positive reinforcement have already been carried out, although they have not yet been published.

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Prepublication Problems

The editorial in *Science* [**127**, 623 (1958)] on "Pitfalls of prepublication" called attention to a new type of scientific publication problem.

Problems of printing the works of productive, perhaps overproductive, scholars are old ones. By the 17th century, for example, the practice of rushing into print was deplored by William Harvey, who wrote of "the crowd of foolish scribblers whose observations were as inconsequential as their theories were wordy" (*1*). Lilienthal, in his *De Machiavellismo Literario,* likened the offspring of such scholarly productivity to blind whelps brought forth without pain (*2*). Johann Mencken, writing in 1715 in *De Charlataneria Eruditorum* (*3*), could not overlook mentioning "those writers who consider themselves suitably blessed if no year, or better, no month passes without receiving something new from their exceedingly fruitful minds."

Until I read the *Science* editorial, however, I had been aware of only one complaint regarding prepublication productivity. That complaint concerned Paracelsus, who dictated the majority of his books. One of his students complained that they were dictated at such a speed "you'd think that the devil was speaking in him" (*4*). This prepublication complaint is interesting historically but barely applicable, because Paracelsus' books were handwritten manuscripts.

Today, however, all sorts of duplicating processes exist, making possible an extensive, but strictly informal, kind of publication—that is, prepublication. The *Science* editorial mentioned one reason for prepublication: accelerating the research process. Sending mimeographed copies of articles in press to colleagues makes them immediately cognizant of information that may not appear for months or, in the case of some journals in my own field, for years. In the field of psychology, three other reasons for duplicated copies have been advanced: (i) There is a growing tendency for convention "handouts" to take the form of full drafts of the paper to be read (*5*). (ii) Brief reports, limited to one printed page, are solicited by one journal for early publication. An author, however, is

required to prepare at least 100 mimeographed copies of a full report of the research study to send without charge to all who request it (6). (iii) Authors of manuscripts not yet submitted for publication are routinely advised to give them a "trial run" on professional colleagues (7). In many cases the feeling seems to be "the more the merrier," and mimeographed copies are scattered broadside.

A few years' collection of such items may result in confusion about citations and reduce the helpfulness of the reference section of articles. Gradually, a fixed procedure is being introduced in psychological writing (7). For example, only articles accepted for publication may be designated "in press." In such cases the name of the accepting journal is part of the citation form. If a paper has been presented at a meeting, the preferred forms of citation are (in order of rank) to the published version of the paper, to the published abstract, or (if it is essential to cite the paper and no version exists in the professional literature), to the title and author, followed by a blanket citation, such as "paper read at Va. Acad. Sci., Old Point Comfort, May, 1957." It should be noticed that this least preferred method eliminates citation of a specific page reference for any quotation and thus avoids difficulties occasioned by editorial changes in a version published later. To differentiate between convention "give-aways," which often bear only a title and the author's name for identification, and the full reports mentioned in (ii), I suggested that such material carry a reference to the brief, published report. My suggestion was adopted by the editor, L. F. Shaffer (personal communication). It is in the hope that these methods will be of use to research workers in other fields that they are presented here.

Early alchemists, like Paracelsus, resembled donkeys lured along by carrots dangling before their noses. Today's scientists are like jet planes—propelled by their own exhaust. For, apparently, it is only in our communication-conscious era that problems of prepublication arise. Concrete remedies are necessary, lest the exhaust eradicate bibliographic accuracy.

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