Happy birthday, *Reviews of Modern Physics*!

Charles Day

This year the American Physical Society (APS) is celebrating the 90th anniversary of its journal *Reviews of Modern Physics* (*RMP*). This issue of PHYSICS TODAY joins the celebration. Starting on page 32, you'll find a brief history of the journal followed by 11 two-page articles that look back on how papers in *RMP* have tracked and recorded physicists' increasing understanding of superconductivity, critical phenomena, nucleosynthesis, and other topics.

In his introduction to the special issue, *RMP*'s current lead editor, Randy Kamien, speculates that many PHYSICS TODAY readers have, like him, photocopied and kept review articles for so long that they have become decorated with annotations and food stains. When I left the UK in 1988 to start a postdoc at Japan's Institute of Space and Astronautical Science, I took several photocopied reviews with me. I can't remember them all, but they included "Accretion powered x-ray pulsars" in *Astrophysical Journal*,[1] "Accretion discs in astrophysics" in *Annual Review of Astronomy and Astrophysics*,[2] and "X-ray emission from clusters of galaxies" in *RMP*.[3]

One way to gauge the usefulness of review articles is to count how many times they have been cited. In 2004 Sankar Das Sarma and two of his postdocs at the time, Igor Žutić and Jaroslav Fabian, surveyed the theory and applications of spintronics in *RMP*.[4] According to Google Scholar, the article has been cited 9000 times!

Another way to gauge a review's usefulness—or, more precisely, the temporal and disciplinary scope of its subject—is to look at its list of references. Žutić, Fabian, and Das Sarma's list runs for 24 pages and cites more than 900 papers. That huge corpus raises a question that Samuel Goudsmit tackled in a feature-length commentary on page 52 of the September 1966 issue of PHYSICS TODAY. At that time, Goudsmit was the managing editor of APS and editor of *Physical Review Letters*. He and others fretted about the booming proliferation of scientific literature. Goudsmit's solution started with the recognition that most original papers don't need to be cited or even read at all. (For a contrary view, see Ray Goldstein's article, "Coffee stains, cell receptors, and time crystals: Lessons from the old literature," PHYSICS TODAY, September 2018, page 32.) Experimental results were best presented in tables and other compendia. As for theory, he wrote, "The rate at which theoretical papers are published has increased enormously, and with a few brilliant exceptions, most of them contain very little advancement. Many are obsolete in a short time, and there is sharp competition among authors and strong pressure for rapid publishing."

To cope with the plethora of theory papers, Goudsmit advocated review articles and specialized books. His paragon was Arnold Sommerfeld's book *Atomic Structure and Spectral Lines*, which was published in the original German in 1919 and in English four years later: "It summarized in a clear and concise way all that was worth knowing up to the time of its publication."

Having praised review articles and specialized books, Goudsmit went on to consider how to produce them. Paying for them didn't work. He recounted an NSF-funded trial that *RMP* conducted in the early 1960s. Authors were offered $3000 to write one of four articles. The fee had about the same buying power as $24 000 does today. Despite that alluring bounty, *RMP*'s editor at the time, Edward Condon, struggled to find authors willing to give up their research time to write.

A better approach, Goudsmit argued, was to establish centers, whose permanent staff of generalist writers would gather and prepare material under the guidance of a subject-matter expert, who did not have to belong to the center. He looked to the American Institute of Physics (which publishes PHYSICS TODAY) to take the lead in running the centers.

I'm not sure why Goudsmit's idea did not catch on, but I can see a problem with it. Although his proposed centers would yield reviews—possibly more promptly than the current system of expert volunteers—the reviews themselves would unlikely be as good. That's because of the personal nature of a review. The best ones reflect how a small group of experts has surveyed and made sense of a field of research. A different group of experts reviewing the same field could well organize their review differently. That doesn't matter. There's no one true narrative path. What matters is the authors' journey of understanding, which you, the reader, can follow.

APOLOGY TO READERS. Due to a mistake on my part, an article on nuclear physics did not make it into this issue. Look out for it in the next issue.

References

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3. C. L. Sarazin, *Rev. Mod. Phys.* **58**, 1 (1986).
4. I. Žutić, J. Fabian, S. Das Sarma, *Rev. Mod. Phys.* **76**, 323 (2004). PT