Georges Lemaître and Stigler’s Law of Eponymy

David L. Block

Abstract One of the greatest discoveries of modern times is that of the expanding Universe, almost invariably attributed to Hubble (Proceedings of the National Academy of Sciences of the United States of America 15:168, 1929). What is not widely known is that the original treatise by Lemaître (Annales de la Société Scientifique de Bruxelles, Série A 47:49, 1927) contained a rich fusion of both theory and of observation. The French paper was meticulously censored when published in English: all discussions of radial velocities and distances, and the very first empirical determination of $H_0$, were suppressed. Stigler’s law of eponymy is yet again affirmed: no scientific discovery is named after its original discoverer (Merton, American Sociological Review 22(6):635, 1957). An appeal is made for a Lemaître Telescope naming opportunity, to honour the discoverer of the expanding universe.

Lemaître (1927): A Theoretical Paper?

The title of the original 1927 paper indicates to the reader that the content will be a fusion of both theory and of observation: “Un univers homogène de masse constante et de rayon croissant, rendant compte de la vitesse radiale des nébuleuses extra-galactiques.” Which translates into English thus: “A homogeneous universe of constant mass and increasing radius accounting for the radial velocity of extra-galactic nebulae”.

Lemaître spent the years 1924–1925 at the Harvard College Observatory. He had an excellent foundation in observational astronomy, writing about terms such as the effective temperatures of stars, trigonometric parallaxes, moving-cluster parallaxes, absolute bolometric magnitudes, dwarf branch stars, giant branch stars, and the like.
To speak of Lemaître (1927) as a most remarkable and absolutely brilliant theoretical paper only, is a grave injustice to the very title. Not only does Lemaître derive a linear relationship between the radial velocities of galaxies and their distances in the above paper, but he is eager to determine the rate at which the universe expands. Lemaître (1927) carefully uses the radial velocities of 42 extragalactic nebulae tabulated by Strömgberg (1925), and he converts apparent magnitudes \( m \) into distance \( \log r = 0.2 \ m + 4.04 \) following Hubble (1926). The actual value which Lemaître obtains in 1927 for the rate of expansion of the Universe is 625 km s\(^{-1}\) Mpc\(^{-1}\); 575 km s\(^{-1}\) Mpc\(^{-1}\) with different weighting factors (Fig. 1).

Jaki (1974) elaborates: “Lemaître’s treatment of the problem could hardly be more impressive with respect to specific results . . . a formula and a table of values for the redshift of receding galaxies in fine agreement with the actually observed data . . .”

When the Royal Astronomical Society decided to publish an English translation in 1931 from the journal Annales de la Société Scientifique de Bruxelles, a most dramatic censorship of the first empirical determination of \( H_0 \) occurred (Fig. 2). A meticulously researched book (with a foreword by the late Allan Sandage) has been published on this precise theme. It is entitled Discovering the Expanding Universe (Nussbaumer and Bieri 2009). Professor Nussbaumer graciously sent me a copy of the original French paper in 2009, and the sectors censored out in the English translation appear in Fig. 2. Equation (24) holds the key. In an independent study, Sidney van den Bergh (2011) affirms that the suppressions in Eq. (24) were intentional.

It would be historically accurate to say that the testing of a linear velocity-distance relation is due to the meticulous observations by Hubble and Humason in subsequent years, but not the formulation of this relation, as seen in the complete original equation (24).

**Priorities in Scientific Discovery**

And now, I give some insight into the mindset of Edwin Hubble. He was fiercely territorial, as we see in a letter from Hubble to de Sitter, dated 21 August 1930, wherein Hubble writes: “I consider the velocity-distance relation, its formulation, testing and confirmation, as a Mount Wilson contribution and I am deeply concerned in its recognition as such” (emphasis added).

Nussbaumer and Bieri (2009) respond as follows:

... the formulation and its central place in cosmology was first given by Lemaître ... there is no justification to glorify Hubble’s publication of 1929 [as the] original discovery of the linear velocity- distance relationship ... (emphasis, mine).

Lemaître was eclipsed. Multitudes of textbooks proclaim Hubble as the discoverer of the expanding universe. But herein lies a repeated pattern. In 1927,
Fig. 1  *Upper panel:* The data used by Lemaître (1927) to yield the first empirical value of the rate of expansion of the Universe in which $v/r$ is predicted to be constant (see Eq. 24 in Fig. 2). Lemaître derived values of 625 km s$^{-1}$/Mpc$^{-1}$ and 575 km s$^{-1}$/Mpc$^{-1}$. The *solid line in the top panel* has a slope of 575 km s$^{-1}$/Mpc$^{-1}$ and is reconstructed by H. Duerbeck. *Lower panel:* the radial velocity–distance diagram published by Hubble, 2 years later, in 1929, with best slope of 530 km s$^{-1}$/Mpc$^{-1}$ (*Top panel: Courtesy H. Duerbeck*)
Knut Lundmark penned these words, cited by Sandage (2004): “As to Hubble’s way of acknowledging his predecessors I have no reason to enter upon this question here.”

Is it not strange that Vesto Slipher is not referenced at all in Hubble’s landmark paper of 1929? The vast majority of radial velocities in that paper are from Slipher. Perhaps an even more glaring example is Fig. 3, written to J. H. Reynolds on a visit to England.

As elucidated by Block and Freeman (2008), Reynolds rises to the Hubble request. He publishes his results in Reynolds (1920). Hubble very carefully studied this paper and actually pencilled in some handwritten comments, shown to me by the late Allan Sandage. (For example, next to each of the Reynolds class II, III and IV are the Sa, Sb and Sc notations penciled in by Hubble. Dr. Sandage furthermore affirmed to me that the correspondence between Reynolds types and Hubble types is “one-to-one”). Hubble (1926) appeared in print 6 years after Reynolds – with no reference to Reynolds (1920). Was Lundmark correct?

In the English speaking world, a total eclipse fell on the remarkable astronomical insight of Lemaître (Kragh and Smith 2003). The translator has been demonstrated to be Lemaître himself (see below my Note Added in Proof). What an intriguing...
proof of Stigler’s Law of Eponymy; Lemaître was, through his own actions, robbed of being attributed with one of the greatest discoveries in astronomy of all time. There are myriads of speculations as to why Lemaître decided to omit his empirical computation of the rate of expansion of the universe from the English
The alarming “presence of a censor” is seen in this February 1931 letter from WM Smart to G. Lemaître. In extremely polite terms, Lemaître is told by Smart that Hubble’s observational result of 1929 is “something more elegant”. The reason we know that Smart is specifically alluding to Hubble (1929) is as follows: Lemaître is given full freedom to translate his 1927 French paper, from paragraph 1 to paragraph 72 (which at first glance, appears as a symbol “n”, but which is actually the number “72” as affirmed by D. Lambert – private communication). Here follows the punch-line: paragraph 73 is Lemaître’s equation 24. Paragraph 73 would have been the empirical determination by Lemaître of his expansion coefficient, published in 1927 (Courtesy: Lemaître Archives, Louvain-la-Neuve).

CODA: A Lemaître ELT?

One of Galileo’s masterful works was entitled *Sidereus Nuncius* – the starry messenger. The moral of the censorship (Fig. 2) is – as Martin Gaskell (private communication) poignantly reminded me – Mark chapter 4, verse 22. I allow Nussbaumer and Bieri (2009) to have the final word here regarding the legendary Georges Lemaître: “Even in his influential *The Realm of the Nebulae* published in 1936, he [Hubble] avoided any reference to Lemaître. Was he afraid that a gem might fall from his crown if people became aware of Lemaître’s pioneering fusion of observation and theory 2 years before Hubble delivered the confirmation?” (italics, mine).

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Note Added in Proof – “The History of This Science Competition Is Not Irrelevant” – Reflections by Lemaître Himself, in 1950

The world has before its eyes one of the most brilliant examples of Stigler’s law of eponymy—which in its simplest form, asserts that: no scientific discovery is named after its original discoverer. “Priorities in Scientific Discovery: A Chapter in the Sociology of Science” (Merton 1957) is of crucial importance in this context.

In a Comment published in Nature Mario Livio (Nature, 479, 171, 2011) has unearthed a letter from Lemaître to W. M. Smart (dated 9 March 1931). From that document, it is clear that Lemaître himself translated his 1927 paper into English and who also omitted his determination of the coefficient of expansion of the Universe ($H_0$) from values of radial velocities available as of 1927. However, in his Comment Livio omits a vital reference, namely thoughts penned by Lemaître himself in 1950 (L’expansion de l’Univers, Bibliographie: Annales d’Astrophysique, 13, 344):

About my contribution of 1927, I do not want to discuss if I was a professional astronomer. I was, in any event, an IAU member (Cambridge, 1925), and I had studied astronomy for two years, a year with Eddington and another year in the U.S. observatories. I visited Slipher and Hubble and heard him in Washington, in 1925, making his memorable communication about the distance [to] the Andromeda nebula. While my Mathematics bibliography was seriously in default since I did not know the work of Friedmann, it is perfectly up to date from the astronomical point of view; I calculate [in my contribution] the coefficient of expansion (575 km per sec per megaparsecs, 625 with a questionable statistical correction). Of course, before the discovery and study of clusters of nebulae, there was no point to establish the Hubble law, but only to calculate its coefficient. The title of my note leaves no doubt on my intentions: A Universe with a constant mass and increasing radius as an explanation of the radial velocity of extra-galactic nebulae. I apologize that all of this is too personal. But, as noted by the author (p. 161) “the history of this science competition is not irrelevant” and it is useful to highlight the details to enable an exact understanding of the scope of the argument that can be drawn from this. (Emphasis added)

In 1950, Lemaître clearly did not want the rich fusion of theory and observations contained in his 1927 paper to be buried in the sands of time.

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