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NOTES ON THE PREPARATION OF PAPERS FOR PUBLICATION IN THE *JOURNAL OF HYGIENE* AND IN *PARASITOLOGY*[1]

BY THE LATE G. H. F. NUTTALL, M.D., Sc.D., PH.D., LL.D., F.R.S.

Lecturer in Bacteriology (1900–6) *and Quick Professor of Biology* (1906–31) *in the University of Cambridge, Founder and Editor* (1901–37) *of the* Journal of Hygiene *and Founder and Editor* (1908–33) *of* Parasitology

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[1] This article will shortly be published in book form by the Cambridge University Press at about 4*s*. 6*d*.

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FOREWORD

Before the foundation in 1893 of the *Journal of Pathology and Bacteriology* by the late Professor Sir G. Sims Woodhead, there was no English journal devoted to pathology, bacteriology and kindred subjects. In 1901 Professor G. H. F. Nuttall founded the *Journal of Hygiene*, the second English journal of this type, and edited it till his death in December 1937. Owing to the increasing number of papers on parasitological subjects, which he received for publication in this journal, he founded *Parasitology* in 1908 and was its chief editor till 1933. He was very proud of both journals, and for some years made himself personally responsible for the heavy expenses of production. Within a few years of its foundation each began to pay for itself, and afterwards both were taken over by the Cambridge University Press.

In his editorial work Nuttall displayed the same thoroughness as in his research, and his two journals became models upon which the publications of several scientific societies were based. He considered that an editor has an educational function in addition to his duty of assuring the regular appearance and high standard of his journal. In fact, much of his time and energy was devoted to the correction and improvement of papers and to correspondence with contributors. He advised and helped the young and inexperienced workers and in some cases even rewrote their papers.

As editor he exerted great influence on workers scattered all over the world. "Not only did Nuttall require honesty, he required intelligibility....He did much to raise the standard of literary workmanship in medical and biological circles." (M. Greenwood, *Brit. Med. J.* 1937, **2**, 1308.)

From time to time Nuttall thought of publishing in one of his journals "Notes on the preparation of papers", in order to help contributors and to relieve the work of the editor and of the Press.

The proposed notes were never published, but, with the intention of publishing a book to assist contributors to English medical and biological journals, he collected a very large amount of information, much of it dealing with the technical aspects of printing, the production of coloured and special illustrations, etc. This information was in the form of rough notes at the time of his sudden death.

We, as the present editors of his two journals, have selected and edited those of his notes which seem likely to be useful to contributors to these

journals, but have omitted the more technical information, which, though suitable for a comprehensive book, would be of little interest to most contributors.

In matters ruled by Press custom, we have adhered to that of the Cambridge University Press.

We wish to express our gratitude to Mr W. C. Piggott, of the Cambridge University Press, for his extensive and valuable help.

G. S. GRAHAM-SMITH.
D. KEILIN.

INTRODUCTION

Hâtez-vous lentement et, sans perdre courage,
Vingt fois sur le métier remettez votre ouvrage,
Polissez-le sans cesse et le repolissez:
Ajoutez quelquefois et souvent effacez.

BOILEAU.

ALTHOUGH the following Notes may appear elementary to practised writers, over thirty years' experience as an editor has convinced me that many authors need guidance in the preparation of their manuscripts and illustrations for publication and in dealing with their proofs.

These Notes were written to help contributors to the *Journal of Hygiene* and *Parasitology*, but they may prove useful to contributors to other journals. I hope that the Notes will not only help authors of scientific papers, but will also lessen the labour of editors and printers, reduce the cost of printing and proof correction, and hasten publication.

All authors are advised to read and take to heart the late Sir Clifford Allbutt's *Notes on the Composition of Scientific Papers* (1925, London: Macmillan and Co., Ltd.). The subject is treated differently in the following numbered Notes, which deal with practical details and may be regarded as complementary to those of Sir Clifford.

Golden Rules

There are certain Golden Rules which every author should follow as a matter of duty: he should

(*a*) try to imagine himself in his reader's place,
(*b*) proceed on a definite plan,
(*c*) study compression,
(*d*) revise his manuscript carefully,
(*e*) read and correct his proof conscientiously.

Authors should visit printing establishments in order to gain some knowledge of the methods and processes involved and the difficulties that have to be surmounted. This knowledge, supplemented by the account of the stages through which a paper passes and of the scrutiny to which it is subjected (**Note 87**), should impress upon them the necessity for taking great pains in the preparation of manuscripts and illustrations.

I. CONDITIONS GOVERNING ACCEPTANCE OF MANUSCRIPTS FOR PUBLICATION

It is a general rule of British scientific journals that papers published elsewhere or offered to other journals at home or abroad are not accepted, unless by special arrangement with the editors. Authors contravening this rule will be debarred by most editors from publishing further papers in their journals.

Journals usually hold the copyright over all matter, including illustrations, which they publish. Anyone wishing to utilize matter that has appeared in a journal should communicate with the editor, who, after consultation with the publishers, will try, if it is practicable, to meet the wishes of the applicant.

Although they are not required to enter into any formal agreement, authors are expected to observe the well-known custom not to sell their reprints directly or indirectly.

The cost of illustrations and their preparation for press, when exceeding ordinary limits, may have to be borne by the author or met by a grant obtained by him for this purpose.

Authors should note that papers may be returned because they do not conform to the rules laid down in these Notes.

II. THE PREPARATION OF MANUSCRIPTS

A. The Format of the Manuscript

The following rules relating to the format of the manuscript should be adhered to strictly:

1. Manuscripts should be typewritten or written in a perfectly legible hand.

Particular attention should be paid to the clear rendering of technical and scientific names and terms, and the names of authors, especially foreign authors.

2. The manuscript should be written on one side only of sheets of paper of quarto size. All the sheets used should be of uniform size, because smaller sheets, when intercalated, are apt to go astray at each stage before the paper is in proof.

3. A margin, measuring about $1\frac{1}{2}$ in. in width, should be kept free on the left-hand side of the manuscript for the use of the author, editor and printer. In this margin the author should indicate where tables, charts and illustrations are to be inserted.

4. Typewritten and other script should have double spacing between the lines, mainly in order to leave sufficient room for alterations, and also because crowded writing makes reading, correcting and type-setting difficult.

This rule also applies to matter to be printed in small type, descriptions of illustrations, footnotes and intercalations.

5. The pages should be numbered distinctly in the upper right-hand corner as in most printed books, because editors and printers have to handle the sheets singly, and because, if dropped, they may become hopelessly mixed. It is remarkable how many authors forget to number the pages of their manuscripts.

6. The sheets should be fastened with clips or other fasteners which can be removed easily, because the sheets have to be handled separately.

7. Tables should be placed on separate sheets, because different machines are often used for the text and for tabular matter.

8. Illustrations should never be inserted in the text, because a separate block has to be made for each illustration (see Note **64**).

"It is unwise to ignore the fact that the general appearance of a manuscript has a psychological effect on an editor. A manuscript that is carelessly arranged, without pagination, with sheets of various sizes, with additions written on slips pinned or clipped to the side, with corrections made without regard to neatness or to clarity, may prejudice him" (Simmonds, G. H. and Fishbein, M., 1925, *The Art and Practice of Medical Writing*).

B. THE COMPOSITION OF THE PAPER

(*a*) THE ORIGINAL NOTES

9. A definite plan is necessary in order to deal with the contents of the proposed paper in a logical order, to avoid confusion and repetition and to detect omissions.

The original notes on which the paper is based should be looked over and arranged in such a manner that not only the general plan for setting out the paper, but the principal divisions, become clearly defined. Notes on the views and experiments of other workers, which require to be taken into consideration, should then be inserted in their appropriate places. From those rough memoranda the author should be able to draw up in logical order a series of headings under which the first draft of the paper should be constructed. Allbutt (1925, p. 12) has explained in some detail the method he adopted.

(*b*) THE FIRST DRAFT OF THE MANUSCRIPT

10. In the first draft an endeavour should be made to assign all matter, which it is the intention of the author to insert, to its appropriate place under the following headings.

11. *The title of the paper*. "First impressions are strong impressions; a title ought therefore to be well studied."(1) Preferably the title should consist of a few carefully chosen words, which indicate the contents of the paper and permit of easy and accurate indexing (see Note **88**). Sometimes it is necessary to use a main title, followed by an explanatory subtitle. The writer should ask himself, "Under what topics would I naturally look in a subject index of an abstracts journal if I were searching for the literature on the subjects treated

in my article?" The answer to this question will provide the topics which should be included in the title.

When an animal or a plant, which is not well known, is mentioned in the title by its scientific name, the Order, or the Order and the Family, to which it belongs should be added in parentheses, as shown in the following examples: *Cladorchis subtrietrus* Rudolphi (Trematoda); *Melinda cognata* Meigen (Diptera, Calliphorinae).

12. *A short title or page heading* is printed at the head of the left-hand page of the text. It should be based on the title and, owing to the restricted space, should consist of not more than four or five words, or at most words which, when printed, occupy not more than $2\frac{1}{2}$ in.

The short title should be given by the author on the title page.

13. *The author's name, degrees and address.* Authors publishing papers in the *Journal of Hygiene* should give their more important degrees, and in both journals their laboratory addresses after their names, because such information is of great assistance to any readers who may wish to enter into correspondence with them. Moreover, the editor need not then be called upon to act as an intermediary.

14. *Information relating to illustrations.* Beneath the author's address the number of plates, text-figures and charts should be inserted in parentheses.

15. *Table of contents.* If the paper is long or deals with the subject-matter under various headings, sections and subsections, a table of contents may be added after the information relating to illustrations.

16. *Contents.* The contents are usually arranged under sections, headed as follows:

(*a*) *Introduction.* In this the reason for undertaking the work should be given and the problem defined. A short introduction may not require a heading.

(*b*) *Account of previous work.* Only such reference to previous work should be made as has a direct bearing on the problem. As a rule a complete historical review is not necessary.

(*c*) *Methods.* The methods, unless new, should be stated briefly.

(*d*) *The author's observations and experiments* and their results. These should be given in the past tense.

(*e*) *Discussion* of the results; their relation to previous work and their practical applications.

(*f*) *Summary.* The Summary should be an abstract of the significant contents of the paper, stating briefly the methods, principal results and deductions (see Note **39**).

(*g*) *Conclusions.* The composition of the Conclusions requires extreme care (see Note **40**).

(*h*) *Acknowledgements.* These are usually placed after the Summary, but do not require a heading (see Note **41**).

(*i*) *List of references* (see Notes **42**, **43**).

(*j*) *Explanations of plates* (see Notes **22**; **66**(8)).

(*k*) *Appendices* (see Note **45**).

No set arrangement is suitable for all kinds of papers, but whatever the method the plan of the composition should be made very clear to the reader.

The following example illustrates Notes **10–16**:

THE TACHINID PARASITES OF WOODLICE

By W. R. THOMPSON, Ph.D., D.Sc., F.R.S.

Imperial Institute of Entomology

(With Plates XV–XXII, containing Figs. 1–79, and Figs. I–V in the Text)

CONTENTS

(*c*) The second and intermediate drafts of the manuscript

(i) *General instructions*

17. When the first draft seems to contain in a rough form all the information and comments the author intends to publish, he is in a position to revise the manuscript and then to prepare a final draft for submission to a journal.

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At this stage authors would do well to reflect on Allbutt's words: "Again and again have I urged that slovenly writing is slovenly thinking, and obscure writing, for the most part, obscure thinking." (Notes **46**, **69**.)

Dictation of manuscripts to stenographers is a pernicious method, happily not often used (see Note **55**). Careless writers, who regard anything they write as 'good enough' for the Press, accomplish a like result without the intervention of a stenographer.

The author who desires that his paper should produce the best impression should try to imagine himself in the place of a critical reader, who is both influenced by the literary style and desirous of extracting as much information as possible, without having to expend time on 'padding' and thought on the meaning of obscure or ambiguous passages. This attitude should impress upon the writer the desirability of taking pains with his style, of making use of appropriate words in their correct positions, and of giving consideration to the sequence and linkage of sentences in order to convey his precise meaning to his reader. It should also impress upon him the virtue of conciseness and cause him to consider the value of each word, to delete all redundant words, sentences and even paragraphs, and to avoid repetitions.

The value of a paper is not proportionate to its length, and the longer it is the less likely it is to be read carefully. It is well known that short, concise, well-written papers are the most appreciated.

In the second draft the author should revise the title, headings and subheadings, and should indicate, where necessary, the commencement of paragraphs, the parts to be printed in small type, the position of tabular matter, illustrations and footnotes, and verify references.

18. *Headings in the text.* Three grades of heading, *centre headings*, *centre subheadings* and *paragraph side headings*, are enough. Headings help the reader to find what he is seeking and aid the author in ordering subject-matter. Great care should be taken in the wording of headings, which should be identical in the text and in the table of contents.

Each heading should contain a noun. The use of adjectives alone as headings, e.g. 'Experimental', is undesirable. Excessive subdivision should be avoided, since it confuses rather than aids the reader.

The text should be complete in itself, i.e. independent of the headings, so that it is perfectly intelligible when read without any reference to the headings.

Centre headings, indicating principal divisions of the paper, e.g. 'method of investigation', should be typewritten in small capitals. In the margin the words 'Centre head' should be written and enclosed in a circle.

Centre subheadings, indicating subdivisions of the principal divisions, are usually printed in italics.

Paragraph side headings, or italicized words starting a paragraph, are most convenient for indicating smaller divisions and economize space. Only

a small amount of text—not more than a page, or, at the most, two—should be covered by a side heading.

The author should observe the form in which headings occur in the journal to which his manuscript is submitted. He should indicate only the rank of the headings, and leave the editor to mark the manuscript in regard to the size and style of type to be used.

19. *Paragraphs.* Every paragraph should commence on a new line, and the first word should be indented or set in from the left-hand margin of the text. Typists frequently start paragraphs without indenting the first word, and this practice may lead to two or more paragraphs being set up as one in print, the correction of which requires troublesome shifting of type in proof.

If two paragraphs have been typed as one, the commencement of the second may be indicated by the sign ¶ in the margin, and a square bracket placed before the first word, or a line drawn from the first word to near the left-hand edge of the text (see Note **80**, p. 51).

20. *A part to be printed in small type* should be marked by a vertical line close to the left-hand side of the text with the words 'Small type' written beside it in the margin. Such parts should not be closely written for reasons given in Note **4**.

21. *Footnotes* should be used only where they are indispensable. It is best to write each on a separate sheet. Footnotes may, if desired, be inserted directly in the text (not at the foot of the page, but at the place they are referred to) if bounded by lines drawn above and below them across the page. The word 'Footnote' should be written in the margin.

22. *Tables, figures, diagrams, charts, maps and plates.* (*a*) The position of such matter should be indicated in the margin by a note reading, 'Insert Table I hereabouts'.

(*b*) Tables, text-figures, diagrams, charts and maps should be *numbered in their classes.* Plates should be designated temporarily by the letters A, B, C, etc., because they are numbered consecutively throughout the volume and the final number of each plate is determined by the editor. In the text, illustrations, etc. should be referred to by their numbers, e.g. Table III, Chart 2, Text-fig. 8, etc., and not by such expressions as 'above', 'below', 'preceding' or 'following' because when the paper is set up in print illustrations, tables and charts have to be inserted to suit the requirements of space.

(*c*) *Tables* should be set out on separate sheets. The 'rulings' or lines frequently inserted by authors are usually omitted in printing, thereby greatly lessening the cost of production. Designations of weights, measures, etc., should be included in the explanatory matter at the top and not repeated in the columns, which should, if possible, contain figures or signs only. The signs + and − are commonly used instead of the words positive and negative and ,, for ditto. In elaborate tables it may be desirable to print signs in different colours. An example of such a table may be seen in the *Journal of Hygiene* (1938), **38**, 757. The signs in black were printed first, and the red

and green signs afterwards. Notes referring to matter contained in a table should not be designated by numbers, but by the usual signs *, †, etc., and the explanation given in the legend under the table. Scientific names should be printed in Italic.

(*d*) *Keys* to the letters and numbers inserted in text-figures, etc., should be given with the legends. Neither the legends nor the keys must be written on the illustrations (see Note **66** (8)).

(1) Single letters may have no relation to the names of structures indicated by them, but combinations of letters may be used as abbreviations of these names, thus *an.* for anus, *c.e.* for cephalic expansion. Lettering representing abbreviations requires careful punctuation in the figures, in the key and in the text. The key is usually printed in paragraph form, but is sometimes printed in parallel columns.

(2) *Letters* and *numbers* explanatory of the text-figures should be as far as possible *uniform* throughout the series, so as to render repetition under each legend unnecessary.

(3) Authors should *check* very carefully the letters and numbers in the figures, the keys and the text to assure themselves that they coincide, and to avoid omissions which may be difficult to rectify later.

(4) *The linear magnification* employed in the illustration may be given by means of the sign × followed by the requisite figure. Thus ×5 signifies magnified 5 times. Since very awkward magnifications may have to be recorded after the illustrations have been reduced so as to fit into the text, it is better to insert beside an illustration a scale of magnification, which is reduced at the same time as the illustration (see Note **66** (10)).

(*e*) The words 'Table', 'Plate', etc., when followed by their numbers, may be capitalized in the text in order to catch the eye of the reader. When the words 'Plate' and 'Text-figure' are placed in parentheses they are commonly abbreviated to 'Pl.' and 'Fig.' or 'Text-fig.'

23. *Cross-references* to statements made elsewhere in the text, e.g. (see p. —), should state the pages of the manuscript on which the statements occur, so that there will be no difficulty in tracing them when the proof is corrected. Do not write 'in another part of this paper', 'as has been noted earlier', 'as will be explained later' or similar phrases, unless they are accompanied by a cross-reference.

24. *References in the text to authors.* Except in papers of a special type the old method of citing publications by inserting after the author's name in the text a number, which corresponds to one placed before his name in the list of references, should not be used. This method is unsatisfactory because the date of publication is not brought to the reader's notice and because the insertion in its alphabetical position in the list of a new name, preceded by its appropriate number, necessitates fresh numbers being given to all later names and corresponding changes in the numbers representing these names throughout the text. Such changes are fruitful sources of error. If, as often happens,

the list is not in alphabetical order, the insertion of a new name in the order of its first appearance necessitates similar changes. This method creates other difficulties for the reader, who finds it tedious to ascertain the numbers and chronology of the papers by any one author.

In *reviews* and some other papers, in which many and frequent references have to be made, a system of references by numbers, unaccompanied by names, may be useful, e.g. 'It has been shown by many workers (3, 8, 17, 19, 27) that....'

For all other papers the *Harvard System*, which is now widely adopted, should be used. It consists in giving in parentheses the date of the paper to be cited, and, if necessary, the exact page referred to, immediately after the author's name in the text, thus: 'Hayward (1902, p. 6) found....' Usually it is sufficient to give the year only, but if an author has published two or more papers in the same year, the one cited should be distinguished by the letter *a*, *b*, or *c*, etc., corresponding to a similar letter in the list of references, placed after the year, e.g. Jones (1906*b*). Abbreviations such as '16 for 1916 should not be used.

When two collaborating authors are cited their names should be joined by an ampersand, e.g. Smith & Jones. The names of three or more collaborating authors should be given in full on the first occasion of citing, but in later citations *et al.* should follow the first name, e.g. Smith, Jones & Brown (1900) in the first citation should read Smith *et al.* (1900) in later citations.

This system permits of fresh references being inserted in the text and in the list of references without confusion, and has the further advantage of aiding the reader's memory by bringing the name of an author and the date of his publication into juxtaposition.

When the author's name does not form a part of a sentence in the text, but a citation is required, the name and date, separated by a comma, should be placed in parentheses after an important word or at the end of the sentence, e.g. 'Attention has been directed recently to the relation of plant growth to temperature (Lehenbauer, 1914; Livingston, 1916*a*, 1916*b*; Fawcett, 1921).'

Vague terms such as *in litt.* (*in litteris*, in correspondence), *op. cit.* (*opere citato*, in the work quoted), *loc. cit.* (*loco citato*, in the place cited), *ibid.* (*ibidem*, in the same place) and *q.v.* (*quod vide*, which see) should *never* be used instead of dates.

25. *Quotations.* Quotations should be included in double quotation marks (" "), and quotations within quotations in single quotation marks (' '). For example: "It was said by Disraeli that 'one of the greatest legacies of any nation is the memory of a great man and the inheritance of a great example'." Quotations should reproduce the exact words of the original publication, including all details of spelling, capitalization and punctuation. Inverted commas mark the beginning and apostrophes the end of the quotation. Corrections or remarks inserted by the one who quotes should be placed in square brackets [ ], and not in parentheses ( ), because words enclosed in

parentheses occurring in a quotation are understood to belong to the quotation, but words enclosed in brackets are understood to be interpolated by the writer quoting. Omissions from the quotation must be indicated by a series of three full stops or periods separated by spaces, known as an omission mark (...).

A quotation of more than five or six lines should be given as a separate paragraph.

An author who wishes to quote a passage from a foreign language should give an accurate and full translation into English in the text. If he feels that this is insufficient he should quote the passage in the original language in a footnote.

Single quotation marks may be used to emphasize words or phrases which are under discussion (see Note **54**).

26. *The scientific names of animals.* Zoological nomenclature in its present form commenced with the binominal system published by Linnaeus in the tenth edition of his *Systema Naturae* in 1758. After this, various proposals were made to clear away the confusion which gradually arose, but, not having international recognition, they met with little success. Finally, the International Congress of Zoology, held at Cambridge in 1898, set up an International Commission on Zoological Nomenclature as a permanent body. This body issued Codes of Rules and also gave opinions from time to time to control and regulate the whole question of the naming of animals.

In the naming of animals the *International Rules of Zoological Nomenclature* must be adhered to strictly.[1] *In titles of publications and lists* all divisions down to the family and subfamily should be printed in Roman capitals, with larger initial capitals. Generic and subgeneric names are *italicized* and begin with capitals, e.g. *Canis*, *Musca*. Specific and subspecific names and the names of varieties are italicized, but do *not* begin with capitals, e.g. *familiaris*, *domestica*.

The *full name* of a species includes that of the author, placed after the specific name and printed in Roman type without interposition of any mark of punctuation, followed, after a comma, by the date of publication, e.g. *Fasciola hepatica* Linnaeus, 1758.

When the species has been moved to another genus from that in which the author originally placed it, the author's name and the date of publication are enclosed in parentheses and placed before the name of the worker responsible for the change: e.g. *Acarus ricinus* Linnaeus, 1746 is now known as *Ixodes ricinus* (Linnaeus, 1746) Latreille, 1804. The employment of parentheses has therefore a definite significance, when used according to the 'Rules'. In this connexion authors are referred to an excellent paper by H. A. Bayliss

[1] For the convenience of those who may not have access to the 'Rules', those published in the *Proceedings of the Ninth International Congress of Zoology*, held at Monaco in 1913, are reproduced by C. M. Wenyon (1926, *Protozoology*, **2**, 1336–49). The 'Rules', with few changes except in Article 25 (Law of Priority), were reissued in the *Proceedings of the Tenth International Congress of Zoology*, held at Budapest in 1927 (pp. 1583–1609), together with summaries of opinions rendered and a Code of Ethics in regard to preoccupied names. Reprints of these Rules are still unobtainable.

(1926, *Parasitology*, **18**, 203–5) on the correct use of host names in parasitology. Dobell's paper 'On "Teranympha" and other monstrous Latin parasites' (1939, *Parasitology*, **31**, 255–62), giving examples of malformed names, false concords between genera and species and other abuses of the directions, should also be consulted.

Abbreviations of authors' names in connexion with species are often employed, the best-known example being "L." for Linnaeus. Standard abbreviations for the names of the older authors will be found in the *C.R. des Séances du Congrès Internat. de Zool., Paris*, 1880, pp. 486–508. Wrong abbreviations may lead to confusion, and when in doubt it is safer to write the author's name in full.

Abbreviations of generic names. The generic name should always be written out in full when the species is first mentioned in the text, but later a recognized abbreviation, or one which is not likely to lead to confusion, may be used, thus *Rana esculenta* and *R. esculenta.*

Specific names should *never* be abbreviated.

New genera and species. When a new genus or species is described use n.g. and n.sp., *not* nov.gen. or sp.nov. or other variants.

In the text the scientific names of orders, classes and families should be printed in Roman type with initial capital letters. When these names are used adjectively or in anglicized or some other forms they should begin with lower-case letters, e.g. Protozoa, protozoan; Mammalia, mammalian, mammals; Bovidae, bovines, bovine.

27. *The scientific names of plants.* These should be dealt with in accordance with the *International Rules of Botanical Nomenclature*, 3rd ed. (1935).[1]

28. *The scientific names of bacteria and allied organisms.* In the Bacteria it is possible by morphological methods to distinguish groups, but not species. This fact makes the Rules of Nomenclature inapplicable to bacteria in the way they are applied to the morphologically more highly differentiated animals and plants, and it early had the effect of causing bacteriologists to interest themselves in the behaviour rather than in the structure of bacteria. In fact, the study of bacteria has never passed through the phase of detailed and accurate description which has played so important a part in the foundations of zoology and botany, and many medical bacteriologists are scarcely aware of the existence of any rules of nomenclature. It is, therefore, not surprising that, until recently, systematic bacteriology has been very largely neglected.

For many years the medical bacteriologist relied very largely on physiological characters, studied in cultures, and on pathogenicity tests in laboratory animals for identifying stable bacterial types, to which he gave names. More

[1] Edited by J. Briquet, published by Gustav Fisher, Jena, and obtainable through any bookseller. The Rules of Zoological Nomenclature, which are strictly adhered to by medical protozoologists and parasitologists, and are less complex than the Rules of Botanical Nomenclature, seem to be the better foundation for bacteriological nomenclature.

recently he has added to his distinguishing methods antigen-antibody reactions —antigenic analysis—with a technique peculiar to this field of biology.

The inconvenience of a total absence of classification, reflected in the chaotic nomenclature, became so great that attempts were made from time to time to introduce order, especially by the Committee of the Society of American Bacteriologists (Winslow, C. E. A. *et al.* 1917, *J. Bact.* **2**, 505; 1920, **5**, 191) and by D. H. Bergey and his colleagues (*Manual of Determinative Bacteriology*, 1926; 1939). These attempts have not met with the entire approval of bacteriologists in general.

In these classifications morphological differences form the natural basis for the primary subdivisions down to families, and to a considerable extent for the genera, but only to a very small extent for the species. Differences of the grade corresponding to specific differences amongst animals must at present, however, depend to a very large extent on physiological behaviour, antigenic structure, pathogenicity and ecology in general.

In recent years intensive study of small groups has resulted in successful systematic descriptions of differentiable types (species, subspecies or varieties) to which in some groups names have been given and in other groups numbers or letters, or letters and numbers combined.[1]

Topley & Wilson (*The Principles of Bacteriology and Immunity*, 2nd ed. 1936, p. 47) say that "the terms 'genus' and 'species', as applied to bacteria, seem to us to defy definition, except as designations for two convenient groupings, of which genus is the larger including group, and species the smaller included group", and they feel "that the time is not ripe for the creation of large numbers of genera". They have, therefore, adopted the system of nomenclature set out in the final report of the first American Committee (1920), with a few minor modifications, rather than the more elaborate classification of Bergey, and give a list of genera and type species of each genus. In their classification the 'type species' is used as a means of defining a genus, for the genus becomes that group of species which is most closely allied to the type species

Topley & Wilson's nomenclature, which is widely used, should be adopted by authors, unless Bergey's system is preferred.

The binominal names are printed in Italic, the generic name only being given an initial capital letter and used, after the first mention of the species, in an abbreviated form. If it is desired to cite the author's name, this should follow the scientific name without interposition of any mark of punctuation. The date, preceded by a comma, should be placed after the name. The names of subspecies and varieties, the latter being preceded by 'var.' in Roman type, are also printed in Italic, without initial capital letters. For example, the scientific name of the human tubercle bacillus was *Bacillus tuberculosis* Koch, 1884 until in 1896 Lehmann & Neumann erected the genus *Mycobacterium*

[1] Opinion 64 (International Congress of Zoology, Budapest, 1927) states that "serial letters, as *a*, *b*, *c*, etc., are not to be considered as proper specific names".

to include certain acid-fast organisms. The new genus has been generally recognized and therefore, according to the 'Rules', the full name of the tubercle bacillus should now be *Mycobacterium tuberculosis* (Koch, 1884) Lehmann & Neumann, 1896.

Convenient group or quasi-generic names[1] having Latinized forms, such as Pneumococcus, Gonococcus, Meningococcus and Enterococcus, are equivalent to such 'common' names as the 'tubercle bacillus', and are not printed in Italic, though, if it is necessary to draw attention to them, they may have initial capitals. Salmonella is used as a 'common' name by Topley & Wilson and as a generic name by Bergey.

It is unfortunate that the terms 'group', 'type', 'typical', 'variety' and 'variant', more especially 'type', which has a very definite significance in the 'Rules', are often used in an indefinite way by bacteriologists.

"It is very desirable that the proposition of every new systemic group shall be accompanied by a diagnosis, both individual and differential.... This diagnosis should state 'where' the type specimen [or culture] has been deposited", e.g. in the National Type Collection. (Appendix A to the *International Rules of Zoological Nomenclature*, 1913.)

In proposing new generic and specific names the directions given in Articles 8 and 14 of the *International Rules of Zoological Nomenclature* for the formation of such names should be studied carefully and adhered to strictly.

It is also very desirable that the 'Law of Priority' (Article 25)—"The valid name of a genus or species can only be that name under which it was first designated on the condition: (*a*) that this name was published and accompanied by an indication, or a definition, or a description; and (*b*) that the author has applied the principles of binary nomenclature"—or some modification of it (see Budapest Congress, p. 1589) should be applied, whenever possible, in order to avoid species being known by several names, e.g. *Bacillus typhosus*, *Bacterium typhosum*, *Salmonella typhi* or *Eberthella typhi* for the typhoid bacillus. At least, the removal of a species from one genus to another should be indicated (see p. 12).

29. *Chemical nomenclature.* In the titles of papers and, where practicable, in the text, elements and chemical compounds should be written in full and not represented by their symbols.

In general, the rules of the Chemical Society should be followed. When in doubt it is worth consulting the *Collective Index of the Transactions and Abstracts of the Chemical Society*, 1913–22, Part II, Index of Subjects, and *Modern Chemical Nomenclature* (Clarence Smith, *J. chem. Soc.* 1936, pp. 1067–78).

[1] According to the 'Recommendation' appended to Article 8 of the 'Rules', "certain biological groups which have been proposed distinctly as collective groups, not as systematic units, may be treated for convenience as if they were genera, but they require no type species". It seems undesirable to add to the confusion existing in bacteriological nomenclature by making use of this permission.

(1) Chemical symbols do not have a full-stop placed after them unless they come at the end of a sentence.

(2) A hydrate is a compound containing water of crystallization or combination. A compound of a metallic radicle with the hydroxyl group is a hydroxide, e.g. sodium hydroxide, NaOH.

(3) Such terms as acid sodium phosphate should be avoided. Salts of acids containing more than one replaceable hydrogen atom should be described by naming the actual kations, e.g. sodium dihydrogen phosphate and disodium hydrogen phosphate.

(4) Substances containing basic groups have names terminating in *ine* not *in*, e.g. adrenaline, choline, creatine, strychnine, etc. The termination *in* is restricted to certain neutral compounds (carbohydrates, glycerides, glucosides, proteins), e.g. dextrin, pepsin, albumin, etc.

(5) Most of the amino acids follow rule (4): e.g. leucine, glycine, thyroxine, etc. Tryptophan does not have a final *e*, since *ane* is the termination reserved for saturated hydrocarbons, e.g. methane.

(6) All alcohols should have names ending in *ol* not *ite* or *ine*, e.g. glycerol (when used as a chemical term), mannitol, etc. Compounds which are not alcohols, but which are commonly given names ending in *ol*, should be spelt with a terminal *e*, e.g. indole, iminazole, pyrrole, etc.

(7) Lipoid (or better lipoidal) is an adjective. Fatty substances containing nitrogen or nitrogen and phosphorus (lecithin, kephalin, etc.) are lipins.

Pharmacopoeial, i.e. official, names should be given when available and proprietary names avoided whenever possible. The names of non-pharmacopoeial drugs can usually be found in *The British Pharmacopoeial Codex* and *The Extra Pharmacopoeia*. When its name is first used, the brand of a new drug should be stated.

30. *Numerals.* A sentence should never commence with a figure. Revise the sentence, or, if this is impossible, write the number in words.

All specific quantities should be denoted by figures, e.g. 4 in., 3 kg., 56° C. Other numbers up to 100 should be usually denoted by words, e.g. four men, forty-five experiments, but 103 cows, 228 boys. In any case, comparable numbers should be in the same form, and the two styles can sometimes be contrasted usefully. For example: 'No less than 24 of the 42 patients were under twelve years of age.' Cardinal numbers from twenty-one to ninety-nine inclusive should be written with a hyphen. The words in ordinal numbers should be joined by hyphens, e.g. thirty-fourth, but 111th.

Fractions should be written with a hyphen or designated in figures, e.g. two-thirds or $\frac{2}{3}$, and ratios 2/3.

31. *Decimal points.* Except in some statistical papers and in tables, the point should always be preceded by a figure, if necessary 0 being prefixed, e.g. 0·5 must be written, never ·5, because the point may be overlooked by the compositor and proof-readers, and absurd, regrettable or even tragic errors may result.

32. *Per cent and percentage.* The period after per cent is often omitted, and the words are not italicized. The symbol % is often used for per cent both in the text and in tables.

Do not use percentage for per cent. Per cent should be preceded by a figure, e.g. "The results of three analyses gave the following percentages of sugar: 93·2, 93·1 and 92·9. There was an increase of 3 per cent in production."

33. *Dates.* In the text use figures for days of the month, omit st, nd, rd, or th and spell out the name of the month. For example: 12 October 1939. In tables a shortened form as, 12. x. 39, may be used.

The number of the year should be given in full, e.g. 1897, not '97, but 1897–8 should be printed for 1897–1898 or 1897–98. In collective numbers use: 'from 1826 to 1840' *not* 'from 1826–40'.

34. *Measures.* The *metric system* of measurements should be used as far as possible and the following abbreviations employed: km. (kilometre), m. (metre), cm. (centimetre), mm. (millimetre), μ (micron), mμ (millimicron), l. (litre), c.c. (cubic centimetre), c.mm. (cubic millimetre), ml. (millilitre), kg. (kilogram), g. (gram), cg. (centigram), mg. (milligram) μmg or γ (micro-milligram.)

It is not necessary to add *s* to abbreviations to denote plural.

English measures may be used in descriptions of maps, plans, large pieces of apparatus and in some other circumstances, and the following abbreviations employed: cu. (cubic), sq. (square), in. (inch), ft. (foot), yd. (yard), gal. (gallon), oz. (ounce), lb. (pound), gr. (grain), hr. (hour), min. (minute), sec. (second).

The signs ′ and ″ for feet and inches should not be used because they are not understood abroad.

Grains and *grams* should be spelt out in full where there is any conceivable chance of confusion.

35. *Centigrade and Fahrenheit scales.* If the Fahrenheit scale is used the equivalent Centigrade measurement should be stated in parenthesis for the convenience of most scientific workers, especially foreigners; thus 212° F. (100° C.).

36. *Abbreviations applicable in the text*: e.g. (*exempli gratia* = for example), i.e. (*id est* = that is to say), viz. (*videlicet* = namely), Fig. (Figure), Pl. (Plate), exp. (experiment), × (linear magnification). The abbreviation N.B. (*Nota bene*—note well) should not be required, and the use of *sic* (Latin adv. = so; appended in parentheses after a word or expression in a quoted passage as guarantee that it is quoted correctly, though its incorrectness or absurdity would suggest that it is not) is seldom necessary.

After most recognized abbreviations, such as those for titles, months, measures, weights and points of the compass, a full-point should be printed, but not after Mr, Dr, St (Saint).

Contracted forms of names of diseases and methods, such as T.B., C.S.F., W.R., M.L.D., should not be used, unless the name recurs very frequently. If used, they should be explained on the first occasion.

37. *Capitals* should be used sparingly and according to a uniform style throughout. The first letter of names of persons, countries, languages, places, genera, families and orders of animals and plants and manufactured products, and of the first words of sentences, headings, and legends should be capitalized.

38. *The methods of indicating that italic, capitals, etc. should be used.* Italic is indicated by a single line, small capitals by two lines, large capitals by three lines and Clarendon (black) type by a single wavy line under the selected words.

For example, the last sentence would appear as follows: *Italic* is indicated by a single line, SMALL CAPITALS by two lines, LARGE CAPITALS by three lines and **Clarendon** (black) type by a single wavy line under the selected words.

The type in general use is called Roman.

Italic should not be used for emphasis, except for a new term on its first introduction.

39. *Summary.* An author should end his descriptive matter with a brief, but very carefully considered and worded, summary of the significant contents of his paper and of the conclusions at which he has arrived. These conclusions should be warranted by the evidence presented. In most cases the summary should be confined to facts considered in the text and deductions from them, and should indicate clearly which of the results and conclusions are new.

A carefully considered summary may help an author to rearrange his text to better advantage, and may draw his attention to omissions and to the necessity for the further consideration of some points.

40. *Conclusions.* The specific conclusions and deductions should be very carefully worded and usually stated in the *past tense*, because the past tense emphasizes the special conditions of the particular experiments and avoids confusing special with general conclusions. "The *present tense* expresses universal truths or permanent arrangements." (Bain, A, 1874, *A Companion to the Higher English Grammar*, p. 203.)

It should be remembered that many readers peruse the Summary before reading the paper and that some readers and reviewers read the Summary and Conclusions only.

41. *Acknowledgements* for assistance rendered to the writer are best given in a paragraph after the Summary. Usually there is no heading, but the Acknowledgements are preceded by a break or 'white line' in the text. When few, acknowledgements may be included in a paragraph in the Introduction.

Credit should always be given to those who have helped the author directly or assisted him with suggestions or criticisms. Acknowledgements should be made with simplicity and tact, since effusive acknowledgements may be very embarrassing to both helpers and critics.

Throughout the text credit should always be given for ideas taken directly from any publication.

42. *List of references to the literature.* This list should not be styled 'Bibliography', for only in rare instances does this term apply.

The list, headed 'References', and given at the end of the paper, should confine itself strictly to publications cited in the text (see Note **24**). When the author has not had access to an original publication, the source of his information should be stated in parentheses. To quote second-hand information as if it was derived from the original publication is dishonest and liable to mislead others and even the author himself.

References are best given in full. A list of references with the titles included is of very considerable interest and value. The titles supply information, sometimes of an unexpected nature, about previous work having some bearing, direct or indirect, on the subject of the paper, and thus help to widen the reader's views and perhaps to indicate to him some new approach. They also supply information about the types of work undertaken by the various authors cited and help the reader to connect their names with such work, and further they often bring to the reader's notice papers which have appeared in publications not accessible to him, and articles and books which he has overlooked. At the present time, when the output of scientific papers is so great, these are very important services.

On the other hand, the abbreviated list of references, given according to the same plan but with the titles of the papers omitted, as now found in most journals, has not only an uninviting appearance, but requires to be studied and expanded in a library to be of any value. Would the bibliography following an obituary notice, or the author's index of a journal or a page of the *Index Medicus* have, without consulting a library, any interest or value, if printed in the abbreviated form?

Each reference should begin with the author's surname, followed by his initials, the date of publication (in parentheses), the title of the paper, the name and volume of the journal and the pages occupied by the text, as explained in the following sections:

(*a*) *References should be ordered alphabetically* according to the author's name and not by dates, except in the case of a number of articles by the same author which should be listed in chronological order.

(*b*) *The authors' surnames*, in small capitals followed by a comma, precede their initials, both in single and joint publications. Examples:

For L. G. NEUMANN *write* NEUMANN, L. G.

For E. H. PAVLOVSKY & A. K. STEIN *write* PAVLOVSKY, E. H. & STEIN, A. K. Some writers illogically place the first author's initials after his surname, and those of joint author before his surname: e.g. PAVLOVSKY, E. H. & A. K. STEIN.

When an author uses two family names linked by a hyphen, the name preceding the hyphen takes precedence, thus: *for* H. H. GODWIN-AUSTEN *write* GODWIN-AUSTEN, H. H.

When family or other names are used without a hyphen, the second name takes precedence, thus: *for* I. CLUNIES ROSS *write* ROSS, I. CLUNIES or ROSS, I. C.

The authors' names should be doubly underlined to show that small capitals are required in print.

(*c*) *Date of publication* (in parentheses). By placing the date immediately after the author's name the two become closely and helpfully associated in the reader's mind.[1]

When an author has published two or more papers in the same year, they should be arranged according to the dates of publication and distinguished by the suffixes *a*, *b*, *c*, etc., placed immediately after the year symbol within the parentheses (see Note **24**). The date on which a communication is made to certain well-known Societies is accepted as that of 'publication' in relation to priority of scientific discovery. Except in such cases priority is based on the date when a journal is issued for sale. (See Note **87** (13).)

(*d*) *The title of a paper* or of an article in a book should be written out in full as it appears in the original publication, but capitals should not be used except for names. The titles are printed, without quotation marks, in ordinary type. If translated from another language the title should be enclosed in brackets [ ]. (See Note **43**, example 4.)

(*e*) *The names of the periodicals*, in which the articles cited have appeared, are printed in Italic and are abbreviated according to the abbreviations given in *World List of Scientific Periodicals*, published by the Oxford University Press.

Such abbreviations as *J.R.A.M.C.* or *B.M.J.* should not be used, because they are incomprehensible to many readers, especially foreigners. If the author does not know the accepted abbreviations it is best for him to write out the names in full. In writing out the names of foreign periodicals special care should be taken to spell the words correctly and to add the proper accents, if any.

Where the same journal is cited in consecutive references the use of '*ibid.*', or other abbreviations mentioned in Note **24**, is undesirable, for, if changes are made in the list, it is likely to lead to errors.

(*f*) *The name of a book*, which is cited, should be written out in full and printed in Italic. The edition, the numbers of pages, plates and figures, the place of publication and the name of the publisher should be added in ordinary type (see Note **43**, example 10).

(*g*) The *volume number* is given in Arabic numerals printed in Clarendon type in preference to Roman numerals, which are more difficult to distinguish in the higher numbers.

Omit the words Volume, Tome, Band, or their abbreviations, Vol., T., Bd.

Some publications, such as Annual Reports and the Transactions of some Societies and even some Journals, have no volume numbers. In such cases the date of publication is given as usual in parentheses. It should be noted that in the names of some of these, especially Annual Reports, dates are given

[1] Some journals place the date after the author's name, but not in parentheses; others put the date before the number of the volume, which brings all numbers, including those of the pages, into somewhat confusing juxtaposition; others again place the date before the author's name, or at the end of the reference in parentheses. None of these ways of dating is as satisfactory as that here described.

which may antecede those of publication by a year or more (see Note **43**, example 8).

Some of the numerous Bulletins issued are numbered and these numbers should be quoted (see Note **43**, example 9); others are not numbered.

Usually, the Part, Fascicle or bimonthly or quarterly 'Number' of a periodical need not be given, provided the volume number is quoted. For some foreign periodicals it is necessary, however, to give the Part number.

(*h*) *The series number.* In the case of periodicals divided into series, the series number, letter or name should be given in parentheses before the volume number (see Note **43**, examples 5, 6, 7).

(*i*) *Page numbers.* The position of the paper in the periodical and its length should be indicated by quoting the numbers of its first and last pages, separated by a dash and set in ordinary type. This supplies information about the length of the paper. Omit 'p.' or 'pp.' unless, as when the page number follows a Bulletin number, its omission is likely to cause confusion (see Note **43**, example 9).

43. The following *examples of different kinds of references* show how they should be set out in the 'List of references'. Note the punctuation.

ASHBURN, P. M. & CRAIG, C. F. (1908). A comparative study of Tsutsugamushi disease and spotted or tick-fever of Montana. *Boston Med. Surg. J.* **158**, 749–61.

BONNET, A. (1903*a*). Sur le développement post-embryonnaire des Ixodes. *C.R. Acad. Sci., Paris*, **137**, 419–20.

PROUTY, MARGARET JO & COATNEY, G. ROBERT (1934). Further studies on the biology of the pigeon fly, *Pseudolynchia maura* Bigot (Diptera, Hippoboscidae). *Parasitology*, **26**, 249–58. (Note the method of giving the scientific name.)

PAVLOV, P. N. (1916). [Molecular state of pure liquids.] *J. Russ. Phys. Chem. Soc.* **48**, 1175–96. Cited in *Chem. Absts.* 1917, **11**, 1583–4. (Note translation of title and citation from another journal.)

AUSTEN, E. E. (1921). The prey of the yellow dung fly, *Scatophaga stercoraria* L. *Ann. Mag. Nat. Hist.* (9), **8**, 118–23. (Note series number.)

THOMPSON, JAMES (1918). The chemical action of *Bacillus cloacae* (Jordan) on citric and malic acids in the presence and absence of oxygen. *Proc. Roy. Soc.* B, **86**, 1–12. (Note series letter.)

DEMPSTER, W. T. (1934). European anatomy before Vesalius. *Ann. med. Hist.* (N.S.) **6**, 448–69. (Note series name.)

BACK, E. A. (1918). Danger of introducing fruit flies in the United States. *U.S. Dep. Agric. Yearb.* 1917, pp. 185–96. (Note difference in dates.)

DODGE, R. & BENEDICT, F. G. (1915). Psychological effects of alcohol. *Publ. Carneg. Instn*, no. 232, pp. 1–281. (Note the number of the publication.)

DELAFIELD, FRANCIS & PRUDDEN, T. MITCHELL (1912). *A Text-book of Pathology*, 9th ed. 1114 pp., 13 pls., 687 text-figs. London: Baillière, Tindall & Cox.

The editor cannot be expected to verify citations or to look up dates, volume numbers, etc., or to supply other data which have been omitted, but he can aid the author in revising the form to suit the style of the journal.

44. *Abbreviations of Periodicals commonly quoted in the Journal of Hygiene and Parasitology.*

The abbreviations follow those of the World List of Scientific Periodicals

Periodical	Abbreviations
Acta Medica Scandinavica	*Acta med. scand.*
American Journal of Hygiene	*Amer. J. Hyg.*
American Journal of the Medical Sciences	*Amer. J. med. Sci.*
American Journal of Pathology	*Amer. J. Path.*
American Journal of Physiology	*Amer. J. Physiol.*
American Journal of Tropical Diseases	*Amer. J. trop. Dis.*
Annales de l'Institut Pasteur	*Ann. Inst. Pasteur*
Annales de Médecine	*Ann. Méd.*
Annali d' Igiene (sperimentale)	*Ann. Igiene (sper.)*
Annals of Applied Biology	*Ann. appl. Biol.*
Annals and Magazine of Natural History	*Ann. Mag. nat. Hist.*
Annals of Medical History	*Ann. med. Hist.*
Archiv für Anatomie und Physiologie	*Arch. Anat. Physiol., Lpz.*
Archiv für experimentelle Pathologie und Pharmakologie	*Arch. exp. Path. Pharmak.*
Archiv für die gesamte Physiologie	*Pflüg. Arch. ges. Physiol.*
Archiv für Hygiene	*Arch. Hyg., Berl.*
Archiv für mikroskopische Anatomie	*Arch. mikr. Anat.*
Archiv für pathologische Anatomie	*Virchows Arch.*
Archiv. für Protistenkunde	*Arch. Protistenk.*
Archiv. für Schiffs- und Tropenhygiene	*Arch. Schiffs- u. Tropenhyg.*
Archives de Biologie	*Arch. Biol., Paris*
Archives de l'Institut Pasteur d'Algérie	*Arch. Inst. Pasteur Algér.*
Archives de l'Institut Pasteur de Tunis	*Arch. Inst. Pasteur Tunis*
Archives internationales de Physiologie	*Arch. int. Physiol.*
Archives de médecine expérimentale et d'anatomie pathologique	*Arch. Méd. exp.*
Archives of Neurology and Psychiatry, London	*Arch. Neurol. Psychiat., Lond.*
Annales de Parasitologie Humaine et Comparée	*Ann. Parasit. hum. comp.*
Archives de Physiologie normale et pathologique	*Arch. Physiol. norm. path.*
Annales de la Société de Médecine Tropicale	*Ann. Soc. méd. Trop.*
Archivio di farmacologia sperimentale e scienze affini	*Arch. Farmacol. sper.*
Australian Journal of Experimental Biology and Medical Science	*Aust. J. exp. Biol. med. Sci.*
Beiträge zur chemischen Physiologie und Pathologie	*Beitr. chem. Physiol. Path.*
Beiträge zur pathologischen Anatomie und zur allgemeinen Pathologie	*Beitr. path. Anat.*
Berliner klinische Wochenschrift	*Berl. klin. Wschr.*
Biochemical Journal	*Biochem. J.*
Biochemische Zeitschrift	*Biochem. Z.*
Biological Reviews	*Biol. Rev.*
Biologisches Zentralblatt	*Biol. Zbl.*

PERIODICAL	ABBREVIATIONS
Brain	*Brain*
British Journal of Children's Diseases	*Brit. J. Child. Dis.*
British Journal of Experimental Biology	*Brit. J. exp. Biol.*
British Journal of Experimental Pathology	*Brit. J. exp. Path.*
British Journal of Psychology	*Brit. J. Psychol.*
British Journal of Tuberculosis	*Brit. J. Tuberc.*
British Medical Journal	*Brit. med. J.*
Bulletin of Entomological Research	*Bull. ent. Res.*
Bulletin of Hygiene	*Bull. Hyg., Lond.*
Bulletin de la Société de Pathologie exotique	*Bull. Soc. Path. exot.*
Canadian Medical Association Journal	*Canad. med. Ass. J.*
Chemical Abstracts	*Chem. Abstr.*
Chemische Zeitschrift	*Chem. Z.*
Comptes rendus hebdomadaires des séances de l'Acad. des Sciences	*C.R. Acad. Sci., Paris*
Comptes rendus de la Société de Biologie	*C.R. Soc. Biol., Paris*
Deutsche medizinische Wochenschrift	*Dtsch. med. Wschr.*
Edinburgh Medical Journal	*Edin. med. J.*
Endocrinology	*Endocrinology*
Ergebnisse der Physiologie	*Ergebn. Physiol.*
Ergebnisse der allgemeinen Pathologie und pathologische Anatomie	*Ergebn. allg. Path. path. Anat.*
Folia Haematologica	*Folia haemat., Lpz.*
Graefes Archiv	*v. Graefes Arch. Ophthal.*
Guy's Hospital Reports	*Guy's Hosp. Rep.*
Haematologica	*Haematologica*
Heart	*Heart*
Hoppe-Seylers Zeitschrift	*Hoppe-Seyl. Z.*
Indian Journal of Medical Research	*Ind. J. med. Res.*
Indian Medical Gazette	*Indian med. Gaz.*
Jahresbericht Physiologie und experimentelle Pharmakologie	*Jber. Physiol. exp. Pharm.*
Japanese Journal of Experimental Medicine	*Jap. J. exp. Med.*
Johns Hopkins Hospital Bulletin	*Johns Hopk. Hosp. Bull.*
Johns Hopkins Hospital Reports	*Johns Hopk. Hosp. Rep.*
Journal of the American Medical Association	*J. Amer. med. Ass.*
Journal de l'Anatomie et de la Physiologie	*J. Anat., Paris*
Journal of Anatomy	*J. Anat., Lond.*
Journal of Bacteriology	*J. Bact.*
Journal of Biochemistry	*J. Biochem.*
Journal of Biological Chemistry	*J. biol. Chem.*
Journal of Biophysics	*J. Biophys., Tokyo*
Journal of the Canadian Medical Association	*J. Canad. med. Ass.*
Journal of Cellular and Comparative Physiology	*J. cell. comp. Physiol.*

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Periodical	Abbreviations
Journal of the Chemical Society	*J. chem. Soc.*
Journal of Clinical Investigation	*J. clin. Invest.*
Journal of Comparative Pathology and Therapeutics	*J. comp. Path.*
Journal of Experimental Biology	*J. exp. Biol.*
Journal of Experimental Medicine	*J. exp. Med.*
Journal of Experimental Psychology	*J. exp. Psychol.*
Journal of Experimental Zoology	*J. exp. Zool.*
Journal of General Physiology	*J. gen. Physiol.*
Journal of Genetics	*J. Genet.*
Journal of Hygiene	*J. Hyg., Camb.*
Journal of Helminthology	*J. Helminth.*
Journal of Immunology	*J. Immunol.*
Journal of Industrial Hygiene	*J. indust. Hyg.*
Journal of Infectious Diseases	*J. infect. Dis.*
Journal of Laboratory and Clinical Medicine	*J. Lab. clin. Med.*
Journal of the Marine Biological Association	*J. Mar. biol. Ass. U.K.*
Journal of Medical Research	*J. med. Res.*
Journal of Metabolic Research	*J. metab. Res.*
Journal of Nutrition	*J. Nutrit.*
Journal of Parasitology	*J. Parasit.*
Journal of Pathology and Bacteriology	*J. Path. Bact.*
Journal of Pharmacology and Experimental Therapeutics	*J. Pharmacol.*
Journal de Physiologie et de Pathologie générale	*J. Physiol. Path. gén.*
Journal of Physiology	*J. Physiol.*
Journal of the Royal Microscopical Society	*J. R. micr. Soc.*
Journal of Scientific Instruments	*J. sci. Instrum.*
Journal of State Medicine	*J. State Med.*
Journal of Technical Methods	*J. tech. Meth.*
Journal of Tropical Medicine and Hygiene	*J. trop. Med.* (*Hyg.*)
Kitasato Archives of Experimental Medicine	*Kitasato Arch.*
Klinische Wochenschrift	*Klin. Wschr.*
Lancet	*Lancet*
Medical Journal of Australia	*Med. J. Aust.*
Medical Journal of South Africa	*Med. J. S. Afr.*
Medical Research Council Special Reports. *See* Special Report series	
Medical Science, Abstracts and Reviews	*Med. Sci.*
Medico-Chirurgical Transactions	*Med.-chir. Trans.*
Münchener medizinische Wochenschrift	*Münch. med. Wschr.*
Nature	*Nature, Lond.*
Parasitology	*Parasitology*
Philosophical Transactions of the Royal Society	*Philos. Trans.*
Physiological Abstracts	*Physiol. Abstr.*
Physiological Reviews	*Physiol. Rev.*
Practitioner	*Practitioner*

PERIODICAL	ABBREVIATIONS
Presse médicale	*Pr. méd.*
Proceedings of the Physiological Society	*Proc. Physiol. Soc.*
Proceedings of the Royal Dublin Society	*Sci. Proc. R. Dublin Soc.*
Proceedings of the Royal Society	*Proc. Roy. Soc.*
Proceedings of the Royal Society of Canada	*Proc. Roy. Soc. Can.*
Proceedings of the Royal Society of Edinburgh	*Proc. Roy. Soc. Edinb.*
Proceedings of the Royal Society of Medicine	*Proc. R. Soc. Med.*
Proceedings of the Society of Experimental Biology and Medicine	*Proc. Soc. exp. Biol., N.Y.*
Public Health	*Publ. Hlth, Lond.*
Quarterly Journal of Experimental Physiology	*Quart. J. exp. Physiol.*
Quarterly Journal of Medicine	*Quart. J. Med.*
Quarterly Journal of Microscopical Science	*Quart. J. micr. Sci.*
Reports of British Association	*Rep. Brit. Ass.*
Review of Applied Entomology	*Rev. appl. Ent.*
Review of Applied Mycology	*Rev. appl. Mycol.*
Rivista de Malariologia	*Riv. Malariol.*
Science	*Science*
South African Journal of Science	*S. Afr. J. Sci.*
Special Report Series Medical Research Council, London	*Spec. Rep. Ser. med. Res. Coun., Lond.*
Sperimentale. Archivio di biologia normale e patologica	*Sperimentale*
Transactions of the Royal Society of Canada	*Trans. Roy. Soc. Can.*
Transactions of the Royal Society, Edinburgh	*Trans. Roy. Soc. Edinb.*
Transactions of the Royal Society, South Africa	*Trans. Roy. Soc. S. Afr.*
Transactions of the Royal Society of Tropical Medicine and Hygiene	*Trans. R. Soc. trop. med. Hyg.*
Tropical Diseases Bulletin	*Trop. dis. Bull.*
Wiener medizinische Wochenschrift	*Wien. med. Wschr.*
Zeitschrift für allgemeine Physiologie	*Z. allg. Physiol.*
Zeitschrift für Biologie	*Z. Biol.*
Zeitschrift für experimentelle Pathologie und Therapie	*Z. exp. Path. Ther.*
Zeitschrift für Hygiene und Infektionskrankheiten	*Z. Hyg. InfektKr.*
Zeitschrift für Immunitätsforschung	*Z. ImmunForsch.*
Zeitschrift für Kinderheilkunde	*Z. Kinderheilk.*
Zeitschrift für Parasitenkunde	*Z. Parasitenk.*
Zeitschrift für physiologische Chemie	*Hoppe-Seyl. Z.*
Zeitschrift für Psychologie und Physiologie der Sinnesorgane	*Z. Psychol. Physiol. Sinnesorg.*
Zeitschrift für wissenschaftliche Zoologie	*Z. wiss. Zool.*
Zeitschrift für Zellforschung und mikroskopische Anatomie	*Z. Zellforsch.*
Zentralblatt für Bakteriologie, Parasitenkunde und Infectionskrankheiten	*Zbl. Bakt.*
Zentralblatt für Biochemie und Biophysik	*Zbl. Biochem. Biophys.*
Zentralblatt für Physiologie	*Zbl. Physiol.*

45. *Appendices.* Every appendix should have a suitable subheading, stating to what it refers, and when there is more than one, they should be numbered from I onwards in Roman numerals printed in bold type.

Addenda rendered necessary by the publication of papers bearing on the subject after the submission of the paper to the editor or by important new observations should be numbered in Roman numerals in bold type and dated.

(ii) *Style and wording*

46. *Style.* "*Style* is the mode in which we express ourselves; it is the art of choosing words, of setting them in sentences and of arranging sentences into paragraphs. It is the way in which a person says what he has to say." (Nicholson, D. B. (1914), *A Handbook of English.*)[1]

The style of communications to journals should have three outstanding qualities: clearness, simplicity and brevity.

"Plain writing is not something beneath the plane of endeavour of the scientific investigator—indeed it is something so hard to attain that most of us need to aim high, to raise our standards of scientific thinking." (Smith, G. O., 1915, "Plain writing", *Science*, **42**, 620.) "If judged by their literary merit many scientific papers would not deserve publication; only the facts they relate give them value; but unless the facts are stated plainly, in proper order, and with skill to carry conviction the purpose of their publication will not be achieved....Correctness, clearness and conciseness are ideal qualities of good scientific writing....The scientific writer, above all others, should choose words that have precise meanings or to which precise meanings may be given....Of two forms of expression which may be used in the same sense that one should be chosen which is susceptible to but one interpretation...and of two forms of expression which may be used in the same sense the simpler should be chosen." (2)

"Slatternly writing may well be compared with careless and superficial laboratory methods, inaccurate references and controls, and imperfect notes of processes....By disorderly and hazy writing then we fall into worse things than muddle: we blunt the probity of our minds; we slur over difficulties and cover up ignorances....The author who does not try to make the meaning clear and unequivocal will suffer in neglect for his carelessness...and serve him right: others will get the credit. Take pains therefore; with yourself first, then with your reader....Force, lucidity, unity, simplicity, economy of expression are virtues we may all attain; originality will be as God pleases." (1)

47. *Use of first or third person.* An author should determine at the outset whether he will write in the first or in the third person. "Both 'I' and 'the

[1] The quotations and illustrations in the following Notes are taken mainly from Allbutt (1925) and G. M. Wood (1916, *Suggestions to Authors*, etc., Government Printing Office, Washington). Some are taken from other sources and a few of the illustrations are original. The quotations in Note **55** are taken mainly from *Mind the Stop* by G. V. Carey (1939). Quotations from the authors mentioned are marked (1), (2) and (3) respectively.

writer' should not be used indiscriminately. If discreetly used the first person is no less modest or becoming than the third."(2) The needless multiplication of 'I' should, however, be avoided. In joint publications the use of 'we' is correct, but the indefinite 'we', e.g. 'If with these organisms we include...', should seldom, and the editorial 'we', used in newspapers in the sense of 'I', should never, be employed.

48. In the construction of the paper the *order of the sections*, of the paragraphs, of the sentences, of the clauses and of the words have to be considered. Within the *sections* the order adopted may be either that of the research or that of logical exposition of the subject.

49. "A *paragraph*, unless it be in a summary or emphatic position, is more than a sentence; it is a group of sentences, one bearing on the other, and thus compassing a wider meaning than the sentence; it has accordingly its own subject and unity, though of a much narrower scope than the chapter [or section]. A careful portioning of the matter into such paragraphs, all sufficient and various enough to contain the several lines of the argument, but none too long for the reader to grasp, is of great assistance to him....On the other hand, 'to paragraph' a short sentence as a summary, as an axiom, or for emphasis, is often very effective.

"Not infrequently, in page after page, sentences are treated as paragraphs; or again the paragraphs, if any there be, do not correspond with natural parts of the argument, but are fragments or hunks of the thesis."(1)

50. Every *sentence* should be as simple as possible; apart from technical terms it should be intelligible at the first reading to any educated person. The parts of sentences should run in logical order. Usually time clauses should come first and place clauses second to them. Condition clauses and clauses introducing important modifications should not be left to the end. For example: "'This reaction can always be obtained, if the temperature is kept at 20° C.' (The clauses should have been reversed.) Again in 'Twenty-eight patients were treated with hypodermic injections, of which eight died', the 'trail' pulls us up unexpectedly, and makes us fear they died of the injections! The qualifying clause should have followed 'patients'".(1) The author must also see that his words are used in unmistakable senses, that unnecessary words are not used, and that words of certain classes, e.g. 'data', 'occurs', 'tends to be', are not overused or used in more than one sense.

51. *The order of the words* in a sentence determines the meaning, and is as important as the order of the clauses. "To refuse this minor care [careful ordering of the words] is an ill compliment to the reader, and, if his matter be worth the writing, an ill service to the author."(1) For example: "'Not always wise' has not the same meaning as 'Always not wise'; yet the difference is one of order only. 'All mosquitoes are not vehicles of infection' is a different proposition from 'Not all mosquitoes are vehicles of infection'."(1)

By placing 'when heated' after 'abstain' and 'first' after 'was' the meanings of the following sentences—the second an astonishing statement by

no mean author—are completely altered: "Abstain from iced drinks when heated"; "The first eclipse of the sun was foretold by Thales."(1)

"'We can offer you a dining table which will seat twelve persons with round legs, and one which will seat fourteen persons with square legs' (a recent advertisement)."(1)

52. *Repetition of words.* The author should learn when to repeat exactly the same word he has just used and where to employ a synonym. "If the word first accepted be precisely the word wanted, to vary it is to vary the sense, to confuse the argument and to vex the reader....E.g. 'In the first series the reaction was present on 37 occasions, in the second series it occurred 32 times, while in the third it was observed in 27 instances.'"(1)

53 *Tenses. Experimental facts* should be given in the *past* tense, but the *presentation of the data* in the *present* tense, e.g. "Experiments have been made and the results are shown in Fig. 2." Specific conclusions and deductions should be stated in the *past* tense, because this always emphasizes the special conditions of the particular experiments and avoids confusing special with general conclusions. (See Note **40**.)

54. *Some words and phrases often misused. Pronouns.* "It must be admitted that in English the pronoun is very elusive, yet, by a little watchfulness in the order of words and clauses, ambiguity may be avoided....Perhaps the most frequent of these ambiguities is the occurrence of '*it*' after two or three antecedents, the reference, likely enough, being not to the last of them"(1): e.g. "If a public well should encounter an open passage in limestone into which a drainage well carries sewage, typhoid may be communicated to hundreds of *its* citizens, even though the town might be miles from the source of contamination"; and "The water found is cool, clear and delicious, and renders *it* a most delightful place of residence."(2) "The wind blew down the wall; *it* was very high". Which was very high, the wind or the wall?

"On the revision of a manuscript, pause at every such pronoun till you are sure that its particular antecedent is unmistakable. Remember the well-known example: 'No one yet had demonstrated the structure of the human kidneys, Vesalius having examined *them* only in dogs.' (Human kidneys in dogs!)"(1) "The ghost of his old partner appeared to Scrooge. He told him he must reform."

The neutral or indefinite pronoun 'one' should be avoided or used very sparingly. Such a sentence as, "One opens a vein at once", is better written, "A vein must be opened". "A charming lady writes: 'Cobras and kraits were a peril in our hospital, and *one walks about* at nights with a lantern.' Think of that!"(1) Occasionally even with careful writers the pronoun *one* may be followed later in a sentence or paragraph by 'we', 'your', etc. "*One* should control *his* feelings".

The indefinite use of 'they' should be avoided. "They make good microscopes in Germany" is better written "Good microscopes are made in Germany".

"The use of 'you' and 'yours' as indefinite pronouns is generally vulgar, and not rarely unpleasant; e.g. when a student reads to me, '*you* may then get secondary deposits of cancer in *your* liver'." (1)

'This'. A vague *this* not infrequently begins a paragraph: "e.g. 'This being so', etc., where 'this' may indicate any one of several antecedents or the sum, or none of them, without definite distinction. It is better, therefore, to insert a noun substantive after 'this': e.g. 'This problem', 'this story' and the like." (1)

"'*That.*' Keep down your 'thats'; they multiply like lower organisms: e.g. 'He told me *that* he told you *that* you were to see *that* all was in order'." (1)

"'*That that*' is an ugly couple;" e.g. "I am of opinion *that that* [this] is a good method." (1)

'That' and 'which'. "'That' is the 'restrictive' pronoun, to be used where the clause that it introduces is necessary to complete the meaning of its antecedent; 'which' introduces some added or incidental information, which is not needed to complete the sense.... 'Which' may be substituted for 'that' without impropriety, though 'that' cannot take the place of the relative 'which'." (2)

'And which' is a common error, e.g. "The second assertion imputes the evil to a cause in itself inevitable, *and which* has only partially operated in producing it." A clause should not begin with 'and which' unless a previous clause in the same sentence has begun with 'which'.

'Neither...nor.' *Nor* follows *neither*, unless an alternative is stated. "I am neither an ascetic in theory or practice" contains three errors. It should read "I am not an ascetic either in theory or in practice".

'Either' should refer to one of two things, but is sometimes so misused that it may mean 'each' or 'both'; "a pestilent and bewildering error:...as e.g. 'A tuck must be made at either end of the sheet' (one or both?)". (1)

'Both', 'either' and 'neither' are continually misplaced: e.g. "'He found *both* traces of sugar and albumin', where 'both' is intended to apply not to 'traces' but to 'sugar and albumin'." (1)

'Former' and 'latter' are often misused. They should not be used if there are more than two antecedents, nor should they be used in a sentence that is so long and involved that the reader will have to look back to find what the words refer to. If there are more than two antecedents, the expressions 'the first', 'the second', 'the third', 'the last' should be used.

Adverbs. "Padding is often mischievous as well as superfluous, as with adverbs falsely used; such as 'certainly', 'constantly', 'undoubtedly', 'absolutely', 'therefore', 'of course', 'perfectly', and the like, when indeed certainty, constancy, proof, perfection may be remote enough. Some expletives in common use are always wrong, such as 'most constant' (as if one should say 'more square' or 'more circular')." (1)

Adverbs are often wrongly placed, e.g. "People who eat mushrooms often die." How often do they die? "'Although the thing is quite artistically negligible'; 'artistically' ought to have followed 'although'." (1)

Adverbs or adverbial phrases—'often', 'sometimes', 'at times', 'always'—that should apply to time are sometimes used to denote place, e.g. "These fissures often intersect" was written to mean "Many of the fissures intersect".

'Only'. "Few writers think of the proper place of that flighty little word 'only'.... 'Only seems to occur' has a widely different meaning from 'seems to occur only'." The adverb 'only' should be placed as near to the word, or clause, it qualifies as the proper construction of the sentence will permit. 'Only' is often used wrongly for 'one', 'alone', 'sole' or 'not until'—"'You alone stood by me' is right—'You only stood by me' suggests that you might have sat down." (1) "I only want three" is wrong; "I want only three" is right. "I only saw John and Charles" leads to the inference that the speaker saw but could not speak to them, not that they were the only persons whom he saw. 'Alone' expresses the sense of 'unaccompanied.' 'Merely' requires as much care in placing as 'only'.

'While' is an adverb of time, but is often used wrongly for 'and', 'since', 'although', 'because', 'whereas', 'nevertheless', 'yet', 'though' and 'but',; e.g. "while [though] this is the usual arrangement, yet...".

'Since', which is likely to be understood as an adverb referring to time, is sometimes used where 'as' or 'because' would prevent ambiguity, e.g. "The validity of Smith's conclusion is in doubt since [as, because] Brown found that...."

'Always' is often used wrongly for 'everywhere'.

'Between' should be used of two things only.

'Because' and 'as' are being discarded and replaced by "such clumsy and inaccurate phrases as 'owing to the fact that'". (1)

'Quite' is often used wrongly for "'very', 'somewhat' or 'rather', or is used superfluously. Phrases like 'quite large', 'quite a distance' or 'quite a few' should be avoided". (2) If used at all, 'quite' should be used in its primary sense to mean 'entirely' or 'completely' as in the phrases 'quite conclusive', 'not quite finished'.

'When' and 'where', indicating respectively time and place, are commonly misused. "*When* [*where*] the thickness is greatest it is 5 feet." (2)

"'Otherwise' means not a negative, but after another fashion, or in another way.... 'Their success or otherwise', or 'its presence or otherwise' is meaningless. The sentence should run 'Their success or failure', 'its presence or absence'." (1)

The 'split infinitive', in which 'to' is separated by an adverb or other word from the verb to which it relates, should be avoided, because usually it "weakens the sense and puts an adverb in a less effective place; e.g. 'Concentration seems to practically alone determine this reaction' should have run 'In practice concentration alone seems to determine the reaction': 'in practice' comes now, where it was wanted, in an emphatic place; and 'alone' is attached to 'concentration', where it is wanted.... 'To always sleep with the window open' conveys the impression of an everlasting sleep—with the windows open; whereas in all probability something less than this was meant." (1)

Conjunctions, prepositions, etc. "The redundancy of *ands, buts, whiles, sinces*—the bacteria of language—often gives a flabby form to writing otherwise good." (1)

'Than' should not be used for 'when': e.g. "I had scarcely paused *than* he replied."

'With' is much misused, especially for 'and' or 'but'. Not infrequently it is used in place of a verb: e.g. "The average rainfall is 4·84 inches, *with a* [and the] minimum *of* [is] 1·17 inches.... The water is very clear *with* [but has] a faint bluish tinge.... The rock is even grained, finely laminated, (and) well bedded and *with* [exhibits] clearly defined horizontal jointing." (2)

'Such' is misused by many writers. "The deposit is of *such fineness* [so fine] that ordinary filters are of no use." (2)

'All... not' often appears for 'not... all': "'All mosquitoes are not vehicles of infection' is a different proposition from 'Not all mosquitoes are vehicles of infection'." (1)

"'Following' should not be used for 'after' or 'next to'." "He went north following a long illness" (1) sounds like a terrier chasing a dachshund. "Following the fascia is a layer of fat."

"It is a common fault to leave a participle 'hanging' [or unrelated]; that is, without a subject: e.g. 'Complaining of shortness of breath the nurse lifted her into bed' (i.e. the nurse complained?)." "Looking closer [we saw] marks were seen"—the substantive to which a participle relates should appear in the same sentence.

Phrases. Phrases, such as 'there are', 'there were', 'there have been', 'it is', 'it has been' may, of course, begin many sentences, "but the writer who is about to use one of these phrases should consider whether he cannot express his thoughts better in some other way". (2) These phrases not only multiply words but may "have the effect of putting in an inferior place a subject nominative that should preferably stand at or near the beginning of a sentence", (2) and may undesirably detach a sentence from one that precedes it.

"'Known to be', 'found to be' and 'seem to be' are generally superfluous.... On the other hand, these phrases may be improperly omitted where they are required to complete the sense of a statement", (2) as "Under the microscope the surface is [seen to be] covered with minute hairs."

The phrases 'from the standpoint of', 'from the point of view of', 'on the basis of', "are overused by some authors, who employ them in connexions where their propriety may be questioned,... as 'From the standpoint of [According to] this theory'; 'The conclusions stated appear to be warranted on the basis of [by] the data presented'. 'From the point of view of farming' means 'from the farmer's point of view'; the farmer, but not farming, may occupy a point of view". (2)

'In the case of' is often used where 'in' is sufficient. 'In the case of [In] influenza...'.

"The word 'of' in the phrase 'all of' is generally superfluous....'I saw all [not all of] my friends once more'."

'Question' or 'in question' is often used in the place of a 'problem', a 'dilemma', a 'proposition', a 'subject', a 'case', 'this' or nothing whatever. E.g. "'The *question* is one of decreased tissue change', where *answer* would have been nearer the meaning....'The *question* [condition or problem] is one of decreased resistance'."(1) 'The bacillus in question' should not be used for 'the bacillus mentioned' or simply 'this bacillus'.

The use of phrases like 'last year' or 'three years ago' should be avoided, because before publication 'this year' may have passed.

'Etc.' "Its use should be rare, and chiefly for omission of parts of quotations, and the like. When used by an author to eke out his own matter, or to save himself trouble, the reader is disposed to exclaim, 'If you have anything more to say, say it; if not, finish your sentence properly'."(1) Etc. often conveys little meaning, if any. "After phrases following 'for instance', 'for example', 'such as', the use of *etc.* is not only superfluous but improper."(2) E.g. "Deposits of this type occur in several organs, for example, the liver, spleen, *etc.*"

Words. 'Actual' is often wrongly used for 'precise'. As used the word is often redundant: e.g. 'The actual fact.'

'Affect' means to 'influence'; 'effect' to 'bring to pass'.

'Beside' means 'next to'; 'besides' 'in addition to'.

'Case' and 'instance' are often used for 'place', 'patient', 'person', 'example', 'many' 'some' or 'sometimes', e.g. "Specimens in some cases show veins" for "Some specimens show veins". 'In many cases' [many of]. 'In most cases' [usually]. 'In one case' [a specimen].

'Develop' is used for 'appear', 'arise', 'take place', 'form', 'work', 'exploit' "or anything else that happens to be in the mind of the writer who will not take the trouble to think of the word he really wants".(2) E.g. "In some cases fat is developed [occurs]." "These were developed [formed] in great thickness." 'Greatest development' for 'largest size'. 'Typical development' for 'usual' or 'normal'. "The only mineral deposit that has been developed" [worked, exploited]. It has even been "used for retrograde processes: e.g. 'She developed emaciation'."(1)

'Different' should be followed by 'from', not 'than' or 'to'.

'Fact' is often used for 'truth', 'proposition', 'principle', 'conclusion', 'law', 'rule', 'axiom', 'hypothesis', or in the expression 'this is an undoubted fact' for 'in my opinion'. "*A fact is something which has happened,* it has no reference whatever to the future....That a mosquito is the carrier of the parasite of malaria is a truth or a general statement, a hypothesis or a theory, but not a fact; though such a statement as this is founded on a considerable series of facts (or verified past events)....An 'axiomatic fact' (truth) is sheer nonsense; and what is the difference between a fact and an 'actual [or solid] fact'? When we ascribe to Virchow the demonstration of the 'fact' that our

conception of morbid processes must be founded on histological research, we should have said not 'fact' but 'truth' or 'principle'." (1)

'Hypothesis', see 'Theory'.

'Important' and 'importance' are greatly overused. "As a rule 'important' is not the most appropriate word unless it is accompanied by some term denoting why or how the thing described is important, as 'commercially important'." (2) It should not be used for 'abundant', 'valuable', 'conspicuous', 'interesting', 'large', or any other word of clearly defined meaning.

'Invariably' is often used for 'always'.

'Involve' is very commonly used in a slovenly manner for 'attack', 'invade', 'injure', 'affect', 'encroach upon', 'influence', 'permeate', 'penetrate', 'contaminate', 'complicate' and so forth. "The gland was not primarily involved [attacked or affected]." (1)

'Limited' should not be used for 'few', 'small', 'slight', 'narrow', 'reduced' or 'low'.

'Localized' is often used where 'placed', 'referred to', 'small', 'limited', 'enclosed', 'confined', 'deposited', 'diagnosed' and so forth would be more suitable.

'Obvious' and 'obviously' are very commonly used in the sense of 'indubitable' and 'indubitably', terms which in biological sciences can seldom be appropriate.

'Practically' should not be used for 'almost'.

'Previous to' and 'prior to' are clumsy substitutes for 'before'.

'Replace.' It is often better to use 'displace', 'substitute', 'succeed', 'restore' or 'represent'. "The molars were entirely replaced [represented] by a few old stumps." (1)

'Requires' is often wrongly used for 'must be'. "He requires to [must] be careful."

'Subsequent to' is a clumsy substitute for 'after'.

'Theory.' The word *theory* is deplorably misused. 'Guess', 'surmise', 'impression', 'speculation', 'opinion', 'notion' or 'view', especially the last, are often more fitting words.

A "notion or conception, as it bears further examination, may then become more definite and be formulated as an idea or *hypothesis.* If then the observer finds his hypothesis strengthened again and again by methodical observation and experiment, and if again and again it is verified by a continually increasing number of competent observers, it ousts competing hypotheses, if any, and rises to the rank of a *theory*; as for example, the Newtonian theory.... *Theory*, in its proper use, signifies the highest mode of scientific knowledge", whereas an hypothesis is "an idea or working concept for which some probability exists, but not convincing proof....To use it [theory] loosely or slightly is to deprive ourselves of our only term proper to this sense". (1)

'Type' is often wrongly used in the sense of quantity, quality or degree; e.g. 'Influenza has changed its type' [severity]. In a description of a disease

"the 'type' is a kind of fiction" or imaginary pattern, but in zoology 'the type' is a particular specimen. 'Characteristic' is often a better word to use than 'typical'.

'Various' means 'different', though persistently misused for 'numerous'. 'Varying' and 'to vary' imply fluctuation or gradation. 'Ranging' and 'to range' are often better words to express gradation.

'Verbal' means 'couched in words', spoken or written; 'oral' means 'delivered by word of mouth'.

The use of *foreign words or expressions*, as a convenient means of escaping the trouble of finding their English equivalents, should be avoided.

Great care should be taken to use *adjectives* in their usual senses, particularly in Summaries and Conclusions. In one recent Conclusions the term 'lethal rat' was used to mean not a death-dealing rat but, on the contrary, a rat doomed to death by a lethal mutation, and in another the term 'multiple colony investigation' was used to mean not the examination of colonies of different components but the examination of many similar colonies.

55. *Punctuation.* "Many authors leave the stops to the typewriter[1] or to the printer's reader; a slovenly habit. The stops should be inserted by the author himself upon his manuscript, and carefully revised by him in proof. A note should be made on the manuscript that the author's punctuation is to be followed exactly. Too often typewritten theses are delivered as they come from the machine, unrevised and abounding in clerical errors; but the author is responsible, not the typewriter."

One function of punctuation is to indicate pauses appropriate to reading, especially to reading aloud, but "the first essential is that the meaning of what is written should be conveyed to the reader's mind, through his eye, with the least possible delay and without any ambiguity". Therefore "the main function of punctuation is *to make perfectly clear the construction* of the written words. If this function is properly fulfilled, then automatically all risk of ambiguity will be avoided and the appropriate pauses will be indicated to the reader, when they are not so optional as to be left to him to supply". (3)

Though in some respects personal taste may be used, "in the main the insertion of stops should be governed more by the construction of the sentence than by its mere length", (3) and "'loose' punctuation [as opposed to 'open'], especially in scientific and philosophical works, is to be avoided" (H. Hart, 1930). "How much depends upon punctuation is well illustrated in a story told, I believe, by the late G. A. Sala, once a writer in the *Daily Telegraph*, about R. D. Sheridan, dramatist and M.P. In the House of Commons, Sheridan one day gave an opponent the lie direct. Called upon to apologize, the offender responded thus: 'Mr. Speaker I said the honourable Member was a liar it is true and I am sorry for it.' Naturally the person concerned was not satisfied; and said so. 'Sir', continued Mr. Sheridan, 'the honourable member can interpret the terms of my statement according to his ability, and he can put the

[1] Allbutt here uses the word in the sense of the typist, not the machine.

punctuation marks where it pleases him.' H. H." (*Rules for Compositors and Readers at the Oxford University Press*, 1930.)

The *full-stop*, *period* or *point* marks the end of a sentence in the grammatical sense, namely, a sentence, which contains at least one main clause with its own definite verb. To this general rule there is one exception, full-stops being used in reporting conversations, when questions are asked or answered by one or more words that do not amount to a sentence or even to a clause.

It is also customary to use a full-stop at the end of any *abbreviated word*, though by convention many journals do not insert a full-stop after "Mr", "Dr" and the like, when the abbreviation consists of the first and last letters of the word abbreviated.

The full-stop is usually omitted after *titles of papers* and *centre headings*.

To mark words omitted in quotations, *omission marks*, or points separated by spaces, are used. Three (. . .) are sufficient.

The *colon* is now seldom used, except "to separate a clause that introduces a list, summary, quotation, and the like from the actual list etc. itself". E.g. "Requisites for anyone undertaking the journey are as follows: a stout pair of nailed boots, climbing-rope and an ice-axe, a compass, a large-scale map, and an emergency 'iron-ration'."(3)

Though not the custom of the Cambridge University Press, the colon is often combined with a dash (:—) when the list starts on a fresh line.

The *semi-colon* "is heavier than the comma but less heavy than the full-stop",(3) and is most commonly used to give emphasis "between evenly balanced sentences that strike a contrast", thus "bringing into closer apposition some independent or grammatically discontinuous antithesis, reinforcement, or illustration, which, if carried over to a following sentence, would have a less marked effect".(1) Thus, "'They have repudiated all liability; we must reconsider our position.' An ordinary writer would have inserted an 'and'."(1) 'He did not go to Canada; he went to Mexico.'

The semi-colon is also used to divide longer sentences into clauses. 'It is, however, "a sound rule to eschew semi-colons before subordinate clauses [introduced by 'as', 'since', 'because', 'when', 'if', 'though', etc.], but to use them with co-ordinate clauses [introduced by 'and', 'but', 'or', 'yet', etc.] whenever they really aid the sense."(3)

Semi-colons are sometimes used to separate phrases, "especially if there are already commas to mark slighter pauses within the phrases themselves".(3) Thus, "Slipping and floundering for hours at a snail's pace through mud and slime, long lines of men went to and fro—carrying-parties with food, water, ammunition of all kinds, engineer and ordnance stores; forward observation parties with their wire and telephone equipment; stretcher parties piteously burdened; reliefs bulky with arms and full pack and perhaps a parcel from home, struggling after the lightly loaded guide."(3) In this sentence the semi-colons could not have been replaced by full-stops because none of the phrases

contains a finite verb, and the use of commas would have resulted in confusion.

Commas may be used singly or in pairs.

(*a*) *Single or unpaired commas* are used:

(1) To mark pauses in long sentences.

(2) Instead of conjunctions between the earlier members of series of epithets qualifying nouns or of connected phrases or sentences, e.g. 'long, narrow, curved filaments'. When there is a series of words or clauses separated by commas, with an 'and' or 'or' linking up the final one, there is no need to place a comma before the 'and' or 'or', unless its omission might cause ambiguity or unless each of the clauses is of appreciable length. "A comma is out of place before 'and' or 'or' when they join two (and not more than two) words, phrases or short clauses." (3)

(3) To make the meaning clear. The presence or absence of a comma may alter the sense of a sentence, e.g. "she stopped crying", and "she stopped, crying". (1) "I am a prisoner, unfortunately you are my judge", and "I am a prisoner unfortunately, you are my judge". In the sentence, "The prisoner said the witness was a convicted thief", the stigma is placed on the witness, but by placing commas after 'prisoner' and 'witness' the stigma is placed on the prisoner.

(4) To give emphasis, e.g. "I cannot help him, now". (1)

(5) To separate words which might be improperly joined in reading, e.g. "On the path leading to the cellar, steps were heard". (3)

Expressions like *he said*, preceding direct quotations, should be followed by a comma.

An unpaired comma should never be inserted between the subject and its verb or between the verb and its direct object, or in any other position so as to cause an unnecessary break in the construction of the sentence.

It is a common fault to use a comma where a heavier stop is needed, especially in sentences in which the clauses are not linked by conjunctions.

(*b*) *Paired commas* should be placed so as to have the same effect as parentheses or brackets, that is to say they should be placed, when necessary, before and after words in apposition and explanatory words, phrases and clauses, so as to enclose them, as it were, in parentheses. One pair (or more) may be enclosed within another.

In the following sentence the different forms of brackets indicate where the pairs of commas should be inserted.

"Counsel maintained that the accused [if he had {as was alleged by some (though not the most reliable) of the witnesses for the prosecution} taken the articles in question] had been subject to a temporary lapse of memory as a result of shell-shock sustained during the war." (3)

If each bracket is replaced by a comma the sentence reads as follows:

"Counsel maintained that the accused, if he had, as was alleged by some, though not the most reliable, of the witnesses for the prosecution, taken the articles in question, had been subject... the war.

"The result is a plentiful sprinkling of commas, but they are not sprinkled at random; they mark out the construction of the sentence." (3)

"The failure to realize 'the bracket-like function of pairs of commas' as a fundamental principle, and the consequent failure to follow up a comma at the beginning of a subordinate clause by another at the end of it, leads to more than half the mistakes in punctuation, often trivial but occasionally quite misleading." (3)

When a comma is placed after a word, phrase or clause at the beginning of a sentence it acts as the second comma of a pair, the beginning of the sentence being equivalent to the other, and similarly when a comma is placed before a word, phrase or clause at the end of a sentence it acts as the first comma of a pair, the end of the sentence being equivalent to the other (see second and third examples in the following paragraph).

"*Participial clauses* are almost always marked off by commas when they are sandwiched into the middle of a sentence, and even when they come at the beginning or end of a sentence it is usual to separate them from the main clause by a comma. For example:

"'He put down his newspaper and, turning to his neighbour, inquired what he thought of the international situation.'

"'Turning to his neighbour, he inquired what he thought of the international situation.'

"'He buried himself once more in his newspaper, having tired of the conversation.'" (3)

Relative clauses are usually marked off by commas in the same way as participial clauses, except those which are adjectival clauses, identifying or defining particular persons, objects, etc. "A clear distinction in sense is [therefore] marked by the insertion or omission of a comma before the relative pronoun.

"(i) 'The facts which he stated were quite conclusive.'

"(ii) 'He acquainted me with the facts, which he stated with scrupulous fairness.'

"(iii) 'I became aware that my pursuer, who by now was only a few yards off, was the man whom I had seen that morning at the inn.'" (3)

The relative clause in (i) and the second relative clause in (iii) define the 'facts' and the 'man' respectively and are not marked off by commas.

There is a tendency to 'comma off' such words and phrases as 'however', 'meanwhile', 'too', 'no doubt', 'on the other hand', but it is not necessary to do so, unless emphasis is desired or the omission of commas would involve a risk of ambiguity. For example:

'However the incident may be explained...' has a different meaning from 'However, the incident may be explained' and 'Those incidents, however trivial in themselves...' from 'Those incidents, however, trivial in themselves...'. (3)

"Words and phrases *in apposition* to a preceding word or phrase are customarily placed between commas....

"'The capture of the eastern edge of the wood, a difficult and costly operation, was completed by nightfall.'"(3) "Rome, the capital of Italy, is...".

The *dash* is a mark of intercalation. Except when placed before a clause summarizing a list (see p. 35) it should be used rarely in scientific papers. A pair of dashes may be used in place of a pair of commas or parentheses if abruptness or special emphasis is required (see pp 9, 31).

No stop should be placed before or after a dash (see p. 31).

If the second of a pair of dashes comes at the end of a sentence or clause it is replaced by a full-stop or semi-colon (see p. 30).

Parentheses or round brackets, ( ), are used mainly to enclose dates of publication, and occasionally to introduce into the context something that has a bearing upon it in a purely subordinate way. The latter use should be avoided as far as possible. The introduction of parentheses should not disturb the punctuation of the sentence (see Note **25**).

Square brackets, [ ], "are most commonly used in quotations to introduce words that do not strictly belong to the quotation but are needed to clarify it"(3) (see Note **25**).

The *exclamation mark* is seldom required, but may be used to express surprise at some statement.

The *question mark* should not be used to attribute sarcasm by placing it in parentheses after a word.

(iii) *Illustrations*

(1) *General instructions.*

56. Illustrations constitute a most expensive item in publication. Authors should therefore select only such illustrations as appear necessary to explain their publications.

57. Illustrations should *never* be gummed or fixed in the text of a manuscript; they should be sent on separate cards or sheets of paper, or in envelopes, and each should bear a number and the author's name written on the back or front, in the latter case near the margin so as not to intrude on the figure. Unmounted photographs may have the numbers and names lightly written on the back with a soft pencil so as not to indent the paper.

58. If the illustrations are numerous or the figures require an undue amount of lettering or correction, authors may be requested to contribute to the cost of production or to obtain grants covering a reasonable share of the expenses entailed.

59. Editors are always prepared to advise authors upon the best or most suitable methods that should be applied in the reproduction of their figures. Occasionally figures are submitted that are unfit for reproduction, either because they are badly drawn, or drawn in a manner unsuitable for the form of reproduction desired, e.g. too detailed for reduction to the required size, or drawn on an unsuitable background, or because they are submitted in a soiled condition.

60. Illustrative matter must be clean and bear upon it no marks or

blemishes that cannot be erased from reproductions. All drawings for plates and text-figures should be made on a smooth, pure white surface, such as Bristol board.

61. It should be remembered that it is usually difficult, and often impossible, to introduce corrections after a reproduction has been made. Occasionally it may be easy to remove a feature from a block, but to substitute or add anything, including lettering, may necessitate the making of a fresh block, the cost of which must be borne by the author.

62. Authors should make themselves familiar with the size of the printed page, namely, the surface covered by the text exclusive of the page heading. In these journals it is 19 cm. long by 12 cm. wide ($7\frac{1}{2}$ by $4\frac{5}{8}$ in.) and represents the outside limits for a text-figure or chart. Usually a descriptive legend is required, and its length will govern the length of surface available for the figure.

A single plate may occupy a slightly larger area, 19 by 12·5 cm. ($7\frac{1}{2}$ by 5 in.), and a double plate 19 by 29 cm. ($7\frac{1}{2}$ by $11\frac{1}{2}$ in.), but in the latter a space 1 cm. ($\frac{1}{3}$ in.) wide should be left free down the middle to allow for the fold in the paper when the volume is bound.

63. Particular attention should be paid to grouping the figures in text illustrations and in plates to the best advantage both in respect to each other and to the available space (see Note **66** (7)).

64. The general term 'Process', employed by technicians, applies to all photomechanical processes whereby illustrations are reproduced. The forms of 'process' employed in the production of illustrations in journals provide what are generally called line blocks, half-tone blocks, three-colour blocks, collotypes, photolithographs and photogravures. Of these, the last four should be looked upon as luxury processes, and should not be employed where line blocks or half-tone blocks will prove satisfactory. The methods used in making blocks are elaborate, and an author requiring information about them is advised to read some book dealing with the subject.

65. The advantages of *line blocks* and *half-tone blocks* for use in reproduction may be summarized briefly as follows:

(1) *Line blocks* afford the cheapest mode of illustration for plates and text-figures (including drawings, maps, diagrams, graphs, and charts), and involve the least trouble. They are quickly made, and can be printed on any paper. If properly cared for, they do not deteriorate and can be stored indefinitely and, if necessary, used repeatedly. Moreover, they can be duplicated in unlimited numbers by the electrotype process at a cost considerably lower than that of the original block. Though difficult, it is sometimes possible to make slight alterations in these blocks. New blocks can easily be made by photography from line-block figures appearing in publications. Owing to their low cost a larger number of illustrations can be permitted in a paper than if other methods are used. Imprints from line blocks, based on good drawings, are, as a rule, capable of conveying to the mind of the reader all that is required by way of illustration.

Line blocks are usually printed with black printer's ink. If desired, however, red or other coloured inks can be used, or the figure can be printed in white on a black or tinted background. Also figures with some parts in black and others in red can be reproduced. This can be done by making a block for each colour. The two blocks require to be in accurate register, and careful manipulation is necessary in printing. Though two successive printings are necessary such figures may be used in the text as well as in plates (see *Parasitology* (1917), **9**, Pl. IV, and (1937), **29**, Pl. 12).

(2) *Half-tone blocks* are used for reproducing photographs, monochrome water-colour and pencil drawings, and drawings in Indian ink with either fine-line shading, pencil shading or shading with washes of diluted Indian ink.

The size of the objects to be depicted and the amount of detail they contain govern the nature of the paper used for printing. The finer the detail in a photograph or drawing the harder is effective reproduction by the half-tone process. To some extent the difficulty may be overcome either by enlarging the picture or by printing it on a fine grade of 'art' paper.

Half-tone prints are never 'black and white' in their contrasts. The engraver can 'cut out' unwanted backgrounds where the contours of objects are fairly sharp, and skilled artists may engrave or etch parts of the plate with happy results, but such procedures are more or less costly.

From its nature the half-tone process cannot yield results equal to the original photograph; there is invariably loss of detail, which is exaggerated if the figure is reduced.

(2) *The preparation of illustrations for reproduction.*

66. *Drawings for line blocks.*

(1) It is best to draw illustrations in waterproof Indian ink so as to obtain uniformly jet-black lines. Fair results may be obtained with drawings that are uniformly grey, but black and grey lines should not occur in drawings intended for reproduction in line blocks. By adding Indian yellow, sepia or burnt sienna to pale ink it yields, when photographed, as good a result as jet-black ink. Inks inclining to blue are 'cold' and give poor results, whilst 'warm' inks inclining to red and orange are better.

(2) Drawings should be made on smooth, pure-white Bristol board. Smooth pure-white paper may be used, but it is not so satisfactory because it creases readily in handling and when erasures are made. Moreover, it may be difficult to paste such paper down smoothly on a mounting card.

Yellowish card or paper should in all circumstances be avoided, because even traces of yellow are disturbing photographically, and drawings made on backgrounds so tinted give poor results.

(3) In making drawings it is best to use a pen. Good types of pens, known as anti-blotting mapping pens, are recommended. When, in making contours of some size, a fine line of uniform width has to be drawn, a ruling pen, bent and swivelling on the handle, yields, after some practice, remarkably good and

rapid results. By adding a few drops of water containing a little ammonia and shaking the bottle, Indian ink that tends to clog the pen can be made to flow more freely, and the pen can be cleaned more easily. Some artists, when making Indian ink drawings, prefer to use a fine brush and a moderately stiff chalk-surfaced paper. This method is scarcely suited for others than experts.

(4) *The most suitable sizes for drawings intended for reproduction.* It is usually best to make drawings one-quarter to one-third larger (linear measurement) than required in the reproduction, because (*a*) their execution demands less eyestrain and skill on the part of the artist, and (*b*) the lines and detail are rendered finer by reduction and some defects disappear. It is surprising at times to see how greatly a figure gains by reduction.

(5) *The degree of reduction required* is determined by (*a*) the character of the drawing and (*b*) the space available on the page.

(*a*) The finer the drawing the less it can be reduced without detriment. Where considerable reduction is required, say by one-half or more, it is essential that the drawing should be of a character to bear such reduction, i.e. the lines should be sufficiently thick and the stippling sufficiently coarse for the purpose. If too closely drawn, some of the lines and dots may fuse or a finely hatched area may appear solid black when reduced. On the other hand, if lines and dots are too finely drawn they may vanish completely in the reproduction.

(*b*) Text-figures seldom demand a full page. Authors should state to what degree (linear) the figures are to be reduced either (1) by writing in blue pencil at the base of the card, at some distance from the drawing, 'Reduce by $\frac{1}{2}$' ($\frac{1}{3}$, $\frac{1}{4}$, etc., as the case may be), or better (2) by drawing a line parallel to, and the length of, the base of the figure and writing below it 'Reduce to (say) 4 inches'.

A diminishing glass is of assistance in judging how a figure will appear when reduced in size; a moderately thick glass laboratory staining-dish, with a slight circular concavity, may answer the purpose by serving as a plano-concave lens.

It should be noted that a linear reduction by one-half means a reduction of the area of a figure to one-quarter.

(6) *Where no reduction is required,* the author should write 'Reproduce same size' below the figure.

(7) *Grouping figures in text illustrations and plates.* Where there are several figures that can be grouped together it is advisable to make one block, because, when it can be avoided, the text should not be broken up by small, single illustrations. Similarly, the appearance of plates can be greatly improved and expense reduced by judicious grouping of figures.

In grouping figures, the card on which each figure is drawn should be cut down close to the figure, but sufficient margin should be left all round for the subsequent insertion of the lettering. Such trimmed cards, bearing temporary numbers in pencil, should be laid upon a sheet of stiff white mounting card

cut to fit the available space, or, if the drawings are to be reduced, some multiple of it, and moved about until a suitable grouping has been found. The best grouping is that in which the figures are placed in the order in which they are described in the text or legend. If, however, the shapes and sizes of the figures make such grouping ugly or uneconomical, this grouping may sometimes be abandoned with advantage, but the original numbers should not be changed.

After the figures have been arranged in the desired group form, lightly pencilled guide-marks are made upon the mounting card around the trimmed cards in order to fix the positions in which the drawings are afterwards to be pasted down. The backs of the drawings are then brushed with photographers' paste or 'Gloy' and the drawings are fixed in their correct positions upon the mounting card, which should rest on a flat surface. The pasting and fixing in place should proceed rapidly, but care must be taken not to soil the surfaces of the drawings or to use an excess of paste. Sheets of crown or plate glass, cut to $7\frac{1}{2}$ by 5 in. and bearing suitable superimposed weights, should be laid over the figures immediately after they have been placed in position. As the figures are fixed in position successively, the weights should be lifted momentarily and the glass moved along. If preferred, small sheets of glass may be used, each covering one or more figures, and weighted. In order to prevent buckling of the mounting card the weights should remain in position for some hours.

(8) *The positions of letters, numbers and guide-lines to figures* should first be indicated *lightly* with a soft lead pencil. Unless the author has much experience he is likely to mar a good drawing by attempting to insert numbers and letters with a pen. The most satisfactory method is to cut out the desired letters (bold, Roman or Italic) or numbers (Roman or Arabic) in small squares from alphabets of letters or series of numbers printed for the purpose, and paste them in accurate alignment where required. The guide-lines, whether continuous or broken, should be drawn uniformly and finely with a ruling pen. It is usually best, however, for those who have not had considerable experience to leave these procedures to the Press expert. The more uniform and simple the lettering the better. The first letter of the name of a structure, or, if the first letter is preoccupied, the first and some other suitable letter from the name, may be used. For example, *s* may be used for the salivary gland, but, if *s* has already been used to indicate another structure, *s.g.* may be used. Careful punctuation is required and the symbol given to a structure should be used for that structure throughout a series of figures (see Note **22** (*b*)). Paste, not gum-arabic, should be used for affixing the letters, because gum usually discolours the paper yellow. Printed lettering, as described, gives the best results in reproduction; written letters, unless done by an expert, lack uniformity and appear untidy, and typewritten letters, pasted into position, look smudgy and are never sharply defined. The size of the lettering on the original drawing should be graded according to the degree of reduction that

is desired in the final reproduction, and therefore requires careful consideration, because the letters and numbers, when reproduced, should appear neither too large nor too small. Authors who do their own lettering and numbering frequently err on one side or the other. When words or abbreviations are used instead of letters, they are usually printed on slips from which they are cut out and pasted in position. On black backgrounds the lettering and guide-lines should be rendered in process white. Under no circumstances should the surface of the drawing be indented by efforts at ruling or lettering with a pen or hard pencil.

An alternative method consists in pasting a piece of tracing paper to one side of the mounting card, so that it assumes a constant position when resting on the drawing, and accurately indicating on it with a soft pencil where the guide-lines and letters are to be inserted by a skilled hand. This method should not be used for intricate figures, unless careful tracings of them have been made, because the tracing paper may slip, crumple or change its shape in transit.

(9) *Mechanical shading of line blocks.* Although degrees of shading may be indicated by thin or thick lines closely or widely spaced, or by light or heavy stippling, in which the dots are more or less closely aggregated, it is difficult to make large surfaces appear uniformly shaded, and at times uniformity of shading may be very desirable. Uniform shading giving good contrasts, saving much labour and improving the appearance of the figure can, however, be done by mechanical means, either by (*a*) fine parallel lines running across the surface at various angles, or (*b*) by various grades of stippling, giving a dotted effect. If certain areas in drawings need such shading, authors should indicate on a piece of superposed tracing paper the areas which require shading and the character of the shading. The line or stipple shading will then be introduced in the process of block-making. As in hand drawings, the coarseness of the mechanical shading should depend on the degree of reduction required.

(10) *Scales of measurement placed beside figures.* Authors are strongly advised to place a scale of measurement, neatly ruled in Indian ink and in alignment with the page margin, beside or beneath each figure or group of figures, so that the scale may be reduced and reproduced with the figure. The number of centimetres, millimetres or microns should be written lightly in pencil beside the scale as a guide to those who deal with the final lettering.

(11) *Graph paper for charts and curves.* Charts and curves are best drawn in Indian ink on graph paper ruled with pure blue lines, which ensure accuracy, but do not appear in the photographs from which the blocks are made. In the blocks, therefore, only the lines drawn in Indian ink appear.

If the author desires the lines ruled on the paper to appear in the reproduction, a paper ruled with black lines should be used.

(12) *Corrections* may be made on Indian ink drawings by covering the defective parts with 'process white', thickly applied with a brush, and drawing on the new surface. It should be noted that the white scales off readily and

is easily soiled. Alternatively a thin, opaque, chalk-surfaced paper may be pasted upon the part of the figure which requires alteration, and the desired corrections made upon the superimposed paper, which masks the ink drawing beneath.

Erasures should be made with the point of a sharp knife or a tool sold for the purpose.

Sometimes a knowledge of these methods may render the redrawing of a figure because of a slight blemish or error unnecessary.

(13) *Drawings on grained paper* with a chalk surface may yield good results in expert hands.

Various papers of this kind are obtainable: (*a*) Some have closely ruled cross-lines or uniform stippling of various grades printed upon them. These are completely scraped away with a sharp knife or suitable 'scraper' tool where the lights are wanted, or more or less scraped away where the shading needs modification. The mechanical shading gives a flat tone where it is left untouched, and it can be intensified where necessary by using a carbon pencil or Indian ink. Corrections may be made with ease. (*b*) Some have a mammillated surface, and when the pencil is passed across them the tops of the little protrusions become blackened so that stippling results, varying with the amount of pressure exerted. Lines may also be made to appear. Various grades of these papers can be obtained.

67. *Photographs and drawings for half-tone blocks.*

(1) Authors should pay attention to the following points when sending *photographs* for reproduction by the half-tone block process:

(*a*) A good, clear, uninjured print, not reddish or brownish, is required. It should be left *unmounted* so that it can be perfectly flattened under glass.

(*b*) Authors should indicate what part of a photograph requires reproduction. This may be done by tracing the chief features on transparent paper and indicating the parts to be omitted, or by cutting out a mask so as to cover these parts.

(*c*) When several photographs, especially photomicrographs, have to be reproduced, in each of which the essential part is limited to a small area, they should be trimmed down to quadrangles. When properly spaced and pasted upon white or black cards, several pictures may be reproduced on a single block. This arrangement saves space and reduces the expenditure on figures, because the cost of blocks is reckoned approximately according to their size. Occasionally large and small pictures may be advantageously grouped together.

(*d*) By 'cutting out' or removing the original background sharply defined objects or figures may be made to stand out. This method can be applied to drawings.

(*e*) Portraits and photographs illustrating scenery may be slightly 'retouched' to remove blemishes, but photographs which are intended to corroborate other illustrations or descriptions must *never* be retouched.

(*f*) Indicator lines to parts of photographs and lettering are best inserted by experts. They should be marked by the author upon duplicate photographs, or upon superimposed tracing paper.

(2) *Drawings* intended for reproduction by the half-tone process may be executed in Indian ink or in various other ways:

(*a*) Carbon, charcoal or crayon pencils may be employed with excellent results. To prevent smudging it is best to fix such drawings with an alcoholic solution of white resin applied with an atomizer, and the drawings should be left fixed to the board to dry so as to reduce the tendency for the paper to curl.

(*b*) Lead pencil drawings yield poor results by the half-tone process, because they are insufficiently black and the lines often reflect light. Therefore, unless it is absolutely necessary, they should not be used.

(*c*) Wash drawings made with diluted Indian ink, ranging from pale tints to black, reproduce well.

It should be noted that, in any of the foregoing kinds of drawings, the contrasts should be stronger than are desired in the reproduction, because intensity can be reduced but not increased in process blocks. The blacker the drawing the better it reproduces.

(*d*) The exact positions of indicator lines and lettering are best marked by the author upon superimposed tracing paper.

(3) *Miscellaneous instructions.*

68. Note that:

(*a*) All drawings, charts, diagrams, maps, and photographs should bear the author's name, and be numbered in series.

(*b*) Legends, or descriptions of matter reproduced by means of blocks, should *not* be attached to the illustrations or placed in the text, but should be written on separate sheets of paper, and numbered to correspond with the illustrations. These sheets should be appended to the text.

(*c*) Authors should examine every detail in their illustrative matter and endeavour to send such matter in a fit state for immediate photographic reproduction, and not in such a form that redrawing or extensive retouching is required. By doing so the introduction of mistakes in the process of redrawing or retouching is avoided and charges for these processes are eliminated. Any cost incurred in redrawing and lettering, beyond what appears reasonable to the editor or publisher, is charged to the author.

(*d*) Drawings and photographs should be sent flat, protected by tissue paper, between two sheets of stout cardboard somewhat larger than the drawings. Injuries by rubbing to drawings made with carbon pencils can be prevented by spraying them with a colourless fixative and to other drawings by fixing tissue paper to their sides in such a way as to cover them. Large charts, maps, etc., when drawn on paper, may be sent *loosely* rolled, inside stout cardboard tubes.

Many illustrations are damaged in the post owing to lack of care in packing.

(*e*) An author who wishes to reproduce an illustration from another publication should obtain formal permission to do so from the publishers, and make the customary acknowledgements in his paper.

Authors who wish to reproduce in other publications illustrations from the *Journal of Hygiene* or *Parasitology* should apply through the Cambridge University Press for the permission of the editors and of the writers of the articles in which the illustrations appear, and also apply for the loan of the blocks.

(*d*) *The final draft*

69. "Before the *final revision* let some considerable time intervene...in order that meantime the mind may meditate subconsciously on the subject, and that the final reading be done with refreshed attention; it is surprising with what a new critical and constructive interest one comes again to a subject, and to a manuscript, which for a short time has been laid aside."(1)

The final draft should first be read word by word to correct typing errors of spelling, especially of foreign names and technical words, and of punctuation, and of numbers in tables. Then it should be read for the sense, paying particular attention to the position and meaning of every word and statement.

Even if the previous drafts have been carefully composed the last draft should be re-examined very carefully for inaccuracy or exaggeration of statement and for redundant or unnecessary words, phrases and sentences. It is astonishing how large is "the number of words, phrases, clauses, sentences and, occasionally, paragraphs that can be deleted without affecting the meaning in the slightest degree. Deletions of unnecessary words always improve grammatical construction and style of expression and make reading and understanding easy....Many sentences are but repetitions; others can be got rid of by the insertion of a minor clause, or of an adjective elsewhere."(1) E.g. If the word 'adverse' is placed before 'factors' in the sentence, "Other factors, such as rickets and tuberculosis, must be taken into account, as any one of these will have an adverse influence on the case"(1), all the other words after 'account' can be deleted. Transfers may also be made of sentences and paragraphs which would stand better elsewhere. "Perverse constructions and equivocal or defective words should give place to their betters....An author should form the habit of setting down no word, not even the definite article, without weighing...its meaning....Let us not fear lest we be too brief; if the matter be meagre padding will not amend it."(1) "A scientific article is intended to be studied and used as a reference; it is not merely to be read. Hence, literary devices, if they interfere with clearness, should be subordinated." (Trelease, S. F. & Yule, E. S., 1925, *Preparation of Scientific and Technical Papers.*)

70. The alterations should be inserted in the usual way, above the words to be altered, so that the printer will see them before he reaches the words concerned, but if too many corrections are introduced the paragraph or page should be retyped so as to leave room for the editor and Press manuscript editor to introduce their corrections and instructions.

71. If material is to be transferred from one portion of a manuscript to another, it should be marked off by brackets and the transposition indicated by the marginal notice 'transfer to p. —'. On the latter page the point at which the transferred material is to be inserted should be made plain.

The author is expected to make all final revisions in the manuscript. Only genuine errors should be corrected in the proofs.

72. *Controversial papers.* Authors of papers on controversial subjects are often tempted to make use of sarcasm, abuse or recrimination. This attitude may give to the writer some short-lived satisfaction and to the reader some contemptuous amusement, but it invariably leads to ill-feeling. In their own interests the writers of such papers would be better advised to show consideration for, and courtesy to, their opponents, while arranging their facts (see p. 32) so that they may speak for themselves; in short, they should obey the injunction, "Whatsoever ye would that men should do to you, do ye even so to them".

III. HOW AUTHORS SHOULD SEND MANUSCRIPTS AND ILLUSTRATIONS TO THE EDITOR

73. Manuscripts should be sent flat or once folded (not rolled). The pages should be fastened with clips (see Note **6**). A letter containing the author's name and address should accompany the manuscript.

The methods for protecting and sending illustrative matter have been given. (Note **68** (*d*).)

IV. PROOF-READING

74. When the paper is printed the author receives from the editor two sets of first-proof sheets[1] (see Note **87**(8)) together with his manuscript. He will notice that signs in red for the information of the compositor have been made on the manuscript by the Press manuscript-editor. The author will find it useful in the composition of future papers to study these signs, and note their significance by comparing the manuscript with the proof. Other corrections have been made by the editor.

One set of proofs, as noted in a slip attached to the top right-hand corner, has to be returned with corrections. This 'marked' set contains marginal notes and queries in black ink made by the Press-reader. Some of his 'marks' draw the attention of the compositor to irregularities and errors in the type, but others, usually queries, are addressed to the author. It is the duty of the author to answer all queries and question marks, placed in the margins of the proof sheets opposite marked points in the text at which doubt is indicated, inconsistencies are noted, information is wanted or blanks have to be filled. When a question has been answered by making a suitable change or addition, or when, in the author's opinion, no change is required, the query mark should be crossed out. Failure to answer such queries may necessitate the return of the proof to the author because he alone can answer some of them.

The author is also expected to make a general correction of the proof. He

[1] The custom of sending out *slip* or *galley proofs* on sheets about 24 in. long, has been discontinued, and the *first proofs* are now set up in pages as they will appear when published, except that each paper has its own page numbers.

should see that the proof agrees with the manuscript, and should correct all genuine errors, both of printing and of meaning, but it is not permissible for him to make extensive revisions or large additions, because alterations or changes from the original copy of the proof are very expensive. An allowance of about 10*s*. per sheet of 16 pages is made for alterations, apart from printer's errors. Excessive alterations may be disallowed or charged to the author.

75. *Correcting proof*. If possible, another person should read aloud slowly from the manuscript, while the author follows the proof and makes the necessary corrections and changes. The reader should call attention to every paragraph, capitalized or italicized word, mark of punctuation, and number or letter relating to a division in the text or to an illustration, table or chart. If another person is not available the author should carefully compare the proofs with the manuscript, line by line and sentence by sentence.

Always read the proof *twice*, at least, with an interval of a day between the readings.

Special attention should be given to tables, legends, numbers, names, quotations, citations of dates of authors and the pagination of cross references. The last should be inserted in pencil, because they have to be changed in the final proof (see Note **87**(12)), in which the pagination is different. The author should examine very carefully the several proof copies of his illustrations, because when printed on proof paper details may fail to appear in some of them, and he should make certain that the letters and numbers in the legends and in the text agree with those on illustrations, that numbers in tables are added up correctly, and that the dates of publication cited in the text agree with those in the references. Such errors are not infrequent, but happily a very large proportion of them are detected by the efficient proof-reader. For example, the proof-reader noted in the proof of a recent paper that the addition in four columns of important tables was incorrect in each to a considerable extent. Misplaced words, such as adverbs and negatives wrongly placed, and errors in punctuation are more easily detected in the proof than in the final draft of the manuscript. The author should also watch for words, or even lines, which may have been omitted, and should carefully examine all headings for mistakes. In fact, he should assume that errors are present; find and correct them.

In addition some other competent person should be asked to read the proof because the author is apt to grow weary of re-reading his own words and his critical faculty diminishes, so that he fails to detect errors, especially ambiguous phrases and sentences.

76. After reading the proof twice for possible errors, it is well, after an interval, to read it over a *third* time, paying particular attention to the meaning of the statements.

77. The author is advised to make his corrections first in pencil and later in ink on the unmarked copy of the proof, and to transfer them afterwards to the copy which has to be returned. By this procedure he gains the following

advantages: (1) he is enabled to reconsider his original corrections, some of which may require modification, (2) he is better able to judge the most suitable positions in which to place his corrections in the fair copy, (3) he is provided with specimen sheets from which he can make his fair copy, and (4) he retains in his possession a record of his corrections to which he can refer, if, on further reflexion, he feels that other corrections are necessary.

78. All corrections must be made in ink, neatly, clearly and conspicuously and without possible ambiguity, *on the margins* of the proof-sheets, and *not* in the body of the printed matter, except as here noted, because the compositor does not read every line, but merely looks for marks in the margins. Sometimes proofs have to be returned to authors because the corrections are illegible or improperly placed.

The author is not expected to know all the technicalities of proof reading and correcting, but he should make himself familiar with the principal marks employed in correcting proofs, in order that he may understand the meaning of the signs made on his proofs, and that he may make his own corrections properly.

No words should be blocked out so as to be illegible, nor should any portion of the proof be cut away or defaced.

79. As far as practicable corrections should be so made that they do not upset the type. In order to avoid upsetting the type it is advisable to replace the words, phrases or sentences removed by others of equal or less length. This can be accomplished by counting the letters and spaces in the passages removed and substituting passages of equal or less length. If the author finds that in some places he cannot adequately express essential alterations within these limits he is at liberty to overrun them.

80. *How to make corrections in proof.* It is customary to make a sloping line, or 'stop-mark', on the right-hand side of most marginal corrections, because it helps to make isolated corrections catch the printer's eye and to separate one correction from another when they are crowded in the margin (see p. 52, ll. 3, 4, etc.). Both margins may be used for marking corrections.

To indicate that something should be *inserted*, a 'caret' (∧) is placed at the point in the text where the insertion should be made, and the matter to be inserted is written horizontally in the margin, with a stop-mark, terminating below in a caret, beside it (ll. 14, 23).

If a full-stop, or period, has to be inserted, it should be placed in the margin within a circle, ⊙, because, if written without a circle, it may not be seen (l. 26).

If other punctuation marks have to be inserted, they should be followed by stop-marks in the margin. Thus:

,/ ;/ -/ (comma, semi-colon, hyphen) (ll. 4, 23).

To insert a quotation mark or apostrophe place a caret at the appropriate place and insert the mark in the margin accompanied by a stop line with a

side extension under the mark, or place the mark in the margin with a short horizontal line under it (ˌ).

To indicate that something, except a letter or stop, should be *taken out without being replaced by anything else*, draw a horizontal line through it and place the mark  , a form of d, meaning delete, followed by a stop mark, in the margin (l. 8). To delete a letter or stop, draw a vertical or sloping line through it and place the delete mark in the margin. The delete mark should not be employed if something else is to be substituted for the matter expunged.

When a stop, letter, word, phrase or sentence has to be *deleted and replaced* by another, draw a sloping line through the stop (l. 4) or letter and a horizontal line through the word, phrase or sentence and write the correct one in the margin (l. 13). If more than two letters require alteration in a word, it should be crossed out and re-written in the margin (l. 5). A delete sign or caret is not required in the margin.

If matter which has been deleted accidentally is to be retained, place a series of dots under it and write 'stet' (meaning 'let it stand') in the margin (l. 18).

If letters or words require to be transposed, make the appropriate 'switch-back' mark, under one and over the other, in the text and write 'trs.' (transpose) in the margin (ll. 10, 11). Alternatively the letters may be marked with short vertical lines under them and 'trs.' written in the margin (l. 12).

When a space appears between two letters in a word, short curved lines (‿) should be made above and below it and repeated in the margin (l. 25), or the space may be underlined and the mark repeated in the margin. When large spaces have been left they are sometimes marked as in l. 17.

If a space requires to be inserted, a caret or perpendicular line should be placed in the text where it is required and a double cross in the margin (l. 6).

If a letter has been inverted, draw a line through it and place a curly mark in the margin (l. 3).

If a letter from a different fount of type has been accidentally inserted in the text, it may be underlined or indicated by a short vertical line under it and 'w.f.' (meaning 'wrong fount') written in the margin (l. 22).

If a letter is imperfect, place a short vertical line under it and make a single cross in the margin (l. 19).

If letters or words are out of alignment, draw horizontal lines above and below them and repeat the lines in the margin (l. 24).

If a mark such as that made by the misplacement of a piece of lead used for spacing is noticed, draw a line through it and place an inverted T (thus ⊥) in the margin.

If a letter or word has to be converted from ordinary into large capital type, it should be underlined three times and 'cap.' written in the margin, or it may be treated in the manner shown in l. 16. To change a letter or word into small capitals, underline it twice and write 's.c.' (small capitals) in the margin (l. 1).

To reduce from capitals to ordinary type, underline once and write 'l.c.' (meaning 'lower case') in the margin (l. 21).

To convert a word from ordinary, or Roman, to Italic, underline once and write 'Ital.' in the margin (l. 7), and to convert from Italic to Roman underline once and write 'Rom.' in the margin (l. 9). Italic is a style of type in which the letters slope towards the right.

If a word is to be printed in black or 'bold-face' type, underline it with a wavy line and write 'Clar.' (for 'Clarendon', the printer's name for black type) in the margin.

If a fresh paragraph is required, indicate the place where it is to start by placing a square bracket before its first word, and write the sign ¶ or 'n.p.' (new paragraph) in the margin (l. 20).

If a paragraph has been started where one is not intended to be, draw a line connecting the beginning of this paragraph to the end of the previous one and write 'run on' in the margin (l. 15).

If the first word of a line requires to be set inwards, enclose it in a semi-circular line and write 'indent' in the margin (l. 2).

81. The methods and results of using most of these signs are shown on pp. 52 and 53, which have been reproduced by kind permission of the editors of the *Journal of Physiology*.

82. If the author does not know how to indicate some correction, he should draw a line from the place where the correction is needed to the margin and there write clear instructions, enclosing them in a circle.

83. *The proof should be returned* to the editor without undue delay, but it is a mistake to be over-hasty, because proof correction requires careful and deliberate reading and re-reading when the author's mind is fresh (see Notes **75**, **76**).

Some authors are remarkably careless in proof-reading and assume that the editor or others will make the corrections for them. Editors having read the manuscript usually read the proof after it has been through the author's hands, but they cannot be expected to be entirely responsible for the work he should have done. The responsibility for uncorrected errors in numbers, names, and quotations rests entirely with the author, since the publisher has no means of discovering such errors.

84. Authors should *initial* their proof at the top of the first page when returning it to the editor. They should *not* return it to the publisher unless asked to do so.

V. REPRINTS

85. Most journals supply a small number (25–50) of free reprints, or copies of his paper, to the author. If additional copies are required the author is charged for them.

Order forms for reprints usually accompany the proof, and should be filled in by the author and sent to the publisher, with the remittance if additional copies are required. They should *not* be sent to the editor.

PROOF CORRECTION

[Proof]

1.	s.c.	Results
2.	indent	(Most of the experiments in the present
3.	ℐ/	investigation were carried out with
4.	;/	cocaine, and the results to be described
5.	below/	~~bloew~~ were obtained with this unless
6.	#/	special mention is made.
7.	Ital/	Magnitude of action potential.
8.	ℐ/	(1) Conduction along the distal ~~non~~ non-
		narcotised segment. In view of the
9.	Rom/	finding of *Woronzow* that the size
10.	tr/	[the [of] electric response suffers [decrement]
11.	tr/	along the distal region (most) beyond the
12.	tr/	depressed area, it is intreesting, first
13.	see/	of all, to ~~find~~ whether the same
14	λ the	would occur under present experimental
15.	/run on	conditions.)
16.	DD/caps	[For this purpose ~~dd~~ leads were first
17.	L/	employed. Records L of L propagated
18.	stet/	disturbances were taken ~~both~~ before and
19.	x/	at varying intervals during narcosis and
20.	¶/	recovery. [With ND leads diphasic re-
21.	l.c/	cords were obtained in which the POTENTIAL
22.	w.f./	variations appearing in the narcotised
23.	-/	and non narcotised distal regions are
24.	=/	simultaneously represented in the two
		phases of each response, the first phase
25.	⁀	being derived from the former and the
26.	⊙/	second from the latter;

Explanation of marks.

1. To change to small capitals.
2. When a word is too far to the left.
3. When a letter is inverted.
4. Substitution of comma for another point or letter. Similarly for colon and semi-colon.
5. When letters in a word are misplaced.
6. Insertion of a space.
7. When italics should be used.
8. When a letter or word is to be omitted.
9. When a word is to be changed to roman type.

10, 11, 12. Methods of marking transposition. When several words are badly mixed up they may be numbered, the usual mark being placed in the margin.

13. Substitution of one word for another.

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[The same corrected]

RESULTS

Most of the experiments in the present investigations were carried out with cocaine, and the results to be described below were obtained with this unless special mention is made.

Magnitude of action potential.

(1) *Conduction along the distal non-narcotised segment.* In view of the finding of Woronzow that the size of the electric response suffers most decrement along the distal region beyond the depressed area, it is interesting, first of all, to see whether the same would occur under the present experimental conditions. For this purpose DD leads were first employed. Records of propagated disturbances were taken both before and at varying intervals during narcosis and recovery.

With ND leads diphasic records were obtained in which the potential variations appearing in the narcotised and non-narcotised distal regions are simultaneously represented in the two phases of each response, the first phase being derived from the former and the second from the latter.

Explanation of marks (cont.).

14. When a letter or word is to be inserted.
15. When a paragraph occurs wrongly.
16. Substitution of capitals for small letters.
17. To reduce spacing.
18. When words crossed out are to remain.
19. When letters appear imperfectly.
20. Mark for a paragraph.
21. To change capitals to small letters.
22. When a letter from a wrong fount has been used.
23. To insert a hyphen.
24. When letters or words are out of line.
25. When letters are to be brought close together.
26. Insertion of full stop when omitted or replaced by another point.

86. To avoid the delay in publication otherwise entailed, authors living in distant countries not infrequently request the editor to pass their proofs for them. In such cases the number of reprints, free and additional, desired should be noted on a memorandum, bearing the author's name and address, attached to the front of the manuscript. As soon as the cost of the additional reprints has been determined, the publishers send the usual order form to the author, and get the reprints ready, pending the receipt of the required remittance.

Institutions which require reprints for binding in their 'Reports' may save expense by ordering copies without the usual wrappers.

VI. THE HISTORY OF A PAPER AFTER IT HAS BEEN SENT TO THE EDITOR

87. In the preceding notes only those stages in the history of a paper which personally concern the author have been dealt with, but it may be of interest to give a short account of all the stages through which a paper passes after it has been sent to the editor:

(1) The editor reads the paper and, either with or without the assistance of a referee, decides whether it is suitable for publication in the journal or not.

(2) If it is considered suitable, the editor goes over the paper carefully and makes various alterations, amendments and suggestions, and records the date on which it was received.

(3) If necessary, the paper is sent back to the author for his consideration of the alterations and suggestions.

(4) On its return the editor again goes over the paper with special reference to any alterations which may have been made in consequence of his suggestions.

(5) The paper is then delivered by the editor to the Press.

(6) The Press manuscript editor then goes over the paper. His work consists in marking the type to be used in the various headings, in correcting, where necessary, the English and punctuation, in seeing that capital letters, certain spellings, contractions, etc., are used according to the custom of the Press and in 'polishing' the manuscript generally for the information of the compositor (see Note **74**).

(7) The text of the manuscript, or 'copy', is then given to the compositor, who sets it up in type, and at the same time line blocks or half-tone blocks are made from the illustrations.

(8) A *first-proof* is then taken and delivered to the Press reader, who compares it with the manuscript and marks any mistakes the compositor may have made. (If the mistakes are numerous, the proof may have to be given back for correction to the compositor.)

(9) Then two first-proofs, on one of which the Press reader has marked errors in printing and has inserted queries and questions addressed to the editor or author, together with the manuscript, are sent back to the editor.

(10) The editor examines the Press reader's marks and questions, numbers the plates and sends the proofs, together with the manuscript, to the author, who is expected to go over the 'marked' proof very carefully and correct it (see Note **74**).

(11) On the return of the marked proof from the author the editor goes over the corrections and amendments which have been made. (If the corrections are ambiguous or otherwise unsatisfactory it may be necessary to return the proof to the author; see Note **78**.)

(12) The editor then delivers the corrected proof to the Press with instructions, if the corrections have been numerous or intricate, to provide a *revised proof*, which has to be checked by the Press reader, or, if the corrections have been few, to make the alterations necessary for the final proof. The proof thus corrected and repaginated, according to its place in the 'Number', is known as the *final* or *Press-proof*. This is examined by the editor, but is not sent to the author.

(13) When the final proofs have been approved, they are returned to the Press, the requisite number of copies are printed off and bound to form a 'Number' of the journal, on the cover of which a list of the authors and the titles of their papers are printed. For purposes of priority the date of issue, printed on the cover, is regarded as sufficient, but, if the precise date is disputed the date of reception of the manuscript, given at the end of the paper, may be quoted.

(14) In the last 'Number' of the annual volume of the journal an author's index and a subject index are printed, and in the latter each subject dealt with in the paper is recorded.

88. Within the next year the names of the authors of all papers and books on medical and allied subjects, with the titles of their publications and exact references, are recorded in the *Quarterly Cumulative Index Medicus*, and so far as they are indicated in the titles the subjects dealt with are indexed. In *Biological Abstracts* short summaries of the contents of many papers are published.

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[*The references are to pages*]