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Basic Research Journals

Two recent reports from the National Science Foundation, *Characteristics of Scientific Journals, 1949-1959*, and *Characteristics of Professional Scientific Journals, 1962*, contain a good bit of information about the 500 U.S. journals that serve an important scientific function by devoting more than half of their space to reports of basic research (not including technology, agriculture, and medicine). Typically these journals are small, with an average size of 1050 pages a year, 4400 subscribers (3300 domestic and 1100 foreign), and annual expenses of \$31,500.

Analysis of the more detailed figures shows clearly that some of these journals are in trouble. Some are probably doing as well as can be expected. But others face a continuing struggle. Evidence comes from the efforts that editors have made to keep up with their problems. The average length of article has been decreased substantially since 1949. Format changes have allowed printing of a greater number of words per page. Half of the editors receive no compensation for the average of 800 hours a year they devote to their editorial duties. Advertising revenue for journals owned by scientific societies increased from 8 percent of all income in 1949 to 13 percent in 1959. Subscription charges, on a cost-per-word basis, were increased 37 percent from 1959 to 1962. Despite these efforts, many journals run at a loss; in 1962, 40 percent of the university-owned journals and nearly 20 percent of the society-owned ones were partially supported by subsidies or special grants.

Comparisons among the different groups of journals suggest some ways in which the weaker ones might achieve improvements, economies, or additional income.

Journals in engineering, physics, and chemistry have the most economical formats; those in biology and the social sciences, the most expensive. Among the society-owned journals, the cost to subscribers was lowest in physics (\$0.67 a year per 100,000 words of research reports) and highest in the social sciences (\$2.98 per 100,000 words). Costs were still higher for commercial journals, which typically have small circulations (\$3.94 per 100,000 words).

The leadership of the American Institute of Physics in levying page charges against the authors' institutions is now being followed by some other journals, but most have not yet turned to this source of income.

As circulation increases, and as the total amount of material published per year goes up, unit costs come down. There are difficulties in consolidating existing journals, but a change to fewer and larger journals would effect some economies. Studies of circulation overlap and patterns of subscriptions should turn up a number of candidates for journal mergers that could be published more economically than are the separate journals. Most scientists find it necessary to subscribe to several journals. But 500 journals provide fantastically more different combinations than there are scientists. If we assume that no individual subscribes to more than five journals (by no means an unusual number), then 500 journals provide approximately 2.5×10^{14} different combinations to satisfy the individualistic needs of some 2.5×10^6 scientists. Surely fewer journals would suffice, and the merged ones would be stronger and healthier.—DAEL WOLFLE