

consensus, and require the dynamics of exchange, interchange, and debate.

Given Augustine's hierarchical view of the reading of texts on the one hand, and given the call of this historical moment on the other, what conclusion for this article would be most faithful to the *Confessions*? Perhaps the conclusion is to be found in returning again to the garden in Milan and to hearing the ethereal voice. Ultimately the most faithful conclusion to a modern-day reading of this great work would be to extend to the entire Church, and not just to its bishops, or any single class, the same invitation which summoned the bishop Augustine, "*Tolle lege*." The acceptance of this invitation could reform the community in ways more palpable than any initiative thus far known.

- 1 Hal M. Helms, trans., *The Confessions of St. Augustine: A Modern English Version*, (Orleans, Massachusetts: Paraclete Press, 1986). Quotations appearing in this essay are cited from this translation.
- 2 Peter Brown, *Augustine of Hippo*, (Berkeley University of California Press, 1969) p. 162.

Two Paths to Truth: A Tribute to Georges Lemaître

Christopher Dwyer

"I was interested in truth from the point of view of salvation just as much as in truth from the point of view of scientific certainty. It appeared to me that there were two paths to truth, and I decided to follow both of them."

The two paths led Georges Lemaître (1894–1966), the Belgian priest who became a founding father of modern cosmology, to the farthest reaches of the universe. The centenary of his birth fell on 17 July; his face, accompanied by the "primeval atom", is currently featured on Belgium's stamps.

Born in Charleroi, in the heart of French-speaking Belgium, he

planned to become an engineer. But service in the First World War turned his thoughts to the priesthood, and he was ordained by Cardinal Mercier in 1923. After further mathematical studies in Cambridge and in the USA he returned to Louvain in 1927 as Professor of Astronomy, and remained there (apart from frequent travels) for the rest of his career.

The 1920's were exciting years in astronomy. In 1919, the team led by Arthur (later Sir Arthur) Eddington, Professor of Astronomy at Cambridge, to the island of Principe had observed the bending of light near the sun that provided the first proof of Einstein's general theory of relativity. In 1925, Hubble's observations yielded the first evidence that the distant nebulae are separate galaxies, and that they are receding from us.

Lemaître's achievement in those years was to show, in a famous paper of 1927, that the Einstein model of the universe could not be static: it must either expand or contract.

The idea was not wholly new. Although Einstein failed to see it — indeed he resisted it for years, and was downright rude to Lemaître — it had been glimpsed by the brilliant young Russian mathematician Alexander Friedmann, who died in 1925. When Lemaître reached the same conclusion independently, he was too modest to claim the credit.

Lemaître's second achievement came in 1931, when he linked cosmology with quantum physics. Eddington — a Quaker to whom the planning of the mission to Principe had been a congenial wartime task for a conscientious objector — had written that “the notion of a beginning of the present order of Nature” was repugnant to him. Lemaître replied that quantum theory suggested “a beginning of the world very different from the present order of Nature.” He went on: “If we go back in the course of time we must find fewer and fewer quanta, until we find all the energy of the universe packed in a few or even in a unique quantum.”

Lemaître thus carried the idea of an expanding universe to its logical conclusion — that there must have been a moment when all the matter now in the universe was concentrated in a small mass of intense density. He later called this mass “the primeval atom”. Such an “atom”, he reasoned, would have exploded into fragments that cooled and became the galaxies, stars and atoms that we know today.

He did not use the expression “Big Bang”. That phrase seems to have been coined in 1950 by Fred Hoyle, who, being himself an exponent of the rival “steady state” theory then in vogue, used the phrase pejoratively. But Hoyle's phrase was soon picked up by proponents of a “Big Bang”, and the term is now used for a range of theories having as their common factor the idea of expansion from a

state of intense density.

Finally, Lemaître was far ahead of his time in recognizing that the cosmic disintegration must have produced, not only the elements that now form the galaxies, but also a background radiation that must still be reaching us.

For many years, attempts were made to detect this radiation without success. But in 1965, the year before Lemaître died, two young American radio astronomers, Penzias and Wilson, found in their antennae a persistent noise they could not explain. A team from Princeton identified this as the primeval radiation predicted by Lemaître, which has been travelling towards us since the first moments of creation.

This discovery of the “echo of creation” ranks as one of the most momentous in the history of science. Had Lemaître lived a little longer, he might well have gained a Nobel Prize. But that prize is never awarded posthumously, and after years of hesitation it went to Penzias and Wilson for a discovery they had not sought, and did not recognize when they made it, but which confirmed the insight achieved by Lemaître over thirty years earlier.

Professor Odon Godart, his successor at Louvain, informed Lemaître, then seriously ill in hospital, of the discovery of the cosmic radiation. Professor Godart, now in his eighties, received me graciously at Louvain-la-Neuve when this article was in preparation. He is probably the only person living who knew Lemaître intimately; he remembers him as an excellent pianist and a lover of Molière, as well as a priest devoted to the idea of a Catholic university, and deeply hurt by the linguistic conflict that rent it asunder in his final years.

For a mere amateur astronomer like myself, it was a deeply impressive experience to be thus humanly linked with a man whom posterity may yet come to revere as it does that earlier canon of Frauenburg who dethroned the earth and set it spinning around the sun.

For Lemaître’s fame, like that of Copernicus, is inexorably linked with the age-old question of the relation between science and faith. In his youth he had toyed with an attempt to use science to confirm the truth of Scripture. But by the time he spoke at the Sixth Catholic Congress at Malines in 1936, he had abandoned this approach. There, he first publicly drew the distinction between supernatural truth, “placed within our reach by Christ and His Church”, and natural truth, “directly proportionate to the powers of our intelligent nature.”

Lemaître was determined that his theory should gain acceptance on its scientific merit alone. When he attended the seminar of the Pontifical Academy of Sciences in Rome in 1951, he was embarrassed by the

speech of Pope Pius XII. The Pope said that observations on the spiral nebulae and radioactive substances had clothed the opening words of Genesis "in a concrete and almost mathematical expression." Science had "succeeded in bearing witness to that primordial 'Fiat lux' uttered at the moment when . . . there burst forth from nothing a sea of light and radiation." The reply, though incomplete, which all were awaiting from science was "Creation took place in time; therefore there is a Creator; therefore God exists."

It soon emerged that the Pope's remarks were based on Sir Edmund Whittaker's lectures *Space and Spirit*, given in Dublin in 1946. But Whittaker's approach, seeking to enlist science in the service of apologetics, was frankly anathema to Lemaître. He studiously avoided being drawn into controversy, but took the opportunity of a visit to South Africa the following year to make a stop in Rome. He obtained the discreet intervention of a friend, Fr Daniel O'Connell of the Vatican Observatory, to ensure that no similar embarrassment occurred when the Pope addressed the International Astronomical Union in 1952. On that occasion, the Pope made merely a brief poetic allusion to "the cosmic processes which took place in the first morning of Creation", and added that, when human intelligence can go no further, then faith must step in.

This was much closer to Lemaître's outlook. His view was expressed succinctly at the Solvay conference in Brussels in 1958. Speaking of the primeval atom, (modestly called "Friedmann's theory"), he observed:

As far as I can see, such a theory remains entirely outside any metaphysical or religious question.

It leaves the materialist free to deny any transcendental Being. He may keep, for the depth of space-time, the same attitude of mind he has been able to adopt for events occurring in non-singular places of space-time.

For the believer, it excludes any attempt at familiarity with God, like Laplace's 'flick' or Jeans's 'finger'. It is consonant with Isaiah speaking of the Hidden God, hidden even in the beginning of creation."

The present Pope John Paul II has reiterated the statement of Pius XII that, as regards the origin of the universe, "we would wait in vain for a reply from the natural sciences, who on the contrary admit that they are honestly faced with an insoluble enigma."

Lemaître would not have been happy with the seeming implication that there might be no basis for faith if science ceased to regard this

enigma as insoluble. Ironically, at the very same Vatican conference at which the present Pope spoke thus, Stephen Hawking put forward a hypothesis suggesting that science need not forever find a singularity at the beginning of space-time. Some have taken this to mean that science may not forever need the hypothesis of a creation.

This would not have worried Lemaître. For him, there could never be any question of “reducing the Supreme Being to the rank of a scientific hypothesis.”

In his popular book *A Brief History of Time*, Professor Hawking puts it rather differently. He concludes that “the ultimate triumph of human reason” will be to know “the mind of God”.

Lemaître would not have challenged this, just as he did not challenge Hoyle’s assertion that the opposition to the “steady state” theory (a theory now discredited by the cosmic radiation) came from “Judaeo-Christian fundamentalism”. He would simply have gone on quietly working for all the triumphs of which human reason is capable, while pursuing what for him seemed a surer path to the mind of God.

The “Problem” of Homosexuality

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W.E.B. Dubois, speaking of his experience of being a black man in North America in 1903, wrote:

Between me and the other world is ever an unasked question: unasked by some through feelings of delicacy; by others through the difficulty of rightly framing it. All, nevertheless, flutter round it. They approach me in a half hesitant sort of way, eye me curiously or compassionately, and then, instead of saying it directly, How does it feel to be a problem? they say, I know an excellent colored man in my town; or, I fought at Mechanicsville; or, Do not these Southern outrages make your blood boil? At these I smile, or am interested, or reduce the boiling to a simmer, as the occasion may require. To the real question, How does it feel to be a problem? I answer seldom a word.¹