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"Current Comments"

What is a Significant Journal?

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I like to think that most of the significant journals in the relevant fields are covered by the various editions of *Current Contents*® and by *Current Abstracts of Chemistry*™. Our readers, who would naturally like to be assured of the fact, frequently ask us how our publications determine whether a journal is significant.

Until recently, there were few objective measures of significance to help us arrive at a decision. Now many studies, for example that of Martyn and Gilchrist[1], use an "impact factor" first proposed in 1963.[2] This impact factor is the mean number of citations to a journal's articles by papers subsequently published. It is determined by dividing the number of times a journal is cited (R) by the number of source articles (S) it has published. R/S, though perhaps a somewhat crude measure, does reveal some interesting characteristics of scientists, as well as of journals. One must, however, exercise caution in drawing conclusions from comparisons of journals on the basis of such measures as the impact factor. Something that should be taken into account is the "immediacy factor" –the "bunching", or more frequent citation, of recent papers relative to earlier ones. As Price has pointed out, it is the immediacy factor that is responsible for the well-known phenomenon of papers being considered obsolescent after a decade[3].

Recently, we at ISI® have done some studies on the impact factor of various journals. Using magnetic tapes from which the 1965 *Science Citation Index*® was produced, we selected all references to articles published in 1963, sorted the references by cited journal, and ranked the journals by impact factor.

In this study, the average impact factor was 1.9. The *Journal of Molecular Biology* (JMB) scored 7, that is, each of the 168 cited articles appearing in JMB during 1963 was cited an average of 7 times during 1965. JMB is a relatively young journal; it began publication in 1961. In contrast, long established "significant" journals like the *Journal of Biological Chemistry* showed an impact factor of about 3. It is generally recognized that molecular biology is a highly focussed, "hot" field; so, the question arises whether the rapidity of developments in such a field tends to distort the impact factor. Rapid citation of one paper by others in a fast-moving field presents a picture of impact different from that of journals publishing articles that are cited in later years not only frequently but in a wide range of journals.

Thus, if one rules out self-citation, it is possible to gain some insight on

this other aspect of impact. Margolis[4] has also discussed some of these problems in considering the use of the *SCI*® for such studies. But whether a journal is cited because it is in a rapidly developing field, or because it publishes articles of long-term impact, the journal is significant. Both kinds of journals have proven to be of great interest to our readers.

It is relevant also to mention that most large journals also prove to be significant. Thus, journals ranked by the number of source articles invariably prove to be journals considered significant by most readers. About 50 journals in the world publish more than one thousand articles per year.

In the coming months we expect to publish a considerable amount of data based on extensive computer and manual analysis of journal citation indexes. Anyone can make a small-scale study by using the published volumes of the *Science Citation Index*. However, ISI's unique data files ought to provide editors and scientists with stimulating food for thought. The future of scientific publishing may be in the balance. Hopefully, some of the less significant journals would take steps to improve their quality or to merge with other small journals to form larger ones, which, as noted above, tend to acquire a special significance, due possibly to greater exposure.

1. Martyn, J. & Gilchrist, A. "An evaluation of British scientific journals." *ASLIB Occasional Publication No. 1*, London (1968) 51 pp.
2. Garfield, E. & Sher, I.H. New factors in the evaluation of scientific literature through citation indexing. *American Documentation* **14**, 195-201 (1963).
3. Price, D.J.D. Networks of scientific papers. *Science* **149**, 510-515 (1965).
4. Margolis, J. Citation indexing and evaluation of scientific papers. *Science* **155**, 1213-1219 (1967).