EDITING AND PUBLICATION OF THE REVISED
INTERNATIONAL CODE OF NOMENCLATURE
OF THE BACTERIA AND VIRUSES

Editorial Board

R.E. Buchanan, S.T. Cowan, and T. Wikén

The following draft proposal was approved unanimously by the Judicial Commission, by the International Committee on Bacteriological Nomenclature, and by the Plenary Session of the International Microbiological Congress held in Rome (September 1953).

The Editorial Board and the Judicial Commission are requested to edit and publish an "official" International Bacteriological Code of Nomenclature.* It is desirable that there be included texts in one or more other languages (than English), including to the extent practicable French, German, and Spanish. It is proposed that the revised Code be annotated, and that there be included examples drawn from Bacteriology of the effect of the rules. As Appendices are to be included lists of nomina conservanda and of nomina rejicienda, and such other statements as are recommended by the Judicial Commission and approved by the International Committee.

It was agreed that consideration of publication in languages other than English would be by letter ballot.

The Editorial Committee and Judicial Commission have published reports of all actions taken by the Judicial Commission and the International Committee (1,2,3,4) at the Rio de Janeiro (1950) and Rome (1953) meetings. A series of Opinions (Nos.1-14) have been approved and published. The Annotation of the Code is well under way.

This communication is to acquaint the members of the International Committee and all interested in bacteriological nomenclature of the proposed outline of the revised Bacte-

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*A later resolution, duly approved, directed that the name of the revised code should be the "International Code of Nomenclature of the Bacteria and Viruses," and that the abbreviated title "Bacteriological Code" be recognized.

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riological Code, and to detail and illustrate the technique of presenting the draft to the Judicial Commission for needed revision and emendation before publication.

The Judicial Commission has several authorizations:

1. It is directed to study the corresponding provisions of the Botanical and Zoological Codes in order to harmonize the rules and recommendations where this seems practicable and desirable.
2. It is authorized to make such editorial changes as are needed to harmonize the several parts of the Code.
3. It is directed to prepare and secure approval of a series of appendices.
4. It is directed to consider the problem of publication of translations of the Bacteriological Code into languages other than English.

1. Study of Botanical and Zoological Codes. The nomenclatural codes, both in botany and in zoology, have been undergoing much revision. The 13th and 14th International Zoological Congresses (Paris 1948 and Copenhagen 1953) approved in principle a rather sweeping series of changes in the rules. The several directives were published in the Bulletin of Zoological Nomenclature and in the Copenhagen Decisions on Zoological Nomenclature (1953). In most cases no exact and definitive wording of the rules were given, but usually a general directive with the exact phraseology and arrangement to be drafted by Professor J. Chester Bradley, the Editor. No publication of the revised code has appeared, and no direct comparisons of wording are possible. However, the issue of an "Unofficial Interpretation of the International Rules of Zoological Nomenclature" by W.I. Follett has proved of great assistance in making available a summary of all pertinent actions, together with a glossary of technical nomenclatural terms and phrases, and a well organized index. Because of the ownership of the copyright of the rules when published and the special restrictions imposed by the International Trust for Zoological Nomenclature, the title page bears the strange statement,

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"Issued September 1955
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The preface states further:

This paper is not issued for purposes of record, but only for the particular purposes of study and discussion during a limited time. Therefore, it falls within the definition of an unpublished document (The Bulletin of Zoological Nomenclature, 4(7/9), 1950:217-218) and it should not be quoted as authority for any nomenclatural proposition. Immediately upon the publication of Professor Bradley's official draft of the revised Rules, this paper will become obsolete.

In spite of the form of publication, or lack of it, the summary has proved most helpful, due in no small measure to the ease of reference to source material. It is evident, however, that critical comparisons between wordings of the Zoological and Bacteriological Codes must wait upon a future edition of the latter.

The situation with reference to the Botanical Code is somewhat better. The minutes of the Section on Nomenclature of the Eighth International Botanical Congress have recently been published in Taxon (4:121-177, 1955). This gives the vote of the Section on the numerous proposals that had previously been published in "Recueil Synoptique," Regnum Vegetabile 4:1-124, 1954, and the "Geneve Conference on Botanical Nomenclature and Genera Plantarum." Regnum Vegetabile 5:1-59, 1954. The definitive text has not yet appeared.

It has been thought best to proceed with the publication of the Bacteriological Code, even though not all desirable comparisons with the Zoological and Botanical Codes are possible.

2. Authorization to edit the Code. The Bacteriological Code will continue to have the same chapter headings as in the 1947 (Copenhagen) edition. The outline follows:

Preface.

Chapter I. General Considerations and Definitions.

Chapter II. General Principles.

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- Chapter III. Rules of Nomenclature with Recommendations.
  - Section 1. Naming of groups of various ranks.
  - Section 2. Designation of nomenclatural types.
  - Section 3. Publication of names.
  - Section 4. Citation of authors and names.
  - Section 5. Changes in names as a result of segregation or union of taxa or change in rank of taxa.
  - Section 6. Rejection and replacement of names.
  - Section 7. Orthography and gender of names.
- Chapter IV. Provisions for exceptions to the rules and for interpretation and modification of rules.
- Chapter V. Appendices.

In spite of the rather numerous changes in wording, deletions, and additions, it has not been necessary materially to change the order or the numbering of the rules. This will facilitate the comparison of the Copenhagen (1947) Code with the Rome (1956) Code.

The following technique has been put into effect for the final editing of the Bacteriological Code. The copy is first prepared by the Editorial Committee, then duplicated and sent to each member of the Judicial Commission for criticism and emendation. Changes suggested will again be circularized, and final wording agreed upon. Unfortunately it will not be practicable, though desirable, to send copies of drafts to all of the approximately one hundred members of the International Committee, because of the expense of duplication and mailing. If there are members of the Committee who are desirous of receiving these preliminary drafts they may be secured by sending to one or the other of the Permanent Secretaries or to the Chairman of the Editorial Committee a sum adequate to pay mailing costs (to be determined by correspondence).

The draft copy of Chapters I and II and of Chapter III, Section 1, Rules 1-8 have been mailed to the members of the Judicial Commission.

The directive that the Code be adequately annotated with explanations and examples has posed some real problems. How much explanation is needed? And in what detail? To many the Annotations as prepared may seem unnecessarily detailed, that somewhat more of knowledge of the principles of biological nomenclature can be expected of the reader.

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However, the scientific names of microorganisms are probably used by a greater variety of professional workers and scientists than are those of any other group of plants or animals. Some knowledge of how bacteria are named is needed by bacteriologists in many fields, by agronomists, botanists, plant pathologists, physicians, dentists, laboratory technicians, physiologists, protozoologists, veterinarians, biochemists, enzymologists, geneticists, nurses, sanitary engineers, food technologists, specialists in the antibiotic field, limnologists, algologists, public health officials, and many others. Some of these have a good background in taxonomy and nomenclature, the majority have not. The Annotations are intended to assist those who have little training in Latin (and usually none in Greek) to understand how organisms are named, particularly to aid those who wish to coin a new name for a taxon, to determine the correct name of two or more that have been used, how to choose the correct name to be used when taxa are split or united, or how to determine the etymology of scientific names and epithets. The rules, recommendations, and annotations should be so worded as to be of maximum assistance.

To illustrate the procedure in submission of the Code to the members of the Judicial Commission, two excerpts are published herewith as Exhibits 1 and 2. One is the draft copy of "General Considerations" of Chapter I with its Annotations, the second is Chapter III, Section 1, Rule 4.

The official text of the Bacteriological Code will be given in larger print, followed by the Annotations giving explanations, discussions and examples.

Note that the two draft copies given as Exhibits 1 and 2 are not in final form, but are for emendation and final revision, particularly as to the Annotations.

3. The directive to prepare a series of appendices. The Botanical Code, as well as the Bacteriological, authorizes the preparation and inclusion of several appendices. Instead of "Appendix" the term "Schedule" is used in the Zoological Rules.

To be included in the Appendices to the Bacteriological Code will be a schema for transliteration of Greek words for use in nomenclature in microbiology, alternative spellings of names and epithets in microbiology (orthographic variants), lists of conserved and rejected names, and summaries of Opinions rendered.

EXHIBIT 1

GENERAL CONSIDERATIONS AND DEFINITIONS

General Consideration 1. The progress of bacteriology can be furthered by a precise system of nomenclature which is properly integrated with the systems used by botanists and zoologists and accepted by the majority of bacteriologists in all countries. Bacteriological nomenclature considers bacteria, related organisms, and the viruses. Botanical and zoological codes provide for the nomenclature of certain groups such as the yeast and fungi, algae, and protozoa. These are of such significance in the microbiological laboratory that provision is necessary for the consideration of special nomenclatural problems in these groups and for coordination of findings with those of zoologists and botanists.

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General Consideration 1. There is no court which is competent to enforce the several provisions of any nomenclatural code. Adherence to the rules and recommendations of the Bacteriological Code is left to the individual judgement of the microbiologist. Nonconformity seems to be due more to lack of knowledge of the code provisions or to lack of understanding of their intent than to fundamental disagreement with the provisions themselves. There are three official codes of nomenclature, one for each of the three segments of biology, botany, zoology, and bacteriology (including virology). The existence of three codes is troublesome, for the microbiologist works with microorganisms whose nomenclature is determined by the Bacteriological Code (the bacteria and viruses), by the Botanical Code (the fungi, algae, and slime molds), and by the Zoological Code (the protozoa). Fortunately, the more important rules of the three codes are similar, where they differ the differences are reasonably clear and understood. The rules and recommendations of

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(Exhibit 1, continued)

the Bacteriological Code in general agree with those of the Botanical Code; wherever there are noteworthy differences between the provisions of the Bacteriological and the Botanical or Zoological Codes they will be discussed in the appropriate Annotation. When the rules and recommendations of the several codes are in conflict and lead to doubt as to the correctness or legitimacy of a name, General Consideration 1 suggests provisions for coordination through consultation with the appropriate representative committee of botanists or zoologists. The botanists, through action of International Botanical Congresses, have organized special committees and subcommittees to work on problems relating to particular groups of plants, such as for the algae, the fungi, the lichens, and the bacteria. Certain microbiological problems can be referred to such committees for advice or for action. The zoological rules also provide for committees of specialists to consider and make recommendations relative to problems of the several subdivisions of the animal kingdom. The Judicial Commission of the International Committee on Bacteriological Nomenclature is directed to work actively with the corresponding committees in zoology and botany on matters of common interest.

A statement (Art. 3) in the Botanical Code corresponding to General Consideration 1 reads:

Botany requires a precise and simple system of nomenclature which is used by botanists in all countries.

A related statement in the Preamble of the International Rules of Zoological Nomenclature is:

The object of the Rules is to provide a system under which the name of each taxon is unique and distinctive. A primary purpose is to insure the stability and universal acceptance of names. The Rules do not trespass on freedom of taxonomic practice.

EXHIBIT 2

Chapter III. Section 1. Naming of groups of various ranks.

Rule 4. Names of taxonomic groups (taxa) between subclass and genus have suffixes to fix the taxonomic rank. The suffix for orders is -ales, for suborders -ineae, for families -aceae, for subfamilies -oideae, for tribes -eae, and for subtribes -inae.

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Rule 4. The suffixes specified in the Bacteriological Code for formation of names of higher taxa between subclass and genus and those authorized by the Botanical Code are identical. The Zoological Code specifies two suffixes only; all family names must end in -idae and subfamily names in -inae. No specifications as to the endings to be used for other higher taxa have been published.

The suffixes are all plural feminine adjective endings. The singular forms of these suffixes are -alis, -inea, -acea, -oidea, -ea, and -ina; -oidea is from the Greek, -ina may be either Greek or Latin, the others are Latin adjectival suffixes. All as here used have the connotation of "like" or "resembling" or "having the characteristics of." These endings are in the feminine plural as they in theory modify the plural Latin noun Plantae. The family name Spirillaceae literally has the meaning of "spirillaceous plants," that is plants (organisms) resembling those of the genus Spirillum. However, in modern nomenclature the names of taxa above genus are treated as plural substantives (nouns) and not as adjectives. Further discussion of the formation of names of higher taxa will be found in the Annotations in Chapter 7 under "Orthography and Gender of Scientific Names" (p.).

Occasionally (rarely) one finds the name of one of the higher taxa used in the singular. One may, for example, designate an organism as a Spirillacea meaning that it is one of the species belonging to the family Spirillaceae. This is done not infrequently in botany; the phrases, "this is a Rosacea" or "a new Rosacea" are briefer than "this belongs

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(Exhibit 1, continued)

to the Rosaceae" or "a new species of Rosaceae." Apparently this usage has been confined almost entirely to the singular family names; however, such use of a family name in the singular is rare in microbiology.

Authors sometimes change the spelling of names of higher taxa to conform to the characteristic of the vernacular in which they write. In French the family name Spirillaceae may change from its Latin form to Spirillacées, in German to Spirillaceen (or more frequently Spirillazeen). Trevisan used as a title for an important taxonomic brochure, "I generi e le specie delle Batteriacee;" Billet used the phrase, "d'une nouvelle bacteriacée marins." This is not customary in English, one does not often find a spelling Spirillaceas. These words with the changed spellings are no longer Latin, they are vernacular, and are not the names authorized by the international agreements recognized by the several codes of nomenclature. They may be justified in nonscientific writing but cause difficulty when, as has happened, new names of higher taxa as families are proposed in the vernacular spelling. Does such a word have standing in nomenclature when not spelled as a Latin word? Should such words be discarded as not validly published and replaced, or should the incorrect spellings be regarded as unintentional errors and corrected? No formal Opinion has been rendered. It may be that the legitimacy of such vernacular names of higher taxa should be considered individually.

4. Transliteration of Bacteriological Code into languages other than English. Unofficial translations of the 1947 (Copenhagen) edition of the Bacteriological Code were published in French, German, and Spanish in France, Switzerland, and Argentina, respectively. The desirability of such translations and of their publication in a single volume with the English text is recognized. However, securing such translations for publication would much delay the appearance of the Code in printed form. The preparation of suitable translations will be undertaken in the hope that a complete edition containing these may be published later. The question will also arise as to the need for translation of the Annotations and Appendices.

REFERENCES

1. Resumé of Nomenclature Committee and Judicial Commission meetings at Rio de Janeiro. Intl. Bull. Bact. Nomencl. and Taxon. 1:4-7. 1951.
2. Minutes of the Judicial Commission 1953. Intl. Bull. Bact. Nomencl. and Taxon. 3:141-154. 1953.
3. Minutes of the International Committee of Bacteriological Nomenclature 1953. Intl. Bull. Bact. Nomencl. and Taxon. 3:155-162. 1953.