

Speaking of gender bias

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A lot can be learned about the history of science in America from browsing through the front matter of PNAS across its 104-year history. You'd have to look through 73 volumes, for example, before coming across the name of the first distaff editor-in-chief. In 1985, molecular biologist Maxine Singer became the journal's first female editor; at the time she was appointed, she presided over an Editorial Board of 16 NAS members, all of whom were men. By the time her term ended in 1988, plant molecular biologist Mary Dell-Chilton had joined the board, raising its percentage of female members from 0 to 6%. Today, PNAS has 215 Editorial Board members, 52, or 24%, of whom are female. All things considered, that's not really an impressive rate of change—just short of a fourfold increase in representation across three decades. Even the US Congress, a longtime bastion of masculinity, has managed to better that rate; over that same time interval, the representation of women in Congress increased from 25 to 110 (proportionately,

from 2 to 20%). Election to Congress, however, is open to members of the US population who meet a half-dozen or so minimum requirements of age, citizenship, and residency, so for decades, the eligible pool has been ~50% female. In contrast, appointment to the PNAS Editorial Board is limited to members of NAS, another longtime bastion of masculinity, and election to NAS has many more stringent requirements than does election to Congress. In 2019, NAS has 2,811 members (including active members, emeritus members, and foreign associates); of these, 448 are women (16%). Although many factors may be invoked to account for the fact that, today, male emeritus members outnumber female emeritus

members 10 to 1 (70 vs. 6), the ratio is in part a reflection of the historical gender skew of NAS membership.

Gender Issues, Front (Matter) and Center

Browsing the front matter of PNAS made me wonder about the extent to which gender has been a topic of interest within the journal, particularly as it affects the scientific publication process. Service as an editor or editorial board member of a scientific journal isn't exactly a fast track to lasting fame; whereas a search with the phrase "legendary newspaper editor" yields 1,150 hits, a search with the phrase "legendary journal editor" yields only 100 hits across the entire Internet, and most of these don't even refer to science journals. Franz Ingelfinger, editor of the *New England Journal of Medicine* from 1967 to 1976, did earn eponymous fame establishing a policy whereby the journal would not publish research previously published elsewhere, now known as "the Ingelfinger Rule." Notwithstanding the limited opportunities for fame or fortune, editorial service is an essential component of the scientific enterprise. Irrespective of the discipline, editors and editorial boards of science journals have served as stewards of the scientific literature—establishing criteria for standardization and regularization of content; evaluating adherence to accepted practices within a discipline; developing systems for timely, objective, and thorough assessment through expert peer review; and preserving content through time. Because editorial service has the potential to influence the progress and direction of a scientific field, appointment to an editorial board reflects the high regard and trust of a community of colleagues. That said, not all editors or boards are equally successful at achieving these objectives. Notable failures can occur at every stage of the editorial process, and of late, there have been calls to dispense with journals altogether as outmoded "300-year-old scientific technologies" (1) and to transition to open-source postpublication peer review. Thus, the relevance clock may be ticking even for Ingelfinger, not to mention the rest of us.

Among the more conspicuous failures in scientific publishing has been its inability to break free from gender imbalances that permeate the editorial process, including leadership (2), peer review (3), and



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individual scientists can take to change STEM culture (13) by making a deliberate effort to incorporate gender diversity into editorial board structure, being cognizant of the value of diversity in the decision-making process, and recognizing and rooting out language bias in all aspects of the editorial process. Most importantly, we can continue to publish the highest-quality papers on the science of science publication to ensure that policies aimed at overcoming bias are evidence based.

As Kuhn (ref. 14, p. 209) aptly stated in his classic book *The Structure of Scientific Revolutions*, “Scientific knowledge, like language, is intrinsically the common property of a group or else nothing at all. To understand

it we shall need to know the special characteristic of the groups that create and use it.” Because the groups that create and use scientific knowledge include women, they must have a place in the curation and promulgation of that knowledge through the editorial process. For the record, though, in the entirety of Kuhn’s transformational treatise on the nature of science, the word “woman” never appeared in the first edition; in the second edition, published 8 years later, it appears only once—and that’s in the postscript.

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