

CORRESPONDENCE

Citation and Distinction

SIR,—I previously indicated¹ that frequency analyses of the *Science Citation Index* could help forecast Nobel Prize winners. A number of people have pooh-poohed this simple technique. Consequently, it is of interest to note that all of this year's Nobel Prize winners again were among the list of most frequently cited authors. Two of them were anticipated in my article, in which I gave a list of the fifty most cited authors for 1967, using the 1967 *SCI* as the data base. We have, since then, used the annual *SCIs* from the years 1961 through 1971 (except 1962 and 1963 which were not available then) to compile a list of most frequently cited authors. Out of more than 1.8 million authors cited, only 42,000 were cited at least thirty times in a single year during this nine-year period. However, less than 2,100 were cited more than 1,000 times. In this list will be found all of the Nobel Prize winners for 1972 and also winners for the preceding five-year period with few exceptions. Thus, the Nobel Prize winners were members of an elite group consisting of the top 0.1 per cent of all cited authors.

If any of your readers can propose another algorithmic procedure for measuring scientific impact, let him come forward. In the meantime, if scientific journalists, among others, wish to know where the action was, is, and will be, they would do well to look into this method. We recently used a similar technique to determine the relative "impact" of journals². In spite of the snide remarks of those³ who prefer the world of subjectivity, the latter study has caused a considerable amount of soul searching amongst those seeking a rationale for thousands of infrequently cited journals.

Yours faithfully,

EUGENE GARFIELD

Institute for Scientific Information,
325 Chestnut Street,
Philadelphia, Pennsylvania 19106

¹ Garfield, E., *Nature*, **227**, 669 (1970).

² Garfield, E., *Science*, **178**, 471 (1972).

³ Anonymous, *New Scientist*, **56**, 464 (1972).

Reprint Distribution

SIR,—The letter from Dr L. G. Johnson¹ prompts me to take up the problem of reprint requests from the point of view of the author.

I recently described a modification² of a widely used method³ for measuring

protein concentration. After the title had appeared in *Current Contents* the initial trickle of reprint requests swelled to a torrent and passed the 2,500 mark before subsiding to the present one or two per day. In my paper I attempted to balance the advantages of my method against its procedural disadvantages. Yet how many requesters, before writing, saw my paper and assessed whether the new method might on balance be useful? At most about 15 per cent since this group copied my mailing address from the paper. The remaining requests carried (to the despair of the Cambridge Post Office) the address given in *Current Contents*.

Since I could not supply everybody I gave the 15 per cent first priority. This is rough justice since my paper was presumably accessible to this group. On the other hand, it was no doubt inaccessible to many among the 85 per cent. Here I have in mind workers in undeveloped and scientifically underprivileged countries. These became my second priority.

Dr Johnson refers to possible mistaken impressions about working conditions of American scientists. In my view the prevailing impression is not that they are cushioned, by computer-based retrieval systems, so escaping the day-by-day work of reading through the literature, but rather that too many Americans (and too many non-Americans) restrict their reading to published contents lists and to the reprint request system even when, in many cases, adequate libraries and copying facilities are close at hand.

Because of his isolation Dr Johnson asks not to be numbered among the abusers of the reprint system. However, the extent of his isolation may not be widely recognized. I would suggest that his form of request include the information that the alternative to receipt of a reprint is a slog through hundreds of miles of Injun territory. The ubiquity of the Hollywood western would ensure a favourable reply to every request.

Yours faithfully,

E. F. HARTREE

*ARC Unit of Reproductive
Physiology and Biochemistry,*
307 Huntingdon Road,
Cambridge CB3 0JQ

¹ Johnson, L. G., *Nature*, **242**, 143 (1973).

² Hartree, E. F., *Analyt. Biochem.*, **48**, 422 (1972).

³ Lowry, O. H., Rosebrough, N. J., Farr, A. L., and Randall, R. J., *J. Biol. Chem.*, **193**, 265 (1951).

Grafting Neologisms

SIR,—Biomedical vocabulary, specialized for centuries, expands with our knowledge. *Symbiosis* ("living together") connotes an intimate physical and physiological relationship between two organisms. *Prosthesis* ("placing onto") describes attachment of devices to increase comfort, health, or convenience: false teeth, artificial limbs, and so on.

Recently, machines that sustain essential life functions have been developed. Kidney machines clean blood of wastes when natural kidneys fail; heart-lung machines oxygenate and circulate blood during heart surgery. Soon a new type of device, artificial hearts, will be available. (These devices have already been tested successfully in calf, dog and baboon).

A seminar here has considered issues of technological assessment and moral evaluation of such devices as an artificial heart. We noted a lack of clear terms to describe relationships involving such technologies. "Man-machine symbiosis" is inadequate, since it implies two living partners. Machines are not properly candidates for symbiosis; they fulfil physiological needs but are not themselves living. They exist solely for service to their organism-associates, which in turn depend upon them for life, and not simply for comfort or convenience.

I submit to you and your readers two neologisms, hopefully useful for discussion of these organism-mechanism relationships—relationships promising increasing importance in future centuries of biotechnics.

Firstly, *epallobiosis* (ēp-āl'lō-bi-ō'sis; *epallobiotic*, adj.) refers to the dependency of an organism on an external life-support system, e.g., the already well known heart-lung and kidney machines.

Secondly, *enthetobiosis* (ēn-thēt'ō-bi-ō'sis; *enthetobiotic*, adj.) captures the relationship of "life dependent upon intoplacing" of a mechanical device (implant). The prefix *ep-*, emphasizing dependency, would here overburden pronunciation; context will suffice to imply relationship that is not casual but critical.

Yours faithfully,

ROBERT ROGER LEBEL

*The Jesuit School of Theology at
Berkeley,*
1735 Le Roy Avenue, Berkeley,
California 94709