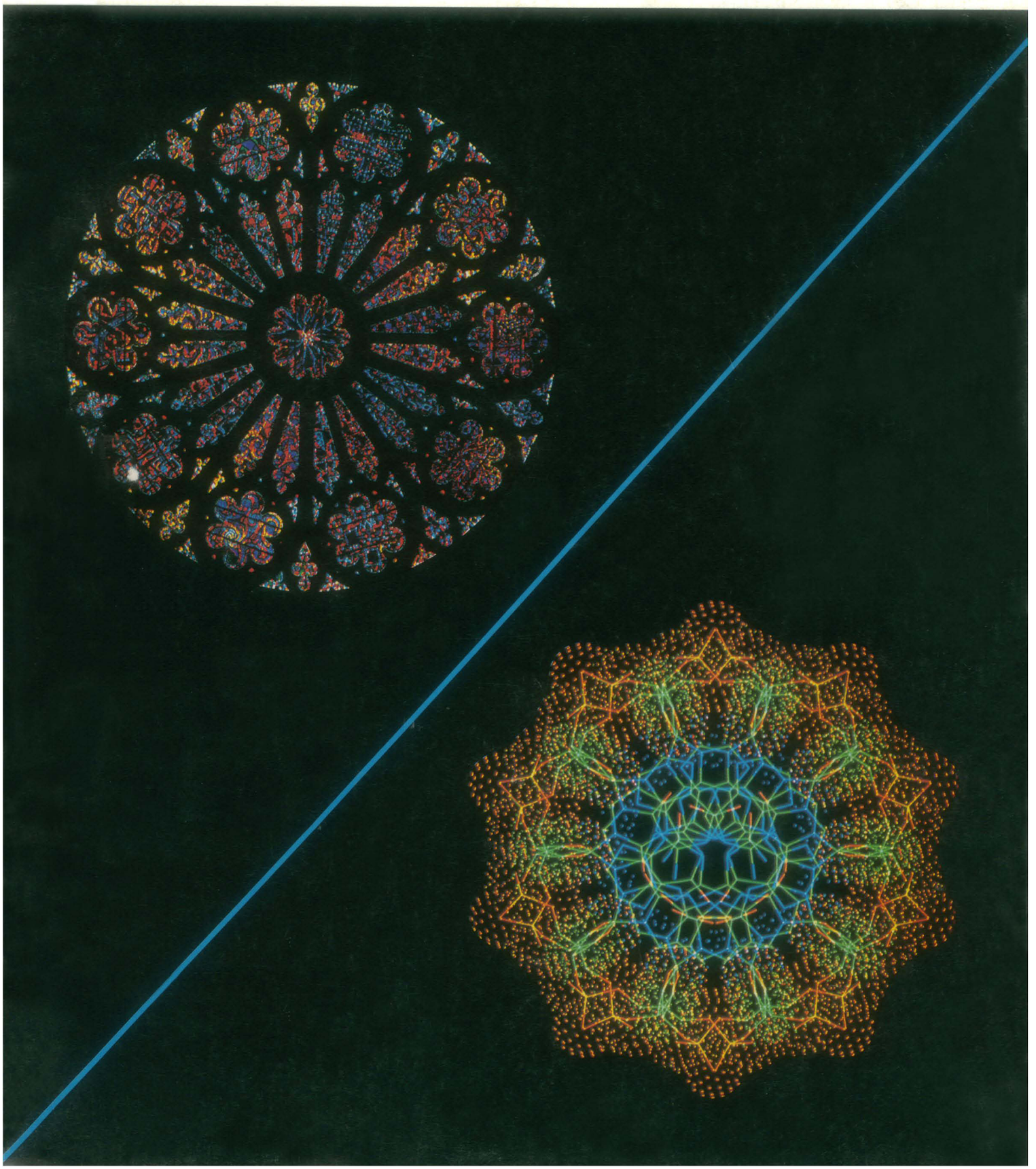
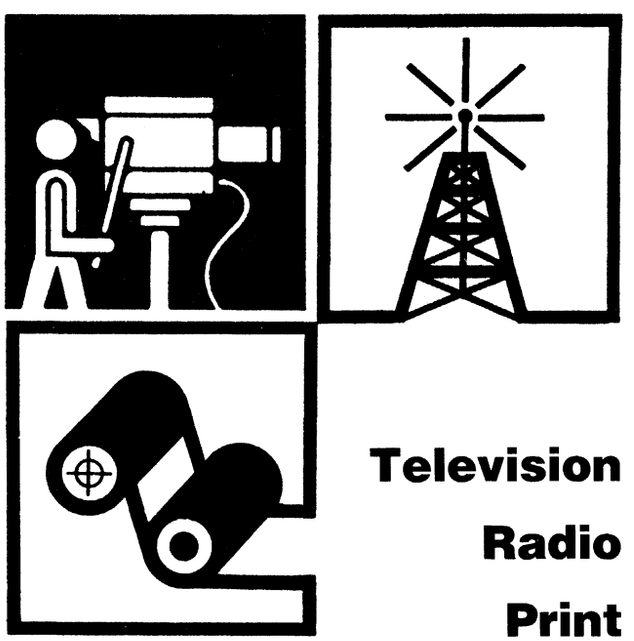
23 DECEMBER 1983 · VOL. 222 · NO. 4630 $2.50

SCIENCE

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



1983 AAAS Westinghouse Science Journalism Awards



Rules

The aim of this competition is to encourage and recognize outstanding reporting on the sciences and their engineering and technological applications in newspapers, general circulation magazines, radio, and television. The following categories are not eligible: items on the field of medicine, items published originally in AAAS publications or produced by AAAS; reports by employees of the AAAS or Westinghouse Electric Corporation.

Print

- An entry for a newspaper competition may be any of the following: a single story; a series of articles; or a group of three unrelated stories, articles, editorials, or columns published during the contest year. A magazine entry may be a single story or series published during the contest year.
- A completed entry blank must be submitted together with seven copies of each entry in the form of tear sheets, clippings, reprints, or syndicate copy (not over 8½" x 11"), showing name and date of the publication. **ENTRIES MUST NOT BE ELABORATE!**

Broadcast

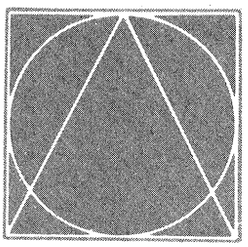
- An entry for the radio or television competition may be an individual news story, feature, or a series, regardless of length, broadcast during the contest year on either public or commercial stations. Entries must be comprised of scripted material. Interviews are not eligible.
- A completed entry blank must be submitted together with a cassette in the case of radio and copy of the script or a ¾" videocassette in the case of television and copy of the script.

- Each entrant may submit three entries for any one category.
- Each entry must have been published or produced and broadcast within the United States during the contest year—**1 January 1983 through 31 December 1983.** (In case of a series, more than half of the items comprising it must have been published or broadcast during the contest year.) The date on the issue in which an article appears will be considered as the date of publication. All entries must be postmarked on or before midnight, 15 January 1984.
- Persons other than the author may submit entries in accordance with these rules. Entries will not be returned.
- Winners of the 1982 awards are not eligible for the 1983 awards. Persons winning three times are no longer eligible.
- The Judging Committees, whose decisions are final, will choose the winners. There are five awards of $1,000: for the winning entry in the over 100,000 daily circulation newspapers competition; for the winning entry in the under 100,000 circulation newspapers competition; for the winning entry in the general circulation magazine competition; for the winning entry in the radio competition; and for the winning entry in the television competition. For award purposes, newspaper circulation will be sworn ABC daily circulation as of 30 September 1982. The Judging Committees may cite other entries for honorable mention.
- The awards will be presented at the dinner meeting of the National Association of Science Writers during the Annual Meeting of the American Association for the Advancement of Science in New York City in May 1984. Travel and hotel expenses of the award winners will be paid. **Entrants agree that, if they win, they will be present to receive their awards, unless prevented by circumstances beyond their control.**

Grayce A. Finger

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

1515 Massachusetts Avenue, N.W. Washington, D.C. 20005



Smith Kline &French Laboratories

Announces

the Second in Its Series of
Annual Research Symposia

Co-Organizers:
George Poste and Stanley T. Crooke

Mechanisms of Receptor Regulation

February 28-March 1, 1984

Franklin Plaza Hotel
Philadelphia

Speakers Include:

M. Berridge	N. Goldberg	E.G. Krebs	B. O'Malley
M.S. Brown	P. Greengard	R. Lefkowitz	G. Palade
Z. Cohn	M. Hollenberg	H. Lodish	M. Raftery
P. Cuatrecasas	L. Hood	R. Michell	M. Rodbell
M. Czech	L. Jarett	P. Molinoff	O. Rosen
A.G. Gilman	J. Kaplan	W. Moolenaar	J. Schlessinger
	D.E. Koshland		H. Schreiber

For Additional Information and Registration Forms, Contact:

Ms. Buff Biddle
Symposium Coordinator
Post Office Box 7929
Philadelphia, Pa. 19101

○ =continuity of life △ =quest for knowledge □ =resolution

ISSN 0036-8075

23 December 1983

Volume 222, No. 4630

SCIENCE

SCIENCE is published weekly on Friday, except the last week in December, by the American Association for the Advancement of Science, 1515 Massachusetts Avenue, NW, Washington, D.C. 20005. Second-class postage (publication No. 484460) paid at Washington, D.C., and at an additional entry. Now combined with **The Scientific Monthly**® Domestic individual membership and subscription (51 issues): $53. Domestic institutional subscription (51 issues): $90. Foreign postage extra: Canada $24, other (surface mail) $27, air-surface via Amsterdam $65. First class, airmail, school-year, and student rates on request. Single copies $2.50 ($3 by mail); back issues $3 ($3.50 by mail); Biotechnology issue, $5 ($5.50 by mail); classroom rates on request. **Change of address:** allow 6 weeks, giving old and new addresses and seven-digit account number. **Postmaster:** Send Form 3579 to *Science*, 1515 Massachusetts Avenue, NW, Washington, D.C. 20005. *Science* is indexed in the *Reader's Guide to Periodical Literature* and in several specialized indexes.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

COVER

(Top, left) West window of Washington Cathedral, Washington, D.C., designed by Rowan Le Compte in 1977, depicts the first chapter of Genesis (the creation). [Photo by John T. Gruppenhoff, Potomac, Maryland] (Bottom, right) Computer graphics-generated axial view of tenfold, B form DNA [R. Langridge *et al.*, *J. Mol. Biol.* **2**, 38 (1960)] using a new, fast surface algorithm. See page 1325. [Computer Graphics Laboratory, University of California, San Francisco 94143]

23 December 1983, Volume 222, Number 4630 **SCIENCE**

A Run Worth Making

It has been said, perhaps too often and too loudly, that science is an objective process, one that is value-free. In our time, when science is being employed most conspicuously as an adjunct of politics and strategic national purposes, a vacuum of internal values tends to be invaded by prevailing external values. Not surprisingly, the eventual recognition of what is taking place produces a level of discomfort that expresses itself, within the strictures of science's methodologies, in concerted displays of scientific responsibility. The conscience of science comes, a step at a time, to life.

Despite admonitions from Rome that believing scientists have the duty to look themselves in the eye when they apply brainpower to weapons systems, scientists are justified in doing what is necessary to offset the unmistakable progress of an unpredictable adversary. But what must be added is that scientific responsibility has another dimension, and it is to look squarely at the consequences of violence in the application of scientific knowledge.

It has been a very good thing for the integrity of science, and a sign of courage, that some 40 scientists of high standing have gone public with their considered estimates of the global atmospheric effects and long-term biological consequences of nuclear war.* Whether such a weapons exchange would be small or vast in its scale, they believe, the effects on the biosphere would be lasting and literally deadly. In effect, life-support systems would be cut, and the diminished surviving populations would have little chance in a darkened and sunless environment.

Some four decades ago in the heat of war and its enforced secrecy, scientists prepared the nuclear weapons that were exploded without warning upon civilian populations. It says a good deal for the emergence of the scientific conscience that, in a difficult age of superpower hatreds and technological gusto, the present warning is timely, unvarnished, and stark. Nor is it the first of its kind. Health scientists have made clear the absurdity of assuming that there would be a medical care system after a major attack and have been stumping the country to put the message across.

There remains the question of who is listening and how deeply these warnings penetrate and adhere to the nation's thought. For a few days, the news of potential biological catastrophe is the stuff of media prominence, only to be quickly displaced by the next catastrophe. The society is exhausted and news-numbed. No special session of the U.N. General Assembly is called to digest and reflect on the appalling meanings of the scientists' findings. If alarms have shaken the American and Soviet tacticians ostensibly seeking a breakthrough in nuclear arms control negotiations, it is a well-kept secret. The drift continues, and the world is ablaze with "small" wars and threats of larger ones. What does this signal to concerned scientists? For all that is obvious about science as a universal force, as a trusted partner in the works of society and governments, can it be supposed that science cannot make a difference in the one matter that transcends all the others? This is not a conclusion that scientists will swallow.

Among the endless arguments centering on arms control agreements, no issue is more vexing than that of verifying compliance, especially as new weapons are promised to the arsenals of both sides. What the cluster of scientists concerned with biological effects have done very well is to nail down, as far as scientific method can do it, the probabilities of consequences of an exchange of nuclear weapons on the biosphere. Even allowing for the constraints imposed on scientific opinion in the Soviet Union, it is fair to assume that the same conclusions are held in that quarter. Here, then, is a new basis for dialogue and for an alternative run at restraint. It is a run worth making.—WILLIAM D. CAREY

*R. P. Turco *et al.* and P. R. Ehrlich *et al.*, this issue.

Revised 30 September 1983

Information for Contributors

The Editors of *Science*

Papers published in *Science* often receive far more attention than papers published in specialty journals. As a consequence, the rate of submission of papers is high—about 5000 manuscripts are submitted each year. The rejection rate of about 80 percent contrasts with that of most specialty journals, which is usually about 30 percent. Most of the material submitted to *Science* is of good quality and worthy of publication, and virtually all the scientific papers are eventually published somewhere. In selecting papers for *Science*, the editors consider the needs of a broad audience. Preference is given to items that seem to be of general significance.

General Information

Five types of signed papers are considered: Articles, Research Articles, Reports, Letters, and Technical Comments. The author's membership in the AAAS is not a factor in selection. Material that has been published before is ineligible for publication. Papers are considered with the understanding that they have not been published and are not under consideration elsewhere. Authors will usually be notified of acceptance, rejection, or need for revision in 6 to 8 weeks (Research Articles and Reports) or 8 to 10 weeks (Articles).

Outside reviews. Most articles and reports are sent to two or more outside referees for evaluation. Some papers are returned promptly to the authors without an external review if they are unlikely to be chosen for publication. Referees are selected from *Science* files as well as from lists provided by authors. Papers that depend on statistical inference for their conclusions may be sent to statisticians (in addition to other referees) for review.

Length limits. Papers that exceed the length limits cannot be handled expeditiously and will usually be returned without review.

1) Articles: Up to 5000 words (approximately five printed pages in *Science*), including the references and notes *and* the figure and table legends. The illustrations (figures and tables) when printed in *Science* should together occupy no more than one page.

2) Research Articles: From 2000 to 4000 words (3 to 3½ printed pages in *Science*) including the references and notes *and* the figure and table legends. Illustrations (figures and tables) may together occupy up to one printed page.

3) Reports: Up to 2000 words (approximately 1½ printed pages in *Science*), including the references and notes *and* the figure and table legends. The illustrations (figures and tables) when printed in *Science* should occupy no more than half a page.

4) Letters: Up to 250 words.

5) Technical Comments: Up to 500 words, including references and notes.

Selection of Manuscripts

1) Articles: About half the Articles published in *Science* are solicited by the editor. Both solicited and unsolicited Articles undergo outside and in-house review. Articles are expected to (i) provide a review of new developments in one field that will be of interest to readers in other fields, (ii) describe a current research problem or a technique of interdisciplinary significance, or (iii) present a study of some aspect of the history, logic, philosophy, or administration of science or a discussion of science and public affairs. Readers should be able to learn from a technical Article what has been firmly established and what are significant unresolved questions; speculation should be kept to a minimum. Preference is given to Articles that are well written, well organized, and within the length limit. Balance of subject matter in *Science* is an important consideration when a choice is made between acceptable Articles.

2) Research Articles: These articles, selected for publication on the basis of outside and in-house reviews, are expected to contain new data and to represent substantial contributions in their fields.

3) Reports: Reports are selected on the basis of reviewers' comments and an in-house review. Reports are expected to contain solid research results or reliable theoretical calculations. Preference is given to those that describe departures or discoveries that will be of broad interdisciplinary interest or of unusual interest to the specialist. In making the final selection, the editors take into consideration (i) the reviewers' comments; reports most likely to be accepted are those that receive persuasive outside reviews favoring publication; (ii) clarity of presentation within the prescribed length limit; and (iii) subject matter in relation to that of other papers on hand. An attempt is made to balance the subjects of Reports so that one discipline is not overrepresented to the exclusion of others.

4) Letters: Letters are selected for their pertinence to material published in *Science* or because they discuss significant problems of interest to most scientists. Letters of a highly technical nature are usually transferred to the Technical Comments section. Letters pertaining to material published in *Science* may correct errors, provide support or agreement, offer different points of view, clarify, or add information. Outside reviewers may be consulted on questions of accuracy. Insinuations and conjecture about another author's motives, abilities, or intelligence are considered inappropriate for publication. The selection of letters is intended to reflect the range of opinions received.

5) Technical Comments: Technical Comments may be selected for publication if they express significant criticisms of papers published in *Science* or offer useful additional information. The authors of the original paper are usually asked for an opinion of the comments and are given an opportunity to reply if the comments are accepted for publication. Discussions of minor issues or priority claims are not deemed appropriate, nor are questions that can be resolved by correspondence between the critic and the original authors.

6) Book Reviews: The selection of books to be reviewed and of reviewers is made by the editors.

Submission of Manuscripts

Submit an original and two duplicates of each manuscript, together with a letter of transmittal giving:

1) the name(s) and telephone number(s) of the author(s);

2) the title of the paper and a statement of its main point;

3) the names, addresses, telephone

number, and fields of interest of four to six persons in North America but outside your institution who are qualified to referee your paper;

4) the names of colleagues who have reviewed your paper;

5) the total number of words included in your manuscript; and

6) a statement that the material has not been published and is not under consideration for publication elsewhere.

Address the manuscript to the Editor, *Science*, 1515 Massachusetts Avenue, NW, Washington, D.C. 20005.

Manuscript Preparation

Typing. Use double-spacing throughout the text, tables, figure legends, and references and notes.

Units of measure. Use metric units. If measurements were made in English units, give metric equivalents.

Symbols and abbreviations. Define all symbols, abbreviations, and acronyms.

References and notes. Number references and notes in the order in which they are cited in the text. Place references cited only in tables or figure legends after the text references. Gather all acknowledgments into a single, brief statement at the end. Use *Bibliographic Guide for Editors & Authors* (American Chemical Society, Washington, D.C.) for abbreviations of journal titles. For journals not listed there provide the full title. Use the following forms:

For a journal paper: H. Smith, *Am. J. Physiol.* **98**, 279 (1931).

For a book: F. Dachille and R. Roy, *Modern Very High Pressure Techniques* (Butterworth, London, 1961), pp. 163–180.

For a paper in a compilation: F. Dachille and R. Roy, in *Reactivity of Solids*, J. H. de Boer, Ed. (Elsevier, Amsterdam, 1960), pp. 502–516.

For unpublished material: A. Giraud, paper presented at the American Nuclear Society Conference, Washington, D.C., November 1976.

Illustrations. For each illustration submit three copies of a quality suitable for reproduction. Label each on the back with the name of the author and the figure number. Plan figures for the smallest printed size consistent with clarity. Color may be used if necessary but authors are expected to pay the full cost of reprints. Cite all illustrations in the text and provide a brief legend for each.

Tables. Type each table on a separate sheet, give it a number and title, and cite it by number in the text. Give each column a heading. Indicate units of measure in parentheses in the heading for each column and do not change the unit of measure within a column.

Equations and formulas. Use quadruple spacing around equations and formulas that are to be set off from the text. Define all symbols.

Special Requirements and Procedures

1) Articles: Provide a title of one or two lines of not more than 26 characters and spaces each; a brief author note giving your position and address; and a summary of 50 to 100 words. The summary should convey to the general reader the main point of the paper and outline the results or conclusions. The introduction should portray the broad significance of the work, and the whole text should be intelligible to scientists in different disciplines. Explain all technical terms likely to be known in only one field. Insert short subheadings at appropriate places in the text to mark your main ideas. Provide a reference list in accord with *Science* style. Reference lists should not be exhaustive; citation of a single review article can often replace many references. A maximum of 40 references is suggested.

2) Research Articles: Provide a title of one or two lines of not more than 54 characters and spaces each and an abstract of about 100 words. The abstract should portray for the general reader the results described and their significance. The whole text should be intelligible to readers in more than one discipline. Provide a brief outline of the main point of your paper in a short introductory section, then describe your experiments and the results, and conclude with a discussion. Subheadings may be used to indicate the different sections of the paper. Provide a reference list in accordance with *Science* style. A maximum of 30 references is suggested.

3) Reports: Provide a title of one or two lines of not more than 54 characters and spaces each and an abstract of 50 to 75 words. The abstract and the first portion of the report should portray for the general reader the results described and their significance. The body of the report should be intelligible to scientists in other fields of expertise. Complete documentation need not be presented but should be available in cited references.

4) Letters: Letters should be typed double-spaced. They should be short (preferably less than 250 words) and to the point; they should be carefully phrased, free of technical jargon, and nonrepetitive. When a Letter refers to an article published in *Science* the original author is usually given an opportunity to reply. Letters are frequently shortened and edited. Letters are acknowledged by postcard; authors are notified if their letters are accepted for publication. Letters must be typed with double-spacing.

5) Technical Comments: Technical Comments on Reports or Articles are published at the end of the Reports section. When a Technical Comment is accepted for publication the authors of the original paper are usually given an opportunity to reply.

6) Book Reviews: Instructions accompany review copies when they are sent to reviewers.

Printing and Publication

Editing. Before being sent to the printers, papers are edited to improve accuracy and effectiveness of communication. When changes are needed because the author's meaning is not clear, the editor may consult the author by telephone; when the editing is extensive, the manuscript may be returned to the author for approval or further adjustment before the type is set.

Proofs. One set of galley proofs is provided for each paper. Alterations should be kept to a minimum and marked only on the proofs. Extensive alterations may delay publication.

Scheduling. Papers are not scheduled for publication until *Science* has received corrected galley proofs from the authors. The median delay between acceptance of papers and mailing of galley proofs to authors is 4 to 8 weeks (allowing for editing and typesetting); the median delay between receipt of authors' galley proofs by *Science* and publication is 4 to 6 weeks (allowing for proofreading, layout, and paging). There may be additional delays in publication for papers with tables or figures that present problems in layout and for papers accompanied by cover pictures.

Reprints. An order blank for reprints accompanies proofs.

Cover Photographs

Particularly good photographs that pertain to a paper being submitted will be considered for use on the cover. Submit prints (*not* slides, negatives, or transparencies) together with the manuscript, and indicate in the letter of transmittal that a possible cover picture is enclosed.