LITERATURE CITED

(1) An informal closed group engaging in various forms of scientist-to-scientist communication. For extensive discussion of "invisible colleges," see Price, D. J. de Solla, "Little Science Big Science," University Press, New York, N. Y., 1963, Chapter 3, p. 63.

(2) Garvey, W. D., Griffith, B. C., "An Overview of the Structure, Objectives, and Findings of the American Psychological Association's Project on Scientific Information Exchange in Psychology," APA-PSIEP Overview Report B, Dec. 1963.

(3) Shilling, C. W., Bernard, J., Tyson, J. W., "Informal Communication Among Bioscientists," Biological Sciences of George Washington University, Communication Project, Dec. 1963.

(4) Kuney, J. H., *J. Chem. Doc.*, **5**, 128 (1965).

(5) Green, D. E., *Science*, **143**, No. 3604 (Jan. 24, 1964).

(6) Abbreviation for Division of Research Grants; the complete address is: Dr. Errett C. Albritton, Scientific Evaluation Section, Division of Research Grants, National Institutes of Health, Bethesda, Md. 20014.

(7) Gould, R. F., *J. Chem. Doc.*, **3**, 76 (1963).

OTHER SOURCES OF REFERENCE

Ackoff, R. L., "Information Systems in Documentation," in "Advances in Documentation and Library Science," Vol. II, J. H. Shera, A. Kent, and J. W. Perry, Ed., Interscience Publishers, New York, N. Y., 1957, pp. 66-74.

Bramer, H. C., "Division of Water and Waste Chemistry Preprints—Advantages and Problems," *J. Chem. Doc.*, **3**, 69 (1963).

Case Institute of Technology, Operations Research Group, "An Operations Research Study of the Scientific Activity of Chemists," Cleveland, Ohio, Nov. 1958, 69 pp. appendices.

Carver, K. J., "Division of Organic Coatings and Plastics Chemistry: Preprints—Advantages and Problems," *J. Chem. Doc.*, **3**, 66 (1963).

DuShane, G., "Pitfalls of Prepublication," *Science*, **127**, No. 3299 (March 21, 1958).

Garvey, W. D., Griffith, B. C., "A Preliminary Study of Information Exchange Activities of Foreign Psychologists and a Comparison of Such Activities with Those Occurring in the United States," APA-PSIEP Report No. 10, June 1964.

Glenn, R. A., "Division of Fuel Chemistry Preprints—Advantages and Problems," *J. Chem. Doc.*, **3**, 64 (1963).

Kronick, D. A., "A History of Scientific and Technical Periodicals," The Scarecrow Press, Inc., New York, N. Y., 1962.

Kuney, J. H., "Economics of Publishing Divisional Preprints," *J. Chem. Doc.*, **3**, 74 (1963).

Lebo, D., Letter to the Editor, *Science*, **127**, No. 3312 (June 20, 1958).

Marschner, R. J., "Concordance between Divisions and Journals of the American Chemical Society," *J. Chem. Doc.*, **3**, 42 (1963).

National Academy of Sciences-National Research Council, "Communication Problems in Biomedical Research," Oct. 31, 1963.

Oblad, A. F., "From the Division of Petroleum Chemistry Preprints to a Journal," *J. Chem. Doc.*, **3**, 71 (1963).

Orr, R., "Report of the Institute for Advancement of Medical Communication," 1958-1962.

Proctor, C. M., Letter to the Editor on Prepublication, *Science*, **127**, No. 3306 (May 9, 1958).

Rosenbaum, C. K., "Preprints of ACS Polymer Chemistry Division—Advantages and Problems," *J. Chem. Doc.*, **3**, 67 (1963).

Skolnik, H., "Introduction to Symposium on ACS Divisional Preprints—Purpose, Production and Costs and Place in the Chemical Literature," *ibid.*, **3**, 63 (1963).

Tate, F. A., "The Place of Preprints in the Chemical Literature," *ibid.*, **3**, 77 (1963).

Terry, L., "The Crisis in Health Communications," *J. Am. Hospital Assocn.*, **38**, No. 12 (1964).

National Academy of Sciences, "International Conference on Scientific Information," Vol. 1 and 2, 1958.

Industrial and Engineering Chemistry Research Results Service. Prepublication Availability of Complete Manuscripts*

JOSEPH H. KUNEY and STELLA ANDERSON
American Chemical Society Publications, Washington, D. C. 20036

Received March 4, 1965

The Research Results Service of *Industrial and Engineering Chemistry* came into being in January 1962. It was part of a new concept of journal publication, designed to provide readers a combination of specialized coverage in a particular area and broad literature coverage of research and development affecting the whole field of applied chemistry and chemical engineering. The plan was given expression through a major redesign of I&EC, then starting its 54th year as the American Chemical Society's principal journal for publication of articles dealing with applied chemistry and chemical engineering.

* Presented before the Division of Chemical Literature, 148th National Meeting of the American Chemical Society, Chicago, Ill., Aug. 31, 1964.

The new publication plan offers I&EC to subscribers as a monthly magazine addressed to the entire field of industrial and engineering chemistry, plus a choice of one or more separately bound, specialized journals publishing original papers. At present, three such specialized journals are published, each one quarterly on a rotating basis to permit one issue of a specialized journal each month. These quarterlies are titled *I&EC Process Design and Development*, *I&EC Fundamentals*, and *I&EC Product Research and Development*, to describe their areas of interest.

To round out the plan—to give readers the widest possible interest—the monthly I&EC offers two features directly related to the quarterlies. One is a section of

"Briefs"—short summaries of articles appearing in the quarterly of that month. The other is a section called the I&EC Research Results Service (RRS), which occupies two or three pages of the I&EC monthly and affords subscribers a rapid, informal literature service which makes available research papers not yet published but in the process of being reviewed for one of the quarterlies or for the I&EC monthly itself.

As shown in Figure 1, the RRS summary is shorter than the "Brief"; it tries to give, in 50 words or less, enough information to let the subscriber decide whether or not he wishes to purchase a copy of the unreviewed, unedited manuscript. These Research Results Service summaries are published as promptly as possible; in some cases it has been possible for a subscriber to obtain a manuscript within six weeks after it has reached the editor's desk.

In the 2.5 years of the I&EC Research Results Service, almost 700 papers have been listed, an average of 23 per month. Orders have totaled over 7500. Subscribers (available to nonsubscribers, starting January 1965, at double the subscriber rate) have ordered papers with fewer than 10 pages and with more than 90. Copies are priced at about the cost of copying and mailing to the subscriber, at the rate of $1.00 for manuscripts up to and including 10 pages; $2.00 for those up to and including 20, and so on. The average manuscript has sold for from $2.00 to $3.00, but many have commanded higher prices, including one for $10.00 and more than a few at $5.00 and $6.00. Unit price does not seem to be a factor, as the papers which are lengthy and thus higher priced sell as readily as those which are brief.

Orders for more than one copy of the same paper are infrequent; when received, they are rarely for more than two copies. Some requests for quotations on rather large quantities have been received, however, so it has been necessary from time to time to explain that the Research Results Service is not geared to mass production.

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W. H. Harwood, Continental Oil Company, and R. M. Hurd and E. S. Snavely, Jr., Tracor, Inc.

Half-esters of malonic, succinic, and glutaric acids disubstituted in various positions were electrolyzed in methanol solutions at various potentials from +3.0 to +12.0 volts *vs.* SCE. Results reveal little effect on ultimate yield. Except for α,α-disubstituted acids, yields of coupled products were generally between 70 and 90% and dependent on "induction period" at start of reaction.

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L. Montesano, Bell Telephone Laboratories, Inc., Murray Hill, N. J.

IND. ENG. CHEM. PROD. RES. DEVELOP. 3, 133–137 (1964)

CONTROLLED-POTENTIAL ELECTROLYSIS OF HINDERED HALF-ESTERS

The effects of controlled anodic potentials on yields of coupled products from the Brown-Walker reaction were determined. Half-esters of malonic, succinic, and glutaric acids disubstituted in various positions were electrolyzed with platinum electrodes in methanol solutions at various controlled potentials from +3.0 to +12.0 volts *vs.* SCE. Results revealed little, if any, effect of potential on the ultimate yield from coupling of half-esters, from cross-coupling of two different half-esters, or in overcoming inherently low yields in coupling α,α-disubstituted acids, provided the potential was sufficiently anodic to form the initial radical at high rates. Except for the α,α-disubstituted acids, yields of coupled products were generally between 70 and 90% and depended on the length of induction period at the start of the reaction, when by-product formation predominated. Radicals formed as intermediates in methanol oxidation were primarily responsible for by-product formation. A mechanism is proposed based on strong adsorption of $CH_3O\cdot$ radicals and little or no adsorption of the intermediate radical involved in the coupling reaction. Because of the importance of adsorption, surface condition of the electrode is the most likely parameter for maximizing yield, although use of solvents which do not react should also be considered.

W. H. Harwood, Continental Oil Co., Ponca City, Okla., and R. M. Hurd and E. S. Snavely, Jr., TRACOR, Inc., Austin, Tex.

IND. ENG. CHEM. PROD. RES. DEVELOP. 3, 105–112 (1964)

Figure 1.

the same time—sometimes as many as ten or twelve. The average order calls for at least two, and as many as 25 have been ordered at one time.

Slightly more orders are received for papers dealing with product research and development than for those concerned with process design and development. The demand for papers classed as fundamental runs slightly less. These data are in the same order as the circulation standings of these three quarterlies.

Reproducing and Pricing Manuscripts. Manuscript copies for RRS customers are photoprints, run off individually as orders are received. At times several orders for the same manuscript may be received on the same day, but there is no way to tell whether 1 or 50 orders for a given manuscript will be received in a given period of time.

It is a rare manuscript which does not receive at least one order. Because of this, Xerox transparencies for use in preparing Ozalid prints are routinely prepared in advance. This may not be the most economical method of operation, but it assures that there will be no delay when orders start coming in.

Orders are heaviest in the month that the list appears and in the month immediately following. After that there is a gradual tapering off, and very few orders are received in the fourth and fifth months after the summary appears. In the meantime, of course, many of the papers will have been published and withdrawn from the service.

If orders are received for papers which have since been published, the issue carrying the article is substituted if feasible. Sometimes tear sheets can be provided, but it seems best to advise the customer how he can order the issue or where he can find the paper if he is a subscriber who has overlooked the printed version.

Preparation and Approval of Summaries. Most of the summaries published in the Research Results Service of I&EC are prepared or "assembled" by the RRS staff. Finding the necessary parts somewhere in the manuscript (very often in the conclusion) is accomplished without much difficulty, as a rule, and the resulting summary (usually in the author's own words) gives the prospective customer a pretty good idea of what will be in the package he orders. The number of text pages, figures, and tables are included, so that the reader has an even better idea of the type of material he can expect.

All summaries are submitted to the authors for approval before they are published. As authors become familiar with the Research Results Service type of summary, more summaries are being submitted in acceptable form by authors.

At the time that an author is asked to approve publication of the Research Results Service summary, he is also reminded that even if his paper is not accepted for publication it can be made available through RRS for "at least 90 days" after the editor's decision if he is willing. Authors usually agree to such an arrangement if they approve RRS listing in the beginning—and more than two-thirds of the authors do. However, some authors prefer to say "no"; if so, no effort is made to persuade them to change their minds. In fact, completely negative replies might even be considered a form of customer protection.

Prospective users are cautioned that they are ordering unreviewed and unedited manuscripts, but I&EC's editorial practice includes a built-in safeguard against their receiving material of marginal interest. No manuscript is listed unless, and until, one of the I&EC editors decides that it should be critically reviewed. As a rule he has looked over the manuscript, and in all cases he has seen the abstract. This precaution eliminates almost all manuscripts on subjects outside the scope of the journals or unsuitable for other obvious reasons.

Not all manuscripts withheld from the Research Results Service columns are absent because the author has not been willing to participate. Sometimes the time interval from receipt to acceptance and publication is too short to make an RRS summary practical. Present policy is not to list an article already scheduled for publication at the time the RRS lists go to press (a month before the issue appears). It is felt that a subscriber should not have to go to the expense of ordering a manuscript that he will find in published form in the next issue of I&EC, monthly or quarterly.

Author Protection for His Unpublished Paper. Subscribers who order RRS manuscripts are advised of the conditions of purchase both in a paragraph which heads the monthly RRS section and by a statement which appears on each copy sold. These conditions are: (1) the subscriber will treat the manuscript as a personal or private communication; and (2) reference to its content will not be made in any publication without the author's prior approval. No problems have been encountered so far with the manuscripts listed.

Handling of Orders. An order coupon, shown in Figure 2, is included with each month's RRS summaries in I&EC, both for the subscriber's convenience and that of I&EC's. However, "reasonable facsimiles" are acceptable, as well as the subscriber's own order forms. Fortunately, customers

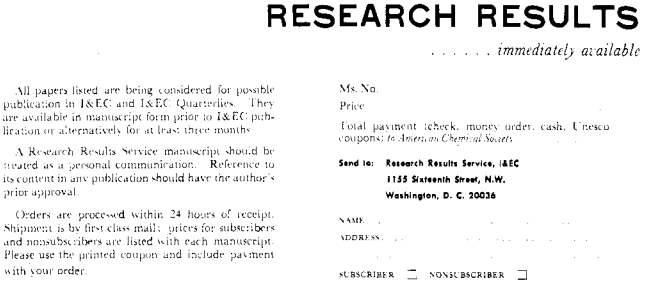

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Figure 2.

have been commendably and increasingly willing to follow the request for payment with order, so billing costs have been held to a minimum.

At first, manuscripts were sent out by third-class mail. It was soon discovered that part of the purpose of the service was being defeated by slow transportation, so first-class mailing was authorized. Air mail is not used unless the subscriber requests it and makes appropriate payment. From the beginning, orders have been filled within 12 to 24 hours of receipt, with the exception of orders arriving on a Friday afternoon.

Costs of the I&EC Research Results Service. The I&EC Research Results Service is not cheap, although operations have been streamlined insofar as possible. The costs of preparing a 30-page manuscript—just the photocopy, envelope, and postage—add up to $2.72. In addition, each

order must be checked on receipt for availability and correctness of the order number and price, checks must be processed, invoices prepared, and later there must be follow-up billings on orders received without payment. These costs are in addition to the costs involved in preparing the master copy of the manuscript and in getting the summaries prepared and published in the beginning. Journal space itself is no small item of cost in the I&EC monthly budget.

As an experiment, the Research Results Service approach to a rapid, informal literature service provides a useful service for a limited number of users. Before we can estimate its place as a permanent feature of literature distribution, we need to know more about the value to users of seeing papers in advance of publication.

We do know that about 70% of the orders are placed by libraries or information departments of companies. Also, we know that in the brief time that RRS has operated we have built up a clientele which makes regular use of the service. We are also well aware that the price paid by users of the service is not covering the costs involved. All of these matters are under study as part of the evaluation program of this experiment.

In many ways this paper is a tribute to the late Will Shearon, who as editor of I&EC shared so greatly in the development of the RRS concept.

Information Centers, Clearinghouses, and Referral Centers Which Offer Chemical Data*

HAROLD OATFIELD
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Received March 26, 1965

Because there is so much viable technical information in the world today, thoroughly intermixed with superseded data, most of us spend at least half of our time looking for information, or seeking it for other scientists, before they or we can apply it in our work or can proceed to develop new studies and data.

Dr. Morris Rubinoff of the University of Pennsylvania has remarked that these pressing needs of research workers in specialized subject fields for current information have frequently resulted in the establishment of *ad hoc* information systems which do not satisfy the need and thus remain unused.

The ex- and im-plosion of such centers is a separate study (*1*, *2*). Here, however, I shall describe the nature of several useful clearinghouses as well as some novelties. While the functions and advantages of referral centers are, for accuracy, best discussed by representatives of the agency involved, it is of some value to give fresh publicity to the clearinghouses in this manner. It is also helpful at times to have user reactions.

As both Scott Adams and Herman Skolnik have pointed out, the root of current awareness problems resides in the condition whereby mission-oriented scientists must use discipline-oriented information services for their informational needs. The existing information centers and clearinghouses are of both types; but the majority of them are small, and specifically mission-oriented.

A clearinghouse, in the words of Senator Humphrey (*3*), "implies cooperative arrangements between a wide variety of sources both as to input and output." This typifies all the major governmental centers.

The five major governmental centers are surely familiar to all. At least four of them were discussed in detail before the Division of Chemical Literature at the 142nd National Meeting of the American Chemical Society in 1962. Probably the number of major centers will soon be ten.

This expansion is in part inevitable and in part perhaps a consequence of Weinberg's prodding. He has suggested that the ignored half of the scientific information crisis is how to transfer the contents of the many documents to the user's mind. He then urged (*4*) expansion of the present system of government-supported specialized information centers.

SPECIFIC CENTERS AND CLEARINGHOUSES

It is now timely to look at information on some specific centers and clearinghouses.

Basic Sources of Information. The National Referral Center for Science and Technology (*5*) at the Library of Congress Annex (John F. Stearns, Director) should be consulted for quick orientation, or when one is stumped. It will suggest likely places to get the information sought, on the basis of an inventory it has drawn up of sources of information. Its objective is to "provide comprehensive coordinated access to the nation's resources of science and technology information."

The basic reference in this field is NRCST's "Directory of Information Resources in the United States (Physical Sciences, Biological Sciences, Engineering)," U. S. Government Printing Office, Washington, D. C. ($2.25, L.C. Card 64-62809). This lists, alphabetically, some 1100 information resources in the United States. It does not

* Presented before the Division of Chemical Literature, 148th National Meeting of the American Chemical Society, Chicago, Ill., Aug. 31, 1964.