Suggestions for Contributors to *Science*

To assure publication of papers with a minimum of delay and to provide readers with subject matter of a wide range and general interest, the AAAS editorial board has established the following policies.

Papers submitted by members and nonmembers of the AAAS will receive equal consideration for publication. Material that is not considered suitable for publication by the editorial board will be returned to the author, and it cannot be the subject of continuing correspondence.

Every article, report, book review, or letter is accepted with the understanding that it has not been published or accepted for publication elsewhere. (Occasionally an important article is reprinted from, or simultaneously printed with, another periodical, usually one not readily available to readers of *Science,* but this is always done by special arrangement with the author.)

Every effort will be made to publish papers promptly. This will require the cooperation of authors, who should follow these suggestions: (i) give special attention to concise expressions; (ii) supply clear figures that unquestionably are suitable for reproduction; (iii) see that manuscripts are submitted in the form and style used by *Science,* especially with regard to references, figure legends, table headings, and abbreviations; (iv) on the galley proof, limit alterations to typographic and factual errors; (v) return galley proof promptly.

An article should receive a thorough review before submission, if possible by someone other than the author. If a manuscript for a report is returned to an author for a thorough revision, the revision date will be regarded as the "Received" date for the article.

All manuscripts are to be submitted in duplicate, in order to expedite reviewing by referees and editorial processing. In the event that a paper is returned to an author for revision, one copy will be retained in the editorial office pending final disposition.

Types of Articles

1) *Lead articles.* Lead articles varying in length from about 1000 to 10,000 words are invited for consideration. These may be general articles or reviews of recent advances in some field. Authors should keep in mind the broad audience of *Science* and should employ reasonably nontechnical language that will be intelligible to most readers.

2) *Reports.* All technical papers and comments on them are published in this section titled "Reports." Reports of research should be limited to four double-spaced typewritten pages (about 1200 words). This includes the space occupied by figure or table, references and notes, and the author's name and affiliation. However, statements of conclusions without supporting data will not be accepted. *Such data should be included to the extent necessary.* Illustrative material should be limited to one table *or* one figure.

A fuller account of the kinds of papers suitable for reports will be found in *Science* **124,** 1273 (28 Dec. 1956).

3) *Book Reviews.* In general, unsolicited book reviews are not considered for publication. The editors reserve the right to reject reviews whether solicited or not.

Anyone who undertakes to prepare a book review has accepted certain obligations: to the author, to the publisher, to the editor, to the reputation of the journal, and especially, to the reader.

The reviewer should consider what a reader might like to know about a book. Is it a good book of its kind? In what way is it better or worse than its predecessors? What field does it cover? To what audience is it addressed? If the book is written for a popular audience, the reviewer should judge how successful it is for that audience. Would it be a good book to own? How well does it fulfill the stated aims of the author? If it is not a first edition, how has it been changed, if at all?

The reviewer owes it to the author, who has undoubtedly spent much time and effort on the book, to be fair. He should not magnify minor errors out of proportion to their importance, but he should point out without rancorous or polemical outbursts any weaknesses, important errors, or misconceptions. In short, the reviewer should give an appraisal of the book, not of the author. If it is a generally good book with some faults, or a generally bad book with some good points, this should be made clear to the reader. If the book lies outside the field of the reviewer's competence, which may mean that its title is misleading, he should return it to the editors, or, if someone he knows is competent both in the field of the book and in writing reviews, he should turn the book over to him for review and *notify* the editorial office. If the book does not merit a review, the editorial office should be notified promptly.

Promptness in a book reviewer is an especially desirable virtue. The longer the lapse between publication of a book and its review, the less valuable the review.

Reviews should be no longer than necessary. An optimum length is between 200 and 300 words; an approximate upper limit is 650 words. The length of a review need not be proportional to the merit of a book. In fact, the relation may be one of inverse proportion, for a book with some merit and many defects may require a long review.

The writing should be clear and concise, and the reviewer should remember that he is writing for some nonscientists as well as for specialists in one or another field of science. The reader should be able to tell whether or not the books reviewed in fields other than his own have merit. A librarian, for example, should be able to decide from the review whether or not the book in question should be purchased for library use.

4) *Letters.* The purpose of the "Letters" section is to provide a forum for the expression of comment and opinion. Letters that are highly technical in content or letters that comment on technical articles will be published in "Reports." Letters that comment on something that has appeared in other sections of *Science* and expressions of opinion of interest to the scientific community—including critical opinion—will be published in the "Letters" section.

In general letters will neither be acknowledged nor returned; authors will not receive proof or have an opportunity to order reprints; anonymous letters will be disregarded; letters of 250 words or less will be preferred; the editors reserve the right to make deletions; the editors' decision about whether or not to publish a letter will be final and not subject to continuing correspondence; letters should be typed double-spaced and submitted in duplicate; as is usual in sections of this kind, the editors take no responsibility for the accuracy or soundness of the letters published.

Preparation of Manuscript

For the first copy of the typescript, use a good grade of bond paper, 8.5 by 11

inches. *All copy, including quotations, footnotes, tables, literature references, and legends for figures, should be double-spaced.* Leave margins of at least 1.5 inches at the sides and at the top and bottom. Pages that are heavily corrected should be retyped. Do not insert corrections and additions lengthwise in the margin; the printer works with the typescript mounted in a frame that exposes only a few lines at a time.

Changes in copy and proof. All corrections in manuscript *and* proof should be transmitted to the editorial office in Washington, *not* to the printer.

Illustrations. A brief legend should be provided for each diagram, graph, map, and photograph. It should *not* be incorporated in the figure. All legends are set in type by the printer and, hence, should be typed double-spaced, on a separate sheet of paper.

On the margin or back of each illustration, write in pencil the number of the figure, name of the author, and abbreviated title of the article. All illustrations should be packed carefully with cardboard to avoid damage in mailing. Cracks and marks made by paper clips or pressure of writing ruin photographs for reproduction.

Line drawings should be made with India ink on heavy white drawing paper or blue tracing cloth. Ruled coordinate paper may be used for graphs, provided that it is printed in light blue; the important coordinate lines and scale markers that are intended to appear in the reproduction must be ruled in India ink.

A good size for a drawing is twice that desired for the printed figure, with all lettering and line thicknesses similarly enlarged. One-column-width illustrations are reproduced 2⅛ inches wide; two-column width illustrations, 4-9/16 inches wide; three-column width illustrations 6-15/16 inches wide.

Diagrams containing little detail should be planned so that the printed figure can be made one column wide. For presenting apparatus, a line drawing is usually better than a photograph.

Photographs should have a glossy finish. For satisfactory reproduction, a print must be unblurred and must show sharp contrast between light and dark areas.

When it is desirable to indicate the magnification in photomicrographs, the scale in microns (or other suitable units) should be drawn directly on the print rather than indicated in numerals in the legend. This allows more flexibility in scaling for reduction and, hence, greater accuracy in indicating size of the subject.

Tables. Each table should be typed on a separate sheet and should be provided with a title. Tables should be numbered consecutively with Arabic numerals.

References and notes. The only footnotes are to be those appended to tables and the author's affiliation in lead articles. All other explanatory notes, including acknowledgments and authorization for publication, and literature references are to be numbered consecutively and placed at the end of the article, under the heading "References and Notes."

Preparation of Graphs

These suggestions do not comprise a comprehensive set of suggestions but merely emphasize certain practices that often are disregarded. Most of the recommendations are in accord with those made in American Standards Association publication Z15.3.

Not more than three or four *curves* ordinarily should be shown on the same graph, although more may be included in the case of a family of well-separated curves. Use a solid line for an especially important curve and dashed, dotted, or lighter solid lines for the other curves. No curve or coordinate ruling of the graph should run through any lettering or outlined circles, triangles, and so forth, that are used to indicate plotted points.

Coordinate rulings should be limited in number to those needed to guide the eye in making a reading to the desired degree of approximation. Short scale markers, or "ticks," may be inserted between rulings if this is desirable. The rulings should be light enough not to distract attention from the curves being presented.

Lettering should be placed so as to be easily read from the bottom and from the right-hand side of the graph; that is, the lettering should face either the bottom or the right-hand side of the drawing.

Explanatory comments, supplementary data, or formulas should be placed in the figure legend or in the text. The exception to this rule is the case where there are several curves on the same graph that need separate identification; if practicable, they should be identified by brief labels placed close to the curve (horizontally or along the curve) rather than by single letters or numbers requiring a key.

If it seems necessary to place supplementary information on the drawing proper, the lettering should be kept within the vertical and horizontal limits of the curves or other essential features of the drawing. Otherwise the space occupied by the drawing may be needlessly large, or else the drawing may have to be reduced in reproduction, often to the point where the lettering or other details are illegible.

Scale captions should be placed outside the grid area, usually at the bottom toward the right for the horizontal scale and at the left-hand side toward the top for the vertical scale. The scale caption should consist of (i) the name of the variable plotted, (ii) its symbol, if one is used in the text, and (iii) in parentheses, the abbreviation for the unit of measure; thus, Pressure p (lb/in.^{2}). Avoid using such captions as "Pressure in lb/in.^{2}" and "Pressure in lb per sq. in." The technical terms, symbols, and abbreviations on a drawing should be in accord with those used in the text of the article.

The *horizontal and vertical scales* for a graph should be chosen with care, so as to give a correct impression of the relationship plotted, for the choice of scales has a controlling influence on the apparent rate of change of the dependent variable. Except where a visual comparison of plotted magnitudes is important, the bottom (abscissa) and extreme left-hand (ordinate) coordinate lines do not have to represent the zero values of the variables plotted; this often results in a more effective graph as well as a saving of space.

The numerals representing the scale values should be placed outside the grid area. If the scale values are smaller than unity and are expressed in decimal form, a cipher should always precede the decimal point; thus, 0.20, not .20.

The use of many ciphers in scale numbers should be avoided, and the best way to do this is to reexpress the quantity plotted in terms of a larger unit of measurement. For example, suppose that originally the scale numbers are 15 000, 20 000, 25 000 . . . and that the scale caption is "Pressure (lb/in.^{2})"; these scale numbers can be changed to 15, 20, 25 . . . , provided that the unit is changed to 10^3 lb/in.^{2} If, in this example, the data are correct to three significant figures and it is desirable to indicate this fact, then the scale figures should be 1.50, 2.00, 2.50 . . . , and the unit, 10^4 lb/in.^{2} *Never* use captions of the types: "Velocity $\times 10^3$ in ft/sec" and "Velocity (ft/sec $\times 10^3$)." They are ambiguous, since they do not indicate clearly whether the scale numbers *have been* or *are to be* multiplied by 10^3.

Date of Publication

Although an author will not be notified of the particular issue in which his paper will appear, receipt of galley proof is a fair indication that publication is imminent—usually within 4 weeks. If such a schedule is to be maintained, it is essential that the author mail his corrected galley proof to the editorial office (1515 Massachusetts Ave., NW, Washington 5, D.C.) within 24 hours after receiving it, and that he refrain from making extensive alterations.

Reprints

Reprint orders are handled by the printer, Business Press, Inc., Lancaster, Pennsylvania. An order form will be sent to the author along with the galley proof. If reprints are desired, this form should be filled out and promptly returned to Business Press. Any subsequent correspondence *concerning reprints* should also be addressed directly to Business Press. In the case of authors living outside the U.S.A., the Business Press requires payment in advance for reprints and postage.

News of Science

Asian Nuclear Center

The United States Government has announced that it will provide about $20 million to help establish the proposed Asian nuclear center that is to be located in Manila. The money will be used for capital expenditures and initial operating costs.

A team from the Brookhaven National Laboratory has been investigating for some months the problems involved in establishing the Manila center. The team's report stated that the center, "is an entirely feasible enterprise, capable of rendering a valuable service to the progress and development of the area." However, the report recommended, among other things, that the nations involved agree in advance on a formula for sharing future operating costs.

The $20 million for the project will come out of the special $100 million Asian regional development fund set up by Congress in the 1955 Foreign Aid Bill. The money is available for 3 years.

IGY Upper Atmosphere Research

Three special National Science Foundation grants of more than $325,000 have been awarded to Stanford University scientists for radio investigations of the upper atmosphere during the International Geophysical Year. The work will involve a network of 24 radio-radar stations extending from the Arctic Circle in the north to Little America near the South Pole. Allan M. Peterson, Robert A. Helliwell, and O. G. Villard, Jr., all of the Radio Propagation Laboratory, are the recipients of the NSF awards.

Peterson's research is related to the IGY's aurora and airglow studies. He will establish and direct the work of 13 ionospheric "scatter-sounding" stations ranging from Greenland down both coasts of North America. Other stations will be located in Central and South America and in Australia. Unusual equipment at the stations will provide a radarlike picture of invisible ionized cloud effects in the upper atmosphere for 1000 miles or more around each post.

Helliwell's work, part of the IGY's ionospheric physics program, has to do with the curious "whistler" sounds believed caused by lightning flashes which generate radio signals that travel far out into space. There will be ten stations located in the Northern and Southern Hemispheres participating in this research. Villard's grant will be used for radar meteor investigations in Little America.

Free Radicals Research Program

A 3-year program of basic research on free radicals has been undertaken by the National Bureau of Standards. The object of the program is to increase fundamental knowledge of the formation, properties, and storage of these highly reactive molecular fragments. The series of experimental and theoretical investigations is receiving support from the Department of Defense through the Office of Ordnance Research, U.S. Army.

Over-all direction and coordination of the work is centered in a Free Radicals Research Section recently established for this purpose. Herbert P. Broida, who has been named chief of the new section, will serve as technical coordinator for the entire program; Arnold M. Bass is assistant chief of the section.

To encourage broad dissemination of the information obtained in the program, and also to minimize interference with other established projects at the Bureau, participating scientists are being drawn largely from other institutions. Approximately half of the technical staff for the free radicals research program will be on loan from industrial research laboratories, working under an unusual cooperative plan. Others will come from universities and various government agencies. It is expected that the work of this central research group will be continued and expanded in many of the industrial laboratories after termination of the present program.

A technical data center is being set up so that free radical research at other laboratories, both in the United States and abroad, may be closely followed. Other activities serving to knit together the various research projects making up the program will include weekly colloquia and a general conference now being planned for mid-1957.

Male Fertility Index

A new index to fertility in males has been discovered by scientists of the Southwest Foundation for Research and Education (San Antonio, Tex.). In studies of thoroughbred horses conducted at the institution's branch in Lexington, Ky., it was found that the sulfhydryl content of seminal fluid provides an index to the ability of the semen to induce pregnancy.

When the sulfhydryl content is high, there is a reduction in the capacity of the sperm to maintain its ability to move. This is associated with failure to cause pregnancy. The sulfhydryl concentration varies from day to day. Studies are now in progress to determine whether or not this new index is applicable to human beings.

Pioneer in X-ray Therapy

Emil H. Grubbe, probably the first American to treat a patient with x-rays, has undergone his 90th operation for cancerous burns resulting from his own early exposure to radiation. Sixty years ago, in Philadelphia, Grubbe gave x-ray therapy to a woman suffering from cancer. This was only a few months after Wilhelm Roentgen, the German physicist, had announced a method for generating x-rays.

Now 81, and living in retirement, Grubbe has lost his left hand, nose, upper lip, and most of the right side of his face. His right hand is enfeebled. He