extends it, gives it parts, and individualises it), and density, a *quality* proper to (a property of) the substance in question.<sup>15</sup>

Now each of these three, *substance*, *quantity* and *quality*, names a formality, that is, something *per se* immaterial. Just as *prime matter* is obscure in itself—it is impossible for it to exist except under some formality—so we may never know precisely what it is that constitutes the nature of mass. But this at least is clear, matter’s involvement in the reality is secondary and subsidiary. What follows? Scientists are wasting their time trying to discover the source of mass in some element of matter.

12 How fortunate for the world if science would, once again, open its mind to the metaphysical. We might discover why, when light is quite incapable of exercising substantial activity, the relation between mass and energy is a function of ‘the speed of light’. We might discover the nature of the substance of which light is the proper accident. We might begin to understand how critical *this substance* is to the structure of material being and how it is involved in the relationship between matter and energy. We might discover things that Einstein’s theories have only hinted at.

As for the discovery of ‘the Higgs Boson’—so what!

Michael Baker

15<sup>th</sup> August 2012—*Solemnity of the Assumption of the Blessed Virgin*

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<sup>15</sup> “The action of a generant does not stop at the bare substance but produces it equipped with the accidents upon which the substance depends, that it may exist and operate.” John of St Thomas; *Curs. Phil. II*, ed. Reiser, p. 268b, quoted in A M Woodbury Ph.D, S.T.D., *General Natural Philosophy and Cosmology*, (Centre for Thomistic Studies, Sydney), nn. 127 and 344.