

NOTES ON OPEN NOMENCLATURE AND ON SYNONYMY LISTS

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ABSTRACT. Rudolf Richter's proposals on practice in open nomenclature and on annotated synonymy lists are described and briefly criticized.

Plus quam leges valent boni mores

Tacitus, quoted by Richter in 1930

AUTHORS of palaeontological papers can discover a great deal of instruction in the International Code of Zoological Nomenclature (Stoll and others 1961). But the Code sets a limit on its provisions: it does not intend in any way to impinge on the individual taxonomist's exercise of his judgement (see the 'Preamble' to the Code). It is therefore necessary to seek elsewhere for guidance on matters such as open nomenclature (a device whereby an author expresses his judgement of his own material) and synonymy lists (the means by which an author concisely expresses his judgements of earlier opinions on the taxonomic problem he is handling). A highly explicit set of recommendations on these matters is available in Rudolf Richter's (1948) 'Einführung in die Zoologische Nomenklatur'. His proposals have never been as well known as they deserve among English-speaking palaeontologists. A French translation, it may be noted, is available as Traduction no. 1448, prepared by Département Documentation du B.R.G.M., B.P. 6009, 45—Orléans—02, France. This present article, intended to bring Richter's views to a wider public, draws freely on what Richter wrote in 1948 (especially pp. 45–56). It is not a direct translation (some things are deleted, and there are certain interpolations) and it makes no claim to carry anything of the authority of Richter's original. It is offered in order to promote discussion of two points of nomenclatural technique, in the hope that authors might become more familiar with the nature of certain devices they commonly employ, and hoping too that greater consistency of practice might emerge. Richter's proposals are recommended by the fact that they have to a large extent become standard in the German palaeontological literature—this article may have some incidental usefulness in explaining the meaning of a system of annotation which regularly appears in papers published in the major German palaeontological journals, but whose significance is not widely understood in other countries.

Those who are entirely unfamiliar with Richter's work may find it useful to read Stubblefield (1957).

OPEN NOMENCLATURE

Richter introduced his discussion of open nomenclature by considering the problem of dealing with a specimen whose identity cannot exactly be determined. If it is too hastily referred to a known species or genus, a previously clear taxonomic

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concept may be diminished. If one refuses altogether to identify it, potentially useful information may be left unemployed. If one decides to propose a new species or genus to contain the specimen (a lesser error, in Richter's view, than would arise by referring the specimen to a previously well-established taxon—Richter, epigrammatic here as elsewhere in his writings, observed that though spoiling the work, this procedure would not damage the tool, the standard form) a feeble name might result, and proposals of feeble new names should not be encouraged.

Open nomenclature was developed as a remedy against such weaknesses of the taxonomic method. It operates by attaching to known species or genera those specimens whose identity is uncertain. The method offers a clear expression of the fact of uncertainty, and also some indication of the degree of uncertainty involved. This is not a matter of abdicating taxonomic responsibilities. It is instead an especially perspicacious form of nomenclature that is involved. In contrast to closed nomenclature, with its firmly established and strictly defined names, it remains open to whatever possibility of improvement future findings might bring. By giving taxonomy a means of stretching (in an entirely honest and proper way) the limits of existing knowledge, it by itself indicates where improvements are needed and in which direction they might be sought. It permits us to build any such improvements into nomenclature left open for that purpose, and this without any upset of established names.

The signs. The signs employed in open nomenclature are in essence nomenclatural and make up an integral part of the name. It should therefore be understood that they are fundamentally different from signs attached to synonymy lists (see below).

1. Signs for uncertainty at family or higher level.

The highest category touched by uncertainty, and above which certainty begins, has the designation 'incerta'. Examples:

Incertae familiae:	Family uncertain
Incerti subordinis:	Suborder uncertain (order known)
Incerti ordinis:	Order uncertain (class known)
Incertae sedis:	Class uncertain

The requirements at other levels are handled in the same way: Incertae subfamiliae; Incertae superfamiliae.

2. Signs for uncertainty at genus or subgenus level.

If the attribution to an established genus is uncertain a ? is placed behind the name of the genus. Examples:

<i>Agenus? album</i> Anton (?Anton)
<i>Agenus? album</i> (Anton) (?Anton)
<i>Agenus? album</i> (Anton) (?Bruno)

In the first case it was Anton himself who, at the time of the establishment of the species *album*, attributed it with a question mark to the genus *Agenus*; for behind the species-name, the name of the author is not in parentheses, and this, according to ICZN Article 11, signifies that the original generic assignment has remained unaltered. In the second and third cases Anton had originally assigned the species without

question to the genus *Agenus*, and it was in later publications that the assignment came into doubt. In the second case it was Anton himself who expressed this doubt, and so added to his authorship of the name *album* also the authorship of the open nomenclature. In the third case it was Bruno who was responsible, and he is the author of the open nomenclature. Because in these latter two cases the generic assignment is no longer unequivocally the one proposed by Anton when he established the species, the name of the author of the species-name appears in parentheses (Article 11).

Uncertainty surrounding the subgenus can be dealt with in a corresponding way. Example:

Agenus (Agenus?) album (Anton) (?Bruno)

3. Signs for uncertainty at species or subspecies level.

(i) When attribution to an established species is possible, but cannot be thought certain, a ? is placed behind the name of the author of the species. In a subsequent citation, the author of the open nomenclature, with the sign he introduced (here: ?), is added in parentheses. Examples:

Agenus album Anton? (?Anton)

Agenus album Anton? (?Bruno)

In the first case, Anton himself had assigned a specimen, with some question, to his species *album*, and in the second case it was Bruno who did this. There are no circumstances in which it would be correct to place a ? between a species-name and the name of its author. These two names (species + author) make up a nomenclatural entity, which nothing should be allowed to divide.

Year of publication is also relevant, e.g. in the case where a certain author has at different times made distinctions between forms but has given them all the same name, assigning each of them, with a ?, to some particular species. These forms, which could of course eventually prove to be specifically different from one another and must be cited individually, may be distinguished for one another by the year.

The corresponding treatment can be given where it is attachment not to the species but to a subspecies that is to be shown to be uncertain. Example:

Agenus album striatum Caesar? (?Bruno)

It also happens (especially in ornithology and herpetology) that the subspecies can be firmly fixed even although the attribution to a species remains under question (in most cases lateral replacement of species is involved). Examples:

Agenus album? striatum Caesar (?Caesar)

Agenus album? striatum Caesar (?Bruno)

(ii) If instead of attribution to an established species, only a possibility of comparison with that species should be indicated, cf. (abbreviation of the Latin word confer) is placed in front of the species-name. Authors' names, repetition of the sign introduced (here: cf.), year, and distinction between several forms can be inserted as in (i). Example:

Agenus cf. album Anton (cf. Bruno)

The corresponding treatment may be given to a subspecies where this is the subject of a comparison only, as compared with the species attribution, which is firm. Example:

Agenus album cf. *striatum* Caesar (cf. Bruno)

(iii) If a specimen shows itself to represent a new species, whose formal establishment is, however, not yet justifiable, one can, in the interim, associate it with some related, known species, before whose name *n. sp.*, aff. (abbreviation of nova species, affinis) will be inserted. Authors' names, restatement of the sign inserted (here: *n. sp.*, aff.), and distinction of several forms can be introduced as in (i). Example:

Agenus n. sp., aff. *album* Anton (*n. sp.*, aff. Bruno).

Association with a known subspecies can be done in the same way. Example:

Agenus album n. subsp., aff. *striatum* Caesar (*n. subsp.*, aff. Bruno).

If any author has several different forms to compare with a known species in this way, it is useful practice to identify each of them by a lower-case letter. These letters have an advantage over names in that they introduce no question of priority and so impose no burden. They can be used, with just as much exactitude as resides in a species-name, for temporary characterization of a particular form. They are placed, together with *n. sp.*, behind the genus-name, or in the case of subspecies, together with *n. subsp.*, behind the species-name. Examples:

Agenus n. sp. a, aff. *album* Anton (*n. sp. a*, aff. Bruno)

Agenus n. sp. b, aff. *album* (*n. sp. b*, aff. Bruno)

Agenus album n. subsp. a, aff. *striatum* Caesar (*n. subsp. a*, aff. Bruno)

If the form is to be treated as a new species, not yet to be defined, and incapable of being associated with any established species, then one writes simply *n. sp.*, or if several forms are involved, *n. sp. a* and *n. sp. b* (there are, quite possibly, many people to whom 'open nomenclature' means no more than this particular provision).

(iv) If, again, the question of a relationship with some established species is unclear, and yet an indication of the possibility of such a relationship is desirable (on taxonomic, geographic, or stratigraphic grounds) then *n. sp. aff. ?* is placed in front of the name of the established species. Example:

Agenus n. sp. aff. ? album Anton (*n. sp. aff. ? Bruno*)

An unclear relationship with a subspecies can be treated likewise. Example:

Agenus album n. subsp., aff. ? *striatum* Caesar (*n. subsp.*, aff. ? Bruno)

(v) If the form might equally well belong to a known as to a new species, *sp.* (or more fully, *sp. inc.*, or *sp. indet.*—abbreviations of: species incerta, indeterminabilis)

[Editorial note: it is the practice in *Palaontology* to put the noun before the adjective, e.g. *sp. nov.*, *subsp. nov.*]

is placed behind the genus-name. The corresponding practice at subspecies level is to place subsp. inc. behind the species name. Examples:

Agenus sp. Anton, or *Agenus* sp. inc. Anton
Agenus album Anton subsp. inc. Bruno

4. Signs for uncertainty of both genus and species.

If both the genus and the species are uncertain, the appropriate signs all appear. Examples:

Agenus? cf. *album* Anton (cf. Bruno)
Agenus? *album* Anton? (?spec. Bruno)
Agenus? n. sp., aff. *album* Anton (n. sp., aff. Bruno)
Agenus? n. sp., aff. ? *album* Anton (n. sp., aff. ?Bruno)
Agenus? sp. inc. Bruno

SYNONYMY LISTS

Non-nomenclatural signs. The signs attached to entries in a faunal list or synonymy list are not integral parts of the zoological names and have nothing to do with formal nomenclature. They stand to the left of the name and belong neither to the name itself nor to the author of the name. Nor do they belong among the signs that stand within or to the right of the name. They express the judgements of the author of the list.

Signs attached to the synonymy list. The author of a synonymy list uses his signs to make qualifying comments on these cases he cites in his list as synonyma of the species whose name appears at the head of the list.

Anyone who wishes to carry forward a piece of research must check the existing information. He needs the whole literature on the subject. In order to assist such an inquirer one must strive to make the synonymy lists as near complete as possible, and yet at the same time try to find means of making them as serviceable and as readable as possible. By such means one can rid one's text of pointless information and discussion. The following signs, first proposed in 1924, have subsequently had much use.

1. Signs which should obviate needless searches.

- 1881 Year in italics: this work has a mention of the species, but without description or illustration. It may be ignored by anyone who wishes to check merely the morphological information, rather than the total data arising out of the occurrence.
- 1881 Year in roman: the work contributes to our knowledge of the species. If such a reference includes an illustration, it may help a later inquirer to give an indication of the anatomical parts figured, e.g. in arthropods \ominus = illustration of the whole carapace, \frown = cephalon, \smile = abdomen.
 [cop. Anton 1856]: the illustration is not a new one, merely a repetition of one already produced by Anton in 1856. Someone who is familiar with the figure in the earlier work need not feel obliged to examine the repeat.

2. Signs which indicate the degree of confidence with which particular items in the list are referred to the species under discussion:

- *1881 * in front of the year: with publication of this work the species can be regarded as valid under the terms of Article 11 of the ICZN (earlier mentions of this name are to be regarded as nomina nuda).
- .1881 . in front of the year: we accept responsibility for attaching this reference to the species under discussion.
- 1881 No sign in front of the year: we have no right expressly to accept responsibility for attaching this reference to the species under discussion; but at the same time we have no cause to doubt such an allocation.
- ?1881 ? in front of the year: the allocation of this reference must be subject to some doubt because of the way in which it was presented (e.g. if the species-name concerned included at that time several forms now treated as separate species).
- v1881 v in front of the year: vidimus! We have checked the deposited specimens that relate to the work cited, and on their evidence we have chosen the additional sign used. v*1881: we have seen the type of the species. v.1881: because of the evidence of the deposited specimens we are able to take responsibility for this assignment, or v1881: we do not accept responsibility. v?1881: the condition of the original specimens is such that no clear decision is possible.
- (1881) year in parentheses: the year of publication is uncertain.

An example of a synonymy list:

- Agenus album* ANTON, 1900.
- v . 1895 *Agenus viride* AULUS. — BRUNO, Monogr. Agenidae, S. 12 Taf. 3 Fig. 2.
 - ? 1907 *Agenus nigrum* ANNA. — BERTA, Bibl. Ind., S. 20.
 - v* 1900 *Agenus album* n. sp. — ANTON, Fauna Bras., S. 35 Taf. 2 Figs. 1-4 ~ ~ .
 - v 1902 *Begeus* cf. *cinereum* AULUS. — CAESAR, Reiseber., S. 10 [vix S. 12].
 - 1908 *Agenus album* ANTON. — ANTON, Neue Beob., S. 25, Tabelle 4.
 - v . 1910 *Agenus? album* ANTON (?BRUNO). — DAVID, Orientierung, S. 30 Taf. 9 Fig. 3 ~ [kop. ANTON 1900 Fig. 1].
 - v ? 1914 *Agenus caeruleum* n. sp. — EMIL, Übersicht, S. 6 Taf. 5, Fig. 2 ~ . [non Fig. 1 = *Agenus fuscum* FELIX.]

A critical synonymy list like this one, Richter observed, may be in itself a piece of scientific work, approaching the state of a detailed monograph in its critical completeness as well as in the range of information on which it draws. A compilatory synonymy list, which brings together every mention of a zoological name available in the literature, but involves no expense of effort on deposited material nor any exercise of judgement, is not a scientific work, although it could usefully supply raw material for one. A transcriptive synonymy list, which does nothing other than repeat earlier lists, serves merely to put a surface gloss, easily penetrated, on something that is quasi-scientific, and in effect no more than a waste of paper. Once a dependable list has been published, it is sufficient at a later date simply to make a reference to it, adding any necessary supplementary material. The supplementary entries will then serve toward preparation of a revised synonymy list.

Concluding comment. It is now twenty-five years since the second edition of Richter's 'Einführung' appeared. Much of what he suggested then has become firmly established in Germany. One or two of his proposals have faltered. His practice of citing the name of the author of a piece of open nomenclature, for example, is not often seen in the literature. His method of recording anatomical parts figured in references (see 'synonymy lists' above) could be applied in a simple way in the case of arthropods, but it would be difficult to contrive similar schemes for other groups—it would certainly be difficult to think of anything that could conveniently be rendered in type. The annotations he proposed for synonymy lists have otherwise proved acceptable and practicable. Rabien (1954) has proposed two additional signs. These are

- (?)1881 (?) before the year: it is probable that the reference applies to the species under discussion, but this cannot be established with certainty (e.g. in a case in which the originals could not be checked, and the illustrations and descriptions were insufficient to justify firm identification, yet in which the identification could be considered probable for reasons stated in detail in remarks which would follow).
- p.1881 p before the year: partim: the reference applies only in part to the species under discussion. If attached to any of the other signs of the synonymy list, p would indicate that the sign applies only up to a certain limit to the work cited. Example: vp before the year: the deposited specimens have been checked, and some only of them belong to the species under discussion.

Struve (1966, p. 125) too has made some supplementary proposals. These have not achieved any great currency, but they may, like Rabien's, be found useful in cases where it is necessary to make more specific comment than is provided for in Richter's own system.

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