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Before the Microwave Background: Early Big Bang Cosmology (The J. Robert Oppenheimer Lecture)

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Finite-age (or big-bang) cosmological models can be traced back to G. Lemaître's relativistic model of 1931 (or even earlier, to A. Friedmann in 1922). However, the big bang concept does not exclusively belong to the class of relativistic models, and in the 1930s it was often associated with E.A. Milne's very different, so-called kinematic cosmology. But it was only with G. Gamow's research program in the late 1940s that the big-bang scenario became widely known and turned into a nuclear-physical theory of the early universe. How does the theory of Gamow and his collaborators R. Alpher and R. Herman compare with Lemaître's earlier ideas of a "primeval atom"? And with the post-1965 version of big bang cosmology? The strange fate of the Gamow-Alpher-Herman hot big bang theory can only be understood if taking into account that relativistic evolution cosmology faced stiff competition throughout the 1950s from the steady-state theory of F. Hoyle and others.