

Durst silt extends this age back into the mists of Pleistocene time if Leighton's estimates of the age of the bottom layer of Elm Creek silts is correct.⁷

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AUTHORS' ABSTRACTS

SINCE it is now about twenty years since the *Astro-physical Journal* and the *Physical Review* began providing authors' abstracts at the beginning of articles, a brief report on the extent to which the practice has been adopted by other scientific journals may be of interest.

Authors' abstracts have been found of value both to readers and to abstract journals. As reported in SCIENCE,¹ answers to a questionnaire sent to the readers of the above journals in 1922 showed that 93 per cent. had found the abstracts useful and wished them to be continued. Two years later, at a meeting in Brussels, an international sub-committee of bibliography appointed by the League of Nations and including H. A. Lorentz (*chairman*), Madame Curie, Paul Langevin (editor of *Journal de Physique*) and Mr. Cooper (editor of *Science Abstracts*), recommended "that all articles published by scientific journals should be preceded by abstracts, prepared as far as possible by the authors themselves." That was fifteen years ago.

In the case of journals of physics, I am glad to be able to report that more than half now provide authors' abstracts. These include most American and British journals and also some Argentine, French, Italian, Spanish, Japanese and Russian journals. Unfortunately, the German journals have not yet adopted the practice and continue to provide only summaries, though these are not as convenient for readers, since they are placed at the end rather than at the beginning of articles, and are not as useful since they are not independent of the articles, as a rule, and are not suitable for reprinting in abstract journals.

The abstracts in the *Physical Review* from 1920 to 1925 were analytic abstracts, including subtitles intended to form precise and complete indexes of the new material contained.² While such abstracts are more efficient than ordinary abstracts, they have been found impractical since they require considerable editorial revision by a specialist. My zeal for perfection led me, as special abstract editor, to spend several thousand hours rewriting authors' abstracts, inserting sub-titles and making sure that they were accurate and complete. I am now convinced that such editorial work is not necessary.

Authors can prepare suitable abstracts for publica-

tion with their articles without much if any editorial revision. As evidence for this conclusion is the fact that the programs of the meetings of the American Physical Society have for many years contained abstracts which, although prepared by the authors and published without revision, are as a rule excellent. Obviously, authors can prepare equally good abstracts for publication with their articles if they will regard the abstract *not as an introduction or summary associated with the article but as a separate entity like the abstract in an abstract journal*. This view-point is difficult for an author to accept, since he naturally prefers to have his article read in full and dislikes furnishing an abstract which gives all the information which many readers desire about the article. Nevertheless, cooperation of authors can be obtained by all journals since it has been obtained by many. I am glad to report that the abstracts now being provided for articles in physics are adequate for the most part, as is proved by the fact that most of them are reprinted without change in *Science Abstracts*. In the volume for 1938 more than half of the abstracts of articles written in English are credited to the authors. Incidentally, this fact shows how important is the service authors' abstracts may render to abstract journals. If all the more than 100,000 scientific articles now published each year included adequate authors' abstracts, re-abstracting of the articles for the various abstract journals published in English, German, etc., would be unnecessary, and many trained scientists would be released from work which now must require some 500,000 hours of abstracting each year.

I must now admit that the rules I formulated for preparing analytic abstracts² are useful only to an expert. I am confident that editors can secure adequate authors' abstracts if they merely require authors "to prepare abstracts suitable for reprinting without change in an abstract journal." Authors are thoroughly familiar with such abstracts, and since they are naturally anxious that suitable summaries of their results appear in the abstract journals, they will prepare adequate abstracts, as a rule.

Authors' abstracts fill a gap between titles, which average ten words or less, and articles, which average several thousand words. They supply the needs of the many readers who wish to know more of what the articles are about than the titles tell, and of those who wish to know the main results without reading the articles. They also supply abstracts to the abstract journals, promptly and at minimum cost in the time of scientists. Thus they constitute an essential feature of an efficient system of scientific documentation. It is hoped that the time will soon come when all scientific journals will consider it their duty to provide authors' abstracts for all their articles.

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⁷ "Excavations at Snaketown," Vol. 2, p. 79. Gila Pueblo, Globe, Arizona, December, 1937.

¹ SCIENCE, 56: 678, 1922.

² SCIENCE, 54: 291, 1921.