SCIENCE CITATION INDEX® 1975 ANNUAL

An International Interdisciplinary Index
to the Literature of Science, Medicine, Agriculture, Technology,
and the Behavioral Sciences

Volume 9

Journal Citation Reports®

A Bibliometric Analysis of References
Processed for the 1974
Science Citation Index®

compiled and edited
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Preface

This book is the product of more than ten years' research. As a matter of fact, the concept which it embodies predates my work on citation indexing and the present *Science Citation Index*,® to which I plan to annex the *JCR*™ annually, as I have done here.

The *Science Citation Index* was planned as a 'radically different' tool for information retrieval in the natural sciences. But its methodology was constructed within a framework revealed to me with the pointed casualness but intense clarity of a great teacher. Chauncey Leake's early suggestion that I study the significance and potential usefulness of review articles and their references offered me more than I recognized at the time. Concerned as I was with the problems of information retrieval, I recognized in his suggestion -- reinforced by a fortuitous contact with W.C. Adair -- the beginnings of the *Science Citation Index.*

As, during the years, I and many others used the *SCI*® for its planned and advertised purpose of information retrieval, I came to see that I had been advised not only to consider the meaning and usefulness of references and citations, but advised especially to consider their meaning *in a particular type of journal.* The data bank amassed over the years to produce the *SCI* gave me a unique and unprecedented opportunity to look at references and citations not just as tools for information retrieval, but to look at them also as characteristics of the journals they linked. Using the *SCI* data bank, I began to study journals as socio-scientific phenomena as well as communications media. In that new study I began the manipulations of the data bank and the listings and relistings that have with repetition, study, continual modification and refinement, produced as a partial result the book I offer here.

In the introduction I have tried to explain clearly what the *JCR* is, how it was compiled, how it can be used for some simple purposes for which, I think, it is certainly needed. I have tried also to suggest its usefulness in what I'll call more advanced research. If I have failed in the latter, it is because I have deliberately, and with some difficulty, restrained my own enthusiasm about the value of what some may find at first sight to be merely another handbook of data. Let me say only that the sociology of science is a relatively new field. I believe that *JCR* will prove uniquely useful in exploring it. As students and researchers use the book, I am confident they will discover in that suggestion not a boast, but a fact. And, with great pleasure, I leave to them also to discover how the *JCR* not only answers the simpler questions they at first bring to it, but then begins to help them formulate questions that are more significant. As its author, I've naturally been pleased to find the *JCR* ready with answers. But as a student and researcher myself, the *JCR* satisfies me most because it teems with questions.

A preliminary edition of the *JCR*™ has been available in the form of computer printouts. It was based on a quarter-year sample of 1969 data, and is described in an article from *Science* reprinted in the introduction to this volume. The scope of this present edition, based as it is on the complete 1974 data, will be much more authoritative. It will be much easier to use than the earlier computer printouts. And it will also be easier to copy from. The convenience it offers me and other members of ISI staff will facilitate our preparation of reports of future research based on *JCR* data. Other users elsewhere will profit from that same convenience. I hope they will, when using the data in this volume, or when selectively copying its listings, acknowledge the source with a suitable citation.

The book is not, in this present form, all that I should like it to be. It cannot be as large as it would have to be to give users all the data on particular journals that interest them. It contains errors that have survived the considerable effort that I and others have expended to prevent them. And in the introduction, as I have implied, I doubt that I have adequately explained the scope and potential of the concept it embodies.

I acknowledge these shortcomings without dissatisfaction. I can be threatened with only one disappointment in publication of this book: that subscribers may fail to become, like myself, enthusiastic users and researchers of the *Journal Citation Reports*®. When they do become avid users, I'm sure they will express in reviews (and perhaps in letters to me) a discontent that equals my own about its necessary and its unplanned shortcomings.

I cannot acknowledge suitably, as to either their number or their effort, the help that many others have given towards what is good in this book. The dedication attempts to do so in part. I should like to mention here, however, the special contribution of Dr. Calvin Lee and Mr. Robert Hayne. The ISI programming staff headed by Mr. David Rovinsky provided invaluable support. Mrs. Loretta Carter also deserves mention for her careful handling of the manuscript and tables, as does Mrs. Sarah Downes for her preparation of the introductory photo-typescript.

Comments and criticisms on the work in its present form will be gratefully received.

Eugene Garfield

Philadelphia
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Introduction

This volume of the 1975 annual cumulation of the *Science Citation Index®* (*SCI®*) adds a new section to the series. The nature and purpose of *Journal Citation Reports®* (*JCR™*) is described in this introduction. The introduction includes a reprint of an article on the background of the *JCR* that will supplement information given here. A selective bibliography on citation analysis and its applications follows the reprint. An *Abbreviated-to-Full Title Dictionary* of citing and cited journals completes the introductory material.

I. Journals, References, and Citations

A citation index is based on the principle that there is some meaningful relationship between one paper and some other that it cites or that cites it, and thus between the work of the two authors or two groups of authors who published the papers.

The entire *SCI®* data base is stored on magnetic tape, and it is thus amenable to extensive manipulation and analysis. In the case of authors, we have been able to identify the frequency with which they and their papers are cited in the literature, over any chosen time period. Counts of this sort are strictly quantitative and objective. But even admitting this limitation, an author's or a paper's frequency of citation has been found to correlate well with professional standing. It is certainly not the *only* measure, nor one that can be used, for any purpose, in isolation. We do not claim for it the absolute reliability that critics of citation analysis have wrongly imputed to us when they have attacked it. The fact does remain, however, that it provides a useful objective criterion previously unavailable.

Basically the same principle can be used in evaluation of journals, rather than of authors' publications or single papers. When a scientist cites a previously published article, he tells us, in a sense, that he has read it and has some reason for bringing it to our attention. The more frequently a journal's articles are cited, the more the world's scientific community implies that it finds the journal to be a carrier of useful information.

Evaluating Journals

It has always been and still remains difficult to assess the relative importance of scientific and technical journals. There have been few, if any, totally objective criteria by which to measure them. Researchers and their library colleagues quickly learn what journals are most 'important' for particular disciplines, and countless studies have been carried out to establish 'core-journal' lists. But as research interest and activity extend beyond the basic discipline, as interdisciplinary and multidisciplinary 'mission-oriented' research requires broader journal coverage, the relevance and usefulness of journals outside the disciplinary core may be difficult to determine. Even within the small disciplinary or departmental library, when a choice between journals is dictated by restricted acquisitions budgets, considerations less relevant than scientific merit may all too likely determine or force the choice--politics, sheer habit, relative subscription cost, and so on.

Thus, the *Journal Citation Reports®* (*JCR™*) extends the use of citation analysis to examine the relationships among journals rather than among articles and their authors. The *JCR* answers these basic questions: how often has a journal been cited? what journals have cited it? how frequently have *particular* journals cited it? does the cited material in the case of a particular journal come primarily from older articles, newer articles, or does the citation pattern show a chronological consistency? what journals has the particular journal itself cited? how often has it cited each of them? is it citing old material, new material? what part of these counts is due to self-citation? In other words: who uses a particular journal? how frequently? for what purposes?

The Total Framework

Like any other tool, the *JCR* cannot be used indiscriminately. It is a source of highly valuable information, but that information must be used within a total framework proper to the decision to be made, the hypothesis to be examined, and rarely in isolation without consideration of other factors, objective and subjective. For example, there are undoubtedly highly useful journals that

are not cited frequently. Scientists read many such journals for the same reason people read newspapers and other non-scientific periodicals--to keep up with what's going on generally. They may rarely cite such journals in their published work. This does not mean that such uncited or infrequently cited journals are any less useful for their intended purpose than cited journals. It does mean, however, that these journals are written and read for a purpose other than the communication of original research findings and the indispensable summary of research findings provided by reviews.

Another consideration is that citation frequency is sometimes--indeed to some extent must be--a function of variables other than scientific merit. Some such variables may be an author's reputation, the controversiality of subject matter, a journal's circulation and its cost, reprint dissemination, its coverage by current-awareness and indexing and abstracting services, society memberships, the availability and extent of libraries' journal collections, national research priorities.

Compiling Journal Data

The *JCR*™ analyzes and summarizes a massive amount of data: the 1974 listings are based on 4,248,065 citations from the references of approximately 400,000 source items published in 1974 issues of some 2400 *SCI* source journals.

Obviously, it will be easier to use information from the *JCR* if one understands how it has been compiled. The user must remember that the *JCR* is a calendar-year report, compiled from the *Science Citation Index*® (*SCI*®) data base.

The *SCI* indicates the reference/citation links between an article published during the year and all previously published articles cited in the current article's references. The *SCI* identifies every unique link between any cited article and all articles that have cited it during the year, supplying authors' names, journal titles, journal volume and page numbers, and year of publication. The *JCR* extracts from each of these unique citation links four pieces of information: two journal titles and two publication years. One of the extracted journal titles is that in which the current citing article was published. The other journal title is that in which the cited article was published. One of the publication years is that in which the current citing article was published. Since the *JCR* is a calendar-year compilation, this year date will be the same in all cases. The other publication year will be the year in which the cited article was published.

In this extraction process many similar links are generated from the millions of different and unique links identified fully in the *SCI*. The *JCR* counts how many of these similar links there now are, and tabulates the results in its two 'detail' listings, first by citing journal and then by cited journal.

Article-to-Article Links

It is important to remember the way these counts have been generated, as described above. They are counts of reference/citation links, not counts of articles, nor of journals *per se*. For example, a 1974 article published in *Journal of the American Chemical Society* may have had 40 references. These 40 references contained, let us say, citations of only 35 *different* articles. The 35 different cited articles appeared in 10 different journals. In other words, the 40 references cited some articles--at the most 5--more than once, and cited each of the ten different journals an average of 4 times. In compiling the *JCR*, it is the number of different article-to-article links that is counted. In this case the *Journal of the American Chemical Society* is credited with 35 unique references. Their 35 citations will be distributed among the 10 different cited journals, each receiving on the average a 'cited' count of 3.5--not 4, and not 1.

Lest this point be passed over as a laboring of the obvious, the user must remain aware that the *JCR* represents only one of several possible descriptions of journal relationships. Others have been suggested above, namely, one based on data *including* duplicate citation links between the same two articles, and another based on data including only *unique journal* links rather than unique article links between the same two articles.

The Ever-Changing River of Journals

Many users will need no reminder that the management of serials, among which are included scientific journals, is one of the thorniest thickets of bibliography and librarianship. Even knowledgeable estimates of the number of extant scientific and technical periodicals vary so widely--by tens of thousands--that the uninitiated cannot be blamed for doubting the competence of those concerned with the problem.

Like a real river, the river of scientific and technical publication is ever-changing. Its elements are complex, its course confusing, but overall the difficulties and problems of serials librarianship in science are a reflection of the strength and force of its river's progress. Journals die but are replaced by others; journals grow, and split into sections (lettered or numbered or subtitled and resubtitled), or into new journals; journals may narrow their interest and merge with other journals under old or new titles; titles change to reflect a reorientation even when splitting and merging is avoided--a few words are added, some dropped, the language of the title itself may change.

This characteristic but vital inconstancy of scientific publication is severely problematic for an effort like the *JCR*™ that seeks to describe journal relationships over periods of time. There is, to be sure, the additional confusion contributed by incorrect or ambiguous citations, by the sometimes truly stultifying virtuosity of title abbreviators, by the 'separateness' of original and translated versions of the same journal, etc. As irritating and time-wasting as such things are, they are nevertheless of relatively minor significance within the total complex framework. Most are amenable to easy solution, given persistence, generous computer time, and the ability to survive seemingly endless deserts of boredom. (One very soon ceases to wonder at the reason behind some probably reasonable researcher's decision to abbreviate in yet another way the title of the *Comptes Rendus* of the French Academy of Sciences.)

When and When Not to Combine Citation Counts

The user is advised in any detailed chronological study to make use of the cross-references in the annually issued *SCI*® *Guide and Journal Lists,* and to consult periodical directories that provide historical and genealogical information about serials, such as Ulrich's or *CASSI.*

Compilation of the *JCR* has, as thoroughly as possible, dealt with these 'minor' problems. Major problems of identification remain, however, and the user and researcher must not expect that they have been solved. Any general attempt to do so would have been misguided and inevitably abortive. We have, thus, in compiling the *JCR* refrained from combining journal counts on the basis of 'lineage', even when it is clearly definable. Except where a title change has been so minor (usually among latter words) that it neither affects the title's position in a catalog listing nor requires additional or different entries, the *JCR* does not combine counts for related journals (replacements, supersedents, continuations, descendants, etc.). Nor does it combine counts for 'sections' of 'the same journal'. *JCR* leaves it to the user to decide whether or not his purpose recommends that counts be combined in such cases.

A particularly well-known example of this problem is that of Soviet journals and their translations. To alert the user, an asterisk after a main entry or subentry abbreviation signals that the journal appears in the *JCR* with counts for both original and translated versions. Unfortunately it would be impractical to attempt anything similar for the hundreds of journals that are lineally or otherwise related to others in these lists. When, for special purposes, counts have been combined, the user is informed, as in the case of the list of 100 most-cited journals shown on page 20.

Caution!

Caution is advisable in comparing journals, especially journals from different disciplines. The journal literature varies in its importance as a means of disseminating information in different fields. Wide citation may be necessary practice in one field, but because of other dissemination in others a redundancy. Citation practices differ from one field to another. The difference may be complicated by a difference in the half-life of journal literature in different fields, as well as the size of the extant citable literature. Rapid obsolescence may characterize one field but not another. Thus, for example, it would be foolish to conclude merely on the basis of citation counts that *Journal of the American Chemical Society* is a 'better' journal than *Annals of Mathematics,* or to hypothesize, without a great deal of study, which serves its own field 'better'.

Other factors must be considered as well. For example, journals that do not use the roman alphabet are not as easily and economically included in the *SCI* data base as those that do. This fact may affect the ranking and citation counts of some Russian and Japanese journals. Or a journal may have published two or three articles that are cited year after year with extraordinary frequency, compared with the 'average' article it has published. Citations of such papers may distort evaluation of the journal unless their records are taken into account.

Introduction

II. Why the *Journal Citation Reports*?®

In other parts of this introduction I have tried to explain the source of the data in the *JCR*,™ to describe how the material has been summarized and displayed in its various sections, and to help the novice use it for the first time. The *JCR* answers the following types of questions immediately: how often has a particular journal been cited? what journals have cited it? how frequently have *particular* journals cited it? is it the older or new material that's being cited? what journals does this journal cite? how often does it cite each of them, etc.?

A merely curious browser, or even students or researchers, may reasonably and bluntly ask *why* these questions should be asked. What is the value of answering these questions? Can it justify a work of the *JCR*'s scope and expense? What is the *rationale* of such questions, beyond an academic itch to know? Who wants or needs the answers? Why is it necessary to compare journals or to determine their importance? Doesn't the mere fact that a journal is published say--with unarguable economic authority--all there is to be said? Aren't journals published because they are important to someone or to some group? Unfortunately life isn't that simple.

This introduction is no place to go into the complicated economics and politics of scientific and technical journal publication. The subject deserves several doctoral theses. In due course, the *JCR* will undoubtedly stimulate students to undertake them. Suffice it to say the 'authoritative' voice of economics can speak in barely more than a whisper. Indeed it can often hardly be heard from its shaky podium of subsidized and unsubsidized society sponsorship, front- and back-door government support, voluntary and mandatory and 'mandatory-voluntary' page-charge systems, advertising and public relations programs, etc. The sheer economic chaos of much of this important activity is alone good enough reason to attempt to answer questions like those posed above.

For that very reason, the *JCR* should quickly prove itself indispensable to people who cannot rely on economic criteria alone in making basic decisions about journals, since the law of supply and demand is not always allowed to prevail. These include administrators in libraries and information service centers; individual scientists; journal editors and publishers; and those who determine science policy and measure its accomplishments.

Librarians can use the *JCR* to counteract the inertia that too often prevails with regard to journal selection. It's just too difficult; therefore, *ad hoc* decisions are rampant. The *JCR* offers objective evidence of the optimum makeup of general and special journal collections. Its yearly editions will indicate or imply changes the library should consider. The chronological spread of citation counts should be invaluable in optimizing retention schedules. Why keep twenty-five years of a journal on your shelves when 80 to 90% of its cited material is less than six years old? Few libraries in the world have a mandate to collect everything and none can afford it. Most must operate within a budget on which users' journal requests can wreak havoc. Because the *JCR* gives good indication of a journal's overall use, it provides a starting point for true cost-benefit analysis in allocating acquisition funds.

Outside the library or information center's administration offices, the *JCR* can be as useful to the librarian as to the library user. At ISI® we have found the *JCR* to be the most reliable--sometimes the only reliable--indicator of a journal's subject area, and of its orientation within the subject area. One quick scan of the columns showing journals that it cites and that cite it can often be more informative than the best title or statement of a journal's editorial objectives. This capability of the *JCR* is especially useful as multidisciplinary work takes scientists to the borders of their own fields, and perhaps over them into others with less familiar journals and journals of different types. These same cited and citing lists reveal what journals in other fields are linking up with journals in their own. And, a far from trivial matter, the *JCR* can be very helpful in deciding

where to publish to reach the audience you want to reach. If, for example, you have a paper that deals with some interesting mathematical aspects of biological problems but is nevertheless definitely a *biological* paper, the *JCR*®can show you which biological journals have the best 'connections' with math, and which are most likely to welcome the paper.

Since publication of the preliminary 1969 edition of the *JCR* we have had many inquiries from journal publishers and editors. Those inquiries seem to me to speak not only for the potential of the *JCR* but also for the managerial acumen of the scientists and business people who expressed immediate interest in *JCR*. As made plain earlier, the *JCR* cannot be used alone in evaluating a journal's performance, but it *can* alone give reliable indication that a thorough evaluation--including use of the *JCR*--may be in order. Has the number of citations dropped in relation to number of articles published? Has the rate of self-citation remained steady at the expected average? How do the self-citing and self-cited rates compare? How are citations distributed among citing journals within and outside the specialty? What is the impact of the average cited article in comparison with other comparably cited journals? How rapidly--see *Immediacy Index* among the *Definitions*--is the journal's material noted in the references of other journals?

The use of the *JCR* can be of far-ranging significance in a field about which I can say least here--science--its planning, its evaluation, its sociology, its history. Citation analysis can be used to identify and map research fronts; to define disciplines and emerging specialties through journal relationships; to determine the interdisciplinary or multidisciplinary character and impact of research programs and projects. I say least about this, to me the most exciting aspect of its potential, because the *JCR* in its present form is, for such advanced applications, only a sketch of that potential, providing little more than suggestions for further and deeper examination of the massive data bank from which its sections have been extracted. I have made plain above my regret that this book has dimensional limits. Even for the generally straightforward lists of ranked and citing and cited journals, we have had to limit the data presented. For the study of science policy and sociology those limitations are more troublesome to me. I believe the *JCR* in its present form can certainly provide material for innovative research in the field. But it will serve the field best if it does, as I hope, prompt more imaginative analyses than I am competent to attempt. I shall be very disappointed if the *JCR* does not, as any good piece of scientific work should, stimulate with every answer it gives more questions that need answers.

Introduction

III. Definitions

These *Definitions* are, in some cases, actually definitions. In others, they explain usages peculiar to the *SCI*® and the *JCR*™ and their editorial conventions. In still others (e.g., *cited journal, citing journal, times cited*), the definition is meant primarily to warn the reader that, in the case of the *JCR*, there is more than initially meets the eye in these apparently obvious terms, and frequently more than the memory instantly discloses. The user will need a fair command of their meaning when reading the descriptions of the *Citing* and *Cited Journal Packages.*

Citation. When one document (B) mentions, or refers to another document (A), the latter (A) has been cited by the former (B) as a source of information, as support for a point of view, as authority for a statement of fact, etc. The word *citation* is used to indicate not only the fact that document A has been cited in a reference of document B, but also for the description of document A contained in the reference (**Lederberg J.** *J. Bact.* **63**:399, 1952). In this sense, citation and reference are frequently used interchangeably.

Citation Index. The *Citation Index* is an alphabetic list, by first author, of items cited in references from footnotes or bibliographies of a source article, Each such citation is followed by a short bibliographic description of the source article which contained the citing reference.

Cited Journal. A journal cited in a reference of an item (source item) published in an *SCI* source journal (citing journal). A cited journal is not necessarily covered by the *SCI*; that is, it may not be found in the listing of *citing journals.* Most cited journals, however, are also citing journals. *Cited journal* is used as a column heading in the *Cited Journal Package* of the *JCR.* Items in that column may include so-called 'soft' journals, and other serial publications. Such entries have been retained for their information value.

Citing Journal. A journal in which published items contained references citing another journal or published item. In the *JCR,* citing journals are necessarily *source journals* of the *SCI.*

Immediacy Index. A measure of how quickly the 'average cited article' in a particular journal is cited. A journal's immediacy index considers citations made during the year in which the cited items were published. Thus, the 1979 immediacy index of Journal X would be calculated by dividing the number of all journals' 1979 citations of items it published in 1979 by the *total number* of source items it published in 1979. It should be obvious that an article published early in the year has a better chance of being cited than one published later in the year. As a result, journals published weekly and monthly will theoretically have an advantage, as regards immediacy, over journals published quarterly and semi-annually.

Impact Factor. A measure of the frequency with which the 'average cited article' in a journal has been cited in a particular year. The *JCR* impact factor is basically a ratio between citations and citable items published. Thus, the 1979 impact factor of journal X would be calculated by dividing the number of all the *SCI* source journals' 1979 citations of articles journal X published in 1977 and 1978 by the *total number* of source items it published in 1977 and 1978. There are other ways of calculating journal impact (see **Garfield E.** Citation analysis as a tool in journal evaluation. *Science* **178:**471-79, 1972; especially note 27).

The impact factor is useful in evaluating the significance of absolute citation frequencies. It tends to discount the advantage of large journals over small ones, of frequently issued journals over less frequently issued ones (weeklies *vs.* quarterlies or annuals); of older journals over newer journals. In each such case the first is likely to produce or have produced a larger citable corpus than the second. All things being equal, the larger that corpus, the more often a

journal will be cited. The impact factor allows some qualification of quantitative data. The qualification is algorithmic and objective, but nonetheless useful in journal evaluation.

Journal Title. The title of a scientific or technical periodical, usually given in the *JCR*™ in an abbreviated form. Abbreviation of titles in the *JCR* usually ignores subtitles and title run-ons (Acta medica clinica--*an international journal of medical practice.* Zeitschrift für Neurologische Forschung *und Angewandte Gebiete*). In abbreviation of journal titles, consistency is subordinated to informativeness and clarity, as far as space allows. In alphabetic listing of journals, abbreviations are alphabetized letter by letter, with a space regarded as a 'letter' preceding *A* and a hyphen as a 'letter' following *Z*. In such alphabetic listings of 'journal titles' in the *JCR*, note that it is the *abbreviation, not the full journal title,* that is alphabetized. An *Abbreviated-to-Full Title* Dictionary begins on page 35.

Reference. The mention or description of one document (A) in another document (B), to indicate a source of information, to provide support for a point of view, to lend authority to some statement of fact, etc. Document B is said to make reference to document A; document A is said to be cited by document B. *Reference* is also used for the document description or bibliographic data given in making the reference (**Lederberg J.** *J. Bact.* **63**:399, 1952). Reference is made, that is, references are given, in footnotes, and more frequently among bibliographic end-notes or in bibliographic listings at the end of an article. From such references are extracted the *citations* which become main-entries in the *Citation Index.*

Rest. A column heading in the *Citing* and *Cited Journal Packages* of the *JCR*, used to mean 'Total Citations of Articles Published in All Previous Years'. Since the format of the *JCR* allows a chronological distribution of citation dates over a ten-year period, *Rest* means 'published prior to the decade just ended'.

Self-Citation. Self-citation of journals occurs when an article in journal X cites another article previously or simultaneously published in journal X. Self-citations are contained in about 20% of a journal's references.

Self-Citation Rate. Self-citations expressed as a percentage of all citations. There are *two* self-citation rates, the self-cit*ing* and self-cit*ed* rates. The self-citing rate relates a journal's self-citation to its total references. The self-cited rate relates a journal's self-citations to the number of times it is cited by all journals including itself. For example journal X made reference to 10000 items, including 2000 items it itself had published. Its self-cit*ing* rate is 2/10 or 20%. On the other hand, journal X was cited 15000 times in the references of all journals, including its own. Its self-cit*ed* rate is 2/15 or 13.3%.

Source Index. The *Source Index* of the *SCI*® gives a complete bibliographic description of all source items processed for the *SCI.* Items are arranged alphabetically by name of first author; all coauthors are cross-referenced to first authors. The *Source Index* is, thus, an alphabetic index by author of all items published by *SCI*-covered journals during a particular year, or during the time covered by any of the cumulations of *SCI* annuals.

Source Item. Called also source document, source article, a source item is an item published in one of the source journals processed for the *Science Citation Index*®(*SCI*). Source items may be original substantive articles, editorials, letters, technical notes, correction notes, meeting reports, reviews, etc. From the references provided by a source item, citations are extracted to prepare the *Citation Index* of the *SCI;* bibliographic descriptions of source items are prepared for the *Source Index* of the *SCI;* and words from the titles of source items are paired for production of the *Permuterm*® *Subject Index* of the *SCI.*

Some types of source items (e.g., news items, non-scientific and non-technical correspondence)

do not by their very nature invite citation in the references of scientific reports. Such source items are excluded from source-item counts in compilation of the *JCR*.™ In the *JCR* only original articles, technical notes and review articles are counted as source items, except in the case of the following journals, whose meeting abstracts are admitted as source items in impact-factor and immediacy-index calculation: *Federation Proceedings, Bulletin of the American Physical Society, Clinical Research, Transactions of the American Nuclear Society,* and *Notices of the American Mathematical Society.*

Source Journal. A journal that is processed for the *SCI,*® so called because it is the source of published items processed for compilation of the three sections of the *SCI.* In the *JCR* a source journal is a *citing* journal.

Times Cited. The *JCR* describes relationships between journals. It is, however, based on citation links between articles. The following explanations of 'times cited' may be unnecessary for most users. Some, however, may need the information, and it is given in some detail in the interest of whatever differentiation research may require.

Times Cited: Authors. In the case of authors, 'times cited' is the sum of the citation of their cited items, as described below, including journal articles, books, etc.

Times Cited: Journals. In the case of journals, 'times cited' is based on citations of articles, as described below. It is a cumulation of the number of times a particular journal has been named in citation of different articles in references of individual source items.

Times Cited: Articles. As elsewhere in these definitions, the term *articles* is used broadly for 'journal items', and includes technical communications, letters to the editor, editorials, etc.; in other words, individual items published in journals. An article cited three times in the references of the same *SCI* source item is counted as having been cited by that source item *once.* Thus, 'times cited' in the case of articles is the cumulative number of times the article has been cited once or more by single *SCI* source items. In the case of articles, therefore, 'times cited' is equivalent to the number of source items that have cited the article.

Times Cited: Books and Other 'Non-Journal' Items. The references of journal items contain citations of many different types of publications. About 80% of the references cite other journal items. The remaining 20% cite books (single- or multi-authored monographs); edited collections of single- or multi-authored 'contributions' or 'chapters' or 'sections'; variously compiled and formatted collations of reports and papers produced by meetings, symposia, congresses; technical reports of academic, industrial, and governmental origin; personal communications; items in press; theses; 'unpublished' reports; collected works of classical and modern authors; handbooks, textbooks, data compilations; encyclopedias and other reference works; etc.

A great deal of such material presents problems for citation analysis that the journal article does not. First, styles of citation vary widely and wildly. Second, internal citation (of a single page, series of pages, section, chapter, etc.) is particularly frequent. Third, different revisions or editions, by the same author(s) or by the same or different editor(s), may be cited.

Such items cited more than once in the references of the same *SCI* source item are taken as cited as many times as there are different forms of citation. Thus, if John Smith's *Classic Chemistry* is cited three times identically as "Smith J. *Classic Chemistry.* New York: ABC Publ., 1954," it is counted as having been cited *once* by the citing article. If, however, the three references contain citations such as (1) "Smith J. *Classic Chemistry,* **1st ed.,** New York: ABC Publ., **1954, p. 25;**" (2) Smith J. *Classic Chemistry,* **1st ed.,** New York: ABC Publ., **1954, p. 86;"** and (3) "Smith J. *Classic Chemistry.* **2nd rev. ed.,** New York: ABC Publ., **1960,"** Smith's 'book' (and Smith) will be taken as having been cited three times. Thus, 'times cited' in the case of such 'non-journal' items is the cumulative sum of their single or multiple citation by individual *SCI* source items.

IV. Components of the *JCR*™

The *JCR* is made up of three data 'packages' or sections. We have retained the word 'packages' in the titles of the sections from their first publication in the form of computer printouts. The three sections are: (1) *Journal Ranking Package;* (2) *Citing Journal Package;* (3) *Cited Journal Package.*

The first section (*Journal Ranking Package*) lists cited journals alphabetically and then ranks them by five different counts or indicators.

The second section (*Citing Journal Package*) shows for each *SCI*® source journal the journals it cited in 1974, and the chronological spread of items cited.

The third section (*Cited Journal Package*) shows for each journal cited by *SCI* journals, the *SCI* source journals that cited it, and the chronological spread of items cited.

Each of these sections is described more fully in the material which follows.

The *Journal Ranking Package*

The first part of the *JCR* is the *Journal Ranking Package.* It contains six listings, described in detail on pages 10-13. The first listing is an alphabetic list of journals cited in the 1974 references of journals processed for the production of the *Science Citation Index*®. The remaining five listings rank the cited journals by various counts and indicators.

The ranking lists present a great deal of useful information. Some of it is a summing of counts of references made and citations received that are broken down by cited journal and by citing journal in the two larger parts of the *JCR.* Some of the information is presented only in these lists; for example, the number of source items published in the years 1972, 1973, and 1974 by each of the cited journals. It can be somewhat difficult initially to understand the calculation of impact factor and immediacy index, as defined in the *Definitions* elsewhere in this introduction. The summing of counts presented in the *Journal Ranking Package* gives the counts involved in the calculation of both, along with the result. Impact factor is the result of dividing the count in the fourth column of figures by the count in the seventh column. Immediacy index is the result of dividing the count in the next-to-last numerical column by the number on its left.

The fact that there are *five* ranking lists will, I hope, serve to remind users that ranking journals by any single criterion can be highly useful. But the result must be used with caution, and not in isolation without consideration of other rankings and other factors which may not be susceptible to any kind of ranking or any kind of objective, especially algorithmic comparison. Not unnecessarily, this advice of due caution is repeated elsewhere in this introduction, and in much else that the author has written on the subject. The user must remember that *rank* in the *JCR* indicates relative standing on certain lists, and that the *JCR* is, among other things, a *tool for* evaluation of journals, not itself an evaluation of journals.

Journal Ranking Package, Section 1:

Specimen

JOURNAL RANKING PACKAGE — J O U R N A L C I T A T I O N R E P O R T S — SECTION 1 PAGE 1

JOURNALS IN ALPHABETICAL ORDER

	JOURNAL TITLE	<------CITATIONS IN 1974 TO------> ALL YEARS	1973	1972	73+72	<--SOURCE ITEMS IN--> 1973	1972	73+72	IMPACT FACTOR	CITATIONS IN 1974 TO 1974 ITEMS	SOURCE ITEMS IN 1974	IMMEDIACY INDEX
1	A GRAEFES A KLIN E O	647	72	52	124	90	78	168	0.738	24	123	0.195
2	A VAN LEEUW J MICROB	557	47	53	100	62	55	117	0.855	15	63	0.238
3	AAPG BULL	1639	151	203	354	145	158	303	1.168	29	161	0.180
4	ABRASIVE ENG	1	0	0	0	25	35	60	0.000	0	24	0.000
5	ACCOUNTS CHEM RES	2738	326	555	881	63	56	119	7.403	65	62	1.048
6	ACTA AGRON HUNG	43	6	2	8	54	60	114	0.070	1	93	0.011
7	ACTA ALLERGOL	334	40	44	84	33	39	72	1.167	9	40	0.225
8	ACTA ANAESTH SCAND	287	25	37	62	54	48	102	0.608	8	61	0.131
9	ACTA ANAT	1212	47	84	131	141	142	283	0.463	17	157	0.108
10	ACTA ASTRONAUTICA	10	0	0	0	40	89	129	0.000	3	94	0.032
11	ACTA BIOCHIM BIOPHYS	250	15	51	66	32	51	83	0.795	7	46	0.152
12	ACTA BIOCHIM POL	336	34	31	65	37	37	74	0.878	11	51	0.216
13	ACTA BIOL CRACOV BOT	48	2	5	7	13	19	32	0.219	1	15	0.067
14	ACTA BIOL CRACOV ZOO	66	5	2	7	27	23	50	0.140	1	18	0.056
15	ACTA BIOL HUNG	227	4	15	19	27	43	70	0.271	1	15	0.067
16	ACTA BIOL MED GER	922	112	189	301	216	228	444	0.678	50	223	0.224
17	ACTA BOT NEER	465	45	43	88	76	76	152	0.579	16	64	0.250
18	ACTA CHEM SCAND	8803	472	720	1192	549	595	1144	1.042	165	434	0.380
19	ACTA CHIM HUNG	904	98	97	195	197	236	433	0.450	29	152	0.191
20	ACTA CHIR HUNG	54	6	9	15	45	32	77	0.195	3	33	0.091
21	ACTA CHIR SCAND	1645	64	142	206	142	137	279	0.738	26	133	0.195
22	ACTA CIENT VENEZ	64	6	14	20	77	101	178	0.112	0	10	0.000
23	ACTA CRYSTALLOGR	7598	22	18	40	0	0	0		3	0	
24	ACTA CRYSTALLOGR A	1793	241	275	516	141	235	376	1.372	73	166	0.440
25	ACTA CRYSTALLOGR B	4520	854	984	1838	630	753	1383	1.329	221	635	0.348
26	ACTA CYTOL	763	98	93	191	81	90	171	1.117	8	73	0.110
27	ACTA DERMAT-VENEREOL	840	96	122	218	120	84	204	1.069	27	96	0.281
28	ACTA DIABETOL LAT	281	12	44	56	46	11	57	0.982	3	39	0.077
29	ACTA ENDOCRINOL PAN	12	0	6	6	8	10	18	0.333	0		
30	ACTA ENDOCRINOL-COP	4909	708	675	1383	251	311	562	2.461	159	278	0.572
31	ACTA ENTOMOL BOHEMOS	79	15	23	38	51	42	93	0.409	7	44	0.159
32	ACTA GENET MED GEMEL	122	1	5	6	13	33	46	0.130	0	61	0.000
33	ACTA GERONTOL	17	11	3	14	25	19	44	0.318	0	0	
34	ACTA HAEMATOL	953	54	111	165	88	100	188	0.878	16	93	0.172
35	[illegible]RATO-GASTRO		25			69			0.418		66	0

Description

Section 1 is a listing of journals cited in 1974 in the references of *SCI*® source journals. The journals are arranged in alphabetic order of title abbreviation (letter by letter, with space preceding *A* and hyphen following *Z*). The first column is an item number. The second column is the journal-title abbreviation. The next four columns, bracketed under the heading '———Citations in 1974 to———' give:

(1) the total number of times the journal was cited by individual *SCI* source items in 1974;

(2) the portion of those total citations accounted for by articles the journal published in 1973;

(3) the portion of the total citations accounted for by articles the journal published in 1972; and

(4) the sum of 1972 and 1973 items cited in 1974.

The next three columns, bracketed under the heading '———Source Items in———', give

(1) the number of source items published by the journal in 1973;

(2) in 1972; and

(3) in those two years together.

The next column, headed 'Impact Factor' gives a figure for the relative frequency with which the journal's 'average cited article' has been cited. (See *Impact Factor* under *Definitions* above.) Briefly, the impact factor is the ratio of citations to citable items published: all journals' 1974 citations of 1972 and 1973 items published by journal X, divided by the total number of source items published in 1972 and 1973 by journal X.

The next two columns show, respectively, the number of times articles in the journal's 1974 issues were cited in the references of 1974 *SCI*® source items; and the number of source items the journal itself published in 1974. The last column, headed 'Immediacy Index' (see that term under *Definitions* above) is the quotient of 1974 citations divided by 1974 source items.

Thus, we see that *Acta Anaesthetica Scandinavica* was cited by all *SCI* source journals 287 times in 1974. Of those 287 citations, 62 were citations of articles published in 1972 and 1973 issues of *Acta Anaesth. Scand.* In 1973 that journal had published 54 source items; in 1972, it published 48. These 102 items (54 + 48), published by *Acta Anaesth. Scand.* in 1972 and 1973, were cited in part by *SCI* source journals 62 times in 1974, as we have seen. The impact factor is therefore 62/102, or 0.608. In 1974, *Acta Anaesth. Scand.* published 61 articles, to a few of which there were, *during 1974,* 8 references. The immediacy index is thus 8/61 or 0.131.

In some cases, a column will show a zero, a small bullet, or a blank. A zero is always a true zero; a small bullet indicates lack of data; a blank indicates an incalculable figure.

It should be remembered, as noted elsewhere, that the journals variously arranged in the sections of the *Journal Ranking Package* include not only *SCI* source journals themselves, but also other journals they have cited. In most cases, we have been able to supply the information on items published in the period 1972-1974 that is needed to fill out the entry for each cited journal not covered by the *SCI*. Where we have not, a small bullet appears.

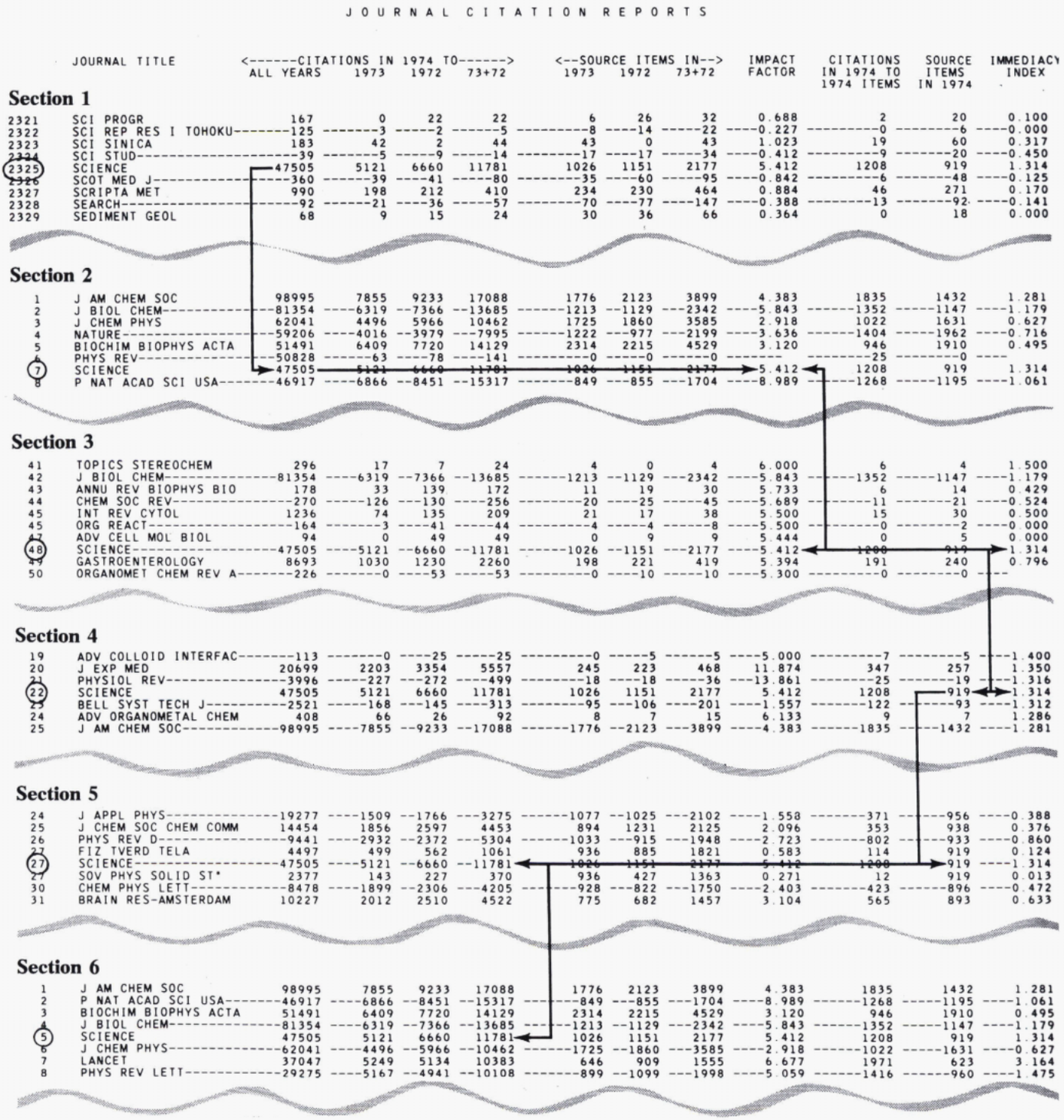
There will, naturally, always be actual counts in the first column of these listings. A zero in the second to fourth columns of the '———Citations in 1974 to———' group is a true zero. *Abrasive Engineering,* for example, was cited only once in 1974; that citation was of an article published in some year other than 1972 or 1973, and the three columns for those two years' citations and their sum show zeros. Both impact factor and immediacy indexes are therefore also zero.

Zeros in the second group of columns headed '———Source Items In———' usually indicate that the journal is no longer published or no longer published under that title. A small bullet indicates the few cases in which we have been unable to determine the number of source items. For example, *Acta Crystallographica* was cited 7598 times in 1974. Of those citations, 40 were supposedly citations of articles published by 'Acta Crystallographica' in 1972 and 1973. As the reader may know, however, the former *Acta Crystallographica* had by 1972 split into separate A and B sections. Counts for those new journals immediately follow the entry for the former title. As shown, 'Acta Crystallographica' published nothing in 1972 and 1973, or in 1974, but incomplete citations in 1974 references of some journals failed to identify which of the A or B sections was meant. The original title is still highly cited, but cannot be given either impact factor or immediacy index. Both appear for the A and B sections in the entries below. The journal origin of the 40 incomplete citations can be partially determined by consulting the *Cited Journal Package.*

As an alert for the user, an asterisk follows the abbreviation of journals (usually Russian) which appear in the listings in both original and translated versions.

Journal Ranking Package, Sections 2-6:

Specimen



JOURNAL CITATION REPORTS

	JOURNAL TITLE	<------CITATIONS IN 1974 TO------> ALL YEARS	1973	1972	73+72	<--SOURCE ITEMS IN--> 1973	1972	73+72	IMPACT FACTOR	CITATIONS IN 1974 TO 1974 ITEMS	SOURCE ITEMS IN 1974	IMMEDIACY INDEX
Section 1												
2321	SCI PROGR	167	0	22	22	6	26	32	0.688	2	20	0.100
2322	SCI REP RES I TOHOKU	125	3	2	5	8	14	22	0.227	0	6	0.000
2323	SCI SINICA	183	42	2	44	43	0	43	1.023	19	60	0.317
2324	SCI STUD	39	5	9	14	17	17	34	0.412	9	20	0.450
(2325)	SCIENCE	47505	5121	6660	11781	1026	1151	2177	5.412	1208	919	1.314
2326	SCOT MED J	360	39	41	80	35	60	95	0.842	6	48	0.125
2327	SCRIPTA MET	990	198	212	410	234	230	464	0.884	46	271	0.170
2328	SEARCH	92	21	36	57	70	77	147	0.388	13	92	0.141
2329	SEDIMENT GEOL	68	9	15	24	30	36	66	0.364	0	18	0.000
Section 2												
1	J AM CHEM SOC	98995	7855	9233	17088	1776	2123	3899	4.383	1835	1432	1.281
2	J BIOL CHEM	81354	6319	7366	13685	1213	1129	2342	5.843	1352	1147	1.179
3	J CHEM PHYS	62041	4496	5966	10462	1725	1860	3585	2.918	1022	1631	0.627
4	NATURE	59206	4016	3979	7995	1222	977	2199	3.636	1404	1962	0.716
5	BIOCHIM BIOPHYS ACTA	51491	6409	7720	14129	2314	2215	4529	3.120	946	1910	0.495
6	PHYS REV	50828	63	78	141	0	0	0		25	0	
(7)	SCIENCE	47505	5121	6660	11781	1026	1151	2177	5.412	1208	919	1.314
8	P NAT ACAD SCI USA	46917	6866	8451	15317	849	855	1704	8.989	1268	1195	1.061
Section 3												
41	TOPICS STEREOCHEM	296	17	7	24	4	0	4	6.000	6	4	1.500
42	J BIOL CHEM	81354	6319	7366	13685	1213	1129	2342	5.843	1352	1147	1.179
43	ANNU REV BIOPHYS BIO	178	33	139	172	11	19	30	5.733	6	14	0.429
44	CHEM SOC REV	270	126	130	256	20	25	45	5.689	11	21	0.524
45	INT REV CYTOL	1236	74	135	209	21	17	38	5.500	15	30	0.500
45	ORG REACT	164	3	41	44	4	4	8	5.500	0	2	0.000
47	ADV CELL MOL BIOL	94	0	49	49	0	9	9	5.444	0	5	0.000
(48)	SCIENCE	47505	5121	6660	11781	1026	1151	2177	5.412	1208	919	1.314
49	GASTROENTEROLOGY	8693	1030	1230	2260	198	221	419	5.394	191	240	0.796
50	ORGANOMET CHEM REV A	226	0	53	53	0	10	10	5.300	0	0	
Section 4												
19	ADV COLLOID INTERFAC	113	0	25	25	0	5	5	5.000	7	5	1.400
20	J EXP MED	20699	2203	3354	5557	245	223	468	11.874	347	257	1.350
21	PHYSIOL REV	3996	227	272	499	18	18	36	13.861	25	19	1.316
(22)	SCIENCE	47505	5121	6660	11781	1026	1151	2177	5.412	1208	919	1.314
23	BELL SYST TECH J	2521	168	145	313	95	106	201	1.557	122	93	1.312
24	ADV ORGANOMETAL CHEM	408	66	26	92	8	7	15	6.133	9	7	1.286
25	J AM CHEM SOC	98995	7855	9233	17088	1776	2123	3899	4.383	1835	1432	1.281
Section 5												
24	J APPL PHYS	19277	1509	1766	3275	1077	1025	2102	1.558	371	956	0.388
25	J CHEM SOC CHEM COMM	14454	1856	2597	4453	894	1231	2125	2.096	353	938	0.376
26	PHYS REV D	9441	2932	2372	5304	1033	915	1948	2.723	802	933	0.860
27	FIZ TVERD TELA	4497	499	562	1061	936	885	1821	0.583	114	919	0.124
(27)	SCIENCE	47505	5121	6660	11781	1026	1151	2177	5.412	1208	919	1.314
27	SOV PHYS SOLID ST*	2377	143	227	370	936	427	1363	0.271	12	919	0.013
30	CHEM PHYS LETT	8478	1899	2306	4205	928	822	1750	2.403	423	896	0.472
31	BRAIN RES-AMSTERDAM	10227	2012	2510	4522	775	682	1457	3.104	565	893	0.633
Section 6												
1	J AM CHEM SOC	98995	7855	9233	17088	1776	2123	3899	4.383	1835	1432	1.281
2	P NAT ACAD SCI USA	46917	6866	8451	15317	849	855	1704	8.989	1268	1195	1.061
3	BIOCHIM BIOPHYS ACTA	51491	6409	7720	14129	2314	2215	4529	3.120	946	1910	0.495
4	J BIOL CHEM	81354	6319	7366	13685	1213	1129	2342	5.843	1352	1147	1.179
(5)	SCIENCE	47505	5121	6660	11781	1026	1151	2177	5.412	1208	919	1.314
6	J CHEM PHYS	62041	4496	5966	10462	1725	1860	3585	2.918	1022	1631	0.627
7	LANCET	37047	5249	5134	10383	646	909	1555	6.677	1971	623	3.164
8	PHYS REV LETT	29275	5167	4941	10108	899	1099	1998	5.059	1416	960	1.475

Description

In Section 1 of the *Journal Ranking Package,* cited journals are listed alphabetically by journal title abbreviation. In Sections 2-6, cited journals are rearranged in descending numerical order of counts or indicators in various columns, as follows:

Section 2. By total citations for all years
Section 3. By impact factor
Section 4. By immediacy index
Section 5. By source items published in 1974
Section 6. By number of 1972 and 1973 citations in the references of 1974 issues of *SCI*® source journals.

In Sections 2-6, the first column is a 'rank' number. In these sections, journals will have the same rank number when they show the same number or value for the count or indicator that has determined the ordering of the entries. After one or more repetitions of a rank number, the next lower rank number is advanced as many times as necessary to compensate for the repetition(s). Thus, in Section 5, B CHEM SOC JAPAN, J APPL CHEM-USSR* , and ZH PRIKL KHIM* all rank *37th* in terms of source items published in 1974. The next journal on the list, J GEOPHYS RES, ranks *40th.*

Once familiar with the *JCR*™ and its potential in journal evaluation, readers will find they want information about particular journals from several or all of the lists in Sections 2-6 of the *Journal Ranking Package.* To find the rank of a particular journal on any of the lists, look it up in the alphabetic list. Determine the count or indicator in the column by which you want the journal ranked, turn to the indicated Section of the *Journal Ranking Package,* and run down the relevant column until you find the journal's count or indicator One can of course work from any one of the Sections to any other in this manner, without beginning with the alphabetic listing in Section 1.

For example, in the alphabetic list of Section 1, *Science* is number 2325 on page 20. From that list, we find that it was cited 47,505 times in 1974. Turning to Section 2, we do not have to go far down the first numerical column to find 47,505; *Science* ranks 7th. Scanning across the row to the impact-factor column, we find a value of 5.412. Turning to Section 3, we scan barely half a page to find 5.412 and *Science,* with an impact factor rank of 48th. Jumping across to the immediacy-index column, we find a value of 1.314. Turning to Section 4, we find *Science* ranks 22nd in immediacy. It published 919 source items in 1974; turning to Section 5, we find it ranked 27th (the same as FIZ TVERD TELA and SOV PHYS SOLID ST*) in this respect. In Section 5, in the fourth numerical column, we find *Science* articles published in 1972 and 1973 were cited 11,781 times in 1974. Turning to Section 6, and starting down the fourth numerical column, we find *Science* ranking fifth.

Erratum

Rather than delay the appearance of the 1975 *Science Citation Index,* of which this volume of *Journal Citation Reports* is a part, we have not fully corrected the results of a compilation error discovered during printing.

During initial sorting of the 1974 citations, those for the journals *Surface Science* and *Surgery* were wrongly 'unified' into one journal with the title *Surface Science.* The error was discovered during production of printer's copy. At that time, the wrongly combined entries were unscrambled to make proper main entries for both journals in both the *Citing Journal Package* and the *Cited Journal Package.* It would, however, have been impractical without delaying appearance of the 1975 *SCI* to correct all the subentries throughout the volume where *Surgery* should appear as a cited or citing journal, and, as a matter of fact, *does* appear with correct counts, but disguised as *Surface Science.*

Fortunately, the two journals involved are of such different character that journals that cite and are cited by the one can rarely be the same as journals that cite and are cited by the other. Therefore, *Surface Science* as a subentry of main-entry journals in the physical sciences means *Surface Science,* but its impact factor to the left of such subentries should read 3.34 instead of 2.44. *Surface Science* as a subentry of main-entry journals in the biological sciences and medicine should read *Surgery,* and its impact factor should read 1.55 in those subentries.

Consequently, item 2404 of Section 1 of the *Journal Ranking Package* is in error. It represents a combination of *Surface Science* and *Surgery.* Thus, in Section 2 of the *Journal Ranking Package. Surface Science* ranks 153 instead of 52, and *Surgery* (for which there is no entry in any section) ranks 112. In Section 3, *Surface Science* ranks 129 in impact, instead of 220; and *Surgery* ranks 426. In section 4, *Surface Science* ranks 64 in immediacy instead of 139; and *Surgery* ranks 425. In Section 5, *Surface Science* ranks 355 in number of 1974 source items, instead of 122; and *Surgery* ranks 321. In Section 6, *Surface Science* ranks 79 in terms of 1974 citations of its 1972-1973 source items instead of 60; and *Surgery* ranks 202.

To the editors of these journals we extend our apologies. We hope that they and you will understand the magnitude of the effort involved in compiling the *JCR,* and the ease with which errors may creep in. We assure readers that every reasonable effort will be made to avoid such errors in future compilations.

JOURNAL TITLE	<------CITATIONS IN 1974 TO------> ALL YEARS	1973	1972	73+72	<--SOURCE ITEMS IN--> 1973	1972	73+72	IMPACT FACTOR	CITATIONS IN 1974 TO 1974 ITEMS	SOURCE ITEMS IN 1974	IMMEDIACY INDEX
SURFACE SCI	4600	938	849	1787	340	195	535	3 340	212	232	0 914
SURGERY	5675	330	512	842	265	275	540	1 559	85	248	0 343

The *Citing* and *Cited Journal Packages*

The *Citing and Cited Journal Packages* show citation-frequency relationships between pairs of journals. In the *Citing Journal Package,* one can find what journals a particular journal has cited, and a distribution by year of the publication dates of the cited material. In the *Cited Journal Package* one can find what journals have cited a particular journal, and a distribution by year of the publications dates of the cited material. Specimens with description from both appear on pages 16-19.

Relatively few journals produce most of the references processed for the *Science Citation Index* data base. Similarly, relatively few journals account for most of the citations made in those references. In either case, a list of 1000 journals will encompass well over 70% of the items. Beyond lists of 1000 journals, the 'return' in references and citations becomes progressively smaller as the lists are extended, but that return can be valuable for the information it gives about 'narrow' but important specialties and subspecialties in which journals may be few, publication infrequent, research relatively slow-paced, and so on.

Ratios like the *JCR*'s impact factor and immediacy index do much to compensate for sheer size in 'comparing' one journal in biochemistry with another, for example, or in 'comparing' a biochemistry journal to a palaeontology journal. But even with the help of such indices, we must extend the lists of citing and cited journals well beyond the select but gigantic core if we are to do justice to as many of the 'narrower' fields and subspecialties and border-marches of science as possible.

The *Citing Journal Package* includes entries for each of the 2443 journals covered by the *SCI* in 1974, provided that issues of the journal did appear during the year, or, as in the case of some 'annuals', appeared with 1974 cover dates during the early part of 1975. The *Cited Journal Package* includes entries for more than 2500 journals and other items, some of them obviously not covered by the *SCI.* As noted above, journal references contain citations of other items besides journal articles. As far as possible, citations of non-journal material have been deleted in compiling the *JCR.* Cited subentry items in the *Citing Journal Package* and main entries in the *Cited Journal Package* will, therefore, be *journals* in almost all cases. Since exclusion of non-journal material from these listings has been algorithmic, a non-journal item may appear occasionally as a cited-journal main entry, or as a citing-journal subentry.

It would have been uneconomical to give for every citing journal all the journals it cited, and for every cited journal all the journals that cited it. To do so would have made this volume many times its actual size, but would have added to it in either case mainly long strings of singly cited or citing items under every main entry. To avoid the latter, but at the same time to avoid neglect of journal relationships in 'smaller' and 'narrower' fields, the length of subentry lists has been controlled in both the *Citing Journal Package* and *Cited Journal Package.*

The following algorithm was adopted to control the length of subentry lists. Subentry lists of cited or citing journals are limited to a maximum of 100 items, or to the number of items that account for 75% of the total references or citations. Where either condition would allow listing of items cited or citing less than 6 times in the year, the items are not printed as subentries but are incorporated in the ALL OTHER subentry, the last subentry under each main entry. Disregarding these conditions, at least six subentries in addition to the ALL OTHER subentry *must* be printed, if the main entry journal can supply them.

Complete citing and cited data on all the listed journals are available on magnetic tape for users whose research requires it. Inquiries should be directed to the Research and Corporate Development Division, Institute for Scientific Information, 325 Chestnut Street, Philadelphia, Pa. 19106, USA.

Main entries in the *Citing Journal* and *Cited Journal Packages* are arranged alphabetically by journal title abbreviation. As mentioned elsewhere, consistency in abbreviation of journal title words has been subordinated to informativeness. The same word may not be abbreviated in the same way whenever it occurs. The reader can 'decode' any abbreviations that may leave him in doubt by referring to the *Abbreviated-to-Full Title Dictionary* beginning on page 35.

Citing Journal Package:

Specimen

JOURNAL CITATION REPORTS

CITING JOURNAL PACKAGE

	CITING JOURNAL / CITED JOURNAL	TOTAL	1974	1973	1972	1971	1970	1969	1968	1967	1966	1965	REST
	<-NUMBER OF TIMES THIS YEAR WAS CITED IN 1974->												
.17	MATH NACHR (CONTINUED)												
	ALL OTHER (313)	478	8	17	46	57	35	34	21	22	30	20	188
.23	MATH SCAND	215*	1	14	30	15	17	14	12	8	14	4	86
.23	MATH SCAND	16	0	3	4	0	0	1	0	0	1	1	6
1.22	ANN MATH	13	0	0	1	1	2	1	0	0	1	0	7
2.08	ACTA MATH	8	0	1	1	0	1	0	2	0	0	0	3
.29	ARK MAT	7	0	0	0	1	1	0	0	1	0	0	4
.51	B AM MATH SOC	7	0	1	0	0	0	0	0	1	0	0	5
.48	T AM MATH SOC	6	0	0	0	0	1	0	0	0	2	0	3
	ALL OTHER (90)	158	1	9	24	13	12	12	10	6	10	3	58
.47	MATH Z	1090*	26	92	115	95	70	66	61	49	41	43	432
.47	MATH Z	151	5	24	18	12	19	6	9	9	6	7	36
.38	MATH ANN	60	4	2	0	3	5	1	7	1	1	2	34
.48	T AM MATH SOC	46	1	3	1	3	2	6	2	1	2	4	21
.77	J ALGEBRA	40	0	3	10	7	1	5	5	1	4	0	4
1.22	ANN MATH	37	0	1	2	0	1	3	2	1	0	0	27
.30	P AM MATH SOC	29	0	1	7	5	0	4	0	1	0	1	10
.77	ARCH RATION MECH AN	25	0	3	3	4	1	3	4	0	2	1	4
.47	AM J MATH	24	0	0	1	1	0	2	0	1	1	0	18
.51	B AM MATH SOC	23	0	3	4	2	0	1	0	3	0	2	8
.59	COMMUN PUR APPL MATH	19	0	3	3	1	1	4	0	0	0	0	7
.31	J LOND MATH SOC	19	0	3	4	2	0	1	0	0	0	2	7
.33	COMMENT MATH HELV	18	0	0	3	0	0	1	0	1	0	1	12
.27	PAC J MATH	18	0	2	0	1	1	2	0	0	2	2	8
.31	CAN J MATH	17	1	1	3	0	2	3	1	1	0	1	4
.22	ARCH MATH	16	0	3	2	0	1	2	2	0	1	0	5
.31	ILLINOIS J MATH	16	0	0	1	0	0	2	1	0	1	0	9
.80	INVENT MATH	14	1	0	0	3	2	0	2	4	2	0	0
2.08	ACTA MATH	13	0	0	0	1	0	0	2	1	1	0	8
	ABH MATH SEM HAMBURG	12	1	0	0	0	0	0	1	2	0	0	8
	CR HEBD ACAD SCI	12	1	1	2	0	0	0	0	0	0	1	7
	FUND MATHEMATICAE	11	1	0	1	1	0	1	1	0	0	0	6
.35	J REINE ANGEW MATH	11	1	0	1	0	0	0	1	0	0	0	8
.53	P LOND MATH SOC	11	0	2	0	0	3	1	0	0	1	1	3
.39	DUKE MATH J	10	1	0	1	0	1	0	0	0	0	0	7
	INDAGATIONES MATH	9	0	2	0	2	0	0	0	0	0	1	4
	J COMB THEORY	8	0	1	1	0	2	1	0	2	1	0	0
.34	MANUSCRIPTA MATH	8	3	4	1	0	0	0	0	0	0	0	0
	J DIFFERENTIAL GEOM	7	0	0	0	2	1	1	2	1	0	0	0
.49	STUD MATH	7	0	0	0	0	0	0	1	0	3	0	3
	TOPOLOGY	7	0	0	0	1	0	1	1	0	1	1	2
.36	ANN I FOURIER	6	0	2	0	0	0	0	0	0	3	0	1
.25	B SOC MATH FR	6	0	0	1	0	0	0	2	0	0	0	3
	J FUNCT ANAL	6	0	0	3	1	0	0	2	0	0	0	0
.30	J MATH SOC JAPAN	6	1	0	0	1	0	0	1	0	1	0	2
	MAT SB	6	0	0	0	0	0	0	0	0	0	0	6
	SOV MATH DOKLADY	6	0	0	2	1	1	1	1	0	0	0	0
	ALL OTHER (217)	356	5	28	40	41	24	15	12	18	9	14	150
.33	MATHEMATIKA	88*	3	9	13	13	3	4	1	0	2	1	39
.33	MATHEMATIKA	12	0	3	4	1	0	2	0	0	0	0	2
1.25	J FLUID MECH	5	1	0	0	2	0	0	0	0	0	0	2
.51	B AM MATH SOC	4	0	0	1	0	1	0	0	0	0	0	2
.31	J LOND MATH SOC	4	0	0	1	0	0	0	0	0	0	0	3
	J NUMBER THEORY	4	0	0	1	2	1	0	0	0	0	0	0
.39	P CAMB PHIL SOC	3	0	1	1	0	0	0	0	0	0	0	1
	ALL OTHER (41)	56	2	5	5	8	1	2	1	0	2	1	29
.04	MATRIX TENSOR QUART	34*	0	0	3	4	4	1	1	4	2	3	12
	IEEE T	4	0	0	1	1	0	0	0	2	0	0	0
1.04	J MATH PHYS	4	0	0	1	0	1	1	0	0	0	0	1
.25	J FRANKLIN INST	3	0	0	0	1	0	0	0	0	1	1	0
.39	SIAM J APPL MATH	3	0	0	0	0	2	0	0	1	0	0	0
	J SOC IND APPL MATH	2	0	0	0	0	0	0	0	0	0	0	2
	ADV CALCULUS	1	0	0	0	0	0	0	1	0	0	0	0
	ALL OTHER (17)	17	0	0	1	2	1	0	0	1	1	2	9
2.00	MAYO CLINIC P	2312*	75	278	203	224	145	152	127	113	72	68	855
6.99	J CLIN INVEST	80	3	13	7	12	2	5	2	2	1	2	31
8.36	N ENG J MED	78	1	16	6	8	7	3	4	5	1	5	22
6.67	LANCET	72	3	10	5	8	2	2	6	5	3	3	25
4.41	AM J MED	57	0	8	2	12	1	4	1	2	2	1	24
2.41	AM J PHYSIOL	54	0	6	8	8	0	6	4	2	7	1	12

Description

Citing journals are listed in alphabetical order of their abbreviated title. Thus, in the specimen shown, the entry for *Mathematische Zeitschrift* (MATH Z) comes before the entry for *Mathematika* (MATHEMATIKA). The first line of the entry for each citing journal gives its impact factor, abbreviated title (in most cases), and total number of unique references from articles the journal published in 1974. The total is asterisked. Succeeding columns of the row distribute the reference total by year in which the articles cited in the references were published. The last column includes counts for 1964 and previous years.

Thus, the specimen shows that articles published by *Mathematische Zeitschrift* in 1974 produced 1090 references with unique citations (citations of the same article in a single article's references are counted as one). Twenty-six of the 1090 references contained citations of articles published in 1974, 92 references cited articles published in 1973, 115 references cited articles published in 1972, etc. The last column in the row shows that 432 of the 1090 references contained citations of material published in 1964 and earlier years.

Under the total line for each citing journal are listed the journals cited in the references of the citing journal named in the main-entry line. These cited journals are listed, in descending numerical order, by the frequency of their citation in references of the citing journal named in the main-entry total line. The abbreviated title of each of the sub-entry cited journals is preceded by the impact factor of that journal if it has been possible to determine it. The total citation count for each sub-entry cited journal is shown, and then distributed, as described above, by year of publication of the cited items.

Thus, *Mathematische Zeitschrift* cited itself 151 times in the references of articles it published in 1974. Of those 151 citations, 5 were of articles published in 1974, 24 of articles published in 1973, 18 of articles published in 1972, etc. Thirty-six of the 151 citations were of articles published in 1964 and earlier years. Similarly, *Mathematische Zeitschrift* cited *Mathematische Annalen* (MATH ANN) 60 times in the references of articles it published in 1974. Four of these references contained citations of articles published by *Mathematische Annalen* in 1974, 2 contained citations of articles published by *Mathematische Annalen* in 1973, and so on. The chronological distribution shows that more than half (34/60) of *Mathematische Zeitschrift's* citation of *Mathematische Annalen* was of material published by *Mathematische Annalen* in 1964 and earlier years.

The last sub-entry under each citing journal main-entry summarizes data on journals that were cited less than 6 times in the references of articles published in 1974 by the journal named in the main-entry line. (Exceptions to the 'less-than-six' convention are explained elsewhere). Thus 'all other' journals cited in 1974 references of *Mathematische Zeitschrift* numbered 217, and these unnamed cited journals accounted for 356 articles. The total for 'all other' journals is distributed chronologically, as described above for named cited journals.

This specimen shows that about 40% (432/1090) of the articles cited in 1974 references of *Mathematische Zeitschrift* were published in 1964 and earlier years, that its self-citing rate is 13.8% (151/1090), that language seems to be of little hindrance in mathematical studies (there are English, French, German, Russian, Japanese journals on this cited list), that *Mathematische Zeitschrift* seems inclined to an interest in physical and applied mathematics, and that 42.6% (464/1090) of the articles it cited in 1974 were published in 1969 or thereafter.

Cited Journal Package:

Specimen

JOURNAL CITATION REPORTS

CITED JOURNAL PACKAGE

	CITED JOURNAL / CITING JOURNAL	TOTAL	1974	1973	1972	1971	1970	1969	1968	1967	1966	1965	REST
	AM J PHARM EDUC (CONTINUED)												
.26	J AM PHARM ASSOC	2	0	0	0	0	2	0	0	0	0	0	0
.67	PHARMAZIE	2	0	0	1	0	1	0	0	0	0	0	0
	ALL OTHER (10)	10	0	1	3	1	2	0	2	0	1	0	0
.25	AM J PHYS	800*	14	95	104	83	77	61	46	40	31	19	230
.25	AM J PHYS	243	7	60	44	34	14	10	17	5	10	8	34
2.91	J CHEM PHYS	29	0	1	4	2	5	3	3	2	1	0	8
.99	NUOVO CIMENTO	26	0	2	6	0	5	1	0	1	2	1	8
2.86	PHYS REV B	25	0	0	1	4	5	2	3	2	0	0	8
2.61	PHYS REV A	21	1	0	6	1	7	0	0	2	1	0	3
.75	LETT NUOVO CIMENTO	18	0	2	2	2	1	1	0	1	1	0	8
2.72	PHYS REV D	17	0	2	3	1	0	1	0	0	0	0	10
.53	FOUND PHYS	14	0	1	5	2	0	0	0	0	0	0	6
1.55	J APPL PHYS	14	0	1	0	4	1	4	1	1	0	0	2
1.04	J MATH PHYS	13	0	0	2	3	4	0	0	0	1	1	2
2.01	J OPT SOC AM	12	1	0	1	3	0	2	1	0	0	0	4
.96	PHYSICA	12	0	0	3	2	5	0	0	0	0	0	2
1.19	J PHYS A MATH NUCL G	10	0	0	1	0	0	1	1	0	0	1	6
.07	IEEE T EDUCATION	9	0	1	0	2	1	2	2	1	0	0	0
.09	ARCH HIST EXACT SCI	8	0	1	0	0	1	0	0	1	0	0	5
1.74	J MOL SPECTROSC	8	0	0	0	1	0	0	0	1	0	0	6
1.51	USP FIZ NAUK*	8	0	0	0	1	2	1	1	0	0	0	3
1.39	J PHYS CHEM SOLIDS	7	0	1	0	0	0	0	1	0	0	1	4
5.41	SCIENCE	7	1	1	2	3	0	0	0	0	0	0	0
1.94	SOLID STATE COMMUN	7	0	0	0	0	0	2	2	1	0	0	2
4.06	ASTROPHYS J	6	0	0	0	0	1	2	0	2	0	0	1
1.02	INT J QUANT CHEM	6	0	0	0	2	3	0	0	0	0	0	1
2.01	P I ELEC ELEC ENG	6	1	0	2	0	0	2	0	0	0	0	1
2.21	P ROY SOC LOND A MAT	6	0	0	0	0	0	0	0	0	1	0	5
1.11	PHYS STATUS SOLIDI B	6	0	1	0	0	0	4	0	0	0	0	1
	ALL OTHER (153)	262	3	21	22	16	22	23	14	20	13	8	100
89	AM J PHYS ANTHROPOL	920*	10	103	106	67	79	57	50	38	32	32	346
.89	AM J PHYS ANTHROPOL	250	2	8	34	23	30	22	16	7	12	2	94
.69	HUM BIOL	61	0	3	11	0	9	6	4	4	2	3	19
.52	J HUM EVOL	57	0	10	12	3	3	6	0	1	4	2	16
3.13	AM J HUM GENET	26	0	4	5	3	3	0	0	1	0	0	10
3.23	BRIT J CANCER	14	2	1	1	2	3	1	0	1	2	0	1
.60	ENVIRON PHYSIOL BIOC	14	0	0	2	1	0	0	4	0	1	1	5
2.80	J LAB CLIN MED	14	0	1	0	2	2	2	3	1	0	0	3
.82	J PHARMACOL-PARIS	14	0	3	4	0	0	1	2	0	1	0	3
6.67	LANCET	14	0	4	2	3	1	0	2	1	0	1	0
.22	ACTA PHYSIOL POL	13	0	0	2	0	0	1	2	2	3	0	3
	ALL OTHER (508)	1770	17	155	239	174	155	180	167	96	102	113	372
	BIOCHEM PHYSIOL VISU	2*	0	2	0	0	0	0	0	0	0	0	0
2.78	J COMP PHYSIOL	1	0	1	0	0	0	0	0	0	0	0	0
1.00	Z NATURFORSCH C	1	0	1	0	0	0	0	0	0	0	0	0
.73	BIOCHEM SOC TRANS	502*	97	398	7	0	0	0	0	0	0	0	0
3.62	BIOCHEM J	73	9	64	0	0	0	0	0	0	0	0	0
.73	BIOCHEM SOC TRANS	38	28	10	0	0	0	0	0	0	0	0	0
3.12	BIOCHIM BIOPHYS ACTA	29	4	25	0	0	0	0	0	0	0	0	0
3.04	FEBS LETT	21	5	16	0	0	0	0	0	0	0	0	0
2.91	J ENDOCRINOL	18	0	17	1	0	0	0	0	0	0	0	0
3.87	EUR J BIOCHEM	12	2	10	0	0	0	0	0	0	0	0	0
3.53	J NEUROCHEM	12	6	6	0	0	0	0	0	0	0	0	0
3.63	NATURE	11	5	6	0	0	0	0	0	0	0	0	0
3.74	BIOCHEM BIOPH RES CO	8	1	7	0	0	0	0	0	0	0	0	0
5.84	J BIOL CHEM	8	0	8	0	0	0	0	0	0	0	0	0
7.50	J MOL BIOL	7	3	4	0	0	0	0	0	0	0	0	0
	ORIGINS LIFE	7	0	6	1	0	0	0	0	0	0	0	0
.47	GENETIKA*	6	0	6	0	0	0	0	0	0	0	0	0
2.16	J GEN MICROBIOL	6	0	6	0	0	0	0	0	0	0	0	0
6.67	LANCET	6	2	4	0	0	0	0	0	0	0	0	0
1.69	PURE APPL CHEM	6	0	6	0	0	0	0	0	0	0	0	0
	ALL OTHER (131)	234	32	197	5	0	0	0	0	0	0	0	0
	BIOCHEM Z	2420*	0	2	1	0	1	4	2	8	199	165	2038
3.12	BIOCHIM BIOPHYS ACTA	131	0	0	0	0	0	0	0	0	15	18	98
5.84	J BIOL CHEM	115	0	0	0	0	0	0	0	0	7	13	95
3.87	EUR J BIOCHEM	100	0	0	0	0	0	0	0	0	8	10	82
3.62	BIOCHEM J	77	0	0	0	0	0	0	0	0	11	5	61
	MOL CELL BIOCHEM	73	0	0	0	0	0	0	0	0	1	0	72
4.71	BIOCHEMISTRY-US	64	0	0	0	0	0	1	0	1	5	1	56
2.29	H-S Z PHYSIOL CHEM	55	0	0	0	0	0	0	0	0	5	5	45
	ARCH BIOCHEM	52	0	0	0	0	0	0	0	0	5	4	43
1.71	J BIOCHEM TOKYO	37	0	0	0	0	0	0	0	0	9	3	25
3.04	FEBS LETT	29	0	0	0	0	0	0	0	0	4	3	22
3.74	BIOCHEM BIOPH RES CO	27	0	0	0	0	0	1	0	0	1	0	25
8.98	P NAT ACAD SCI USA	27	0	0	0	0	0	1	0	1	1	1	23
2.72	J BACTERIOL	26	0	0	0	0	0	0	0	0	5	2	19

Description

Cited journals are listed in alphabetical order of their abbreviated title. Thus, in the specimen above, the entry for *American Journal of Physics* (AM J PHYS) comes before the entry for *American Journal of Physical Anthropology* (AM J PHYS ANTHROPOL). The first line of the entry for each cited journal gives its impact factor, abbreviated title (in most cases), and total citations received in 1974. The total is asterisked. Succeeding columns of the row distribute the citation total by year in which the cited articles were published. The last column includes counts for 1964 and previous years.

Thus, the specimen shows that *American Journal of Physics* (*AJP*) was cited 800 times in 1974 by *SCI*® source journal items. Fourteen of the articles or other items cited in 1974 were published by *AJP* in 1974, 95 in 1973, 104 in 1972, etc. Of the 800 citations, 230 were of articles published by *AJP* in 1964 and early years.

Under the total line for each cited journal are listed the journals in whose references citations of the main-entry cited journal appeared. These citing journals are listed, in descending numerical order, by the number of citations each contributed to the citation totals for the cited journal named in the main-entry total line. The abbreviation for each of the sub-entry citing journals is preceded by the impact factor of that journal, if it has been possible to determine it. The total citation count for each sub-entry citing journal is shown, and then distributed, as described above, by year of publication of cited *AJP* items.

Thus, *American Journal of Physics* (*AJP*) cited itself 243 times in references of articles it published in 1974. Seven of those references contained citations of articles published by *AJP* in 1974; 60 of the 1974 references cited 1973 *AJP* articles, and so on. Similarly, *Journal of Chemical Physics* (J CHEM PHYS) cited *AJP* 29 times in references of articles it published in 1974. None of those 29 references cited 1974 *AJP* articles. Of the 29 references from *Journal of Chemical Physics* in 1974 that cited *AJP*, 1 cited a 1973 *AJP* article, 4 cited 1972 *AJP* articles, 2 cited 1971 *AJP* articles, etc. In eight cases, *Journal of Chemical Physics* cited articles that had been published in *AJP* in 1964 or earlier years.

The last sub-entry under each cited journal main-entry summarizes data on journals whose 1974 references included fewer than 6 citations of *AJP* in 1974. (Exceptions to the 'less-than-six' convention are explained elsewhere.) Thus, 'all other' journals whose 1974 references contained citations of *AJP* numbered 153. These 153 journals contained in all 262 citations of *AJP* articles in their references. The total for these 'all other' journals is distributed chronologically, as described for named citing journals.

This specimen shows that *AJP* has a self-cited rate of 30.4% (243/800); that 28.8% (230/800) of 1974 citations of the *AJP* were citations of older material published in 1964 and earlier years; that *Science* in 1974 cited *AJP* as often as *Solid State Communications* cited *AJP*, and interestingly enough, that *Science* cited newer *AJP* material, while *Solid State Communications* cited older material.

The specimen below opposite shows several features whose significance users will soon understand at a glance. BIOCHEM PHYSIOL VISU was cited only twice and the cited items are from the same year. The cited work is *Biochemistry and Physiology of Visual Pigments,* a symposium product published in 1973. When all citations, as in this case, are confined to the same year, the cited item is likely to be a 'soft' journal, as in this case, or as mentioned elsewhere a book of some type. Where citations are confined to two or three years, each separated by a lapse of several years, the cited items are likely to be successive reports from irregularly held symposia, conferences, etc., or successive editions of a book.

BIOCHEM SOC TRANS was cited only 502 times. The journal is *Biochemical Society Transactions,* which began publication in 1973--hence the zeros in most of the right-hand columns. The seven citations for 1972 items are the result of incorrect references. The array of zeros on the right alerts the user to the fact that the journal is relatively new. As a matter of fact, it replaces a proceedings section formerly included in *Biochemical Journal.*

BIOCHEM Z was cited 2420 times. It shows no impact factor, and practically no counts for cited items published after 1966. In fact 84% (2038/2420) of the citations refer to items published before 1965. *Biochemische Zeitschrift* ceased publication with issue number 5 of volume 346 in January 1967. It was superseded by *European Journal of Biochemistry.* The ten counts for cited items published after 1967 are the result of incorrect references.

The 100 Most Highly Cited Journals in 1974

The journals are listed in descending numerical order of the total citations in references of source journals processed by the *SCI* in 1974. An italicized title indicates (1) that citation counts for separately published or sub-titled sections or parts of a journal have been combined to make the total given here; (2) that changes of title have been ignored and counts combined; or (3) that counts for an original and its translated version have been combined. In the listing below A = rank, B = total times cited in 1974, C = impact factor, D = journal title (abbreviation).

A	B	C	D
1.	98,995	4.383	J. Amer. Chem. Soc.
2.	91,646	2.670	*Physical Review*
3.	81,354	5.843	J. Biol. Chemistry
4.	75,206	4.006	*Nature*
5.	66,272	1.870	*J. Chem. Society*
6.	62,041	2.918	J. Chemical Physics
7.	51,491	3.120	Biochim. Biophys. Acta
8.	47,505	5.412	Science
9.	46,917	8.989	Proc. Nat. Acad. Sci. USA
10.	37,047	6.677	Lancet
11.	31,563	3.627	Biochemical J.
12.	29,275	5.059	Physical Review Letters
13.	27,080	4.711	Biochemistry
14.	26,726	8.364	New Engl. J. Medicine
15.	24,768	6.992	J. Clin. Investigation
16.	24,209	7.502	J. Molecular Biol.
17.	23,220	3.744	Biochem. Biophys. Res. Comm.
18.	22,520	4.495	J. Physiology (London)
19.	22,460	2.514	*Nuclear Physics*
20.	22,245	6.770	*J. Cell Biology*
21.	22,201	4.063	Astrophysical J.
22.	21,519	2.414	Amer. J. Physiology
23.	20,748	3.556	Brit. Med. J.
24.	20,699	11.874	J. Exp. Medicine
25.	20,539	1.495	J. Organic Chem.
26.	19,277	1.558	J. Applied Physics
27.	18,375	2.727	J. Bacteriology
28.	18,190	3.291	Analytical Chemistry
29.	18,171	1.471	Proc. Soc. Exp. Biol. Med.
30.	18,086	2.031	J. Physical Chemistry
31.	17,211	3.068	J. Amer. Med. Assoc.
32.	17,201	2.350	*Proc. Royal Society* (London)
33.	16,782	0.346	*C. Rend. Acad. Sci.* (Paris)
34.	16,509	1.777	Tetrahedron Letters
35.	15,970	2.952	*Arch. Biochem. Biophys.*
36.	15,948	4.337	Endocrinology
37.	15,826	5.112	J. Immunology
38.	15,666	2.133	*Physics Letters*
39.	15,281	2.536	J. Geophys. Res.
40.	14,706	1.506	*Chemische Berichte*
41.	14,668	1.181	Ann. New York Acad. Sci.
42.	14,461	6.834	Circulation
43.	14,310	2.457	Inorganic Chemistry
44.	13,911	1.361	*Acta Crystallographica*
45.	13,847	3.857	*Eur. J. Biochemistry*
46.	13,753	3.576	J. Pharmacol. Exp. Ther.
47.	13,072	0.751	Federation Proc.
48.	12,544	3.391	Cancer Research
49.	11,645	5.170	J. Clin. Endocrinol. Metab.
50.	11,371	3.752	Virology
51.	11,127	3.014	Exp. Cell Research
52.	10,756	2.070	*Angewandte Chemie*
53.	10,275	2.446	Surface Science
54.	10,231	4.828	Ann. Internal Medicine
55.	10,227	3.104	Brain Research
56.	10,206	2.379	Analytical Biochemistry
57.	10,072	0.353	Doklady Akad. Nauk USSR
58.	9779	4.411	Amer. J. Medicine
59.	9678	3.289	J. Nat. Cancer Inst.
60.	9497	2.361	Cancer
61.	9142	1.396	Canad. J. Chemistry
62.	9094	3.049	FEBS Letters
63.	9082	4.922	Circulation Research
64.	8903	1.576	Tetrahedron
65.	8890	2.100	Amer. J. Obst. Gynecol.
66.	8835	2.580	Plant Physiology
67.	8803	1.042	Acta Chem. Scand.
68.	8798	2.802	J. Lab. Clin. Med.
69.	8693	5.394	Gastroenterology
70.	8625	3.220	Applied Physics Letters
71.	8619	1.780	J. Appl. Physiology
72.	8478	2.403	Chem. Physics Letters
73.	8241	2.392	J. Organomet. Chem.
74.	8183	1.001	Bull. Soc. Chim. France
75.	7941	0.932	Bull. Chem. Soc. Japan
76.	7928	2.173	J. Chromatography
77.	7922	2.204	Acta Physiol. Scand.
78.	7914	1.132	J. Phys. Soc. Japan.
79.	7794	3.535	J. Neurochemistry
80.	7753	1.195	*Zh. Eksp. Teoret. Fiz.*
81.	7656	3.516	Brit. J. Pharmacology
82.	7459	2.129	Ann. Surgery
83.	7335	1.961	*Cell Tissue Research*
84.	7183	2.600	J. Pediatrics
85.	7120	4.319	Blood
86.	7117	1.649	Helv. Chim. Acta
87.	7063	1.836	Philosophical Mag.
88.	7007	2.023	Biochem. Pharmacology
89.	6951	2.502	Pediatrics
90.	6811	3.704	Amer. J. Cardiology
91.	6788	4.864	J. Virology
92.	6662	1.340	Zschr. Physik
93.	6600	0.883	Experientia
94.	6539	4.308	J. General Physiology
95.	6307	1.198	Radiology
96.	6177	1.024	Ann.Chemie (J. Liebig)
97.	6066	2.202	*Arch. Internal Med.*
98.	5994	1.791	Amer. Heart J.
99.	5885	2.016	J. Opt. Soc. America
100.	5766	1.394	J. Phys. Chem. Solids