

Evaluation of a Dual Journal Concept[†]

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The concept of a dual journal system, consisting of a summary journal and an archival journal, has been evaluated by the American Chemical Society, partially supported by a grant from the Division of Science Information of the National Science Foundation. The concept was illustrated via three sample issues of the *Journal of the American Chemical Society*, published concurrently with the corresponding regular issues. Reaction to the concept was obtained by means of panel discussions, personal interviews, and questionnaires mailed to statistically selected samples of authors, reviewers, editors, librarians, and readers. Although no "mandate" was evident for conversion of JACS to a dual journal, as exemplified by the sample issues, strong evidence was obtained of an interest in, and need for, summary journals. Investigation of alternative journal systems is continuing.

INTRODUCTION

Publishers of scientific and technical information are faced with a number of problems and needs. Two of the most important are (a) the need to remain economically viable and (b) the need to develop systems that will deliver information via suitable media, in formats and packages that are useful, convenient, and affordable. The principal method used today to disseminate primary scientific and technical information is traditional journal publication. The present journal system has several important characteristics: first, journal articles are normally composed and typeset prior to printing; and second, the articles usually contain all of the information provided in the authors' manuscripts.

The objective of the present study was to evaluate the concept of a dual journal system—a system whereby scientific articles might be published in two companion journals: in a summary version intended for individual subscribers, and in an archival version intended primarily for institutional (library) subscribers. The summary journal would contain short articles (approximately two typeset pages) in which the key information would be presented. At least two possibilities exist for the content of the archival journal. In one form, the journal would contain the same summaries plus any additional material furnished by the authors. The additional material would not be composed and typeset; instead, the authors' typed manuscripts would be used as camera-ready copy at slightly reduced size. An alternate form of the archival journal would contain full articles (printed via camera-ready copy of reduced-size, typed manuscripts) and the corresponding typeset summaries of the articles.

The investigation was initiated because it was expected that a dual journal system would improve the economics of journal production through reduced composition costs and that it might better serve the information needs of scientists. It was desired to obtain detailed, quantitative information about the potential impact of such a system upon both the producers and users of primary scientific and technical information.

BACKGROUND

One of the obvious results of the rapid expansion of published scientific and technical information has been the significant increase in the number of journal pages composed and printed. This increase, along with the rising costs of each

component in the production and distribution stream, has made it necessary to reassess the traditional journal publishing process in a search for more efficient, less costly means of supplying readers with information. A large portion of the total publishing cost results from the composition steps; thus, economies have been sought in this area. Some major cost reductions have been realized in recent years through changes from hot metal composition to computer-controlled photo-composition and from sheet-fed to web offset presses in the printing step.

A slight decrease in the number of pages per article has been accomplished in some journals by the efforts of authors and editors to limit the length of articles to that required for an adequate explanation of the work being reported. The savings realized have not been significant. Thus, a number of alternatives have been investigated and adopted, e.g., the use of "miniprint" (reduced-size print) for portions of articles, and microfiche for supplementary information—in most cases, data that assist in detailed understanding of the article but are not needed by the general reader.

Another factor that not only impacts the economics of journal publication, but also the utility of (and audience for) the information, is that much more material is provided to the subscriber than is needed or can be used within an acceptable time frame. Journal users require specific, discipline-oriented information and also information of general interest to them. The more specialized the information is in a journal, the less the potential audience (for detailed information) becomes. Thus, the cost per unit of detailed, specialized information to an individual subscriber is high. The same specialized information may be of general interest and relative importance to many (both within and outside of the discipline), but only from the standpoint of the main thrust of the work and the conclusions. It would appear that a system capable of serving both kinds of information needs should probably be based upon presenting and packaging the information in different ways.

Investigation of such systems has been in progress for a number of years and a variety of approaches have resulted (see Bibliography). The feature common to most of these systems is the use of short or abbreviated versions of the total information, variously described as extended abstracts, summaries, synopses, etc. Usually, the full accounts or articles have been provided by the publishers only on request, sometimes as hard copy and sometimes as microfiche. In addition to the potential economic advantage offered by a dual journal system, it was the conviction that full articles should be published and made readily available that stimulated the

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investigation of the dual journal concept by the American Chemical Society.

PURPOSE AND OBJECTIVES

It was expected that adoption of a dual journal system for the publication of the *Journal of the American Chemical Society* (JACS) would permit potential savings of 25–30% of the production costs. This estimate was based upon two assumptions: first, that the ratio of individual to institutional subscriptions (approximately 10 000 and 6 000, respectively) would remain about the same; and, second, that individuals would want to receive the summary journal and institutions would subscribe to the archival journal.

It is generally believed that most scientists read only a small percentage of the total number of articles published in scientific and technical journals, even in those covering their own fields of interest. Further, of the articles "read", only a few are read in their entirety. It was therefore postulated that a dual journal system might better serve scientists' information needs by providing just the key information in the summary version, yet making all of the details available, to those needing them, in the archival version.

JACS was selected for the experiment because of its general interest articles and broad readership. The findings of the evaluation study should thus be applicable to the production and use of similar scientific and technical journals.

The objective of the investigation was to obtain an organized body of information on the potential impact of a dual journal system upon producers as well as users of primary scientific and technical journals. In addition, it was desired to accumulate background information concerning the attitudes, perceptions, and behavior of people involved in the present, traditional journal system. Some of the key questions to which answers were sought include the following. If a dual journal system were adopted for JACS: (a) Would authors continue to submit manuscripts and reviewers continue to referee them? (b) Would present subscribers continue their subscriptions? (c) Would nonsubscribers begin to subscribe? With respect to the present journal system: (a) How do readers use JACS? (b) What elements of the journal's contents are useful? (c) What perceptions do subscribers, and non-subscribers, have of journal value versus cost?

METHODOLOGY

Evaluation of the dual journal concept included: (a) illustration of the concept via three sample issues of the *Journal of the American Chemical Society*, prepared from author-furnished summaries and article redrafts, that were published concurrently with the corresponding regular issues of the journal (3000 sample sets for each of the three issues); (b) obtaining of reaction to the concept via correspondence, meetings, discussions, face-to-face and telephone interviews, and by means of mailed questionnaires (including pilot, full-scale, and follow-up surveys); and (c) dissemination of the results of the study by presentation of papers, seminars, and a final report, as well as journal article publication.

Preparation of the JACS sample issues required the assistance of authors whose manuscripts had been accepted for publication. Response to the request for help by the Editor, Dr. Cheves Walling, was excellent. Those authors who agreed to participate in the experiment were asked to choose one of two approaches.

In one approach, an author prepared a summary of his work (to be typeset) and also a separate write-up that included the remainder of the information he wished to communicate. The additional information (author's typed manuscript) was used as camera-ready copy, arranged and photographically reduced so that four pages of typed material resulted in one page in

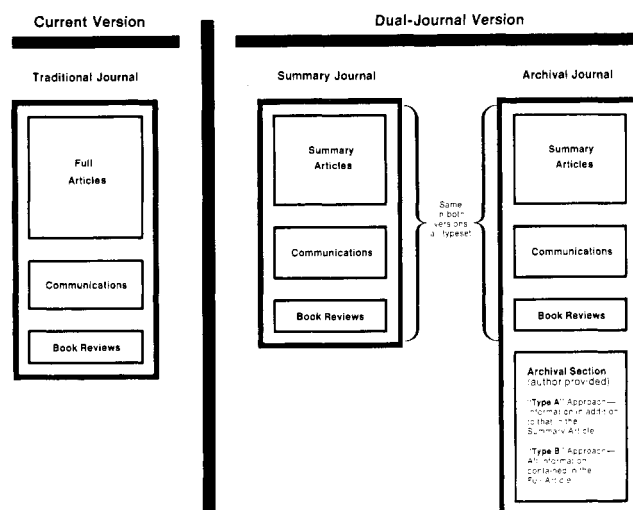


Figure 1.

the sample journal. This approach produced a summary journal, containing the typeset summaries, and an archival journal, containing the typeset summaries and the corresponding typewritten material which had been processed as just explained.

In the second approach, authors were asked only to prepare summaries of their work. These were typeset and used in the summary journal. Typewritten manuscripts of the corresponding full articles were used as camera-ready copy, as previously described, and included in the archival journal along with the typeset summaries.

The first approach produced an archival journal designated "Type A", and the second approach resulted in a "Type B" archival journal (Figure 1). It should be noted that "Communications to the Editor" and "Book Reviews" are published regularly in JACS. The sample issues also contained these features, since it was expected that they would be included if a dual journal system were adopted. Two Type B sample issues, dated February 4 and March 3, and one Type A sample issue, dated February 18, 1976, were published.

Since scientific and technical journals serve a variety of functions and audiences, it was considered essential to obtain reactions to the dual journal concept from all concerned with the use of journals. Thus, included among those contacted were authors, reviewers, editors, librarians, and readers (both JACS subscribers and nonsubscribers). One of the techniques used in soliciting reaction to the concept was to hold small, panel discussions involving groups of five or six people. Separate discussions were held with authors, readers, and librarians. Each session was conducted by a trained discussion leader and tape recorded.

The bulk of the quantitative data gathered during the evaluation project was obtained by means of surveys. These surveys were based upon careful identification and selection of representative samples of each of the journal-using groups mentioned above. Standard techniques (interviews and mailed questionnaires) were used and the surveys were conducted by an experienced professional organization, Strategic Futures, Inc., under a contract based upon competitive bidding. The questionnaires were tailored for each group and the data tabulated so as to preserve the identification of group responses (from authors, from reviewers, etc.). Editors were surveyed by the ACS project staff, as were the authors who provided the summaries and articles for the JACS sample issues.

The major data-gathering operations were, in the order shown: (a) about 40 personal interviews; (b) an extensive mail

Table I. Informational Benefits of Journals Considered Very Important

	Readers		Authors	Reviewers
	Sub.	Nonsub.		
Current awareness	69%	57%	57%	82%
In-depth understanding of specific topics	45	38	43	69
Stimulation of creative thinking	58	45	47	79
Subsequent reference or referral	48	39	50	71

survey, involving a total of approximately 3000 questionnaires, conducted in three stages: a small pilot mailing, a large-scale mailing of modified and improved questionnaires, and a follow-up (second) mailing to nonrespondents; and (c) approximately 90 personal interviews. It should be noted that a telephone survey was done among those who did not respond to either the first or follow-up mailing. About 160 telephone interviews were conducted to determine whether or not any bias existed between the mail survey's respondent and non-respondent groups. Based upon accepted research and statistical methodologies, it was apparent that no bias existed that would invalidate the conclusions drawn from the survey. A few details of the conduct of the survey are given below.

After the potential survey participants had been selected, letters were sent to apprise them of the dual journal concept evaluation and to request their cooperation in the mail survey. About 200 people were selected at random from the total list (approximately 3000) and included in a pilot survey. They only received the first of the three sample issues of JACS; questionnaires and explanatory cover letters were sent to them several weeks later. A review and analysis of the returned questionnaires permitted modifications and improvements to be made in both their contents and wording. Those people who were not included in the pilot survey received all three sample issues of JACS. They were sent the modified questionnaires and explanatory cover letters after they had received the last sample issue. It was necessary (and planned) to follow up with a second mailing to nonrespondents. The combined mailings resulted in an excellent response (58% return).

The categories within the journal-using community that were contacted in both the pilot and large-scale surveys included the following: authors who had published in JACS in 1975, reviewers of manuscripts submitted to JACS editors, librarians employed in both industrial and academic institutions, faculty members, graduate students, both industrial scientists and managers/administrators, and ACS members who were not JACS subscribers. All except those in the last category were JACS subscribers; all were domestic (U.S.) subscribers except for one group of foreign faculty members and one group of foreign industrial scientists. It was desired to compare the reactions to and perceptions of the dual journal system by those who had access to only one version of the journals with those who could see both versions. Thus, one group of industrial librarians was sent only the archival journal sample issues and another received both versions. Similarly, one group of faculty members received the summary journal samples only and another group received both versions.

SUMMARY OF FINDINGS

It must be stressed that the information obtained during the evaluation project is detailed and complex. Attitudes and perceptions in some cases covered wide ranges; in others they were remarkably uniform. There were no universally applicable answers to some of the questions asked.

Some highlights of the study findings are provided in the following tables and explanatory text. (In some cases, the figures do not total 100% since some respondents did not answer all of the questions.) Although most of the information given here was obtained from the large-scale mail survey, the inferences and conclusions derivable from these data are in

Table II. Journal Components Considered Very Useful by Individual Subscribers

Component	Subscribers	Component	Subscribers
Table of contents	68%	Full articles	44%
Communications	61	Abstracts	53
Book reviews	11	Structures	58
		Tabular data	25
		Citations	42

Table III. Reading Behavior (JACS Issues)

	Read thoroughly		Just scan		Note for reference	
	Sub.	Nonsub. ^a	Sub.	Nonsub. ^a	Sub.	Nonsub. ^a
None	7%	12%	—%	1%	6%	9%
One	24	39	2	5	12	17
Two	29	18	9	17	17	20
Three	21	13	16	28	19	11
Four or five	10	5	33	28	20	18
Six to nine	2	—	19	7	7	4
Ten or more	1	—	17	3	4	1

Question: In a typical issue of JACS, how many articles (not communications) might you . . .

^a Refers to nonsubscribers who say they "read" JACS.

general agreement with those based upon the discussions and personal interviews mentioned in the Methodology section of this paper.

Present Journal System. A number of questions were asked concerning the present journal system—on attributes, advantages and disadvantages, use patterns, etc. The replies provided some background against which perceptions of a dual journal system could be compared and judged.

Informational Benefits. The four informational benefits listed in Table I, derived from the use of scientific and technical journals, are all important to readers, authors, and reviewers. General awareness of current developments is the leader in being very important to all groups, whereas in-depth understanding of specific topics trails, though not by much, and is still considered to be very important by a sizable proportion of respondents. Reviewers attach more importance to all of the benefits than do the others, which might be expected, since they are critical of the lack of them in the journals for which they review.

Useful Journal Features. Individual subscribers view the Table of Contents and Communications as most useful among the components of a journal, with over 60% considering them very useful. Within an article, the majority feel that both abstracts and structures are very useful, with somewhat less enthusiasm for the usefulness of citations (references) and tabular data (Table II).

Reading Behavior (JACS Issues). Information was sought on the way in which subscribers and nonsubscribers read JACS issues, with particular emphasis on articles (approximately 40 articles per issue). As can be seen in Table III, there are some differences apparent in the reading behavior of the two groups. Further, the data help to substantiate the oft-stated view that scientists, in general, read only a small proportion of the total number of articles published, even in journals covering their own fields of interest. Also, of the articles "read", only a few are read in their entirety.

Table IV. JACS Subscriber/Nonsubscriber Comparisons

	Nonsubscribers		
	Non-readers	Readers	Subscribers
Ph.D. degree	51%	54%	82%
Age			
Under 30	6%	23%	19%
30 to 45	41	45	51
46 and over	51	32	29
Primary technical interest			
Analytical chemistry	24%	18%	7%
Biochemistry	13	15	11
Chemical engineering	13	9	2
Inorganic chemistry	4	11	13
Organic chemistry	18	45	71
Physical chemistry	11	13	13
Other	23	20	7

Table V. Opinion on Conversion of JACS to a Dual Journal

	Readers				Li-	Ed-
	Sub.	Non-sub.	Au-thors	Re-viewers	brarians	itors
In Favor						
Strongly	18%	33%	18%	11%	10%	8%
Moderately	24	28	22	17	16	35
Slightly	11	17	15	4	17	12
Opposed						
Slightly	9	4	11	12	12	19
Moderately	13	6	15	18	16	8
Strongly	18	7	18	36	29	15
Total in favor	53	78	55	32	43	55
Total opposed	40	17	44	66	57	42

Approximately three-fourths of the subscribers claim to read thoroughly one to three articles per issue. An additional handful or so of articles are scanned and about the same number noted or marked for future reference. Nonsubscribing readers infrequently read articles. Most typically, this group reads thoroughly about one article per issue, scans three to five more, and notes for future reference one or two more.

JACS Subscriber/Nonsubscriber Comparisons. Information about several personal characteristics and academic degrees was obtained from both subscribers to JACS and nonsubscribers. Nonsubscribers also indicated whether or not they read JACS. The data are helpful in interpreting the use or nonuse of JACS. The age distribution of nonsubscribing readers is quite similar to that of subscribers, but the proportion of Ph.D.'s is markedly lower, as is a primary interest in organic chemistry. Among the nonreaders, interest in organic chemistry drops to the level of interest expressed in other fields, and the nonreader group is appreciably older than the reader group (Table IV).

Dual Journal System. The major portion of the data obtained during the evaluation concerns the dual journal concept. The opinions on conversion of the present journal system, some

anticipated effects of the conversion, potential subscription behavior, and other topics are discussed in the following sections.

Opinions on Conversion of JACS to a Dual Journal. A key question, of obvious importance in the overall evaluation of the dual journal concept, concerned the feelings of those contacted toward converting JACS from its present format to the dual journal system of a summary version and an archival version. A six-point verbal scale was used (Table V), with no "neutral" response permitted in order to "force" commitment, short of failure to respond.

Individual JACS subscribers, authors, and journal editors are favorable to conversion by a small margin, whereas over three-fourths of individual nonsubscribers are in favor. The strongest opposition to conversion of JACS is found among reviewers, closely followed by librarians.

The attitudes of different subscriber groups toward conversion of JACS, as given in Table VI, vary only slightly. This consistency of attitude is somewhat surprising, considering the diversity of the groups, as defined by occupation, age, primary technical interest, as well as domestic versus foreign in some cases. There are general tendencies toward favoring or opposing conversion. U.S. faculty subscribers are more opposed than are foreign faculty. In fact, U.S. faculty subscribers make up the only group among individual subscribers in which those opposed outnumber those in favor of conversion. Age is a factor that affects attitude toward the dual journal concept. This is apparent in the age group as well as faculty versus graduate student comparisons, with younger people more in favor of conversion than older people. No striking differences are apparent among those having various primary technical interests. It should be noted that perception of the dual journal concept was apparently not influenced by receipt of only the summary version of the JACS sample issues (instead of both versions), since both U.S. faculty groups involved have the same opinions about the conversion of JACS.

Options to Best Serve Information Needs. When asked to select the one option that would best serve the information needs of the chemical community, high percentages of all concerned chose something other than the current journal alone. The responses naturally bear a strong resemblance to the personal preferences expressed about conversion of JACS to a dual journal. Data in Table VII show that combinations of a summary journal and the current journal or of a summary journal and either of the two archival journal formats are considered the best option by about the same proportion of each group as favored conversion to a dual journal system. Considered in another way, the data also show that (except for nonsubscribers) 54–71% of the journal-using community responding believe that it is desirable and necessary to continue the current journal format as part of any journal system developed.

Archival Journal Format Preference. Two kinds of archival journal formats were used in the dual journal evaluation, as

Table VI. Subscriber Characteristics and Opinions on Conversion of JACS to a Dual Journal

			U.S. faculty			Foreign faculty	U.S. scient.	Foreign scient.	Grad student
	Total	Mgrs	Total	Both ^a	Summary ^a				
Favor	53%	56%	44%	43%	44%	59%	55%	54%	60%
Oppose	40	33	54	53	55	30	41	35	37
		Age				Primary technical interest ^b			
	Under 30	30-45	Over 45			Bio.	Org.	Inorg.	Phys.
									All other
Favor	59%	53%	48%	Favor	53%	52%	50%	48%	58%
Oppose	38	40	43	Oppose	38	42	45	45	30

^a Both (saw both summary and archival); Summary (saw summary version only). ^b Biochemistry, organic chemistry, inorganic chemistry, physical chemistry, and all other fields (analytical chemistry, chemical engineering, etc.)

Table VII. Option That Would Best Serve Information Needs

	Readers			Re-viewers	Editors	Li-brarians
	Sub.	Non-sub.	Authors			
Current journal	32%	13%	35%	56%	19%	40%
Summary + current	23	20	19	15	43	14
Summary + archival	13	23	14	10	10	8
Type A						
Summary + archival	21	29	23	13	19	22
Type B						
Archival Type A only	2	5	1	1	-	1
Archival Type B only	3	1	4	-	5	7
Other	2	3	1	5	-	2

Table VIII. Archival Journal Format Preference

	Readers			Re-viewers	Li-brarians
	Sub.	Nonsub.	Authors		
Type A	26%	34%	24%	31%	22%
Type B	53	42	61	52	60

noted previously: the Type A (summaries plus additional information provided by authors) and the Type B (summaries plus the corresponding full articles). There is general agreement that the Type B format is preferable, although to varying degrees (Table VIII). The negative aspect of the Type A format most frequently mentioned by readers is their inability to find a continuous report of the work in one place in the archival journal. Authors and reviewers who prefer the Type B format feel that the Type A format presents more potential writing and refereeing difficulties.

Summary Article Content. There is general agreement among readers, authors, and reviewers on the kinds of information that are "very important" to include in summary articles. Some comparisons of readers' and authors' concerns about the content of summaries are given in Table IX. The data clearly indicate the correlation between attitude toward conversion to a dual journal and the importance of some of the types of information. In all cases, a higher proportion of those opposed, than in favor, feel that the content elements given in the table are very important in the summaries.

Anticipated Effects of a Dual Journal. (1) **Authors and Reviewers.** Voluntary submission of manuscripts by authors and participation by reviewers are vital to the existence of most journals published by scientific societies. It is therefore absolutely essential to consider the impact upon authors and reviewers of any potential change in the traditional journal system. Authors and reviewers were asked about the effect of conversion of JACS to a dual journal upon the probability of their continuing to submit manuscripts and to review articles (Table X). Both authors and reviewers believe that conversion to a dual journal system, as illustrated by the sample JACS issues, would affect contributions to and voluntary participation in such a system. The extent to which the conversion is expected to affect participation is influenced by how active people are in the present journal system. The greater their participation, the less likely authors and reviewers would be to submit and review articles, respectively. However, the

potential impact is difficult to assess, since much of the reluctance to continue efforts within a dual journal system is based upon a perceived probable loss of prestige and audience for the journal if such a system were adopted. If the quality and prestige of the journal were to continue at the present high levels, then authors and reviewers would be only slightly less inclined to submit and review articles. Another point can be made. Since younger scientists are more in favor of conversion of JACS than are older scientists, the likelihood of their contributing to a dual journal is also greater. Thus, the authors of tomorrow will probably be more receptive to alternative journal systems than those of today.

(2) **Readers.** Attitudes concerning the effects of having a summary journal available reveal that authors and reviewers are somewhat more optimistic than are subscribing readers as to the increased current awareness effect of a summary version, but so are nonsubscribing readers (Table XI). A higher proportion of authors and reviewers believe that readers will need access to a library copy of the archival journal than do the readers themselves, particularly the nonsubscribers. There is obvious agreement on the saving of time for the reader. It is expected that a summary journal would not only permit a reader to be able to read less, but also that what he read would be more pertinent to his interests.

(3) **Library Operations.** The adoption of a dual journal system could be expected to have quite different effects upon librarians (and library operations) than upon editors, authors, reviewers, and readers. Data on some of the potential impacts considered likely by librarians are given in Tables XII and XIII. Of those developments listed in Table XII, the need for increased storage space and the potentially higher cost to libraries are seen as more likely. About half of the librarians who responded would expect some added difficulty with referencing and with interlibrary loans. Fewer foresee increased difficulty with either acquisition or cataloging operations. Those librarians employed in industrial libraries who saw only the archival version of the JACS sample issues tend to expect more problems and difficulties with a dual journal system than do their counterparts who saw both versions.

Journal Format Preference and Subscription Price Effect. Conversion of JACS to a dual journal would pose some subscription choices for both present subscribers and nonsubscribers. An estimate of subscription patterns was sought by presenting a number of format and subscription price combinations to respondents. They were asked to indicate their probable choice within each of the combinations offered. Table XIV shows the format preferences and probable subscription behavior of ACS member subscribers (the member subscription price for JACS in 1976 was \$28). The alternate pricing schedules offered to nonmember subscribers, represented by libraries in the study, and their reactions to them are given in Table XV (the 1976 nonmember subscription price was \$112).

Some indications of behavior can be deduced from the combinations offered to member subscribers. Of present subscribers, 17-28% prefer something other than the current JACS; a small percentage (3-6%) do not appear to favor JACS in any form at \$28. At the same price, those choosing

Table IX. Information Content of Summary Articles

Very important to include in Summary articles	Individual subscribers ^a			Authors ^a		
	All	In favor	Opposed	All	In favor	Opposed
Experimental details	32%	18%	51%	12%	4%	22%
Chemical structures	57	51	67	46	35	60
Tabular data	24	16	35	17	7	30
Extensive citations	39	29	52	30	14	49

^a "In favor" or "opposed" refer to feelings about conversion of JACS to a dual journal; "all" refers to the total response.

Table X. Potential Effect If JACS Were Converted to a Dual Journal

	Submission of articles by authors who publish		Review of articles by those who referee	
	Frequently ^a	Occasionally	Frequently ^b	Occasionally
Definitely less likely	22%	5%	24%	7%
Probably less likely	22	15	24	13
Equally likely	54	76	52	76
Probably more likely	-	1	-	4
Definitely more likely	3	1	-	-

^a Five or more articles published in JACS in the last five years.^b Thirty or more articles reviewed for publication in JACS in the last five years.**Table XI.** Anticipated Effects of a Summary Journal

	Readers			
	Sub.	Non-sub.	Authors	Reviewers
Save readers' time	73%	76%	75%	73%
Increase current awareness	49	69	71	62
Would require use of library copy of archival journal	47	25	65	87

Table XII. Developments Considered Likely If a Dual Journal Were Adopted^a

	Libraries			
	All	Academic	Industrial ^b	
			Both	Archival
Greater demand for librarian's guidance	49%	47%	42%	55%
Greater demand for library copy of JACS	56	47	50	67
Increased use of copying machines	50	43	50	54
Increased storage space required	62	65	59	66
Higher total cost to library	73	75	72	73

^a Opinions of librarians employed in types of libraries noted.^b Both (saw both summary and archival); Archival (saw archival only).**Table XIII.** Expected Increased Difficulty in Library Operations If a Dual Journal Were Adopted^a

	Libraries			
	All	Academic	Industrial ^b	
			Both	Archival
Acquisition	30%	35%	26%	31%
Cataloging	16	25	12	13
Referencing	49	52	44	49
Interlibrary loans	44	46	38	47

^a Opinions of librarians employed in types of libraries noted.^b Both (saw both summary and archival); Archival (saw archival only)

the archival format over the current journal must want the summaries, since both forms contain all of the information provided by the authors. At the same price, with just two choices, about the same proportions appear to want "all" of the information (archival) and "not all" of the information (summary). The summary journal becomes more attractive at a \$13 price advantage over the current journal, or a \$10 advantage over the archival journal. Perceived disadvantages of the archival journal (separation of information and/or use

Table XIV. ACS Member JACS Subscribers' Format Preference and Price Sensitivity

Same price (\$28)	Current \$35, Summary \$22
Summary 28%	Summary 41%
Current 62	Current 49
Neither 3	Neither 5
Same price (\$28)	Current \$45, Archival \$28
Archival 17%	Archival 41%
Current 67	Current 23
Neither 6	Neither 24
Same price (\$28)	Summary \$22, Archival \$32
Summary 36%	Summary 49%
Archival 38	Archival 27
Neither 17	Neither 15

Table XV. Nonmember JACS Subscribers' Format Preference and Price Sensitivity

Subscription option ^a	Academic libraries	Industrial libraries
Archival only at \$112	44%	47%
Summary only at \$88	7	6
Both versions at \$200	25	33
Would not subscribe	13	8
Archival only at \$112	44%	41%
Summary only at \$88	7	5
Both versions at \$175	24	39
Would not subscribe	13	8

^a Price for "Both versions" is the difference between the options.**Table XVI.** Subscription Price vs. Subscription Behavior of JACS Nonsubscribers (ACS Members)

Reply	All	JACS readers	JACS nonreaders
Yes	26%	45%	9%
No	67	51	82
Question: Is price (\$28) the main reason you do not subscribe?			
\$24	1%	1%	0%
\$22	-	-	-
\$20	4	6	2
\$15	26	39	14
N.I. ^a	61	47	74

Question: Would you probably subscribe to a JACS Summary Journal at the following price?

^a N.I. means "not interested in JACS Summary Journal subscription at any price".

of typewritten material at reduced size) appear to be compensated for by a price advantage of \$17 over the current journal.

The choices offered to librarians (nonmember subscribers), represented in Table XV, were gauged to detect demand and price sensitivity in addition to preference for journal formats. The archival journal alone would be subscribed to by 41–47% of the libraries at the same price as the current journal. Another 24–39% would subscribe to both versions at the prices shown in the table. There is only a slight difference evident between academic and industrial libraries; more industrial libraries would subscribe to both versions. Reaction to the lower subscription price for the combination of both versions indicates only slight price sensitivity.

Price and Nonsubscriber Subscription Behavior. As noted previously, one of the key questions about conversion of JACS to a dual journal was whether or not individual nonsubscribers would want to subscribe to a summary version (about three-fourths favor the conversion to a dual journal system). As background and as a reference point, they were asked whether or not the price of a JACS subscription (\$28) is the reason that they do not subscribe. As can be seen in Table

XVI, 67% of all respondents (about half of those who read JACS and over three-fourths of those who do not) state that the subscription price is not the reason. Thus, other reasons are involved; for example, the subject matter may not be of interest, the format or amount of material in the journal may be a deterrent, etc.

A range of potential subscription prices was offered for their consideration to provide an estimate of the potential market for a JACS summary journal and to gauge the price sensitivity. The results of the inquiry (Table XVI) indicate that about 30% of the respondents would subscribe to a JACS summary journal if the subscription price were \$15–20. Of course, the proportion of those expressing an intent to subscribe who would actually carry out that intent is subject to a number of factors (e.g., the intensity of a promotional campaign). However, even a drastic reduction in the percentages indicated would translate into thousands of subscriptions if the survey results can be projected to the total ACS membership not subscribing to JACS (approximately 100 000).

Production Economics. It was stated in the Purpose and Objectives section of this report that adoption of a dual journal system for the publication of JACS would be expected to result in savings of 25–30% of the production costs. This expectation was verified during the publication of the three sample issues of JACS by a comparison of the costs for the dual journal samples and the regular journal issues published concurrently.

FUTURE PLANS

Although no "mandate" is apparent for conversion of JACS to a dual journal, as exemplified by the sample issues, strong evidence has been obtained of an interest in, and need for, a summary journal. There are no plans at present to publish JACS by the methods used to produce the sample archival journals. However, it is planned to investigate the potential

of a summary journal that would be a companion to the current, conventionally published JACS (or to other ACS journals), as well as other alternatives to the present journal system. Potential variations might be (a) a summary journal plus a microfiche version of the regular journal, (b) a summary journal plus requested articles, (c) a summary journal that would contain summaries of articles from more than one journal. It is possible that favorable reaction to one or more of the schemes might permit an experimental journal system to be tried for a year or two.

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Influence and Interrelationship of Chemical Journals[†]

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The structure and interrelations of the chemical journal literature are investigated as a preparatory step for studies of chemical research activity. Newly developed techniques of bibliographic citation analysis are used to construct influence measures for individual journals and for the subfields of chemistry into which the journals have been classified. Hierarchical influence diagrams are presented to display the influence and interrelations of the chemical subfields, and of the individual journals themselves.

The structure of the scientific literature has been of continuing interest to chemists. The scientific literature can help to define the interrelationships of the different subfields of chemistry by revealing patterns of influence and information flow. Within the scientific literature, the journal literature is the accepted formal communication network of science and reflects the mechanisms by which knowledge is transmitted and evaluated. The use of quantitative measures to evaluate the influence of scientific research in a given subfield of science or within a given institution can serve as a management aid

in assessing the effectiveness of the scientific enterprise as well as providing data for science policy studies.

The appeal of citation analysis is attested to by its recurrence in the scientific literature during the last 50 years. In 1927, a modest paper published by Gross and Gross was the first to use citations to evaluate the importance of scientific journals; its concern was the adequacy of the chemical library collection at Pomona College.¹ Gross and Gross tabulated the references from the *Journal of the American Chemical Society* in 1926 and used these to rank the importance of the cited journals to American chemistry students. There followed at least 20 papers which used the same technique, the direct counting of citations from one or a small group of journals, as a measure

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