

Reaching across the sciences

Since the inception of PNAS in 1915 as the “official organ of publication” of the National Academy of Sciences, it has been the journal’s policy to publish reports of research in all of the scientific disciplines represented by the membership of the Academy. In accord with this, Volume 1, comprising 645 pages (about the size of a single current issue), contained 164 papers, distributed roughly as follows: mathematics (13%), physical and earth sciences (42%), biological sciences (37%), and anthropology and psychology (8%).

Both the size and composition of PNAS remained relatively constant for the first few decades of its history, averaging, over the period 1915–1954, 140 papers per year, with the following multidisciplinary distribution: mathematics (27%, reaching 48% in 1951); physical and earth sciences (27%); biological sciences (34%); and anthropology and psychology (3%). The subsequent decade witnessed a significant increase both in the size of the journal and in the representation of the biological sciences. Between 1954 and 1963, the size of PNAS nearly doubled, and the fraction of papers in the biological sciences increased from 35% to 74%. This increase reflected, in part, a decrease from 136 to 85 in the number of mathematics and physical sciences papers, but principally a surge in the number of papers in the biological sciences from 76 to 261. By 1984, the disparity had grown to the point that the biological sciences accounted for about 98% of the content of the journal, where it has remained during much of the intervening period.

During the past few years, the PNAS Editorial Board has mounted an initiative to broaden the coverage of PNAS to reflect the range of disciplines represented by the NAS membership by attracting and publishing more papers in the physical and social sciences and mathematics. Some, albeit modest, progress has been achieved through several measures, including: more vigorous recruiting of nonbiology papers; the publication of Inaugural Year articles by new members from most of the NAS sections; the publication of the proceedings of the, typically interdisciplinary, NAS Sackler Colloquia; and the publication of PNAS Special Features, comprising solicited Perspectives and research articles focused on specific cutting-edge interdisciplinary topics. Themes of such special features published thus far include: Astrobiology, Evolutionary Developmental Biology, Rapid Climate Change, Social and Behavioral Sciences, and Astronomy.

The current issue of PNAS contains the most ambitious such special feature to date, encompassing the related themes of Supramolecular Chemistry and Self-Assembly. The term *Supramolecular*, introduced in 1978 by Jean-Marie Lehn, the author of the Introductory Perspective in this collection of papers, refers to ordered molecular aggregates that are held together by noncovalent binding interactions, such as metal-ligand bonds, hydrogen bonds, or van der Waals’ forces. Because of the weakness of such binding interactions, the formation of such supramolecular assemblies often is thermodynamically dictated, so that they com-

monly are generated by spontaneous self-assembly rather than through sequential bond-forming synthetic strategies; hence the connection between the two themes that make up the title of this special feature. The field encompassed by these themes continues to attract intense interest. Today it pervades much of chemistry and extends to the interfaces of chemistry with a diverse array of other disciplines, including biology, physics, materials science, and engineering. Manifestations and applications include: molecular recognition, selective binding and encapsulation, receptors and sensors, drug delivery strategies, catalysis, biological mimics, and nanoscale electronic and mechanical devices. The highly interdisciplinary character of this field makes it a particularly appropriate theme for a PNAS special feature.

Indeed, interest in this special feature has been extremely high, and the response to the solicitation of papers has been enormously enthusiastic and gratifying. Of the 90 or so scientists, including most of the leaders of the field, who were invited to contribute Perspectives or research articles, nearly all accepted and submitted manuscripts. The resulting collection of 13 Perspectives and 67 research articles that make up this special feature constitutes a major contribution to the research literature on the subject. Hopefully, it also will serve to advance the initiative that PNAS has launched to expand its coverage of the chemical, physical, and social sciences and of mathematics. We welcome your submission of papers in these areas.

Jack Halpern, *Associate Editor*