

## Narrow specialization and other forms of sin

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I recently had cause to look up occurrences of the phrase “statistical significance” in the PHYSICS TODAY archive. Among the earliest appeared in the May 1958 issue in a review of the seventh volume of *Annual Review of Nuclear Science*. It caught my eye because the reviewer, Sidney Warshaw of Argonne National Laboratory, was unusually waspish.

Warshaw took issue with the unevenness of the volume’s articles, which include “Hyperons and heavy mesons (systematics and decay)” by Murray Gell-Mann and Arthur Rosenfeld and “Vertebrate radiobiology (lethal actions and associated effects)” by Victor Bond and James Robertson. Whereas Warshaw praised the volume’s physics articles, he dismissed the others as containing “much less information per word” and as becoming “a series of rather disconnected sentences, or short paragraphs with not much more information.”

The range of topics exasperated Warshaw. “Your reviewer is as opposed to narrow specialization as he is to other forms of sin,” he wrote. “Still it would seem that even a modern da Vinci would have trouble maintaining a continuously high level of interest in all of the disparate titles in this volume.”

Critical acuity aside, Warshaw was an apt choice for reviewer. His research encompassed nuclear physics, particle physics, the effects of radiation on matter, and radiobiology. When confronted with the disparity of the articles in *Annual Review of Nuclear Science*, he speculated that they all dealt “somehow with problems that arose, historically, from the discovery of ionizing radiation.”

The volume’s disparity had a more proximate cause. The journal arose not as the result of the publisher of *Annual Reviews* identifying a promising new field to enter and profit by. Rather, in the early 1950s, the National Research Council’s (NRC’s) committee on nuclear science approached *Annual Reviews* with a partnership offer: We’ll edit a journal devoted to nuclear science if you’ll publish it. *Annual Reviews* took full editorial control from the NRC in 1953.

The volume that Warshaw reviewed was the last under the journal’s first editor, James Beckerley, who served as the Atomic Energy Commission’s director of classification in 1949–54. In that capacity, he was present at the 1953 AEC inquiry that deprived J. Robert Oppenheimer of his top security clearance in 1954. “If Oppenheimer or his witnesses had given anything away, they’d have been had up for it,” Beckerley recalled in 1987, “but they knew better than the prosecutors what ought not to be said.”<sup>1</sup>

Beckerley’s successor as editor-in-chief of *Annual Review of Nuclear Science* was Emilio Segrè. By the mid 1960s, the number

of radiobiology articles had dwindled to about one per volume. At first glance, that shift might seem, in Warshaw’s words, to constitute a sinful narrowing of specialization. But in fact, under Segrè, who remained editor until 1977, the journal expanded its coverage to include astrophysics and geophysics. In 1978 it changed its name to the one it retains to this day, *Annual Review of Nuclear and Particle Science*.

A search for the most highly cited articles in the journal, before and after its name change, reveals a remarkable consistency of impact. Among them is Robert Hofstadter’s “Nuclear and nucleon scattering of high-energy electrons,” which appeared in the very volume that Warshaw reviewed for *PHYSICS TODAY* in 1958. More recent hits include Hans-Thomas Janka’s “Explosion mechanisms of core-collapse supernovae” (2012) and Ulrich Heinz and Raimond Snellings’s “Collective flow and viscosity in relativistic heavy-ion collisions” (2013).

What lessons does the history of *Annual Review of Nuclear and Particle Science* hold for us today? Although the NRC committee that launched the journal might have cast too wide an editorial net, the journal’s editors, from Segrè to his successors, simultaneously narrowed the scope to nuclear physics while broadening it beyond investigations into the atomic nucleus. As nuclear and particle physics evolve, so does the content of the journal. Recent articles have covered the application of deep learning to data from the Large Hadron Collider, the search for axions, and primordial black holes as candidates for dark matter.

By contrast, it’s hard to feel confident in the longevity of new journals whose focus is on a currently fashionable field. The number of physicists is hardly exploding. Their output can be comfortably accommodated in existing journals whose scope, like that of *Annual Review of Nuclear and Particle Science*, evolves with time.



### Reference

1. M. R. Lehman, “Nuisance to nemesis: Nuclear fallout and intelligence as secrets, problems, and limitations on the arms race, 1940–1964,” PhD dissertation, U. Illinois at Urbana-Champaign (2016), p. 236. PT