phrase he took out of context. I wrote that “in this short article” I could not present a convincing scientific case for impact projections. A convincing case can certainly be made, but only, alas, to those who will undertake a thorough study of the technical literature. Therefore officials and the public have little choice but to heed the consensus of committees of expert scientists—unless (like some people) they dismiss the entire scientific process.

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Correcting the history of the CMB idea

In their response to my letter (Physics Today, August 2015, page 10) regarding the prediction by Ralph Alpher and Robert Herman of the cosmic microwave background (CMB), what John Carlstrom, Tom Crawford, and Lloyd Knox report as the correct history unfortunately continues to perpetuate myths.

The authors include George Gamow in their attribution of early predictions of the CMB in the late 1940s. It does not disparage Gamow to point out that he had no role in the prediction and interpretation of the CMB at 5 K. The misattribution is so common that citing all of its occurrences would be virtually impossible.

Gamow did not embrace the work by Alpher and Herman; for several years he rejected the validity of their CMB concept.[1,2] In addition, the question of Gamow’s involvement can easily be answered by further documentation. During the summer of 1948, when Alpher and Herman were working on the CMB idea and preparing a manuscript, Gamow was busy giving lectures in Ohio and at the Los Alamos laboratory in New Mexico.[3]

I must also take issue with the statement by Carlstrom and coauthors that Robert Dicke’s research group at Princeton University “immediately understood the significance” of the measurement by Arno Penzias and Robert Wilson. Actually, the Princeton group posited several different cosmological scenarios in 1965; none of them referred to Alpher and Herman’s work, which provided the theoretical framework for the CMB some 17 years earlier than is generally accepted today.

Before giving his Nobel Prize acceptance address in 1978, Penzias met with Alpher because he wanted a correct, firsthand account of Alpher’s work on the CMB.

Alpher and Herman did immediately understand the cosmological significance of the work by Penzias and Wilson: It confirmed their prediction. That caused a great deal of angst during the rest of their professional lives, as repeated publications regarding the CMB ignored their pioneering publications. They wondered why so many radio astronomers told them the radiation could not be measured back in the 1940s and 1950s despite attempts over many years.[1] Penzias remarked to Alpher that the measurement could have been made “back then” with a bolometer. Today we know that before 1965 several CMB measurements were made but not interpreted as significant.[4]

In later publications, Gamow discussed one attempt to make the CMB calculation on his own—with predictable inexactitude.[1] He traveled often to present talks based on Alpher’s 1948 dissertation titled “On the origin and relative abundance of the elements.” In revising his presentations, Gamow frequently requested updates, slides, and preprints from Alpher.[3] The revisions were published in major journals through the early 1950s. An analysis of the 20 years of that written correspondence is forthcoming.

It is unfortunate that so much dogma has permeated the literature for the past 50 years. Hopefully, new generations of physicists will become aware of this problem in scholarship in cosmology and astrophysics and will not continue to perpetuate such myths.

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