

# General Introduction to the *Draft BioCode*<sup>1</sup>

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- [Origins of the \*BioCode\*](#)
- [Scope of the \*BioCode\*](#)
- [Status of the \*BioCode\*](#)
- [Comparison of the \*BioCode\* with existing \*Codes\* of bionomenclature](#)
- [Implementation of the \*BioCode\*](#)
- [Abbreviations](#)
- [References](#)

For further discussion, see also McNeill, J. The *BioCode*: integrated biological nomenclature for the 21st century

## Origins of the *BioCode*

"Biology as a science is unusual in that the objects of its study can be named according to five different *Codes* of nomenclature" ([Hawksworth 1995](#)). The rules governing the names of animals and plants, respectively the *International Code of Zoological Nomenclature (ICZN)* ([Ride et al. 1985](#)) and the *International Code of Botanical Nomenclature (ICBN)* ([Greuter et al. 1994](#)), have origins that diverged in the mid-19th century. Although based on essentially the same principles, notably that there should be a unique name for each taxon and that the choice of competing names should be determined by precedence in date of publication, the two sets of rules have diverged in detail over their 150 or so years of separate existence. A third set of rules, the *Bacteriological Code (BC)* ([Lapage et al. 1992](#)), first developed in 1953 (published in 1958), started essentially as a derivative of the *ICBN* and 1973 developed what amounted to a new starting date through the establishment of an "Approved List of Bacterial Names". The *International Code of Nomenclature for Cultivated Plants (ICNCP)* originated in 1953 and represents a set of rules subordinate to those of the *ICBN* and applicable specifically to cultivated plants. The most recent (6th) edition ([Treharne et al. 1995](#)) clarifies the complementary role of the *ICNCP* relative to the *ICBN*. The naming of viruses and sub-viral agents (prions etc.) will be covered by the draft *International Code of Virus Classification and Nomenclature*, currently being developed from the current *Rules of Virus Classification and Nomenclature* by the International Committee for the Taxonomy of Viruses (ICTV) of the International Union of Microbiological Societies (IUMS).

For the general user of scientific names of organisms, there is inherent confusion in many aspects of this situation: different sets of rules have different conventions for citing names, provide for different forms for names at the same rank, and, although primarily each is based on priority of publication, they differ somewhat in how they determine the choice of correct name. This diversity of *Codes* can also create more serious problems as, for example, in the determination of which *Code* to follow for those organisms that are not clearly plants, animals or bacteria, the so-called ambiregnal organisms, or those whose current genetic affinity may be well established but whose traditional treatment has been in a different group (e.g. the cyanobacteria, alias the blue-green algae). Moreover, the development of electronic information retrieval, by often using scientific names without clear taxonomic context, accentuates the problem of divergent methods of citation and makes homonymy between, for example, plants and animals a source of trouble and frequently confusion.

The desirability of seeking some harmonization of all biological codes has been appreciated for some time (see [Hawksworth 1995](#)) and an exploratory meeting on the subject was held at Egham, U.K. in March 1994. A report of that meeting was published by IUBS as a Special Issue of *Biology International* ([Hawksworth et al. 1994a](#)). The key decisions of the meeting are summarized by Hawksworth ([1995](#)). Recognizing the crucial importance of scientific names of organisms in global communication, these decisions included not only agreement to take steps to harmonize terminology

and procedures, but also that it would be highly desirable to work towards a unified system of biological nomenclature. The *Draft BioCode* is the first public expression of this.

Following review by the members of the IUBS/IUMS International Committee on Bionomenclature who had prepared the initial draft in 1995 (see heading to *Draft BioCode*), and by others involved in committees dealing with biological nomenclature, the *Draft BioCode* is now being made available to the general scientific public. It was published in the May 1996 issue of *Taxon* (45: 349-372) and can be consulted electronically through a Listserver at University of California, Berkeley, U.S.A.

([biocode@cmsa.berkeley.edu](mailto:biocode@cmsa.berkeley.edu); subscribe to [listserv@cmsa.berkeley.edu](mailto:listserv@cmsa.berkeley.edu))<sup>3</sup>, and on the World Wide Web at the Royal Ontario Museum, Toronto, Canada

(<http://www.rom.on.ca/biodiversity/biocode/biocode.html>). The first direct public discussion of the *BioCode* intended for biologists of all disciplines will take place during ICSEB V (17-24 August 1996) in Budapest, Hungary. The Session is entitled "The New Nomenclature" and is scheduled from 15:45 to 19:45 on Wednesday, 21 August. Discussions are also planned during the IUMS Congress of Bacteriology and Mycology that takes place in Jerusalem, Israel, in the same week.

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<sup>1</sup>Derived, in part, from Greuter, W. and Nicolson, D.H., Introductory comments on the *Draft Biocode*, from a botanical point of view. *Taxon* 45: 343-348, 1996. See also: Hawksworth, D.L. Steps along the road to a harmonized bionomenclature. *Taxon* 44: 447-456. 1995; and Hawksworth, D.L., McNeill, J., Sneath, P.H.A., Trehane, R.P. and Tubbs, P.K. 1994a. Towards a harmonized bionomenclature for life on earth. *Biology International*. Special issue 30: 1-44.

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<sup>3</sup>Neither the address for subscribing (LISTSERV@CMSA.BERKELEY.EDU) nor the address for posting messages (BIOCODE@CMSA.BERKELEY.EDU) is case-sensitive, so uppercase or lowercase (or any combination, e.g. "BioCode" or "Berkeley") may be used. To subscribe include in the text of e-mail sent to [listserv@cmsa.berkeley.edu](mailto:listserv@cmsa.berkeley.edu) only: subscribe biocode Yourfirstname Yourlastname

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## Scope of the *BioCode*

### (i) Coverage

From the very first discussions on harmonization of *Codes*, it was evident that the botanical and zoological *Codes*, in particular, had diverged so extensively over the years, that any attempt to provide a unified *Code* for the names of the past would involve so extensive change in scientific names as to be totally unacceptable. What has proven feasible, however, is to provide a common *Code* for the future, despite the divergent past. It is proposed, in general, that the provisions of the *BioCode* will apply to the names of all taxa published on or after a date to be determined. The *Draft BioCode* specifies 1 January 2000, but this should be viewed as a target date to focus thought, rather than a firm proposal. Implementation will only come about with the approval of the international authorities responsible for the existing *Codes* of bionomenclature (see *Draft BioCode* Div. III. 3.)<sup>4</sup>.

Delimitation of coverage in relation to the current *Codes* is defined in Pre. 2-3, where it is made explicit that the *BioCode* is intended to govern only the nomenclature of the future. This means that: (a) names existing prior to the starting-point date for the *BioCode* will not (except in specified cases) be affected by the new rules, and (b) the current *Codes* for the major groups of organisms will remain operational for pre-*BioCode* names.

### (ii) Retroactivity

Rules governing the form of names (e.g. whether nouns or adjectives) must, however, be fully retroactive. The form of existing names may, therefore, be affected by such rules insofar as they deviate from those in one of the current *Codes*. To minimize change, and to respect, in so far as

possible, traditions of long standing, different standardization rules may be permitted for the different major groups (notably for the spelling of epithets); such provisions would be covered in a future special Annex, foreshadowed in Art. 37.8-9. Differences in the terminations at the higher ranks will remain (Art. 25-26), adding to those already in existence between fungi, algae, and other plants.

Also retroactive are the rules governing the choice, in making taxonomic changes, between competing names in order to establish which name is to be accepted for a taxon in a given circumscription, position, and rank (Art. 19).

The new (across-kingdom) homonymy rule (Art. 18) would not, however, be retroactive.

### *(iii) Harmonization of Terminology*

One of the mandates of the 1994 Egham meeting, arising from the XXIV IUBS General Assembly held in Amsterdam in 1991, was to consider how to harmonize the terminology of biological nomenclature (see also [Hawksworth \*et al.\* 1994b](#)). The need for this is clear when one realises that when a botanist or bacteriologist describes a name as "valid", he is applying it to a name that a zoologist would call "available", a term that in turn a botanist would equate with something close to the zoologist's "potentially valid". By contrast, the zoologist's "valid name" is the botanist's and bacteriologist's "correct name". Indeed, one of the first things that the participants at the Egham meetings had to do among themselves was to acquire a knowledge of the terminology of the other *Codes*, e.g. to allow botanists and bacteriologists to understand what we quickly came to call "zoospeak", and, conversely to ensure that "botspeak" was intelligible to zoologists. The need for a new "biospeak" was self-evident and [Table 1](#) of the *Draft BioCode*, is one result.

The principles under which the new nomenclatural terminology was chosen were as follows. In all cases of confusion (such as the use of "valid" and "available" mentioned above), a new term would be adopted, if possible one whose meaning was identical to, or was encompassed by, the everyday meaning of the word. In the more numerous cases in which there was different usage but no inherent confusion, the more generally understandable term was adopted. If no such distinction appeared to exist, a choice was made such as to maintain approximately equal number of usages from the different *Codes*.

New terms are, therefore, being proposed for many of the familiar nomenclatural expressions used in Botany such as "effectively published", "validly published", "legitimate" and "correct", and some in Zoology such as "available", "valid" and "senior" and "junior". In this way, it is hoped in the future to avoid the ambiguity that results, under the current *Codes*, from use of the same terms in a different meaning, or of different terms for the same concept. Interestingly, the International Commission for the Nomenclature of Cultivated Plants has found it possible to adopt the new terminology in the most recent edition of the *International code of nomenclature for cultivated plants* ([Trehane \*et al.\* 1995](#)).

### *(iv) Relationships to the Codes covering viruses and cultivated plants*

Confusion arising from the existence of different *Codes* is essentially confined to applications of the bacteriological, botanical and zoological *Codes*. As noted above, the *ICNCP* supplements the botanical *Code* by providing for special ranks covering "plants whose origin or selection is primarily due to the intentional actions of mankind". The different form of virus names has hitherto precluded confusion with names of non-virus organisms. The relationships of the *BioCode* to these *Codes* is outlined in Pre. 5 & 6, and special provisions to prevent future confusion with virus names are enacted in Art. 25.6, 26.2 and 28.1.

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<sup>4</sup>For explanation of abbreviations regarding components of the *Draft Biocode* and other *Codes*, see [end](#) of General Introduction

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## Status of the *BioCode*

Providing a novel basis for a unified nomenclature of organisms for the future may at first sight seem a revolutionary, even reckless enterprise, but given the current strong unifying trends in biology, particularly in teaching and dealing with environmental crises such as that related to biodiversity, it can be better understood as an appropriate and timely response by biological systematics to the challenges of a rapidly changing scientific and intellectual environment. The enormous savings of non-scientific time and effort, currently devoted to interpreting old names and studying old literature, that would come with lists of accepted names and a new *Code* for the future, seem reason enough in themselves to explore the *BioCode* options vigorously.

Much thought has already gone into the *Draft BioCode*, although further refinement is still necessary. Many questions that come readily to mind have been taken care of, but this may not be immediately obvious. To facilitate an understanding of the *BioCode*, a comparison with existing *Codes* is provided below. Meanwhile questions and comments regarding the *BioCode* and its provisions are solicited. These can deal with the broad issues of desirability and need, as do two of the three contributions in the "Points of View" column of the May 1996 issue of *Taxon* ([Orchard et al. 1996](#); [Greuter 1996](#)), or with trends and directions within a *BioCode* or its specific provisions, as did the third ([Garnock-Jones & Webb 1996](#), on citation of authors of scientific names).

At present the *BioCode* is a draft for active discussion ([see details above](#)); how it will be implemented is discussed separately below.

## Comparison of the *BioCode* with existing *Codes* of bionomenclature

The typographical layout of the current *Draft BioCode* will be more familiar to botanists than to zoologists, bacteriologists and others. This is because it conforms to that of the *International Code of Botanical Nomenclature (Tokyo Code) (ICBN)* ([Greuter et al. 1994](#)). This should not be taken as implying that the *Draft BioCode* rests more heavily on the principles of the *ICBN* than it does on that of other *Codes*. It is simply an artifact of the availability to the Egham group in 1995 of an electronic version of the *Tokyo Code*, which conveniently became a technical template for the new *BioCode*. In fact the *Draft BioCode* seeks to integrate elements of the existing *Codes*, most notably the *ICBN* and the *ICZN*. The ways in which this is done and the main differences between the *Draft BioCode* and the existing *Codes* are discussed below.

The portion that follows is in large part a generalization of the "Introductory comments on the *Draft BioCode* from a botanical point of view" by [Greuter and Nicolson \(1996\)](#).

### (i) *General points*

Understandably, though perhaps regrettably, no examples are listed in the *Draft BioCode*. While some may be supplied at a later stage, authentic examples will not be possible for many of the provisions, which deal exclusively with future names and situations. Notes and Recommendations have also been omitted at the present stage, although some will no doubt be needed.

Many provisions of existing *Codes* are not included in the *Draft Biocode*, either because they refer solely to situations of the past, or because they were found to be inapplicable or inappropriate in the new context. This is very clear when one compares the *Draft BioCode* with the botanical *Tokyo Code*, used as the electronic template, from which a very considerable number of articles and paragraphs were dropped, e.g. the *Draft BioCode* has only 41 Articles, whereas the *Tokyo Code* has 74.

### (ii) *Ranks, priority*

The present ranks of the botanical *Code* are maintained in the *Draft BioCode*, and a few tentatively added: domain (above kingdom), in use for the pro-/eukaryotes, superfamily (in widespread use in zoology), and the option of adding the prefix super- to rank designations that are not already prefixed (Art. 3-4). In turn, from a zoological perspective, this implies that ranks additional to those of the species-group, genus-group and family-group will be governed by the *BioCode*, although to none of these additional ranks does the principle of precedence apply (see below).

The *Draft BioCode* recognizes six groups of ranks (Art. 9.3); these are important because the principle of mandatory precedence (priority) is to operate only within three of them (Art. 19.8), and because vertical transfers of names across the boundaries of the groups is to be precluded (Art. 9.3). Both features would be major innovations for botanical nomenclature.

The three rank groups with mandatory precedence are those presently covered by the zoological *Code* (which does not deal with ranks outside these groups): family-group, genus-group, and species-group. For botany, the principle of precedence is to remain facultative at the suprafamilial ranks, and to become so at ranks of subdivisions of genera other than subgenus and at infraspecific ranks other than subspecies (this provision would have retroactive effect). There can be little doubt that the removal of mandatory precedence, when considered in the light of Principles VII and VIII, will have a stabilizing effect on nomenclature at these ranks.

Transfers of names (stat. nov.) across the subgenus-section and subspecies-variety boundary, hitherto standard in botanical usage, would no longer be possible, although former such transfers would remain "valid" (established) under the botanical *Code*.

### (iii) *Coordinate status*

It is proposed that the rule presently prevailing in zoology be extended to botany and bacteriology. This would mean that in the family-group, genus-group, and species-group, establishment of any name will automatically establish coordinate names, with the same authorship and date, at all other ranks of the same group. This rule, which would not, of course, operate retroactively, would replace the present autonym rule in botany, and differ from it in two major respects: (a) the date of establishment of the "autonym equivalent" would usually be earlier (and more easily ascertained), and (b) the "autonym equivalent" would be established in an upward as well as downward direction in the taxonomic hierarchy, e.g. the establishment of the name of a new subspecies would, at the same time, establish the same name at species rank.

Introducing coordinate status in the genus group has one major consequence: since any new subgeneric name will simultaneously be established at generic rank, its epithet must have the same form as a generic name and no longer can be a plural adjective, as is currently permitted under the botanical *Code*. This rule (Art. 28.2), concerning the form of names, should logically be retroactive and, if so, would lead to the disestablishment (devalidation) of former subgeneric names of which the epithets (contrary to Rec. 21B.1 of the *Tokyo Code*) are adjectival (Art. 28.3). Negative effects of this rule, if any, might be minimized by a minor change, whereby such names, rather than losing their nomenclatural status, would remain valid but become unranked (and infra-subgeneric).

### (iv) *Publication*

Some possible innovations, to account for recent progress in publication technology, have been tentatively incorporated into Art. 5.2. They would not of course be retroactive.

### (v) *Establishment of names*

Establishment (valid publication) under the *BioCode* includes registration as a last step after fulfilment of the present requirements for valid publication (Art. 8.1(e), 13). This is nothing new for botanists, being already foreshadowed in the *Tokyo Code* (Art. 32.1-2, 45.2), and an analogous

provision requiring indexing by the *Zoological Record* within five years of publication was included in the draft 4th edition of the *ICZN*. Procedures and mechanisms of registration are yet to be worked out and would be detailed in a special Annex; these may well be to some extent independent for the various major groups of organisms. Ultimate responsibility for the registration system is assigned to the International Committee on Nomenclature in Div. III.7, but international disciplinary organizations such as the IAPT, although not now explicitly mentioned, are likely to play an active role in the registration of names of taxa.

At present, the requirement of Latin descriptive matter for the validation of names of new taxa (if non-fossil) is a unique feature of the botanical *Code*. The *Draft BioCode* (Art. 8.2) opts for a compromise between zoology (any language) and botany (Latin only), and follows the solution pioneered by palaeobotany in that a Latin or an English description is currently required for publication of names of plant fossils (*Tokyo Code* Art. 36.3). The draft 4th edition of the *ICZN* suggests a restriction to languages using the Latin alphabet.

Art. 8.3 would introduce the additional requirement of a clearer statement of intent for the establishment of names. Zoologists have proposed such a provision in the forthcoming 4th edition of their *Code*, and this seems a good idea in botany too, minimizing the risk of "inadvertent" establishment of new names when, in future, the Latin requirement no longer serves as a filter.

#### (vi) *Limitations of precedence (priority)*

Adopted lists of names in current use, a much debated issue in botanical nomenclature, would become a newly available option (Art. 21), analogous to what the draft version of the next zoological *Code* proposes to rule. For the conservation of names (Art. 20), rank limitations would be abolished, by analogy to the current zoological *Code* and as a logical consequence of coordinate status of future names within rank groups. The difference with respect to the present situation in botany is in fact minimal, since limitation of precedence makes sense only in rank groups with mandatory precedence. Conservation and rejection procedures would remain largely the same as at present (Div. III.9). The botanical process of sanctioning concerns old names only and need not be provided for in a future *BioCode* (see also Art. 19.1, last sentence).

#### (vii) *Homonymy*

The major change with respect to the homonymy rule would be that, in the future, it would operate across the kingdoms (Art. 18.1). In order that this provision be applicable, it is necessary that lists of established generic names of all organisms be publicly available, ideally in electronic format; most such, apparently, already exist, but are not yet generally accessible. A list of across-kingdom generic homonyms in current use is being prepared, and, as a next step, a list of binomina in the corresponding genera is planned, so that future workers may avoid the creation of new (illegal) homonymous binomina. Existing across-kingdom homonyms would not lose their status of acceptable names, but would be flagged for the benefit of biological indexers and users of indexes.

As mentioned above, Pre. 5, Art. 25.6, 26.2 and 28.1 would, for future names, preclude homonymy and confusability between names of organisms and those of viruses. Existing names are not affected by the proposed rules.

#### (viii) *Secondary Homonymy*

"Secondary Homonymy" is the term given by the *ICZN* to situations in which species-group names established for different nominal taxa (i.e. taxa based on different types) under different generic names are brought together under the same generic name. The zoological practice is to give precedence to the first published name regardless of the date upon which the names are brought into homonymy by taxonomic decision. Botanical practice does not distinguish "secondary homonymy" and considers that a homonym would only be created with the publication of the "new combination",

the binomen in the genus into which the species are being brought together. The *BioCode* follows botanical practice in this regard, restricting precedence to the binomina *per se*, so that an established name can never be altered as a result of a later taxonomic decision.

(ix) *Spelling and gender of names*

Lively discussions are taking place among zoologists, aiming at the abolishment of gender of generic names and the maintenance of the original or a later termination of adjectival epithets upon transfer. Essentially this would remove the long-standing provision in all three *Codes*, retained in the *Draft BioCode* (Prin. VI), that scientific names are Latin or deemed to be Latin. This might ultimately result (taking a zoological example) in *Passer domesticus* (L.), based on *Fringilla domestica* L., having to become known as *Passer domestica*. To those who have any familiarity with Latin (an increasingly small number, we are told), and presumably to those many biologists fluent in modern Romance languages, such a change would be very disturbing (to put it mildly). It would also detract from one element of the "predictability" of names, forcing users of names to check the original nomenclatural source, or at least to consult an authoritative compendium.

An alternative might be the provision of fool-proof recipes to users and inventors of names, at three levels: (1) authoritative guidance on the appropriate gender of generic names (Art. 39.2-3) - already present for a substantial share of botanical names in *NCU-3* ([Greuter et al. 1993](#)); (2) similar guidance on the appropriate form, spelling and declination of epithets and word elements used in their formation (Art. 37.5-10); and (3), perhaps somewhat less urgently, guidelines on the appropriate genitive singular termination to be used in compounding and in the formation of suprageneric names. Concomitantly, an effort to standardize a number of presently allowed variant spellings (e.g. *sylvaticus/silvaticus*, *caespitosus/cespitosus*, *missouriensis/missourensis*) might be possible, so as to make the appropriate spelling of scientific names of organisms more predictable than at present (Art. 37.8-9). For future names, the registration procedure would offer an excellent opportunity to prevent incorrect usage of gender, or non-standard spellings, from spreading (see Art. 37.2, 39.4).

(x) *Author citation*

The *Draft BioCode* signals a departure from the botanical tradition of laying great emphasis on the use of author citations, even in contexts where such citations are neither informative nor really appropriate. This may be a timely change, since botanical attitude is showing signs of cracking ([Garnock-Jones & Willis 1996](#)). Art. 40.1 is so worded as to reflect this new attitude. Zoological tradition has never been friendly toward the authors of new combinations. Under Art. 41, mention of the (post-parenthetical) author of a transfer would become optional. Otherwise, the draft rules for author citation closely follow the wording of Art. 46 of the *Tokyo Code*.

(xi) *Ambiregnal organisms*

While many of the provisions of the *BioCode* will come as a relief to workers in ambiregnal groups, they will not completely solve their problems. Inevitably some rules will remain that are different for different groups of organisms, however defined. Borderline problems are notoriously difficult to solve, and are in fact insoluble unless and until a consensus is reached, among workers in the groups concerned, as to which is the appropriate borderline. As experience tells, such difficulties are surmountable if they can be dealt with under a single *Code*: there has never been a problem, under the botanical *Code*, in delimiting fungi from algae, algae from other plants, or fossil from non-fossil taxa, and there used to be no problems with the "blue-green algae" so long as bacteria and algae were dealt with under the same *Code*. It will be the task and privilege of a future *BioCode* to define which rules apply to dinophytes and dinoflagellates, to euglenids, trichomonads and trypanosomes. Div. III.4 provides the necessary mechanisms for doing so, and there is no reason to doubt that they will work and lead to generally acceptable solutions.

(xii) *Hybrids*

The Appendix for Hybrids in the botanical *Code* is replaced by a single Article in the *Draft BioCode*, Art. 34. This extreme simplification should in no way disrupt present and future usage of hybrid designations, but has some philosophical changes as its basis. Most importantly, taxonomy and nomenclature are disentangled, in conformity with Principle I: nothing remains of the former statement on appropriate rank, or of the requirement of a single hybrid taxon per hybrid combination. The condensed formulae designating intergeneric hybrids are restricted to usage as surrogates of generic names in the formation of binomina. The danger that, in view of that quasi-generic function, they might have to be considered for purposes of homonymy (and thus indexed) has been avoided by the proposed convention of considering the multiplication sign as part of these "names".

(xiii) *Special topics.*

Art. 25.1 endeavours to introduce a clearer definition of what the botanical *Code* calls "descriptive names", at the suprafamilial ranks. Such names being generally used in zoology, much more widely than in botany, the clarification was needed. As worded, it appropriately reflects current botanical and zoological practice.

### **Implementation of the BioCode**

The *Draft BioCode* includes, as its final item, a Division III on authority and mechanisms showing how and under which procedural rules the *BioCode* can become operational. The pertinent international scientific Unions (IUBS and IUMS) intend to play, much more directly in the future, the leading role in governing bionomenclature, which is theirs by tradition. However, the immediate patrons of the current *Codes* are given the right to veto the whole change.

It must thus be assumed that the Nomenclature Section of the XVI International Botanical Congress meeting in St Louis in late July 1999 will be faced with the request to authorize authority transfer from the botanical *Code* to the *BioCode*, conditional upon approval of similar requests by the two other bodies concerned. These are the International Commission on Zoological Nomenclature, which is meeting at ICSEB V in Budapest in August 1996, to consider the Draft 4th edition of the *ICZN*, and would normally meet again at the XXVI General Assembly of IUBS, scheduled to take place in Taipei in 1997, and at subsequent General Assemblies of IUBS which are held every 3 years, and the International Committee on Systematic Bacteriology, which will also meet in August 1996, but in association with the International Microbiological Congress in Israel; it will meet thereafter at the next IMC, scheduled for 1999.

The date on which such transfer of authority may take effect will be decided by the new *de facto* nomenclatural authority, an international committee in which botanists will be represented with two of nine members. As noted above the "fateful" date, 1 January 2000, whose prominence in the *BioCode* has apparently caused some concern that implementation would be effected with undue haste, is a notional date rather than a plausible projection.

Assuming all this will happen, the role of the existing bacteriological, botanical and zoological *Codes* will change but will continue. They will still rule the names of the past, although their provisions on the formation of new names will see their effect limited in time, and relevant Recommendations may presumably be scrapped. Several editorial changes, including new notes and examples, will presumably be needed. It may be desirable, and would certainly be feasible, to produce a combined edition, or combined editions for each discipline, integrating the old and new rules in a single body of text.

Independently of the ultimate fate of the *BioCode*, a worthwhile consideration may be whether any of the provisions of its draft are attractive enough to be incorporated into existing *Codes* on their own merits. Following the example of the *ICNCP*, terminology would be an obvious candidate, as would the removal of mandatory priority (precedence) from certain ranks.

## Abbreviations

To help all interested biologists who wish to compare the proposed new rules with the corresponding entries in the three current *Codes* involved (*BC*, *ICBN*, *ICZN*), cross-references are provided at the end of each paragraph of the *Draft BioCode*, preceded by a dash. The following, largely self-explanatory abbreviations have been used:

- BC*      *International Code of Nomenclature of Bacteria (Bacteriological Code)*. ([Lapage et al. 1992](#)).
- ICBN*    *International Code of Botanical Nomenclature (Tokyo Code)*. ([Greuter et al. 1994](#)).
- ICNCP*   *The International Code of Nomenclature for Cultivated Plants - 1995*. ([Trehane et al. 1995](#)).
- ICZN*    *International Code of Zoological Nomenclature*. ([Ride et al. 1985](#)).

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| <i>App.</i> = Appendix;              | <i>Pre.</i> = Preamble;       |
| <i>Art.</i> = Article;               | <i>Prin.</i> = Principle;     |
| <i>G.C.</i> = General Consideration; | <i>Rec.</i> = Recommendation. |

Equivalences between technical terms used in this *Draft* and those that appear in the current *Codes* of biological nomenclature: *BC*, *ICBN*, *ICZN*, and the *ICNCP*, are given in [Table 1](#). Terms used in the draft "International code of virus classification and nomenclature" (prepared by the International Committee for the Taxonomy of Viruses) parallel the usages of the bacteriological *Code*, but, as they are primarily defined on the basis of taxonomic acceptability, are not their exact equivalents and so are not included in the Table.

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