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of physicists by the general public. Although the printed media contribute to this problem, a more drastic distortion occurs on TV, especially in the programs aimed at young viewers. The Saturday-morning offerings frequently portray the scientist as the fiend (usually with a foreign accent) who would destroy mankind but for the intervention of superhero. If any other occupation or minority were thus portrayed, the networks would quickly hear complaints. Perhaps some of the current antiscientific attitude in this country may be a consequence of this early brainwashing. It may be appropriate for APS to take a hard look at this problem.

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Author's revision

In a recently published book,[1] I devoted one chapter to describing the discovery[2] of the cosmic background radiation. In keeping with the aims of the work, I attempted to describe the significance of the experimental results in relation to the state of understanding at the time it was done. I have recently learned that, in so doing, I gave a distorted picture of the development of that understanding. I wish to present here an improved version of the material contained in lines 8–15 on page 284 of reference 1. The pertinent literature includes papers by George Gamow[3] and by Ralph Alpher and Robert Herman.[4]

The big-bang theory was proposed by Gamow as early as 1946, and by 1948 he recognized that the initial stages of such a universe would be dominated by thermal radiation. Alpher and Herman immediately took note of the fact that a remnant of the radiation would still be present—now truly blackbody radiation, as the severe nonequilibrium conditions of the initial explosion no longer held. The continued expansion of the universe would have reduced its temperature to a value at the present epoch, which they initially estimated at about 5 K, a value not affected significantly by further refinements of the theory.

I wish to apologize to Alpher and Herman for having obscured in my book their role in the above developments.

References

1. G. L. Trigg, *Landmark Experiments in Twentieth Century Physics*, Crane, Russak, New York (1975).
2. A. A. Penzias, R. W. Wilson, Astrophys. J. **142**, 419 (1965).
3. G. Gamow, Phys. Rev. **70**, 572 (1946), Nature **162**, 680 (1948), and K. Dan. Vidensk. Selsk., Mat.-Fys. Medd. **27**, No. 10 (1953).
4. R. A. Alpher, R. Herman, Nature **162**, 774 (1948), and Phys. Rev. **75**, 1089 (1949). See also R. A. Alpher, R. Herman, Proc. Am. Phil. Soc **119**, 325 (1975).

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H. G. Wells foresees isotopes

The nomination of Isaac Asimov as an armchair discoverer having fallen through (February 1976, page 11 and November 1976, page 93), I submit the late H. G. Wells for consideration. The following passage is taken from an essay, "The Possible Individuality of Atoms," originally published in the *Saturday Review* of 5 September 1896, **82**, pages 256–257, and reprinted by R. M. Philmus and D. Y. Hughes, "H. G. Wells: Early Writings in Science and Science Fiction," University of California Press, 1975. The experimental work referred to was by Edward C. C. Baly ("A Possible Explanation of the Two-Fold Spectra of Oxygen and Nitrogen," Proceedings of the Royal Society, **57**, 1895, pages 468–469) who reported a separation of oxygen into fractions of slightly different densities by an electric discharge. Wells writes:

"This is really a very remarkable result indeed. Unless some experimental error has been overlooked, one of two things must follow. Either oxygen is not an element (nor nitrogen, nor argon), and the electric spark decomposes it, or there are two kinds of oxygen, one with an atom a little heavier than the other. And this opens one's eyes to an amazing possibility. The suggestion was made some years ago that, after all, atoms might not be all exactly alike, that they might have individuality just as animals have. The average man weighs (let us say) twelve stone, but some men are down to seven and others up to eighteen. Taken haphazard, however, you can safely say that a million men will weigh (with the minutest margin of error) twelve million stone. Take, however, some force to sort out your men—say, for instance, the stress of economic forces—and take one sample of a million coal-heavers and another of a million clerks, and one will be above the average and another below. Now it may be the electric spark traversing the gas has an analogous selective action. Your heavier atoms or molecules get driven this or that way with slightly more force. Clearly the oxygen in one direction will become a little denser than that in another. It is at least an odd suggestion (for which Baly must not be held guilty). We offer it merely as a dream. This is indeed a time for dreaming. There cannot be the slightest doubt that we are at last in the dawn of a period of profound reconstructions in the theory of chemistry. And where the threescore and ten *Elements* will be at the end of it even our speculative enterprise hesitates to guess." [*The reference to prior suggestion is to a philosophical essay by Wells.*]

It would therefore appear that Wells has a reasonable claim to have introduced the concept of an isotope. I would appreciate hearing from those more familiar with the early history of physics whether there are earlier suggestions and what the ultimate result of Baly's work was.

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Corrections

The March issue (page 45) states that H. Tracy Hall "began working at General Electric's Research and Development Center in 1948 and served as director of research, 1955–67."

The reference to "director of research" apparently was meant to apply to a position held by Hall at Brigham Young University after he resigned his position at General Electric in August 1955.

C. Guy Suits served as General Electric vice-president and director of research, and as head of the General Electric Research Laboratory, from 1945 until his retirement in 1965. Since that time Arthur M. Bueche has been GE vice-president for research and development, a position that includes responsibility for directing the work of the General Electric Research and Development Center, successor organization to the former Research Laboratory and Advanced Technology Laboratories.

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A somewhat misleading statement with regard to the PEP Project appeared in the March issue (page 20), "in-brief" heading, paragraph 2, line 4:

". . . ERDA has approved a $28-million contract for the design and construction of housing for research equipment."

Although less brief for "in brief," a more accurate statement would be:

". . . ERDA has approved a $28-million contract for the design and construction of the PEP conventional facilities. This includes all sitework, the main tunnels for the storage ring-magnet systems (≈1.4 miles in circumference), electrical and mechanical utilities, technical support buildings, and interaction halls (experimental areas) for colliding-beam experiments."

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