

## EDITORIAL

### *Citing the taxonomic literature: what a difference a year makes*

We all know that the world of scientific publishing has changed profoundly since the onset of the digital revolution. One relatively new development is the rapid publication of scientific papers online, frequently before they are copyedited and typeset, and sometimes even before being peer reviewed (Sheldon 2018). *Climate of the Past* is one such journal that posts manuscripts online before they have been refereed. The purpose of doing this is to allow online discussion of a manuscript while it is in review in the conventional sense. Manuscripts may thus benefit from any useful feedback from readers as well as from the formal reviews.

The above developments mean that scientific articles may appear online long before being assigned to a particular volume/issue and with final page numbers. Such designations commonly occur in the following year when the complete volumes or issues of a journal appear in print and/or digitally. Before the digital revolution, authors had to wait perhaps 12 months or more between acceptance and final publication. Today, just a week or two may elapse before the typescript of an accepted manuscript is available online. In most respects this revolution is good, especially now that many authors aim for metricised output targets. However such early publication of a paper may cause complications regarding its referencing, but in most cases this does not really matter so long as the reference in a bibliography leads to the retrieval of the correct publication. For example the paper cited below as Pound & Riding (2016) was initially issued online in 2015, prior to assignment to a volume of the *Journal of the Geological Society* published in 2016. Before 2016 it would have been cited as Pound & Riding (2015) but that situation would not have lasted for long and would have affected very few, if any, citations.

Electronic publication of a paper prior to designation of the volume number and final pagination can be confusing, but in most cases problems are limited to referencing. However, it has critical implications for papers with biological systematics, especially those with new nomenclatural proposals (new taxa, combinations, substitute names, etc. — so called nomenclatural novelties). Until recently, codes of nomenclature in botany and zoology required nomenclatural novelties to be published in paper format in publicly distributed articles. However, the most recent codes permit the publication of nomenclatural novelties in a hybrid (online and paper) journal or even in a purely electronic periodical (but not in an online database or catalogue).

It is useful at this point to give an overview of the correct use of certain terms under the *International Code of Nomenclature for algae, fungi, and plants* (ICN; Turland et al. 2018, known informally as ‘The Shenzhen Code’ or simply ‘the Code’ — <http://www.iapt-taxon.org/nomen/main.php>). The ICN supersedes the *International Code for Botanical Nomenclature* (ICBN). According to the Code, a new name needs to be **effectively published** (in a formal paper, hybrid publication or an online periodical), **validly published** (in a publication that is formally published as hard copy, online, or both) and **not illegitimate** (not a homonym or

41 having the same type as a previously validly published name of the same rank). Note that the  
42 antonym ‘legitimate’ is problematic to use in nomenclatural contexts and is best avoided. The  
43 Code does condone the term **correct** for any name that is validly published, is not illegitimate, is  
44 accepted by the author(s) using it and is not a taxonomic (subjective) junior synonym. It is  
45 unofficially acceptable to use the word ‘current’ in contexts where the word ‘correct’ might seem  
46 inappropriate. Rules for the previous version of the ICN (McNeill et al., 2012), which are not  
47 very different from the present ones regarding electronic publishing, are discussed in detail, with  
48 a dinoflagellate focus and examples, in Williams et al. (2017, p. 8–34) and in DINOFLAJ3  
49 ([http://dinoflaj.smu.ca/dinoflaj3/index.php/INTRODUCTION#RULES\\_OF\\_NOMENCLATUR](http://dinoflaj.smu.ca/dinoflaj3/index.php/INTRODUCTION#RULES_OF_NOMENCLATURE)  
50 [E](http://dinoflaj.smu.ca/dinoflaj3/index.php/INTRODUCTION#RULES_OF_NOMENCLATURE)). The provisions of the *International Code for Zoological Nomenclature* are broadly similar  
51 (International Commission on Zoological Nomenclature 1999). Under that Code an amendment  
52 on electronic publication came into force in 2012 (<http://www.iczn.org/iczn/index.jsp>).

53 Major problems resulting from the Shenzhen Code involve the year of effective  
54 publication and the appropriate pagination to be cited. In the Code, Article 29.1, states that  
55 ‘Publication is ... effected ... [in addition to previously allowed conventional means] by  
56 distribution on or after 1 January 2012 of electronic material in Portable Document Format (PDF  
57 ...) in an online publication with an International Standard Serial Number (ISSN) or an  
58 International Standard Book Number (ISBN).’ However, publication is not effected if it is a  
59 preliminary version of something finalised later (Article 30.2). The content of an electronic  
60 publication **must not be altered** after it is effectively published (Article 30.3); (our emphasis).  
61 When co-compiling the latest Lentin and Williams Index of fossil dinoflagellates, one of us  
62 (RAF) became aware that, in botanical nomenclature — like many things in today’s ‘alternative  
63 facts’ world — not all things are what they claim to be. In other words, when is an alteration not  
64 an alteration?

65 The Shenzhen Code helps answer this question but creates its own problems. Article 30.2  
66 states that ‘An electronic publication is not effectively published if there is evidence within or  
67 associated with the publication that its **content is merely preliminary** and was, or is to be,  
68 replaced by content that **the publisher considers final**, in which case only the version with that  
69 **final content** is effectively published.’ Crucially, Note 1 of Article 30.2 clarifies what it means  
70 by ‘final’: ‘An electronic publication may be a final version, even if details, e.g. **volume, issue,**  
71 **article, or page numbers**, are to be added or changed, provided that those details are not part of  
72 the content’ (our emphases in the above; see also Article 30.3). The publisher’s term ‘Version of  
73 Record’, which effectively involves typesetting and finalisation of content but does not require  
74 the addition of volume, issue, article, or final pagination, can be used to signify a ‘final’ version  
75 as acceptable to the ICN (Article 30.3, Examples 5 and 6, and Recommendation 30A.1). So the  
76 version of an article we see in a journal with final pagination may actually postdate the version  
77 the Code considers to be ‘final’! It is important to stress here that uncorrected page proofs  
78 appearing on websites do not constitute a Version of Record because the content itself may still  
79 change. Only corrected page proofs posted online would potentially count as the Version of  
80 Record, with or without final pagination etc.

81 Two examples from papers published in *Palynology* illustrate this tricky situation. Poul  
82 Schiøler's new dinoflagellate cyst genus, *Bianchina*, was first published as an online PDF  
83 version of a paper in *Palynology* where it appears properly typeset, laid out and corrected by the  
84 author. As the Version of Record, it fulfills requirements for effective publication (and, as Poul  
85 Schiøler provided a description, type, illustration, etc., also for valid publication). This PDF bore  
86 the date 2015 and the pagination 1–6 (with the new genus proposed on pages 3 and 5). However,  
87 the pagination was not final and the paper eventually appeared on pages 406–412 in an issue of  
88 *Palynology* published in electronic and hard copy in 2016 (Schiøler 2016). The 2015 online PDF  
89 serving as the Version of Record was replaced by the 2016 version of the PDF with final  
90 pagination: the validating version of the PDF is therefore no longer publicly available.  
91 Furthermore, and confusingly, the literature reference to *Bianchina* Schiøler 2015 is Schiøler  
92 (2016)! Moreover, it would be more useful to cite the pages on which *Bianchina* Schiøler was  
93 proposed as 408–410 than as 3–5 in a version of the PDF that no longer appears online and so is  
94 not generally available.

95 In a similar example, a paper by Alina Iakovleva in *Palynology* that includes several new  
96 species of wetzelielloidean dinoflagellate cysts first appeared online as a typeset and properly  
97 laid out version in 2016. But the pagination was given in an issue of the journal in 2017  
98 (Iakovleva 2017). A footnote in the latter states that 'This article was originally published with  
99 errors. This version has been amended.' In this case, it is clear that the Version of Record as  
100 accepted by the publisher is the 2017 PDF, and not the 2016 PDF. Such situations cause potential  
101 confusion, however, so we recommend not altering in any way the content (i.e. excluding  
102 volume, issue, article or page numbers) of a version that usually would be recognised as being  
103 the Version of Record (see also Article 30.3 of the Code). Best practice would be for publishers  
104 to identify the Version of Record by indicating it clearly on the PDF itself. It would then become  
105 important also, for purposes of priority, to state the date on which the Version of Record became  
106 available online. Some journals, including the *Journal of Phycology*, post this information on  
107 their website.

108 With the introduction of the Melbourne Code of the ICN in 2012 (see also Special  
109 Committee on Electronic Publication, 2010), botanical nomenclature finally entered the digital  
110 age, some would say not a moment too soon, effectively allowing print versions of many  
111 journals to die a natural death. Indeed, given that the online PDF of a paper often has colour  
112 illustrations while its print counterpart for reasons of cost is frequently in black and white, the  
113 PDF is now regarded as the definitive version. Moreover, it makes good sense for the online  
114 version of a paper to count for purposes of nomenclatural priority even before it has acquired  
115 final pagination — it can speed up the dissemination of our science by a year or more, with due  
116 credit being preserved. This approach follows a long pre-electronic tradition of accepting  
117 preprints of articles as having been effectively published (Article 31.3), as witnessed for example  
118 by a note in Williams et al. (2017, p. 1000) appended to a reference to Ehrenberg (1834): 'From  
119 the publication it is clear that this work was presented in July 1832, published as a separate in  
120 May 1834, and published in the journal in 1835; thus, effective publication was May 1834.'

121 The confusion with the year of publication and the change in pagination nonetheless  
122 remains, and is a very real and unresolved problem. As an interim practical measure pending a  
123 possible formal resolution, we suggest that while authors of systematic papers are required under  
124 the Code to use the date of the Version of Record, where known, for the name of a particular  
125 taxon, they cite the bibliographic details of the version with final pagination. Thus, from the  
126 example above, the citation for Poul Schiøler's genus would be *Bianchina* Schiøler 2015 and the  
127 reference would be cited as dating from 2015, but followed by the pagination and other details of  
128 the version with final pagination; a bracketed note in the reference would indicate that this final  
129 version first appeared in 2016.

130 Notwithstanding our suggested solution to this dilemma, the fundamental problem still  
131 exists. The Code cannot make unrealistic demands of publishers, so any solution would need to  
132 rely on the cooperation of journal editors and publishers. Editors of taxonomic papers might  
133 alleviate the problems we have discussed by indicating 'Version of Record' on the relevant PDF,  
134 and keeping that Version of Record on the journal website, with a note of its date of publication,  
135 alongside later paginated versions. A further problem could be solved by moving away from  
136 print versions of articles. These are, in any case, inferior in many respects to the PDF versions.  
137 This change would allow scrapping the antiquated concept of issues and volumes that require  
138 later repagination and perhaps a different year. Papers could be then be published just once, as an  
139 electronic Version of Record, in an ever growing list on the publisher's website. Think of the  
140 clarity that would bring, and the trees it would save!

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196 *Keyworth*  
197 *Nottingham NG12 5GG*  
198 *UK*  
199 *Email: [jbri@bgs.ac.uk](mailto:jbri@bgs.ac.uk)*  
200  
201 Robert A. Fensome  
202 *Natural Resources Canada*

203 *Geological Survey of Canada (Atlantic)*  
204 *Bedford Institute of Oceanography*  
205 *P.O. Box 1006*  
206 *Dartmouth*  
207 *Nova Scotia*  
208 *Canada B2Y 4A2*  
209 *Email: [rob.fensome@canada.ca](mailto:rob.fensome@canada.ca)*  
210  
211 *Martin J. Head*  
212 *Department of Earth Sciences*  
213 *Brock University*  
214 *1812 Sir Isaac Brock Way*  
215 *St. Catharines*  
216 *Ontario*  
217 *Canada L2S 3A1*  
218 *Email: [mjhead@brocku.ca](mailto:mjhead@brocku.ca)*  
219