The foundation of the *Melbourne Code* Appendices: Announcing a new paradigm for tracking nomenclatural decisions

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Abstract A newly expanded digital resource exists for tracking decisions on all nomenclature proposals potentially contributing to Appendices II–VIII of the *International Code of Nomenclature for algae, fungi, and plants*. This system owes its origins to the Smithsonian Institution's "Proposals and Disposals" website created by Dan H. Nicolson to track conservation/rejection proposals, but now also treats proposals to suppress works or requests for binding decisions. The new resource was created to accommodate the steadily expanding content of the Appendices in relation to the main body of the *Code*. A database is now available to generate these Appendices, as has been done for the *Melbourne Code*. A web interface allows users to query database content in various ways to review proposal histories or to extract all or part of the Appendices. An analysis of the underlying data was conducted to make comparisons between proposals submitted for the various editions of the *Code*. These include the type of nomenclatural remedy sought, the major group concerned, the numbers of names involved, the timeliness of the proposal evaluation process, the proposal success rate, and the diversity of proposal authorship. The success of proposals was also evaluated by the type of remedy sought and by major groups.

Keywords Algae; Angiospermae; angiosperms; binding decisions; Bryophyta; bryophytes; conservation proposals; conserved types; Fossil plants; Fungi; Gymnospermae; gymnosperms; nomenclature database; Pteridophyta; pteridophytes; rejection proposals; Spermatophyta; spermatophytes; suppressed works

■ INTRODUCTION

As noted in the preface to the *International Code of Nomenclature for algae, fungi, and plants (Melbourne Code)* (*ICN*, McNeill & al., 2012), one of the decisions of the XVIII International Botanical Congress in Melbourne in 2011 was that the Appendices to the *ICN* (excluding App. I on the nomenclature of hybrids) could be published apart from the main text, and possibly only electronically. Although the separate volume comprising the Appendices II–VIII has just appeared, both as a printed volume (Wiersema & al., 2015) and electronically, it seems useful to draw attention to the underlying digital mechanism now in place to accomplish the relevant tasks. This mechanism owes its origin to Dan H. Nicolson's pioneering "Proposals and Disposals" and "Confusable Names" websites, which were supported by databases that provided historical information on individual conservation and rejection proposals and requests for binding decisions on confusable names, respectively (see Nicolson, 2000 for the history of these processes). With the addition by the senior author of data captured from Appendices II–VI of the *Vienna Code* (McNeill & al., 2006) and all subsequent nomenclatural proposals and decisions published in *Taxon*, we now have an integrated database system that was used to compile this edition and will be used for future editions of *ICN* Appendices II–VIII. This digital resource is available online from the Department of Botany of the Smithsonian Institution's National Museum of Natural History at http://botany.si.edu/references/codes/props/index.cfm.

While Appendices II–VI continue to cover conserved and rejected names and suppressed works as in the 2006 *Vienna Code*, the binding decisions under Art. 38.4 on whether or not to treat a name as validly published when it is doubtful whether a descriptive statement satisfies the requirement for a "description or diagnosis" are now included in App. VII, and the binding decisions under Art. 53.5 on whether or not to treat names as homonyms when it is doubtful whether they or their epithets are sufficiently alike to be confused are included

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in App. VIII. All nomenclature proposals and their outcomes relevant to each of these seven Appendices are represented in this database system.

■ ADVANTAGES OF THE NEW SYSTEM

The necessity of moving toward this digital resource was becoming increasingly inevitable due to the burgeoning content of the Appendices in relation to the main text of the *Code*, the latter including preliminary pages, the Preamble, the Principles, Rules and Recommendations, the Provisions for the Governance of the *Code*, the Names of Hybrids (App. I), the Glossary, the Index of scientific names, and the Subject index. Fig. 1A provides a comparison of the relative pages comprising both the [English] main text (and those parts later incorporated into this text) and the Appendices of all past *Codes*, excluding the indices and glossary, with Fig. 1B providing further indication of the growth in the numbers of Appendix entries involved. As can be readily seen from these comparisons, both the number of published Appendix pages and the number of included conservation and rejection entries have been growing steadily, especially since the 1988 *Berlin Code* (Greuter & al., 1988). This pattern will be further accentuated by the addition of two new Appendices (VII and VIII) to cover binding decisions to the *Melbourne* and subsequent *Codes*.

In addition to the time-saving value in the preparation of future *Code* Appendices, this digital resource will facilitate other improvements as well. With the ease of isolating similar records for any set of criteria, it allows for increased consistency in the Appendix entries, especially in applying the standard forms for authors' names and publication titles, dating publications, citing collection data and collectors, using abbreviations in entries, and synchronizing their overall format. It also permits more thorough cross-referencing between related entries. It furthermore provides the means to record permanently the basis for any editorial adjustments to existing entries, thereby avoiding the necessity of revisiting some of these same issues for future *Codes*.

■ CAPABILITIES OF THE SYSTEM

The databasing of the *ICN* Appendices together with the underlying proposal histories, and the search tool that now accompanies this resource, opens a new range of possibilities to examine these data. While one can download the entire content of all Appendices with a single command, it is also possible to simultaneously query all entries for a variety of criteria. Searches can be performed on all or part of any name proposed for conservation, rejection, or a binding decision; on any author who proposed such an action; on any character string (of a word or phrase) that appears anywhere in an Appendix entry; by a particular plant group (e.g., division, fossil, etc.); by the taxonomic rank of a conserved or rejected name; by the nomenclatural action that was proposed; and/or by the volume number of *Taxon* in which the original proposal appeared.

The results from any of the above queries can be displayed in either of two ways, depending on the interest of the user. A "Proposals" report provides information on the history of the relevant proposal(s), such as the proposal number of each, the name(s) being proposed for conservation/rejection or a binding decision, the division (e.g., *Bryophyta*) or group (e.g., fossils) of these names, the subgroup (e.g., class) if the name is that of a genus, the nomenclatural action sought by a proposal, the author(s) of a proposal, the place where a proposal was published, where and what were the Nomenclature Committee and General Committee decisions on a proposal published, any additional notes or remarks on a proposal, and an indication of subsequent *Code* Appendices where the relevant name(s) has/have appeared if the proposal was successful. This information largely represents what has been available since Nicolson's original resource first appeared in 2000, with some additional standardization and with the added reproduction in this report of any entries from the *ICN* Appendices that have resulted from a proposal.

A second "Code Appendices" report provides content from the *ICN* Appendices only for those names that match the search criteria. Apart from obtaining a complete report

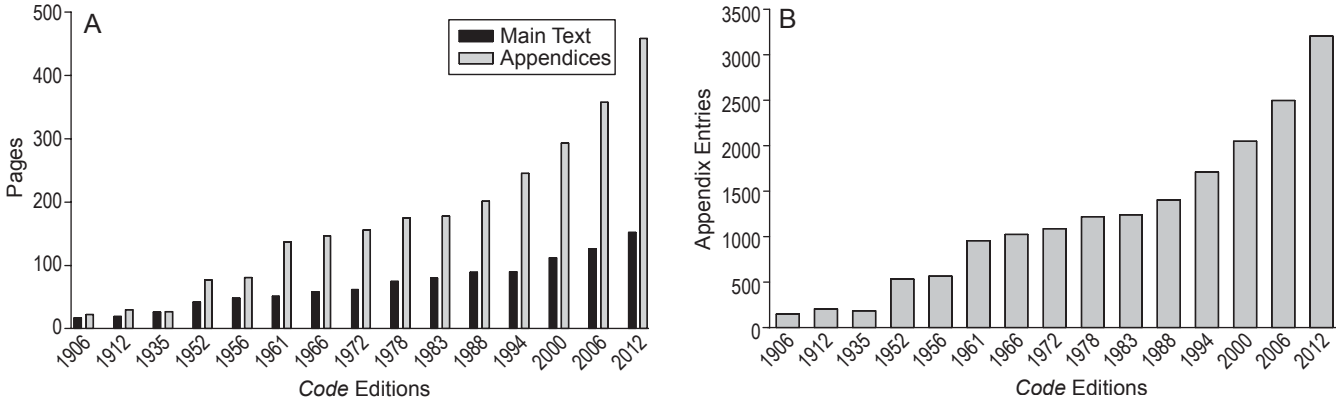

Fig. 1. A, Comparison of the number of pages comprising the main text (i.e., the rules) and the Appendices (of conserved or rejected names, suppressed works, or binding decisions) of various editions of the international *Codes* of nomenclature covering algae, fungi, plants, and their fossils. For older multilingual *Codes* only the English portion was compared. **B,** The respective number of entries in these Appendices. A single conservation entry (in App. IIA, III & IV) was considered to include any names listed as rejected against the conserved name.

of all Appendices from this selection, users may find it useful to examine only a subset of the Appendix entries, such as those from a particular plant group, a particular Appendix, or those names published by a certain author or in a certain work. The content is provided exactly as it would appear for those entries in the published Appendices (Wiersema & al., 2015), and includes the Appendix introductions as well. Ready access to the "Explanation of symbols and Latin terms" used in the Appendices is also provided.

Those contemplating the preparation of proposals to address nomenclatural problems for various names should check these data to determine whether any such action has been proposed before for the names involved. If a proposal is prepared, guidance in structuring the formal nomenclature heading may be gleaned from similar entries, perhaps involving names from the same work or by the same author, which can now be easily retrieved from the current Appendices.

■ ANALYSIS OF 120 YEARS OF CONSERVATION/REJECTION PROPOSALS

An added advantage of the digitizing of nomenclature proposal data is that it now becomes possible to undertake analyses of the underlying process that would otherwise have been quite difficult or impossible. In fact, the senior author's original impetus for capturing the data from Dan Nicolson's original database was to conduct such an analysis for a colloquium presentation in honor of John McNeill in Columbus, Ohio in 2012 (Funk & al., 2012). To accomplish this task, the origin of each nomenclature proposal was dated to its year of publication, and if successful its first appearance in the *Code*, either as a provisional entry and/or as a permanent one, was also dated. As Nicolson (2000) indicated, the first conservation proposals were published in 1892, now over 120 years ago. At the time of Nicolson's report, 4438 proposals were indicated to have appeared. For the present report, which takes account of all proposals (excluding 110 duplicate proposals) up to those adjudicated for the *Melbourne Code* Appendices, the revised figure stands at 4822.

Evolution of nomenclature proposals. — Conservation of generic names was provided for in Art. 20 of the 1906 *Vienna Rules* (Briquet, 1906), family names in Art. 23 of the 1935 *Cambridge Rules* (Briquet, 1935), with Art. 24 of the 1952 *Stockholm Code* (Lanjouw & al., 1952) extending this to any suprageneric name. After the conservation provisions were moved to Art. 14 in the 1956 *Paris Code* (Lanjouw & al., 1956), where they remain today, conservation of suprafamilial names was later dropped from the 1961 *Montreal Code* (Lanjouw & al., 1961) and of names of subdivisions of families from the 1983 *Sydney Code* (Voss & al., 1983). Conservation became possible for names of species of major economic importance in the 1983 *Sydney Code* (Voss & al., 1983); this was extended to include widely misapplied species names or those needed to fix generic typification in the 1988 *Berlin Code* (Greuter & al., 1988), and finally to any species name in the 1994 *Tokyo Code* (Greuter & al., 1994). Article 14.1 of the 2012 *Melbourne Code* now makes it possible to conserve names of subdivisions of genera or infraspecific taxa that are basionyms of threatened generic or specific names as well.

Rejection, of any widely misapplied name, first became possible in Art. 69 of the 1978 *Leningrad Code* (Stafleu & al., 1978), and combinations based on listed names were also to be rejected in the 1983 *Sydney Code*. This provision was renumbered as Art. 56 in the 1994 *Tokyo Code*, and any name causing nomenclatural disruption was then eligible for rejection.

Just as the nomenclature provisions providing for conservation or rejection have evolved over this period, so too have the nomenclature proposals themselves. Figure 2 provides an indication of how differing nomenclatural remedies have been pursued in proposals under various editions of the *Code*. To evaluate the underlying data, proposals were assigned to a particular edition of the *Code* based on their date of publication, with the date of the last proposal to successfully enter a given *Code* providing the cut-off date for that edition of the *Code*, and a subsequent date providing the beginning date for the next edition of the *Code*. The few proposals to conserve or reject names of subdivisions of families, names of subdivisions of genera, or infraspecific names were grouped with similar proposals for families, genera, or species, respectively.

As would be expected, proposals to conserve generic names were dominant up to the 1994 *Tokyo Code*, after which proposals to conserve or reject outright [utique] species names have become increasing prevalent. Once conservation of family names became possible in 1935, a large number of proposals to conserve family names of Spermatophyta appeared for the 1952 and 1961 *Codes*, and there was also a large number in other major groups for the 1988 *Code*. Surprisingly, as Nicolson

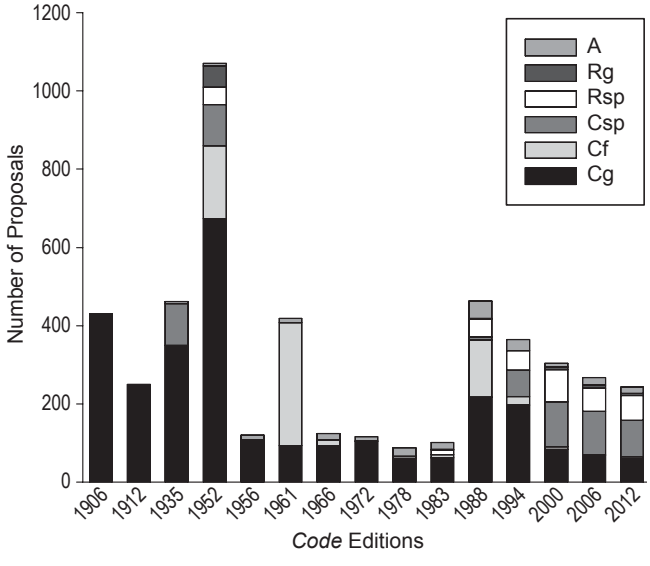

Fig. 2. Changes in the nomenclatural remedies sought by the proposals submitted for consideration by various editions of the *Code* (A = amend entry, Rg = reject genus [or subdivision of genus] name, Rsp = reject species [or infraspecies] name, Csp = conserve species [or infraspecies] name, Cf = conserve family [or subdivision of family] name, Cg = conserve genus [or subdivision of genus] name).

(2000) discussed, as many as 213 species names were proposed for conservation as early as the 1935 and 1952 *Codes*, but the underlying provisions to permit this were not approved at that time. Other proposals to reject outright 98 fungal generic and specific names were submitted for the 1952 *Code*, again long before the necessary provisions were approved.

Figure 3 compares by various editions of the *Code* the number of names proposed for conservation, proposed for rejection against these conserved names, or proposed for outright rejection. These data suggest that until the 1988 *Berlin Code* names were being proposed for conservation against multiple additional names, except the 1961 *Montreal Code* when numerous spermatophyte family names were conserved without the need to list competing names. However, from the *Berlin Code* on there has been an increase in proposals of a different sort, such as to conserve a type, overcome illegitimacy, or conserve orthography or gender, but not against competing names. Figure 3 also indicates that conservation continues to be the most proposed remedy to resolve nomenclatural problems, even for the last several editions of the *Code* when outright rejection has been an available solution.

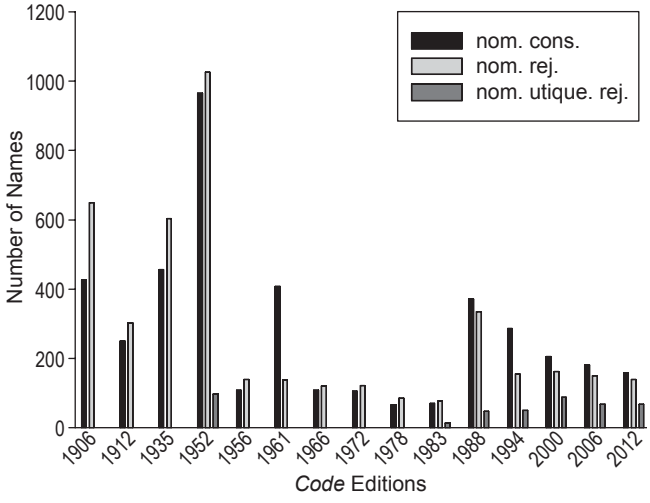

Fig. 3. A comparison by editions of the *Code* of the number of names proposed for conservation (nom. cons.), proposed for rejection against these proposed conserved names (nom. rej.), or proposed for outright rejection (nom. utique rej.).

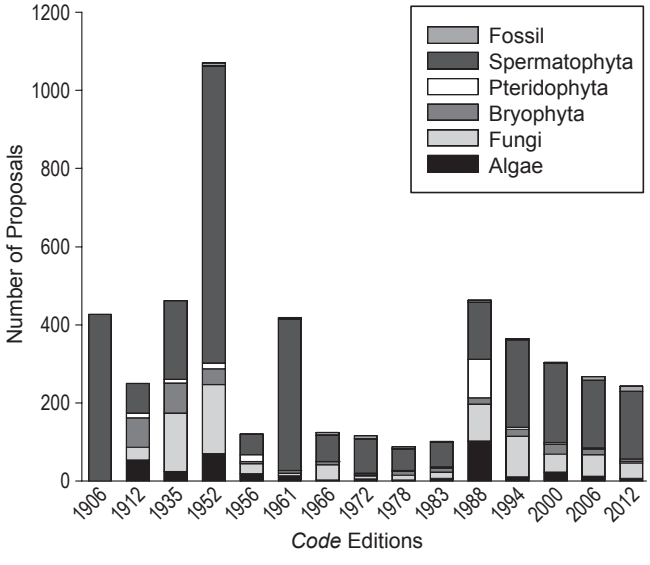

Fig. 4. Changes in the proposals submitted for major groups in various editions of the *Code*.

The number of proposals considered for each *Code* has varied widely over the years, from over 1000 for the 1952 *Stockholm Code* to less than 100 for the 1978 *Leningrad Code* (Figs. 2, 4). Except for the set of proposals to conserve all spermatophyte family names in current use for the 1961 *Montreal Code*, a relatively small number of proposals were submitted after the 1952 *Stockholm Code* until the 1988 *Berlin Code*, when a fourfold increase in proposals was observed that has steadily declined for subsequent *Codes* but remains over twice the number of this earlier period. Figure 4 indicates that although the largest batch of proposals for each *Code* have always concerned spermatophyte names, large numbers of proposals for other major groups have appeared for certain *Codes*, such as for bryophytes in the early *Codes* and for the fungi in more recent *Codes*. Activity leading to algal or fern proposals has been more sporadic, and the limited number of fossil proposals have been associated with only a few *Codes*.

Success of nomenclatural proposals. — Nicolson (2000) observed that the percentage of all conservation/rejection proposals leading to the addition or modification of an entry in the *Code* Appendices was at that time 62%, but since some proposals were still in process he estimated the success rate to be about two-thirds. The latest data now place this at 63%, but for proposals processed subsequent to the 1952 *Stockholm Code*, when nomenclature committee procedures became more formalized, this figure rises to 68%. The overall success rate of conservation/rejection proposals can be compared in several ways, by successive *Codes* (Fig. 5), by major group (Fig. 6), or by the nomenclatural action sought (Fig. 7).

A comparison of the success of proposals, including those to amend already conserved entries, for each edition of the *Code*

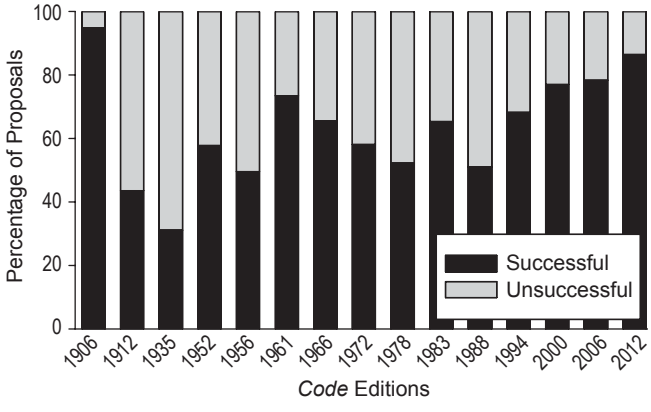

Fig. 5. Of the proposals to conserve, reject, or amend existing Appendix entries that were considered for each successive edition of the *Code*, the percentage that were successful in adding to or modifying the *Code* Appendices.

is provided in Fig. 5. The highest rate of success, at 95%, is evident for the 1906 *Vienna Rules*, but this was before Committee procedures were initiated following the 1952 *Stockholm Code*. The higher success of proposals for the 1961 *Montreal Code* was strongly influenced by the acceptance of 422 proposals to conserve spermatophyte family names after a subcommittee review (Buchheim, 1966). Most of these were derived from a list of family names compiled by Bullock (1958), although 183 were leftover proposals that had been unsuccessful for the two previous editions of the *Code*. On the contrary, the low success observed for the 1988 *Berlin Code* was rooted in the wholesale rejection of 82 proposals to conserve pteridophyte family names (Voss, 1986). Apart from this latter anomaly, there has been a gradual increase in the success of proposals since those of the 1983 *Sydney Code*, reversing a downward trend of the four previous editions of the *Code*, and peaking at over 86% for the 2012 *Melbourne Code*.

One can observe in Fig. 6 clear disparities in the success of proposals by major group, each represented by its own Nomenclature Committee since the 1952 *Stockholm Code*, until the amalgamation of the Committees for Pteridophyta and Spermatophyta into the Committee for Vascular Plants at the 2005 Vienna Congress (Zimmer, 2005). Although the 23% success rate for pteridophyte proposals would improve to 53% if the batch of failed family name conservations mentioned above were excluded, this rate would still be nearly 20% lower than for all other groups except the fossils, which has a similar low rate of success. Proposals relating to the remaining four groups succeed at or above 70% of the time, with the highest rate (78%) associated with bryophyte proposals.

A comparison of the success of post-1952 proposals by the nomenclatural remedy that was proposed is depicted in Fig. 7. The low success of proposals to conserve family names partly reflects the failure of the previously mentioned pteridophyte proposals, but compensating for this it would still not exceed the 80% success of proposals to outright reject species names. In general, proposals involving species names have fared better than those relating to generic names. As pointed out previously, more such proposals have appeared for recent editions of the *Code* (Fig. 2), which have also been associated with a higher rate of proposal success (Fig. 5), doubtless contributing to this trend.

Evaluating the proposal evaluation process. — Figure 8 provides an indication of the length of time for successful proposals to impact the *Code* Appendices, being in some ways a measure of the timeliness of the adjudication process of proposals, albeit only for successful ones. Because some earlier editions of the *Code* provided for the early entry (with an asterisk) of names in proposals that had not yet received the final approval of an International Botanical Congress, the average time of first entry into the *Code* is plotted separately from the average of full approval (entry without an asterisk). Other than a single entry in the Melbourne Appendices, editions of the *Code* since 1994, which have been published more

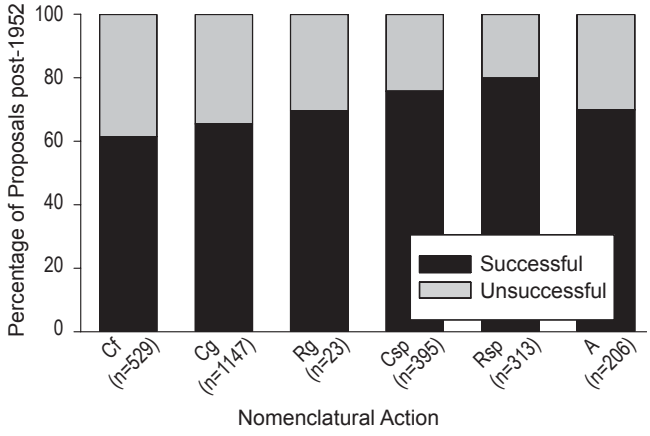

Fig. 7. The success rate of all proposals submitted since the 1952 *Stockholm Code* to conserve, reject [utique], or amend existing Appendix entries for each type of nomenclatural action sought (Cf = conserve family [or subdivision of family] name, Cg = conserve genus [or subdivision of genus] name, Rg = reject genus [or subdivision of genus] name, Csp = conserve species [or infraspecies] name, Rsp = reject species [or infraspecies] name, A = amend entry).

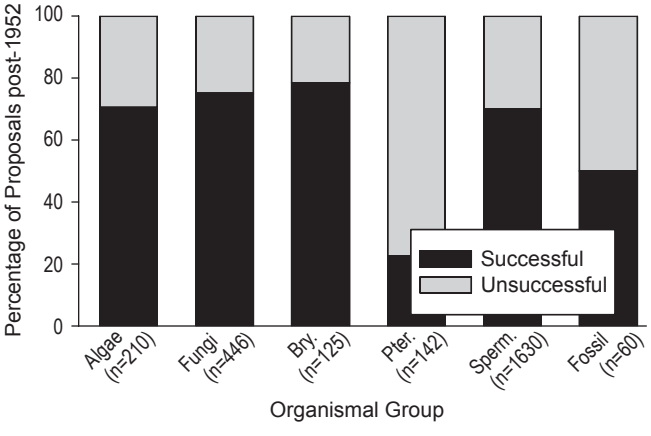

Fig. 6. The success rate of all proposals submitted since the 1952 *Stockholm Code* to conserve, reject, or amend existing Appendix entries for each major group in the *Code* Appendices (Bry. = *Bryophyta*, Pter. = *Pteridophyta*, Sperm. = *Spermatophyta*).

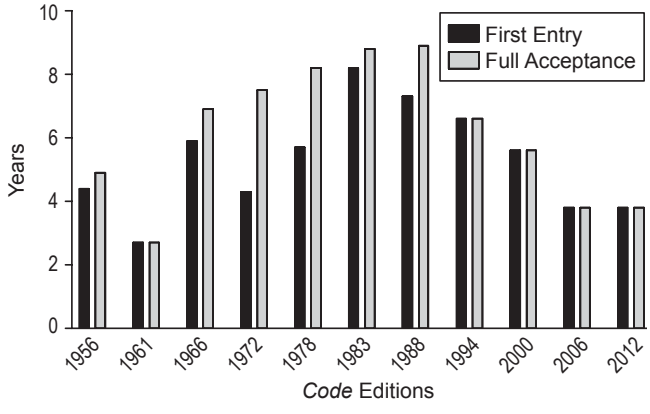

Fig. 8. For the successful proposals considered for each successive edition of the *Code* since the 1952 *Stockholm Code*, the average number of years required for their impact on the *Code* Appendices. See text for explanation of bars.

promptly than earlier ones, have not had occasion to include any early entries, so the two times are equivalent. It is apparent that since 1983 these times have been steadily decreasing, now to an average of less than 4 years for the 2006 and 2012 *Codes*, suggesting that the proposal evaluation process may now be proceeding at peak efficiency.

Authors of nomenclature proposals. — A final analysis of nomenclature proposals is provided in Fig. 9, which provides an indication of the level of participation by different authors in generating proposals to conserve or reject names, amend existing entries, or suppress works, or requests for binding decisions. All authors associated with all proposals for each edition of the *Code* have been compared among the organismal groups (Fig. 9A). The general trend is on the upswing, having increased substantially for the 1988 *Berlin Code* and actually peaking for the last three editions of the *Code*, and appears so for most groups, except perhaps the algae. This increase in diversity of proposal authorship appears although the absolute number of proposals has trended downward since the *Berlin Code*. A similar trend can be seen in the number of countries represented among these authors when compared across all editions of the *Code* (Fig. 9B). These data argue against the notion that interest in scientific nomenclature is waning, rather suggesting that an increasing number of persons, from many more places, are actually paying sufficient attention to it to seek solutions to their nomenclatural problems.

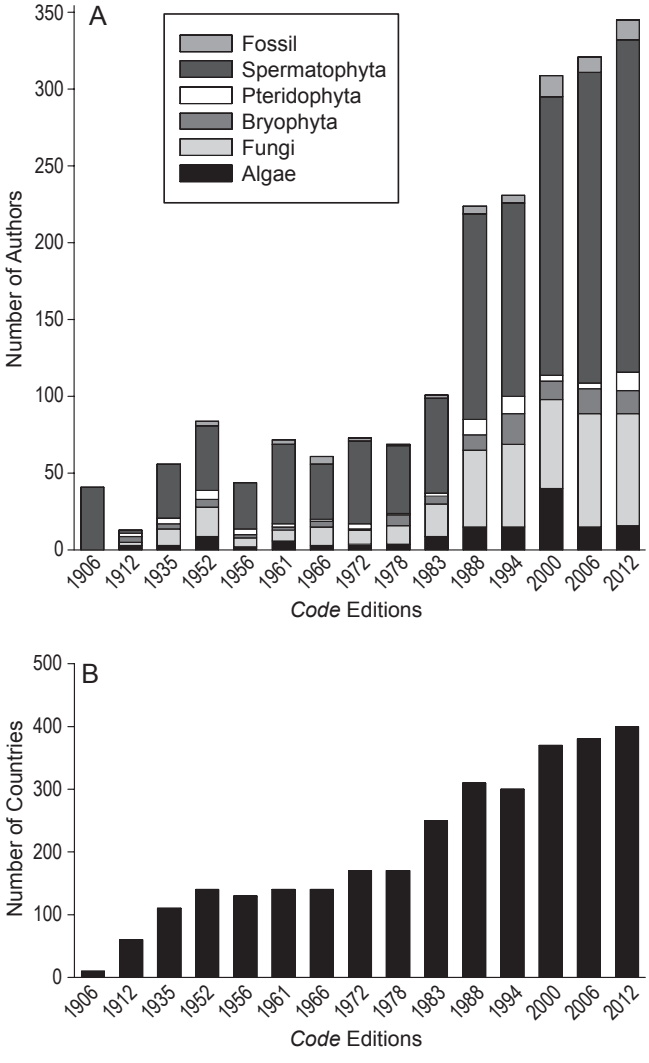

Fig. 9. For each successive edition of the *Code*: **A,** the number of proposal authors, for all types of proposals, segregated by major groups; **B,** the number of countries represented among these authors.

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■ LITERATURE CITED

References followed by an asterisk (*) are not directly referenced in the text but in most of the figures (by year of publication).

Briquet, J. 1906. *International rules of botanical nomenclature: Adopted by the International Botanical Congress of Vienna 1905.* Jena: Fischer.

Briquet, J. 1912. *International rules of botanical nomenclature: Adopted by the International Botanical Congresses of Vienna 1905 and Brussels 1910.* Jena: Fischer.*

Briquet, J. 1935. *International rules of botanical nomenclature: Adopted by the International Botanical Congresses of Vienna, 1905, and Brussels, 1910; Revised by the International Botanical Congress of Cambridge, 1930.* Jena: Fischer.

Buchheim, G. 1966. Report of the Subcommittee for Family Names of the Committee for Spermatophyta. *Regnum Veg.* 44: 61–65.

Bullock, A.A. 1958. Nomina familiarum conservanda proposita. *Taxon* 8: 154–181, 189–205. http://dx.doi.org/10.2307/1216755

Funk, V.A., Turland, N. & Wagner, W.L. 2012. *Colloquium in honor of John McNeill.* [Washington, D.C.]: Smithsonian National Museum of Natural History; Missouri Botanical Garden; IAPT.

Greuter, W., Burdet, H.M., Chaloner, W.G., Demoulin, V., Grolle, R., Hawksworth, D.L., Nicolson, D.H., Silva, P.C., Stafleu, F.A., Voss, E.G. & McNeill, J. (eds.) 1988. *International Code of Botanical Nomenclature: Adopted by the Fourteenth International Botanical Congress, Berlin, July-August 1987.* Regnum Vegetabile 118. Königstein: Koeltz Scientific Books.

Greuter, W., Barrie, F.R., Burdet, H.M., Chaloner, W.G., Demoulin, V., Hawksworth, D.L., Jørgensen, P.M., Nicolson, D.H., Silva, P.C., Trehane, P. & McNeill, J. (eds.) 1994. *International Code of Botanical Nomenclature: Adopted by the Fifteenth International Botanical Congress, Yokohama, August–September 1993.* Regnum Vegetabile 131. Königstein: Koeltz Scientific Books. [online ed., http://www.bgbm.org/iapt/nomenclature/code/tokyo-e/default.htm]

Greuter, W., McNeill, J., Barrie, F.R., Burdet, H.M., Demoulin, V., Filgueiras, T.S., Nicolson, D.H., Silva, P.C., Skog, J.E.,

Trehane, P., Turland, N.J. & Hawksworth, D.L. (eds.) 2000. *International Code of Botanical Nomenclature: Adopted by the Sixteenth International Botanical Congress, St. Louis, Missouri, July–August 1999.* Regnum Vegetabile 138. Königstein: Koeltz Scientific Books.*
[online ed., http://www.iapt-taxon.org/SaintLouis/0000St.Luistitle.htm]

Lanjouw, J., Baehni, C., Merrill, E.D., Rickett, H.W., Robyns, W., Sprague, T.A. & Stafleu, F.A. (eds.) 1952. *International Code of Botanical Nomenclature: Adopted by the Seventh International Botanical Congress, Stockholm, July 1950.* Regnum Vegetabile 3. Utrecht: International Bureau for Plant Taxonomy and Nomenclature.

Lanjouw, J., Baehni, C., Robyns, W., Rollins, R.C., Ross, R., Rousseau, J., Schulze, G.M., Smith, A.C., Vilmorin, R. de & Stafleu, F.A. (eds.) 1956. *International Code of Botanical Nomenclature: Adopted by the Eighth International Botanical Congress, Paris, July 1954.* Regnum Vegetabile 8. Utrecht: International Bureau for Plant Taxonomy and Nomenclature.

Lanjouw, J., Baehni, C., Robyns, W., Ross, R., Rousseau, J., Schopf, J.M., Schulze, G.M., Smith, A.C., Vilmorin, R. de & Stafleu, F.A. (eds.) 1961. *International Code of Botanical Nomenclature: Adopted by the Ninth International Botanical Congress, Montreal, August 1959.* Regnum Vegetabile 23. Utrecht: International Bureau for Plant Taxonomy and Nomenclature.

Lanjouw, J., Mamay, S.H., McVaugh, R., Robyns, W., Rollins, R.C., Ross, R., Rousseau, J., Schulze, G.M., Vilmorin, R. de & Stafleu, F.A. (eds.) 1966. *International Code of Botanical Nomenclature: Adopted by the Tenth International Botanical Congress, Edinburgh, August 1964.* Regnum Vegetabile 46. Utrecht: International Bureau for Plant Taxonomy and Nomenclature.*

McNeill, J., Barrie, F.R., Burdet, H.M., Demoulin, V., Hawksworth, D.L., Marhold, K., Nicolson, D.H., Prado, J., Silva, P.C., Skog, J.E., Wiersema, J.H. & Turland, N.J. (eds.) 2006. *International Code of Botanical Nomenclature (Vienna Code): Adopted by the Seventeenth International Botanical Congress Vienna, Austria, July 2005.* Regnum Vegetabile 146. Ruggell: Gantner. [online ed., http://www.iapt-taxon.org/icbn/main.htm]

McNeill, J., Barrie, F.R., Buck, W.R., Demoulin, V., Greuter, W., Hawksworth, D.L., Herendeen, P.S., Knapp, S., Marhold, K., Prado, J., Prud'homme van Reine, W.F., Smith, G.F., Wiersema, J.H. & Turland, N.J. (eds.) 2012. *International Code of Nomenclature for algae, fungi, and plants (Melbourne Code), adopted by the Eighteenth International Botanical Congress Melbourne, Australia, July 2011.* Regnum Vegetabile 154. Königstein: Koeltz Scientific Books.
[online ed., http://www.iapt-taxon.org/nomen/main.php]

Nicolson, D.H. 2000. A new online bibliographic database of proposals for conservation and rejection of botanical names. *Taxon* 49: 549–554. http://dx.doi.org/10.2307/1224354

Stafleu, F.A., Bonner, C.E.B., McVaugh, R., Meikle, R.D., Rollins, R.C., Ross, R., Schopf, J.M., Schulze, G.M., Vilmorin, R. de & Voss, E.G. (eds.) 1972. *International Code of Botanical Nomenclature: Adopted by the Eleventh International Botanical Congress, Seattle, August 1969.* Regnum Vegetabile 82. Utrecht: Oosthoek.*

Stafleu, F.A., Demoulin, V., Greuter, W., Hiepko, P., Linczevski, I.A., McVaugh, R., Meikle, R.D., Rollins, R.C., Ross, R., Schopf, J.M. & Voss, E.G. (eds.) 1978. *International Code of Botanical Nomenclature: Adopted by the Twelfth International Botanical Congress, Leningrad, July 1975.* Regnum Vegetabile 97. Utrecht: Bohn, Scheltema & Holkema.

Voss, E.G., Burdet, H.M., Chaloner, W.G., Demoulin, V., Hiepko, P., McNeill, J., Meikle, R.D., Nicolson, D.H., Rollins, R.C., Silva, P.C. & Greuter, W. (eds.) 1983. *International Code of Botanical Nomenclature: Adopted by the Thirteenth International Botanical Congress, Sydney, August 1981.* Regnum Vegetabile 111. Utrecht: Bohn, Scheltema & Holkema; The Hague: Dr. W. Junk.

Voss, E.G. 1986. General Committee Report 1982–1985. *Taxon* 35: 551–552. http://dx.doi.org/10.2307/1221916

Wiersema, J.H., McNeill, J., Turland, N.J., Barrie, F.R., Buck, W.R., Demoulin, V., Greuter, W., Hawksworth, D.L., Herendeen, P.S., Knapp, S., Marhold, K., Prado, J., Prud'homme van Reine, W.F. & Smith, G.F. (eds.) 2015. *International Code of Nomenclature for algae, fungi, and plants (Melbourne Code): Adopted by the Eighteenth International Botanical Congress Melbourne, Australia, July 2011; Appendices II–VIII.* Regnum Vegetabile 157. Königstein: Koeltz Scientific Books.

Zimmer, B. 2005. Report of the Committee for Pteridophyta: 15. *Taxon* 54: 831–832. http://dx.doi.org/10.2307/25065448