

obsequies have been performed, Glozel refuses to remain in its sepulcher, and the literary battle continues. Dr. Morlet very kindly sends me newspapers and pamphlets, and a distinguished pro-Glozelian of Belgium, Professor Tricot-Royer, has just supplied me with his defense of Glozel which is particularly interesting because Professor Tricot-Royer was present during the visit of the international commission.

What keeps Glozel alive? First, we have the fact that when men take sides in print they are loath to recant, fearing ridicule—the more untenable their position, the more stubborn their resistance.

Secondly, six months after the international commission's visit Dr. Morlet called together a *comité d'études* of twelve men, consisting of Dr. Foat, Bayet and Tricot-Royer, of Belgium; Reinach, J. Loth, W. Loth, Van Gennep, Deperet, Ajeelin, Roman and Audollent, of France, and Soderman, of Sweden. At their meeting they pronounced unanimously in favor of the genuineness of Glozel.

Another reason is found in the attitude of a group of French and German scientists who are opposed to the traditional belief that *ex oriente lux*—that civilization is of oriental origin. The alleged Neolithic alphabet of Glozel and similar finds at Alvao in Portugal are grist to their mill.

In addition quasi-political factors have entered into the controversy—Fradin an obscure peasant, Morlet a provincial doctor without much influence have a definite appeal for the proletariat and for a large section of the press.

And finally, it must be remembered that the Academicians are not always right—that they ridiculed Pasteur and Boucher des Perthes, and that even Koch and Lister met a similar fate in the beginning.<sup>7</sup>

All these elements cooperate to keep the spark of life in Glozel. Within the past few weeks the publication of an exhaustive treatise by Dr. Morlet has been announced. This, however, I fear, can throw no new light upon the subject.

As a detective tale the story of Glozel remains unfinished and will remain so until a Sherlock Holmes discovers the supposed person or persons who manufactured the articles and put them in the ground. What was the motive? How are we to explain the extraordinary industry that has fashioned five thousand or more articles, and how is it that he, the *esprit de Glozel*, escaped detection in a community of twenty-nine souls where every one knows every one else's business? Or how, if there are witnesses to the dark deed, can we explain an unbroken neighborly silence extending over a period of six exciting years?

## PREPARATION OF SCIENTIFIC ARTICLES

By W. M. DAVIS

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RECOLLECTIONS of many untrained efforts and of many changes in methods of writing scientific articles prompt me to set down some of the more profitable results of a rather long experience in that sort of work, in the hope that they may prove useful to others.

### THE ARTICLE

After the subject of an article has taken shape in the mind and the general sequence of its headings has been planned, cut some typewriter paper in half and write brief statements of the leading points on separate half pages. Never begin a second paragraph on the same page with the end of the preceding one. Do not hesitate too long over the precise wording of this first draft; set ideas down as they take form; revise, clarify and compress the wording afterwards. Arrange the pages in a logical order, number them 5, 10, 15, 20, and so on, and make out a provisional table of contents. Changes and additions which require the rewriting of paragraphs and the later insertion of afterthoughts with intermediate paging are thus much facilitated.

Carry a blank book with the growing manuscript—an examination blue-book will serve—and keep a record of work done on its first pages. Besides mention of whatever occurrences led up to the preparation of the article and notes on the incidents of its progress, the following dates should be entered: Beginning and ending of the rough draft; making first clean copy, and second also if a second prove necessary; sending copy to the publisher and acknowledgment of its receipt; arrival and return of galley proof and page proof; appearance of article; receipt and distribution of reprints. The more significant of these notes and dates should be later copied off in good form and pasted, with a list of correspondents to whom reprints are sent, in the reprint kept in one's own file. Much do I regret not having such a

<sup>7</sup> Recently the Geological Society of Normandy (*Mercur de France*, April 15, 1930) has formally proffered "ses plus vives félicitations" to Dr. Morlet for his science, his tenacity and above all for the magnificent energy with which he has faced the attacks and unjust calumnies to which he has been subjected and which the Court of Appeals at Riom has definitely condemned.

set of records, one for each reprint on my personal book-shelf.

On later pages of the same blank book enter all questions which arise during composition or revision of the manuscript and for which answers have to be searched in various sources. Both questions and answers should be written out rather fully, so as to avoid misunderstandings and errors. Do not trust to scraps of paper for these memoranda; enter them all, both questions and answers, in the blank book in orderly form. If scraps are used much time is lost in re-search in case they are accidentally mislaid.

When the time comes for making the first clean copy of the apparently completed manuscript, examine the periodical to the editor of which the article is to be offered for publication, and thus learn the form in which "copy" should be prepared for its pages; for example, whether a summary or a table of contents should be inserted at the beginning; whether references should be made by star and dagger signs, by numbers to numbered foot-notes, by numbers to a numbered bibliographic list at the end of the article, or otherwise. Then prepare the rough manuscript accordingly for clean copy on full-sized sheets, and the editor will be grateful. My own preference as to references is to place a list of all articles cited, arranged alphabetically by author's names, at the end of the manuscript; and when an author's name or a citation of his writings appears in the text, add a parenthesis containing the year in which his article was published and the page on which the cited passage is found. This avoids the repetition of a title in successive foot-notes when the same article is referred to several times, and also does away with those inconvenient abbreviations, *loc. cit.* and *op. cit.*

Faults of style and arrangement that passed unnoticed in a first rough draft often become rather glaringly visible in a clean copy, and it therefore soon becomes more or less disfigured with erasures and interlinings. As clearness of text is more important than elegance of appearance, it usually suffices to typewrite the disfigured parts in close lines on narrow strips and paste them over the disfigurement; a good deal of unnecessary copying is thus saved. When this stage of improvement is reached, it is a good plan to lay the article aside for a week or a fortnight, and then read it aloud to some patient listener. The main thing to consider at this time is whether the style is as concise as possible and whether the subject has been presented in such a manner that a reader not familiar with its details can comprehend it. His honorable points of ignorance must be carefully enlightened, and a listener is likely to be helpful in showing where enlightening sugges-

tions are needed. So many improving changes may be thus made, especially if the article is argumentative, that a second clean copy has to be prepared. This causes some delay which an enthusiastic author may not enjoy; but the world will have already waited so long for his article that a little longer waiting will not cause wide-spread discontent.

#### BIBLIOGRAPHY

Whenever a book or article is consulted and an extract is made from it, enter the name of the author, title of the article and its source, as well as all abstracts and quotations with their pages, on a slip about the size of a postal card (several slips may be needed for long excerpts). Then compare every word with the original; if found correct make a nick (✓) opposite name, title, source and each quotation. When final clean copy is made and when proof is received, compare all citations with these authenticated slips and thus save many hours of fatiguing labor that would otherwise be demanded by returns to the original sources for verification. If an author has two initials before his family name, they suffice to identify him; if only one, his first name should be given. Thus, J. B. Hazelton, but Thomas Simonds. If a book is consulted, its place and year of publication should be noted.

It would be a good thing if the National Research Council would propose a standard form for bibliographic references; and if they do so I beg leave to suggest that they recommend Arabic numerals for volume numbers, omit parentheses enclosing dates and discard Vol. and pp. Thus if the abbreviated name of a periodical is followed by the figures 38, 1924, 263-279, no uncertainty can be felt as to their meaning. The first number, 38, can mean only the volume; the second, only the date of publication, and the last two numbers, only the first and last pages of the article cited. In case Vol. and pp. are retained, why not insert A. D. before the date and use Roman numerals for the volume? Then the same reference would read: Vol. XXXVIII, A. D. 1924, pp. 263-279, and would occupy almost double the space of the more condensed reference. If a periodical groups its volumes into successive series, the number of the series need not be quoted, because the year suffices to indicate the volume intended. But until a standard form for references is introduced and adopted, the style of references used in the publication of the author's choice should be followed.

Professional bibliographers and library cataloguers are of course expected to transcribe the entire title of an article or book, however long it may be; but a scientific author may be excused if he condenses an overlong title to a reasonable shortness, the omitted parts being indicated by dots. I do not know how

others feel about it, but my patience is always tried by titles of twenty words or more. Here are two samples, paraphrased from actual titles: "Outline of the mountain forms on the south coast of Labrador, with special attention to the littoral outcrops of Devonian strata"; and "Preliminary notes on the geology of the Marquesas Islands, with particular consideration of the Mehetian and Paumotuan dolomites." They might be advantageously reduced to "Mountain forms in southern Labrador" and "Geology of the Marquesas Islands." If an author regards further details as indispensable, let him show consideration for those who wish to cite his work by dividing its title into a main and a subordinate heading; for example, "The south coast of Labrador, with an outline of its mountain forms and an account of littoral Devonian outcrops." Then only the first five words need be quoted; a few dots will show that more title follows, unquoted. But if an author thus condenses the title of other writers' articles, let him take care to compress the title of his own articles into the fewest possible words. A title should not be a table of contents but only a concise name, easily cited. On the other hand, it should not omit essential words; for example, "Fossils of the Dobrevia formation" is not so intelligible as "Lower Triassic (Dobrevia) fossils from Nevada."

Condensation of unreasonably long names of periodicals is also advisable, if for no other reason than to persuade their editors to adopt shorter names. Why, for example, can not the University of California be satisfied to have its excellent geological bulletin referred to as "Univ. Calif. Geol. Bull." instead of asking that it should be cited as "Univ. Calif. Publ. Bull. Dept. Geol. Sci." The fact that the bulletin is published by the department of geology—if such be the case—is merely a local administrative detail, of little or no interest in geological science. The complete title is, indeed, so long that it has to be abbreviated in its own page headings, and even the graduates who contribute to it do not always cite it correctly! And yet six of the abbreviated words are dutifully cited in the invaluable Bibliography of American Geology, published as Bulletin 746 of the U. S. Geological Survey, which otherwise carries abbreviation to its farthest reach; B means Bulletin; J, Journal; Ac, Academy; Am, American; Pr, Proceedings; Sc, Science, and so on.

Quotations between inverted commas should follow the original passage with scrupulous care, even to the point of reproducing incorrect spelling. Omissions from quoted passages should be indicated by dots; additions to them should be enclosed in square brackets.

## ILLUSTRATIONS

When it comes to the preparation of illustrations, cut a rectangle of paper the size of a page in the selected journal of publication, and trace on it the outline of the space given to the printed text. Illustrations should then be drawn so as to fit that space, which is generally narrower than it is imagined to be. Whatever the height of a figure, its width should as a rule be that of the printed page, like Fig. 1, *A*. If smaller it should be only about half as wide, like *E*, so as to leave sufficient room for text alongside of it. If an extra-long figure is needed, it may be drawn in two halves, to be set opposite each other

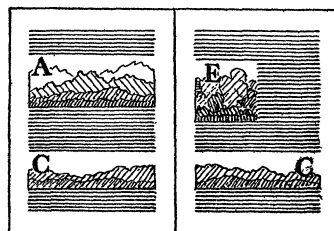


FIG. 1

on facing pages, like *C*, *C*, each half being as wide as the printed page—always provided the editor will permit so unconventional an innovation.

In order to know which one of the above sizes is best for an illustration, outline it roughly on as small a scale as it will bear. Then draw a rectangular frame around it of the size selected. From this construct a pencil frame two or three times as large on smooth, hard-surfaced paper, and outline the drawing carefully in pencil in the space thus defined. Omit unnecessary marginal lines, in order that the essential part of the drawing may be on as large a scale as possible. Set the outline aside for a day or two, so that on coming back to it with refreshed eyes it may be critically examined and improved before it is finished in smooth, firm, jet-black ink-lines with a fine pen. The frame also may be inked with a ruling pen if desired. Do not ink any lines so close together that the narrow white space between them will be blurred or lost when the drawing is photographically reduced to smaller scale in a process cut.

If a mistake is made in inking, do not erase it, but first rub out all near-by pencil lines, then paste a slip of opaque white paper over the mistake, and correct it after the slip is well dried. Be careful that the paste does not overrun the edge of the slip; if it does, ink lines will blot there. In pasting the slip on the drawing, lay a cover-paper over it and rub down the cover paper, not the slip. If explanatory letters are needed on the drawing, take from the waste-

basket an advertising pamphlet; cut from it plain capitals of sufficient size—they need not be A, B, C, D; any other letters will do as well; and paste the letters on the drawing. Erasure of pencil lines before pasting is advisable, because if a pencil line is accidentally covered by paste, it can hardly be erased. Do not guess at the size the letters should be; find some journal in which the illustrations are satisfactorily lettered, and enlarge the height of the letters as much as the drawing frame was enlarged; then search for letters as nearly as possible of that enlarged height. If names must be added, print them in unshaded Roman letters, **BbRrKk**, without serifs. Here again, do not guess at the size of the letters, but determine the proper size by enlarging good hand-printing on a figure in some book.

Do not print or write the title of a figure inside of its frame; the title will look much better if set up in type below the figure and printed with it. When a drawing is finished and unnecessary blank paper is trimmed off, paste it at the corners on a blank half sheet. Below it draw a line, crossed like a T at its ends, to show the width to which the drawing is to be photographically reduced. Below this line write the title of the figure and any explanatory legend that is to be printed with the title. Wait until the final copy of an article is about to go to the publisher before numbering the figures and inserting the numbers in the text. Then add to the half-sheets which carry the drawings the figure numbers and the number of the manuscript page where each figure belongs. Finally, write out a list of the figures with their numbers and titles and add the list to the clean copy of the manuscript. If it is proposed to have photographs reproduced in half-tone illustrations, be sure that they are worth reproducing. Many poor photographic views have been undeservedly immortalized in recent years of inexpert Kodakery. Better than a poor photograph is an outline neatly traced from it.

If a book is contemplated, the larger it is to be the more all the above suggestions or their equivalents should be emphasized. The record book, the orderly listing of all questions in it for which answers have to be looked up, the careful authentication of titles and

quotations, the adjustment of illustrations to pages, all gain greater and greater importance as the size of the book increases. The advice but not the dictation of an experienced publisher regarding the form and style of the book is valuable; and this advice should be sought early, in order that the work done in composition and illustration should be properly directed toward its goal.

When galley proof is received, indicate the position desired for each illustration on the margin. If page proof is seen later, some figures may be found on the back of the page that carries their text. It is then desirable to rearrange the text if possible by shifting paragraphs so as to bring the figure and its explanation together. If an order for reprints is given, be sure to request that the pages of the reprints be neither rearranged nor renumbered; the reprints should be exact duplicates of the article as originally paged and printed. If a cover is ordered it should bear the title of the article and the author's name, and the name of the journal of publication, with its volume and year, and the first and last pages of the article. It is desirable that the author's address should also be given, for it is very likely unknown to some of those to whom reprints are sent.

The plan of work outlined above may be called methodical; and some writers, deeming themselves unmethodical, may regard the plan as too systematic for their adoption. Yet it is particularly to such writers that the plan is submitted, for I began unsystematically myself and long failed to form orderly habits of work—in consequence of which I have had to retrace many steps and reopen many books needlessly. A little patient practice on the plan here set forth or on some other consistent plan can not fail to be serviceable to many a young scientist in reducing accidental and more or less disorderly habits of work to more orderly and time-saving habits. The use of half-sheets is a very helpful device, especially in the early stages of composition; the addition of authenticating nicks on reference slips, soon becoming habitual, will save hours and days in verifying quotations. One more suggestion in closing: condense all manuscripts as much as is reasonably possible.

## OBITUARY

### RECENT DEATHS

DR. JAMES MORFORD TAYLOR, professor emeritus at Colgate University, where he held a professorship of mathematics from 1873 to 1920, died on July 31 at the age of eighty-six years.

DR. HENRY W. HENSHAW, formerly chief of the

U. S. Biological Survey, died at Washington on August 1 at the age of eighty years.

PROFESSOR ALLVAR GULLSTRAND, professor of physiological optics at the University of Upsala, who received the Nobel prize for medicine in 1911, died on July 27. He was sixty-eight years old.