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17

The Linz *Zoocode* project: a set of new proposals regarding the terminology, the Principles and Rules of zoological nomenclature. First report of activities (2014–2019)

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on behalf of the Linz Zoocode *Committee (LZC)**

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CONTENT

ABSTRACT

In July 2014, the international meeting "Burning questions and problems of zoological nomenclature" was held in Linz (Austria). It acknowledged the presence in the current *International Code of Zoological Nomenclature* of a number of severe problems, and accordingly decided the creation of a new international body, the Linz *Zoocode* Committee (LZC), in charge of writing the Linz *Zoocode*, a set of new proposals regarding the terminology, the Principles and Rules of zoological nomenclature. Here we present the first report of the activities of this Committee, covering the period 2014–2019. It contains the presentation of our work, and the first documents adopted by the Committee: the Preamble and Principles of the *Zoocode*, the description of its structure and a first instalment of the *Zoocode* Glossary. The *Zoocode* regulates the status of zoological nomina and nomenclatural acts (onomatergies). Its aim is to provide an explicit, precise and objective nomenclatural system for the unambiguous and universal naming of all zoological taxa recognised by taxonomists, so that, in the frame of a given classification, the nomen of each taxon is unique and distinct. It relies on a Nomenclatural Process consisting in four main stages: nomenclatural assignment and availability, taxonomic allocation, nomenclatural validity and correctness, and registration of nomina and onomatergies. Whereas the *Code* currently in force is based on six stated Principles, the *Zoocode* recognises 17 distinct ones. We here submit these documents to the consideration of the international community of zootaxonomists, in the perspective of the incorporation of these proposals into the next version of the *Code*.

Key words: zoological taxonomy, zoological nomenclature, *Code*, *Zoocode*, terminology, nomenclatural ranks, Preamble, Nomenclatural Process (assignment, availability, allocation, validity, correctness, registration), Principles of the *Zoocode* (independence, foundation, nominal-series, binomina, coordination, neonymy, onomatophores, zygoidy, homonymy, synonymy, priority, airesy, proedry, nomography, sozoidy, archoidy, registration), Glossary of the *Zoocode*.

Important preliminary note

The first three sections of this work are not part of the first texts of the *Zoocode* project proposed here by the Linz *Zoocode* Committee, but provide information allowing one to understand them. Only the fourth section of this paper, including the Preamble, the Nomenclatural Process and the Principles, as well as the terms of the Glossary and the References cited therein, is an integral part of the *Zoocode* proposal.

In this paper the edition currently in force of the *International Code of Zoological Nomenclature* is referred to as 'the *Code*' (Anonymous 1999, 2003, 2012, 2017), the International Commission on Zoological Nomenclature as 'the Commission', the *Bulletin of Zoological Nomenclature* as 'the *BZN*' and the Linz *Zoocode* Committee as 'the LZC' . The abbreviation *LAN* designates a *List of Available Names* as recognised in the 1999 edition of the *Code* (Article 79).

In the text below, novel or unfamiliar technical terms designating nomenclatural concepts are presented in ***bold italics*** upon their first appearance in the text and sometimes elsewhere, and information about them is provided in the Glossary below. Words in simple **bold** are stressed as particularly important. Double quotation marks include "exact quotations" from publications, whereas single quotation marks include 'highlighted terms or expressions', often considered inappropriate or obsolete here.

1. THE LINZ INTERNATIONAL WORKSHOP OF ZOOLOGICAL NOMENCLATURE (9–10 JULY 2014)

1.1. Introduction

Millions of animal ***taxa*** (species, genera, families, etc.) have so far been described and named by taxonomists, the scientists in charge of recognising, classifying and naming the taxonomic units of animal biodiversity according to a scientific classification. In order to ensure unambiguous international communication about these taxa, their designation by scientific names or ***nomina*** must follow precise Principles and Rules, which are provided by the *Code*. This *Code* is the result of a historical process which developed over almost two centuries and which involved many practicing zootaxonomists (Melville 1995; Dayrat 2010). In order for an international system of nomination of taxa to be efficient, rigorous, unambiguous and universal, it must display a number of properties (Dubois 2005*c*: 375–378, 2015*b*: 7–9), most of which are indeed present in the current *Code*. Nevertheless, this text still contains a rather high number of unclarities, ambiguities and contradictions which require serious updates (Dubois 2011*a*). This is also required, to a certain extent, by some recent developments of taxonomic research and of scientific publications. However, substantial stability of the Rules is crucial for universal and clear communication about animal taxa, and making significant changes to the Rules in order to follow some technical progress, or even fashion, without sufficient experience, is very risky, as was shown by the misguided experience of

Article 8.6 introduced in the 1999 *Code*, which had to be cancelled less than 15 years later (Anonymous 1999, 2012; Dubois *et al.* 2013). Sudden drastic changes in the *Code* create the possibility of a schism between different groups of zootaxonomists, some following the new Rules and others preferring to retain a minimally improved version of the *Code*.

As a matter of fact, in recent decades, a number of changes were brought into the *Code*. Most of them did not concern the conceptual aspects of the Rules, but were meant to help zoological nomenclature adapt to modern techniques such as electronic publication and archiving, or cladistic analysis based on nucleic acid sequencing. These changes have raised various problems (see e.g. Dubois 2010*b*, 2011*a*; Dubois *et al.* 2013; Löbl 2015*a–b*; Löbl *et al.* 2016) which do not appear to have all been sufficiently taken into account so far. Besides these, a number of other urgent theoretical and practical problems relating to the *Code* have remained unanswered, such as some of those, sometimes aptly, raised by the supporters of the *Phylocode* (Cantino & Queiroz 2010), or those related to the absence of Rules for the nomenclature of taxa above the rank of superfamily (Dubois 2005*a–d*, 2006*a*, 2011*a*). This led to the implementation of new and potentially problematic Rules in the *Code*, whereas the inertia regarding some vexing problems raised concern in the taxonomic community. Combined with these, the Commission, the sole authority responsible for updating the *Code* and of publishing the *BZN*, was not able to provide a proper and open channel for uncensored debate and discussion amongst the community (see e.g. Dubois 2005*b–c*, 2017*b*; Laurin 2008).

For this reason, a group of nine practicing zootaxonomists from six countries decided to meet to identify these problems and to start addressing them. On 9–10 July 2014, after public notice on social networks, they convened an open international meeting entitled "Burning questions and problems of zoological nomenclature" which was held at the Biology Centre of the Upper Austrian Museum in Linz (Austria). The main objectives of this meeting were to encourage an encounter of zoologists interested in nomenclatural matters, questioning the pertinence of some recent evolutions of the *Code* and trying to identify the main problems, discuss them freely and openly, work on proposals of solutions to at least some of them and publish these proposals.

The eleven participants of this meeting, coming from eight countries, were very motivated and competent on the questions of zoological nomenclature. The meeting consisted in lectures and round tables. The discussions were very rich, held in a good atmosphere, and they did pinpoint several major problems of contemporary zoological nomenclature. Given the time limitation, it was impossible to go into very detailed discussions, but the crucial purpose of the meeting was to determine the most important questions, and the points of agreement and disagreement among participants. For some of these problems, possible solutions were suggested, through modifications that could be brought to the *Code* in the near future, but other questions will require more time and work. It was unanimously felt that these problems are important enough to deserve to be freely discussed within the community of zootaxonomists before publication of the next edition of the *Code*.

1.2. Organisers and participants of the 2014 Linz meeting

Chairman: Alain Dubois (Paris, France).

Secretary: Erna Aescht (Linz, Austria).

Scientific Committee: Erna Aescht (Linz, Austria); Aaron M. Bauer (Villanova, USA); Pierre-André Crochet (Montpellier, France); Edward C. Dickinson (Eastbourne, United Kingdom); Alain Dubois (Paris, France); Ivan Löbl (Genève, Switzerland); Antoine Louchart (Lyon, France); André Nemésio (Uberlândia, Brazil); Annemarie Ohler (Paris, France).

Technical organisation staff: Renate Taubner, Anita Pertlwieser, Waltraud Standhartinger, Hannelore Hahn.

Participants (Fig. 1): Erna Aescht (Linz, Austria); Agnes Bisenberger (Linz, Austria); Luis Ceríaco (Lisboa, Portugal); Po-Wei Chen (Tübingen, Germany); Edward C. Dickinson (Eastbourne, United Kingdom); Alain Dubois (Paris, France), Santiago Gaviria-Melo (Wien, Austria); Ivan Löbl (Genève, Switzerland); André Nemésio (Uberlândia, Brazil); Annemarie Ohler (Paris, France); Jan van Tol (Leiden, The Netherlands).

FIGURE 1. The participants of the Linz meeting photographed on 10 July 2014 at 9.35 am.
From left to right: Jan van Tol, Luis Ceríaco, André Nemésio, Erna Aescht, Edward Dickinson, Agnes Bisenberger, Annemarie Ohler, Alain Dubois, Ivan Löbl, Po-Wei Chen, Santiago Gaviria-Melo.

1.3. The Linz meeting

The two-day meeting, reported in detail by Dubois *et al.* (2016), consisted in lectures and round tables, which covered the following topics:

[A1] Introductory lecture (Alain Dubois, France).

[A2] Round table 1: nomenclatural availability (moderator: Edward C. Dickinson, United Kingdom).

[A3] Round table 2: taxonomic allocation of nomina (moderator: André Nemésio, Brazil).

[A4] Round table 3: validity and correctness of nomina (moderator: Ivan Löbl, Switzerland).

[A5] Round table 4: terminology (moderator: Annemarie Ohler, France).

[A6] Lecture: some data and comments about the Commission (André Nemésio, Brazil).

[A7] Round table 5: nomenclature of higher zoological taxa (moderator: Erna Aescht, Austria).

[A8] Conclusion (Alain Dubois, France).

1.4. Conclusions and final decisions

The workshop identified a number of questions that should be discussed among zootaxonomists before embarking on the writing of the next edition of the *Code*. Although certainly not exhaustive,

this list of questions is considerable and shows that their full consideration will require work, communication and time.

On most important points a large consensus was easily reached among all participants of the meeting. In particular, a complete agreement concerned the following seven points:

[B1] ***The Nomenclatural Process***. The Linz meeting acknowledged that the process leading to the identification of the valid nomen of any taxon under any classification consists in three distinct stages, namely: [B1a] ***nomenclatural availability*** of nomina, [B1b] ***taxonomic allocation*** of nomina and [B1c] ***nomenclatural validity and correctness*** of nomina. Accordingly, the plan of the *Code* will have to be drastically modified.

[B2] ***The nomenclatural availability of nomina and nomenclatural acts***. [B2a] They must be **published**, i.e. made public, and **obtainable by all** upon request, in a **permanent**, immutable form (even in its smallest details like pagination). [B2b] Electronic publications raise many problems for zoological nomenclature, that have not all yet been adequately addressed. [B2c] *LANs* will doubtless be incomplete and imperfect, with omissions and mistakes, and they should therefore remain **modifiable** even after their first publication.

[B3] ***The taxonomic allocation of nomina***. [B3a] Nomina of species and subspecies should be based on **preserved** specimens permanently ***accessible*** to all taxonomists interested, not on virtual specimens (photographs) or only on tissues or nucleic acid sequences. [B3b] As this may appear to some contradictory with the conservation of biodiversity, this requires proper **communication** with non-taxonomist colleagues and with the public opinion to explain the reasons and consequences of this point of view. [B3c] The status of 'nomina dubia' should be clarified through 'neotype' designations or other appropriate procedures. [B3d] The concept of 'hapantotype' is based on a confusion between taxonomy and nomenclature and should be abandoned.

[B4] ***The nomenclatural validity of names and correctness of spellings.*** [B4a] As defined in the *Code*, the concept of 'prevailing usage' is unclear and confusing, and should be replaced by strictly defined ***categories of usage*** of nomina. [B4b] The basic distinction between ***nomina*** and ***spellings*** is not clear in the *Code* and this should be improved. [B4c] The plea for **nomenclatural stability** does not answer a scientific, but a practical need, and it should not take the lead on **nomenclatural accuracy**: ***Priority*** should be reinstated as the only **basic Principle** of validity of nomina, and usage should be called upon only for **very-well-known nomina**, objectively defined. [B4d] Despite the recent proliferation of so-called 'taxonomic' databases of unequal, but often poor quality, the absence of several serious nomenclatural databases so far is a real problem that should be addressed as soon as possible: e.g. databases providing actual dates of publications of works, lists of ***airesies*** by taxonomists, and an updated listing of all the decisions taken under the Plenary Power by the Commission since its beginning.

[B5] ***The terminology of the*** **Code.** New terms are necessary for new nomenclatural concepts or for concepts already present in the *Code* but that had not been identified as such until the recent years, as well as to replace terms that are inadequate for some reasons (see e.g. Dubois 2011*a*, 2013).

[B6] ***Higher zoological nomenclature***. The participants of the meeting considered that, in our epoch where many cladistic analyses are carried out, resulting in the recognition of many new higher taxa, it is high time for zoological nomenclature above the rank superfamily to be covered by the *Code*.

[B7] ***The governance of zoological nomenclature***. The legitimacy of the current Commission, the members of which are not elected by the community of zootaxonomists but co-opted, as well as the current mode of governance of zoological nomenclature, are questionable, and if these concerns are not addressed the establishment of an independent, open international society of zoological nomenclature should be seriously considered.

On a few other questions, different opinions were defended. In the future, efforts will be devoted to clarify the arguments of their supporters and trying to reach a consensus, before eventually adopting a common proposal.

In order to continue the work started during this symposium, the workshop decided unanimously to establish a permanent working group. The first duty of this group will be to organise discussions among the founder members of the group and with the colleagues who, sharing its approach and its main conclusions [B1] to [B7], will join it subsequently. In the longer run, an ultimate goal of this group will be the writing of a complete '*Zoocode*', an alternative 'non official' version of the *Code*, incorporating many of the suggestions of change in the *Code* discussed at the Linz meeting and later in the group. In a way, it will probably be shorter and simpler than the current *Code*, many 'exceptions' to the Rules being removed, but on the other hand it will address also the nomenclature of taxa above the rank superfamily and other questions not mentioned in the current *Code*. Once adopted by our working group, this text will be made available to the international community of practicing zootaxonomists, who will be able to compare its advantages and drawbacks relative to the current *Code*. Jan van Tol, then President of the International Commission on Zoological Nomenclature, who attended the whole meeting and contributed to all its discussions, supported this proposal. In conclusion, all zoologists present at the Linz meeting unanimously adopted the decision to establish a permanent working group.

2. THE LINZ *ZOOCODE* COMMITTEE (LZC)

2.1. Composition of the LZC through time

The list below provides in alphabetical order the names of the fifteen colleagues from seven countries who participated in the work of the LZC from January 2016 to October 2019, either as active LZC members [A] or as observers [O], or both, with the period during which they served.

Erna Aescht (Linz, Austria). [A], LZC Secretary: 01.2016–10.2019.
Aaron M. Bauer (Villanova, USA). [A]: 01.2016–10.2019.
Roger Bour (Montgeron, France). [A]: 01.2016–05.2018.
Luis Ceríaco (Porto, Portugal). [A]: 01.2016–10.2019.
Pierre-André Crochet (Montpellier, France). [A]: 01.2016–05.2018.
Edward Dickinson (Eastbourne, UK). [A]: 01.2016–05.2018. [O]: 05.2018–10.2019.
Alain Dubois (Paris, France). [A], LZC President: 01.2016–10.2019.
François Dusoulier (Paris, France). [A]: 07.2016–10.2019.
Thierry Frétey (Saint-Maugan, France). [A]: 01.2016–10.2019.
Ivan Löbl (Genève, Switzerland). [A]: 01.2016–05.2018. [O]: 05.2018–10.2019.
Olivier Lorvelec (Rennes, France). [A]: 01.2016–10.2019.
Antoine Louchart (Lyon, France). [A]: 01.2016–05.2018. [O]: 05.2018–10.2019.
Annemarie Ohler (Paris, France). [A]: 01.2016–10.2019.
Marcos Raposo (Rio de Janeiro, Brazil). [A]: 08.2017–05.2018. [O]: 05.2018–10.2019.
Renata Stopiglia (Fortaleza, Brazil). [A]: 08.2017–10.2019.

2.2. Status, functioning and first decisions

In January 2016, the permanent working group established by the Linz meeting to continue its work took the name of 'Linz *Zoocode* Committee' (LZC). The LZC is an autonomous body, first launched on a volunteer basis by a group of zootaxonomists. Its organisation is simple, with just a Board (the tandem President-Secretary) and two categories of members: active members, who participate in all discussions and votes, and observers, who receive all internal documents of the Committee and can intervene in the discussions, but not in the votes. Given time availabilities and other vicissitudes (such as health problems), a given member can move at will from one of these categories to the other one. The status of observer also allows to take a first contact with the LZC, possibly as a first step before becoming an active member.

The main purpose of the LZC is to propose improvements to the *Code* along the lines developed in the Linz Meeting. In a first step, the LZC started to work through **Sessions** dedicated either to its internal functioning or, for most of them, to the discussion of formal **Proposals** regarding specific Principles and Rules of the *Code*, as well as the general architecture and philosophy of the latter. In the longer run, our plan is to articulate these Proposals under the form of a complete document, the Linz *Zoocode*, which will be submitted to the International Commission on Zoological Nomenclature and to the international community of zootaxonomists for comparison of its merits with those of the *Code*.

Decisions concerning zoological nomenclature have important consequences on the daily work of all biologists worldwide and should be taken only after a thorough, thoughtful and equitable process of reflection and consultation of the whole community—particularly in the cases of strong disagreements between groups of taxonomists, as well as in those of retroactive changes in the Rules, which may have heavy, often unpredicted consequences (see examples in Dubois 2010*b*). Accordingly, a collective body in charge of taking the decisions of modifying the Rules should listen closely to the demands of the community of taxonomists in order to be representative of this community. The composition of this collective body should be public, as well as its internal discussions, its exchanges with all interested members of this community and the detailed process of its decisions. This information should be duly published and remain available to all in the long run. It is is not acceptable to have decisions on these important matters taken 'secretly', after non-public discussion and without public information regarding the votes made by each commissioner—as has too often been the case with the decisions and publications of the Commission, even recently (e.g. Anonymous 2014, 2017). For these reasons, we think that the details of the process of discussion and decision of such a group should be made public in the form of permanent publications. For the time being, since 2016, a special section 'Zoologos' of the journal *Dumerilia* (founded in 1991) has been used as the official organ of the LZC to publish its adopted Proposals and the related discussions and votes. For financial reasons, all the details of the discussions were not published on paper after 2017, but they are available online through the link <http://www.zobodat.at/publikation_series.php?id=21003>.

At regular dates, a summary of the last Proposals adopted will be published in a widely distributed journal. The present paper is the first one of this kind. If necessary, in the future the LZC may decide to become an autonomous society, with its own Statutes, officers, budget, publications and website.

The LZC is not a closed group. It is open to all zootaxonomists who share its concerns and aims. All interested colleagues who agree with the main consensual analyses outlined above under [B1] to [B7] are welcome to apply for co-option by the Committee as additional members.

From the start of its work, the LZC established a detailed procedure for new members to join it, on the basis of agreement with the consensual points listed above, and for its internal functioning in

its discussions and votes. The LZC develops its discussions and takes its decisions through two main procedures: online discussions and votes among active members of the Committee; and physical meetings of the Committee. An important difference between our functioning and that of the Commission deserves to be highlighted. Before voting on a Proposal, we often develop several rounds of discussion, until all points of potential disagreement among us are clarified, and only then we proceed to the vote, but in this final step no further comments are possible. In contrast, in the reports of the Commission, in many cases it is clear that final comments were given by some commissioners along with their vote: not being brought to the knowledge of the other commissioners at the time of voting, these comments could not of course be taken into account to guide their decision. This is not a democratic procedure. In the LZC Sessions, final decisions concerning the Proposals are taken through formal votes involving all active LZC members at a majority of two thirds (66.7 %) of the latter. Votes are always public, not anonymous.

One of the consensual outcomes of the Linz Meeting was that the Rules of the *Zoocode*, unlike those of the *Code*, should not be limited to nomina from the rank subspecies to superfamily, but should also cover nomina below and above these ranks. This means in particular that one of the tasks of the LZC will be to propose Rules for the nomenclature of higher-ranked taxa (orders, classes, phyla, etc.), which should be compatible with those of the *Code* for lower-ranked taxa. Later, our discussion should also cover the nomenclature of taxa at ranks below subspecies (variety, form, etc.), which are covered by the botanical but not the zoological *Code* although they could be most useful, particularly in the fields of phylogeography, ecology and conservation (Dubois 2006*b*). This requires the recognition in the *Zoocode* of five nominal-series (class, family, genus, species, variety) instead of three in the *Code* (family, genus, species).

So far, from January 2016 to November 2019, the LZC has held 47 working Sessions and has adopted 39 Proposals, six of which have been published in volume **6** (2016), eight in volume **7** (2017) and 25 in volume **8** of *Dumerilia*. Table 1 gives the list and whereabouts of these Sessions. Those related to the internal functioning of the LZC are not published but are available on request.

The present document presents a first synthesis of the first part of the LZC work on the *Zoocode*, dealing with general questions concerning its structure and main concepts. These texts include the LZC Proposals regarding the *Zoocode*'s Preamble, its redefined and expanded Principles, the description of the Nomenclatural Process, which underlies all its Principles and Rules, as well as the Glossary of the terms used in these texts. We first provide a brief presentation of the context and rationale of each Proposal, which are presented in a much more detailed manner in the complete reports of the corresponding Sessions published in *Dumerilia*, and below we give the text adopted by the LZC for each Proposal. Some of the terms used in these texts are not in common use in the taxonomic literature. Upon their first use in the texts below, and sometimes again later, they are printed in ***bold italics***, and the Glossary below provides their etymology, definition, and if relevant their equivalent or partial equivalent in the *Code*.

TABLE 1. Sessions held by the Linz *Zoocode* Committee (LZC) from January 2016 to November 2019.

Contents of columns

SNr ● Session number: 1–38, Sessions devoted to discussion and adoption of Proposals for the *Zoocode*; P1–4, Texts of presentation of LZC Reports; R1, Report of the Observatory on Availability in Zoological Nomenclature; I1–I9, Sessions devoted to the internal functioning of the LZC.

Session title.

Dom ● Domain concerned in the Session: ALL, taxonomic allocation of nomen; AVA, nomenclatural availability of nomen or airesy; COR, nomenclatural correctness of nomen; GEN, generalities of the *Zoocode*; INT, internal functioning of the LZC; PRE, Presentation of LZC Reports; PRI, Principles of the *Zoocode*; TER, terminology of the *Zoocode*; VAL, nomenclatural validity of nomen or airesy.

From ● Date of opening of Session: day, month, year.

To ● Date of closing of Session: day, month, year.

Reference ● Reference of publication: All these publications appeared in the journal *Dumerilia* and were signed by the LZC Board, as 'Alain Dubois & Erna Aescht (editors)', except for R1, signed by 'Alain Dubois' (Dubois *2017d*). In this column only two pieces of information are provided: the year and number of paper (e.g., 2016*c* for 'Dubois & Aescht 2016*c*') and the volume and page of *Dumerilia* where this paper was published (e.g., **6**: 39–44). The publication dates of the three issues of *Dumerilia* concerned are as follows: Volume **6**, 19 July 2016; Volume **7**, 21 July 2017; Volume **8**, 28 October 2019.

SNr	Session title	Dom	From	To	Reference
1	Procedure proposed for the internal functioning of the LZC	INT	01.02.16	03.03.16	2016*c* ● **6**: 39–44
2	Nomenclatural problems with electronic publications	AVA	01.02.16	07.02.16	2016*d* ● **6**: 45–46
3	The term *nomen*	TER	16.02.16	31.03.16	2016*e* ● **6**: 47–53
4	The structure of the *Zoocode*	GEN	01.03.16	07.04.16	2016*f* ● **6**: 54–57
5	The Nomenclatural Process	GEN	01.03.16	26.04.16	2016*g* ● **6**: 58–61
6	Observatory on Availability in Zoological Nomenclature	AVA	12.04.16	08.06.16	2016*h* ● **6**: 62–70
7	Documents proposed for the Observatory on Availability in Zoological Nomenclature	AVA	25.06.16	23.08.16	2017*b* ● **7**: 19–20
8	The Principles of the *Zoocode*. 1. The Principle of Zoological Nomenclature Independence	GEN	26.07.16	18.01.17	2017*c* ● **7**: 21–23
9	The Principles of the *Zoocode*. 2. The Principle of Nomenclatural Foundation	GEN	26.07.16	29.08.16	2017*d* ● **7**: 24–25
10	Nominal-series	TER	08.08.16	06.11.16	2017*e* ● **7**: 26–28
11	The Principles of the *Zoocode*. 3. The Principle of Nominal-Series	GEN	08.08.16	06.11.16	2017*f* ● **7**: 29–31
12	Availability of new species-series nomina: the need of at least one name-bearer specimen preserved in a public permanent curated collection and available for study	AVA	25.09.16	01.03.17	2017*g* ● **7**: 32–34
13	Problems with the 2012 Amendment of the *Code*	AVA	24.11.16	06.02.17	2017*h* ● **7**: 35–47
14	Diagnoses in zoological nomenclature	AVA	13.02.17	06.04.17	2017*i* ● **7**: 48–49
15	Preamble of the *Zoocode*: purposes and functions	GEN	03.09.17	31.12.17	2019*b* ● **8**: 3–5
16	What is the meaning of 'fixed content and layout' in Article 8.1.3.2 of the 2012 Amendment of the *Code*? Consequences regarding this Amendment	AVA	03.11.17	28.12.17	2019*c* ● **8**: 6–34
17	The Principles of the *Zoocode*. 4. The Principle of Binomina	GEN	16.12.17	02.02.18	2019*d* ● **8**: 35–36
18	The term *type*	TER	24.12.17	13.02.18	2019*e* ● **8**: 37–41
19	The Principles of the *Zoocode*. 5. The Principle of Coordination	GEN	30.12.17	01.02.18	2019*f* ● **8**: 42–47

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TABLE 1. (Continued)

SNr	Session title	Dom	From	To	Reference
20	The Principles of the *Zoocode*. 6. The Principle of Neonymy	AVA	07.01.18	15.02.18	2019*g* ● **8**: 48–52
21	The Principles of the *Zoocode*. 7. The Principle of Onomatophores	ALL	14.01.18	06.03.18	2019*h* ● **8**: 53–56
22	Format conventions of the *Zoocode*	GEN	21.01.18	18.04.18	2019*i* ● **8**: 57–61
23	The Principles of the *Zoocode*. 8. The Principle of Zygoidy	VAL-COR	29.01.18	06.03.18	2019*j* ● **8**: 62–65
24	Subtelties of homonymy in zoological nomenclature	VAL	03.02.18	21.04.18	2019*k* ● **8**: 66–84
25	The Principles of the *Zoocode*. 9. The Principle of Homonymy	VAL	03.02.18	21.04.18	2019*l* ● **8**: 85–87
26	Misidentified specimens and taxa	AVA	12.03.18	24.05.18	2019*m* ● **8**: 88–97
27	Suffixes in family-series nomenclature	COR	09.04.18	27.05.18	2019*n* ● **8**: 98–105
28	The Principles of the *Zoocode*. 10. The Principle of Synonymy	VAL	21.04.18	24.05.18	2019*o* ● **8**: 106–109
29	The Principles of the *Zoocode*. 11. The Principle of Priority	VAL-COR	28.04.18	31.05.18	2019*p* ● **8**: 110–113
30	The Principles of the *Zoocode*. 12. The Principle of Airesy	VAL	09.05.18	11.06.18	2019*q* ● **8**: 114–116
31	The Principles of the *Zoocode*. 13. The Principle of Proedry	VAL	27.05.18	04.08.18	2019*r* ● **8**: 117–118
32	The Principles of the *Zoocode*. 14. The Principle of Nomography	COR	03.08.18	11.03.19	2019*s* ● **8**: 119–132
33	The Principles of the *Zoocode*. 15. The Principle of Sozoidy	VAL	13.01.19	29.03.19	2019*t* ● **8**: 133–142
34	The Principles of the *Zoocode*. 16. The Principle of Archoidy	GEN	25.03.19	12.06.19	2019*u* ● **8**: 143–146
35	The Principles of the *Zoocode*. 17. The Principle of Registration	GEN	14.04.19	08.07.19	2019*v* ● **8**: 147–154
36	The status of Recommendations in the *Zoocode*	GEN	01.07.19	01.08.19	2019*w* ● **8**: 155–158
37	Diagrams of the Nomenclatural Process	GEN	01.07.19	06.09.19	2019*x* ● **8**: 159–168
38	Adoption of the text of *Dumerilia* **8**	GEN	02.08.19	02.10.19	2019*y* ● **8**: 169
P1	The Linz *Zoocode* Committee	PRE	–	–	2016*a* ● **6**: 35–37
P2	Session 1–6 of the Linz Zoocode Committee (February–June 2016)	PRE	–	–	2016*b* ● **6**: 38
P3	Sessions 7–14 of the Linz *Zoocode* Committee (June 2016–April 2017)	PRE	–	–	2017*a* ● **7**: 18
P4	Sessions 15–38 of the Linz *Zoocode* Committee (May 2017–October 2019)	PRE	–	–	2019*a* ● **8**: 1–2
R1	Report 2017-1 of the Observatory on Availability in Zoological Nomenclature	AVA	17.06.16	04.07.17	*2017d* ● **7**: 50–61
I1	Abbreviation or acronym	INT	07.06.16	18.09.16	–
I2	Proposal of co-option. 1	INT	25.06.16	26.07.16	–
I3	Funding the LZC	INT	26.07.16	11.08.16	–
I4	Proposal of co-option. 2	INT	25.07.17	29.08.17	–
I5	Glossary of the *Zoocode*	INT	07.03.18	21.04.18	–
I6	Linz informal meeting	INT	13.03.18	13.03.18	–
I7	LZC membership	INT	13.05.18	04.08.18	–
I8	Short overview of the Singapore meeting of the International Commission on Zoological Nomenclature	INT	24.06.19	24.06.19	–
I9	Adoption of the text of the present paper for *Bionomina*	GEN	19.10.19	11.11.19, 18.11.19	2019*y* ● **8**: 169

3. The 2016–2019 Sessions of the LZC

3.1. Content and structure of the Linz *Zoocode*

The *Zoocode* will follow a plan different from that of the *Code*, with the following main chapters and subchapters. These nine chapters will constitute the *Zoocode* as such. They will be followed by references, Recommendations and an index, which will not be part of the *Zoocode* itself.

1. Generalities
    1.1. Preamble of the Linz *Zoocode*
    1.2. The Principles of the Linz *Zoocode*
    1.3. The Nomenclatural Process
    1.4. Other generalities
2. Nominal-series assignment of nomina and nomenclatural availability of works, nomina and onomatergies.
    2.1. Nominal-series assignment of nomina
    2.2. Nomenclatural availability of publications
        2.2.1. Paper publications
        2.2.2. Electronic publications
        2.2.3. Disk publications
        2.2.4. Date of publication
        2.2.5. Authorship of publication
    2.3. Nomenclatural availability of nomina
        2.3.1. Criteria of availability and unavailabity of nomina
            2.3.1.1. General criteria
            2.3.1.2. Criteria specific for the species-series
            2.3.1.3. Criteria specific for the genus-series
            2.3.1.4. Criteria specific for the family-series
            2.3.1.5. Criteria specific for the class-series
        2.3.2. Dates of nomina
        2.3.3. Authorship of nomina and scriptorship of paronyms
    2.4. Nomenclatural availability of onomatergies
        2.4.1. Criteria of availability and unavailabity of onomatergies
        2.4.2. Dates of onomatergies
        2.4.3. Authorship of onomatergies
3. Taxonomic allocation of nomina
    3.1. Onomatophores
    3.2. Species-series: onymophoronts
    3.3. Genus-series: nucleospecies
    3.4. Family-series: nucleogenera
    3.5. Class-series: [Rules still to be addressed by the LZC]
4. Nomenclatural validity of nomina and onomatergies
    4.1. Zygoidy
        4.1.1. Zygonymy
        4.1.2. Zygophory
    4.2. Criteria of validity and invalidity of nomina
        4.2.1. Species-, genus- and family-series
            4.2.1.1. Priority

3.2. Terminology of the Linz *Zoocode*

As discussed in the 2014 Linz meeting, the terminology of the *Code* is often unclear, ambiguous and misleading, and one of the first decisions of the LZC was to adopt a more precise and unambiguous terminology which should, after a period of adaptation, allow a better communication among zootaxonomists regarding the concepts and Rules of the *Zoocode*. Below, some of these terminological novelties are presented in the context of the Principles for which we introduce them. Three of them have a more general value and are introduced here before examining the Principles themselves: the term 'nomen', the expression 'nominal-series' and the term 'onomatophore' and related ones.

3.2.1. The term 'nomen' and related ones

3.2.1.1. Justification of this Proposal

Zoological nomenclature deals with 'names', therefore this term is bound to appear in almost every Article of the *Code*. However, this text deals with different 'kinds' of names, and for a proper and unambiguous communication it would be useful to have a clear way to distinguish them. This is not the case in the present *Code*, where the term 'name' is used at least in 8 different senses (see details in Dubois & Aescht 2016*e*): [C1] a 'Latin-like' ***scientific name***, introduced to designate a ***taxon***, and having an author, a date and a 'name-bearing type'; [C2] any particular ***spelling*** or ***rank*** of a scientific name, whether 'correct' or 'incorrect'; [C3] any particular ***combination*** of a binominal or plurinominal scientific name; [C4] a scientific name originally published in a language other than Latin but subsequently 'Latinised' and used as a valid scientific name; [C5] a 'vernacular name', in a

language other than Latin; [C6] the name of a nomenclatural 'author'; [C7] the name of the first user of a new spelling, rank or combination of an already existing scientific name; [C8] various other kinds of 'names', such as names of localities, of persons, of plants, etc.

This imprecise use of a term playing a central role in the *Code* and in zoological nomenclature as a whole is a permanent source of problems, which may be illustrated by the frequent confusion between scientific names and their 'forms' or 'avatars'. This is well shown, among other cases, by two examples: [D1] the confusing use of the term 'synonym' to designate genuine ***synonyms*** but also ***aponyms*** and ***chresonyms*** (see Dubois 1982, 2000; Dubois & Aescht 2019*o*); [D2] the many *Opinions* where the Commission decided to suppress, and to enter in the *Official Index of Rejected and Invalid Names in Zoology*, not only some scientific names, but also some of their original or subsequent 'avatars', such as incorrect original spellings or (correct or incorrect) subsequent spellings. This is not justified, because an incorrect or a subsequent spelling of a name has no independent availability (Articles 32.4, 33.3): in nomenclatural terms, it **does not exist** as an autonomous scientific name and as such **cannot be suppressed**!

3.2.1.2. LZC decision

To avoid such problems due to carelessness and fuzzy terminology, it is necessary to clearly distinguish between an available scientific name and its original or subsequent 'forms', having either a different spelling or a different combination, or both.

On 31 March 2016, in its Session 3 (Dubois & Aescht 2016*e*), the following important terminological change in the *Zoocode* were adopted by the LZC:

[E1] The abandonment throughout the *Zoocode* of the imprecise term 'name' to designate a 'scientific name' and to replace it everywhere by the term ***nomen*** (Dubois 2000). The latter term has already been used for a very long time, with the exactly same meaning, in zoological nomenclature, in expressions like *nomen nudum*, *nomen novum*, *nomen dubium*, *nomen oblitum* or *nomen protectum*, and these five expressions are still recognised in the current *Code*, so the meaning of the term *nomen* should be easy to understand by all zootaxonomists.

[E2] The introduction in the *Zoocode* of the following terms (Dubois 2000, 2010*b*; Dubois & Aescht 2016*e*, 2019*f,g,k,p*): [E2a] ***paronym***, for any 'form' of a nomen, either original or subsequent, and concerning its spelling (***parograph***), its rank (***parohypse***) and/or its combination (***paronymorph***); ***protonym***, for the original paronym of a nomen, with its subcategories ***protograph***, ***protohypse*** and ***protonymorph***, but also ***symprotograph***, ***lectoprotograph*** and ***leipoprotograph*** in case of multiple original spellings; and ***aponym***, with its subcategories ***apograph***, ***apohypse*** and ***aponymorph***. The *Zoocode* Glossary below provides the etymologies, definitions and original references of these terms.

Adoption of this clear terminology should avoid many nomenclatural problems and errors, such as listing the aponyms of a nomen among its synonyms, or listing them in *Lists of Available Names* (LANs), or the absurd 'suppression' of aponyms, which have no nomenclatural existence by themselves and are therefore ipso facto 'suppressed' by the invalidation of the nomen itself.

3.2.2. The expression 'nominal-series' and related ones

3.2.2.1. Justification of this Proposal

A peculiarity of the zoological *Code*, which it does not share with other biological codes (see Dubois 2011*b*), is the existence of three distinct and closed gatherings of nomina. Each of these gatherings collects nomina designating taxa of several distinct but 'related' ranks: e.g., family, subfamily, superfamily. The nomina of each gathering obey slightly different although similar Rules, and are largely independent from one another. Within each gathering, the Principle of Coordination applies, and nomina and their paronyms interact regarding homonymy, synonymy, priority and other situations of conflicts of precedence (e.g., regarding ***onomatergies*** such as ***airesies***).

A problem of terminology exists for the designation of these gatherings of nomina. The two 'official texts' of the current *Code*, the English and the French, which are stated in Article 86.2 to be "equivalent in force, meaning and authority", use fully different and undeniably non-equivalent terms for this purpose. The English text uses the term 'group', which may be a strong source of confusion with other uses of this term, particularly between the taxonomic concept of 'species group' designating a rank (between genus, or subgenus, and species)—a very frequent use in the taxonomic literature (along with 'species complex', less common however)—and the nomenclatural concept of 'species group' as a gathering of nomina of related ranks, submitted to the same Rules. Instead, the French version of the *Code* uses the term 'niveau' ['level'] instead of 'groupe' ['group'], but this term is not better chosen, as a given 'level' includes several ranks which are not at the same 'level'. A solution to remove these ambiguities is the use of the term ***nominal-series*** for these gatherings of nomina (Dubois 2000).

The scale of taxonominal ranks that have been used in zoology since 250 years, which started with 16 ranks in Linnaeus (1758) (see Dubois 2007*c*), covers potentially several dozens or hundreds ranks (see details in Dubois 2006*a*), from reign to variety and even form, but, quite strangely, the *Code* does not take the two ends of this scale into account. It recognises only three nomenclatural 'groups or levels': [F1] that of **species** (***species-series*** here) which includes the nomina of only four ranks: species, subspecies, 'aggregate of species' and 'aggregate of subspecies'; [F2] that of **genus** (***genus-series*** here) with only two ranks acknowledged in the *Code*: genus and subgenus; and [F3] that of **family** (***family-series*** here) with the nomina of ranks family, subfamily, superfamily, tribe, subtribe and "any other rank below superfamily and above genus that may be desired" (Article 35.1); therefore this gathering of nomina is limited upwards by the *Code*, for a completely mysterious reason, to the rank superfamily, so that a rank like 'hyperfamily', above superfamily and coordinated with the latter, would not be *Code*-compliant; it is proposed here to abandon this unjustified limitation.

Two additional 'groups or levels', not mentioned in the *Code*, could or should be recognised to cover ranks traditionally used in the nomenclatural hierarchy: [F4] one (***class-series***) for all nomina of taxa above the family-series (orders, classes, phyla, etc.); [F5] one (***variety-series***) for nomina of taxa below the species-series (varieties, forms, etc.), which, although not usual in zootaxonomy, are of widespread usage in botany. Their use will be discussed in future LZC Sessions.

Some authors have supported the idea that each 'group or level' of nomina is limited to the ranks that are designated by the same basic or 'key' term, possibly combined with another 'qualifying' term, such as 'family', 'subfamily' and 'superfamily'. Under such an interpretation, ranks based on different 'key' terms, such as family and tribe, or phylum, class and order, should be referred to different nominal-series. This is obviously wrong in the case of family and tribe, and using such a rule in the case of nomina at ranks above superfamily, in recognising e.g. a 'phylum-series' and an 'order-series' distinct from the class-series would only unnecessarily but considerably complicate the nomenclature of higher-ranked taxa (for details see Dubois 2006*c*). Such proposals ignore the fact that the ranks of taxa are completely arbitrary and merely based, in each zoological group, on

tradition or consensus, as they provide by themselves no information on the biological characteristics of taxa or on their evolutionary history.

In order to remove this ambiguity, the LZC proposed to use the new expression ***nominal-set*** to designate the gathering of all the ranks the nomina of which are based on the same 'key' term (e.g., family, tribe, phylum, class, order). All members of the same nominal-set belong of course in the same nominal-series, but a given nominal-series may include several nominal-sets (e.g., family and tribe in the family-series).

3.2.2.2. LZC decision

The following solutions to these problems were adopted by the LZC on 6 November 2016 in its Session 10 (Dubois & Aescht 2017*e*):

[G1] The abandonment throughout the *Zoocode* of both expressions 'group of names' and 'nomenclatural level' ('niveau nomenclatural'), to use instead the expression ***nominal-series*** ('série nominale' in French).

[G2] The recognition in the *Zoocode* of the following four nominal-series, which cover the whole scale of the nomenclatural hierarchy: ***class-series***, ***family-series***, ***genus-series***, and ***species-series***, as well as possibly a fifth one, the ***variety-series***.

[G3] The adoption of the expression ***nominal-set*** to designate a gathering of nomina, referred to the same nominal-series, the ranks of which are designated by the same 'key' term combined or not with 'qualifiers' like 'sub-' or 'super-'.

The new terms and expressions adopted here are defined in the Glossary below.

3.2.3. The term 'type' and related ones

3.2.3.1. Justification of this Proposal

'Type' is a common language term used in multiple senses. Typologism or essentialism holds that all the members of a given group share certain properties that are necessary and sufficient to define the group. In biology, one has to differentiate between at least three different meanings of the term 'type': [H1] the **nomenclatural** type concept which applies to nomen-bearing specimens, [H2] the **taxonomic** type concept which applies to character-bearing specimens and which refers to taxonomic models, and [H3] the **morphological** type concept as a morphological plan or 'ground-plan'.

Given the existence of these different 'kinds' of types, for a proper and unambiguous communication it is necessary to have a clear way to distinguish them. This is not the case in the present *Code*, where the term 'type' (including the adjectives and compound terms based upon it) is used in two main contexts:

[I1] a **nomenclatural** context, related to the concept and function of 'name-bearing type': [I1a] terms related to concrete specimens having this function ('holotype', 'syntype', 'hapantotype', 'lectotype', 'neotype', 'type series', 'type specimen'); [I1b] terms related to the origin of these specimens ('type horizon', 'type host', 'type locality'); [I1c] nominal taxa ('type species', 'type genus') having this function; and [I1d] onomatergies through which specimens or nominal taxa are credited with this function ('type fixation', 'typification', 'monotypy' in the nomenclatural meaning of the term—opposed to its taxonomic meaning, to designate a taxon that does not include ***subordinate*** taxa, see Dubois 2011*a*: 11);

[I2] a **taxonomic** context, related to the concept and function of 'character-bearing type': [I2a] terms regulated by the *Code* having both a nomenclatural and a taxonomic functions ('hapantotype'); [I2b] terms regulated by the *Code* but without nomenclatural function ('paratype', 'paralectotype'); [I2c] terms not or no more regulated by the *Code* but still mentioned in its text and Glossary ('allotype', 'cotype', 'genotype', 'topotype', 'topotypic').

In modern biological thinking, where the concept of evolution plays a central role, there is no place for essentialism. Evolution does not result from the realisation of a preconceived 'program' but from an unpredictable combination of 'chance and necessity', as well put by Monod (1970). Therefore this is no surprise to modern biologists if different organisms that belong to the same lineage or 'clade' do not always share any 'common character', whether plesiomorphic or apomorphic, that could be stated to be 'necessary and sufficient' for being used as the basis for a ***monothetic diagnosis*** of the taxon allowing the taxonomic recognition of the lineage, thus requiring in such cases the recourse to ***polythetic diagnoses*** (Sneath 1962; Van Regenmortel 2016; Dubois 2017*c*).

The term 'type' will permanently remain a problem in nomenclature because it is impossible to disconnect it from the idea that a 'type' bears something 'typical' of the entity it represents. To avoid the misinterpretation that the *Code* relies on an essentialist and typological thinking, the term 'type' should be extirpated from zoological nomenclature and all its derivatives using the root 'type' replaced by other terms, which do not have this misleading connotation (Dubois & Ohler 1997; Dubois 2005*c*, 2007*a*).

In fact, the concept of nomenclatural type is a very unusual one in science and even in human thinking as a whole. Usually, a term designating a 'class' is 'defined', either ***intensionally*** or ***extensionally***. But in the case of nomenclature the 'type' only provides an 'anchor' to which the class is attached, but no 'necessary and sufficient' property that would be shared by all its members. In other words, it is not intensional but ostensional: it **points** to the class but does not provide its **content** or **limits**. This is a **very unusual** concept (for details see Dubois & Aescht 2019*e*). Using a specific term for this very special concept points to the fact that nomenclature is a **specific technical domain** which uses **specific concepts** that must be understood by those working in the domain. The fact that nomenclatural types do not have any function of pointing to **characters** but to **included specimens** is a very important one and must be made clear by the use of a special term.

The formula 'name-bearing type' currently used in the *Code* is not only unpalatable, but also still based on this term and then does not fully clarify this question (as would have, e.g., formulae like 'name-bearing specimen', 'name-bearing nominal taxon' or simply 'name-bearer'). Several terms have been proposed to designate this tool, which is a unique particularity of the codes of biological nomenclature, providing an objective connection between the world of specimens (and, through them, of natural populations of organisms) and the world of language. We here retain the term ***onomatophore*** (Simpson 1940) for the general concept of 'nomen-bearer'. In zoological nomenclature, there are two distinct kinds of onomatophores: specimens for nomina of the species-series and nominal taxa of subordinate nominal-series for nomina of the genus- and family-series. This further distinction needs special terms, which were provided by Dubois (2005*c*: 403): ***onymophoront*** for concrete organisms or parts of them, and ***nucleomen*** for nominal taxa.

The abandonment of the term 'type' and its associated terms is likely to face resistance from part of the community of taxonomists. The main arguments against it are the fact that this term has been in use for two centuries in thousands of publications, and is 'well-known' to all taxonomists, who are plainly conscious that it is not a typological concept but refers to an 'anchor' for the allocation of nomina to taxa. However, many specialists of other branches of biology (and science in general), **are not aware** of the particular sense of the term 'type' in taxonomy and may therefore be led to consider that taxonomists are still using typological thinking in modern day science, believing in the

existence of fixed entities created once and for all. Therefore, the continuous use of the term 'type' in zoological nomenclature may be more harmful to the image of taxonomy than most taxonomists think, with clear and direct consequences on the daily practice of the field, funding and above all recognition among the biological sciences. The resistance, quite frequent in science, to novelty in a domain where a tradition has long been in force, the attachment of taxonomists to the term 'type', explains its overdue persistence in nomenclature, but this should change, in order to free nomenclature from this misleading image. Sticking against all evidence to the use of the term 'type' cannot but result, among other factors, to maintain taxonomy in a 'ghetto'.

3.2.3.2. LZC decision

On 13 February 2018, in its Session 18 (Dubois & Aescht 2019*e*), the LZC decided:

[J1] For better clarity of communication, especially with non-taxonomists, to replace 'name-bearing type' by ***onomatophore*** in the *Zoocode*.

[J2] To introduce in the *Zoocode* the terms ***onymophoront*** (specimen(s) serving as onomatophore of a nomen of the species-series) and ***nucleomen*** (onomatophore of a nomen of a nominal-series above the species-series).

[J3] To extirpate from the *Zoocode* all terms based on the term 'type' in the nomenclatural meaning of the term and to replace it by appropriate terms based on other roots.

[J4] To abandon throughout the *Zoocode* the term 'hapantotype', which has a double (taxonomic and nomenclatural) function, and the traditional terms 'paratype' and 'paralectotype', and not to replace these terms which have no nomenclatural function and testify to a persistence of typological thinking in zoological nomenclature. For the designation of the specimens used as ***semaphoronts*** (Hennig 1950, 1966) to provide the characters diagnostic of a new taxon, the *Zoocode* will just support the use of Simpson's (1940) term ***hypodigm*** (see also Dubois 2005*c*: 401–405, 2011*a*).

Adoption of this clear terminology would avoid many nomenclatural obscurities and errors, such as listing the paratypes, which have no nomenclatural function, under 'type material' (***onymophoronts***) in taxonomic revisions, faunistic checklists and catalogues of collections.

3.3. Preamble of the Linz *Zoocode*

3.3.1. Justification of this Proposal

The Preamble of the current *Code* states: "The objects of the *Code* are to promote stability and universality in the scientific names of animals and to ensure that the name of each taxon is unique and distinct." The LZC has deep reservations about this formulation, which places 'nomenclatural stability' on top of the priorities of the *Code*. Focusing on stability suggests that nomenclature should be subservient to the commodity of bureaucrats and legislators involved in laws and regulations concerning biodiversity, on conservation issues and curation of collections, rather than to the effective needs of the science of taxonomy.

As a matter of fact, and as discussed in the 2014 Linz meeting, the current 1999 *Code* is a flawed text which relies on two antagonistic Principles, the Principle of Priority and an unstated and imprecise 'Principle of Usage'. Although the latter nowhere appears as such in the *Code*, **many** of the Rules of this edition are meant at implementing it, not only in Article 23.9 but in various other Articles as well. Furthermore, over the last decades many decisions of the Commission (except

mysteriously some, such as the very strange one concerning the herpetological works of La Cepède; see Dubois & Raffaëlli 2009) go in the same direction, even when the 'usage' invoked was very meagre (see Dubois 1994, 1995*b*, 2010*c–d*).

The LZC does not adhere to the current worship for so-called nomenclatural stability. We consider that Priority should be reinstated as **the basic Principle** of validity of nomina, and that usage should be called upon only for **very-well-known nomina**. The formula "very-well-known nomina" points to nomina that have been used as valid **hundreds or thousands of times** in the **general** scientific (and even non-scientific) literature, like *Drosophila melanogaster*, *Homo neanderthalensis* or *Tyrannosaurus rex*. The protection against Priority should be limited to such nomina, and in all other cases the normal Rules should apply. The so-called 'nuisance' caused by nomenclatural instability exists only for these well-known nomina. In all other cases, the 'nuisance' comes instead not from nomenclatural instability but from those who do not want to follow the *Code* and who will engage our community into endless discussions to establish whether or not the normal Rules should be circumvented in order to protect an 'obscure' nomen (used, and even known, by only a handful of persons) against another 'obscure' one. Such sterile discussions have already been the cause of the loss of hundreds of working hours and of printed pages in the last century and, in the century of extinctions, it is time for this to stop, in order to free up a lot of time for genuine taxonomic work.

On the other hand, there are many good and important reasons to have a strict and binding *Code* for zoological nomenclature. Among them, instead of stability, it would be much preferable to highlight nomenclatural **universality** and **univocality**, **accuracy** and **clarity** (absence of ambiguities and of 'tolerance for errors'), **stability of the Rules** (instead of that of the nomina) which do not forbid evolution of the *Code* if care is taken for the new Rules not being retroactive, and **automaticity** (which requires to limit exceptions to a few very special situations, instead of being widespread throughout the text as in the current *Code*). Such foundations could allow in the future conception and implementation of adequate tools to enhance this automaticity, such as softwares helping taxonomists to follow rigorously the Rules.

Another point that should be made clear in the Preamble is that a code of nomenclature like the *Zoocode* is a text of 'legislative' or 'juridical' nature. In the domain of taxonomy, it has the same constraining force as the laws and regulations in a country. It does not provide a list of 'suggestions' or a guide for 'good practice' that zootaxonomists are free to follow or not. This means that, in the domain of its jurisdiction, i.e. that of zoological nomenclature, it does not give 'advice' or 'recommendations' but provides ***Rules***, which **must** be followed if an onomatergy such as the establishment of a new nomen is to be accepted as *Code*-compliant by the international community. Failure to respect them in a scientific publication renders the faulty statements nomenclaturally invalid and all subsequent authors are fully entitled to ignore them.

The current *Code* consists in three different kinds of items which are stated (page 124) to be "integral part of the *Code*": the Preamble, the Articles 1–90 (as far as they concern the Principles, the Rules and the exceptions) and the Glossary. This is not the case of a number of other kinds of items which are expressly stated not to be part of the juridical text of the *Code* itself, including the 'Recommendations' which are spread throughout the document "appended to relevant Articles of the Code", as well as those presented in the Appendices devoted respectively to the 'Code of ethics' and to 'General recommendations'. According to the *Code* itself, these Recommendations are provided "as a guide to good usage in nomenclature" and "zoologists are urged to follow them", but in fact not doing so has no nomenclatural consequence.

On the other hand, in the *Code*, ***Regulated Exceptions*** do exist indeed, for example to implement reversal of precedence between nomina in cases falling within the requirements of Article 23.9, or to call on the Commission to make use of its Plenary Power to solve some

nomenclatural problems, but in no case are individual zoologists or even groups of zoologists entitled to set aside any Rule of the *Code* to solve what they regard as nomenclatural problems. In this respect, the decision of some zoologists not to follow the Rules concerning the availability of some nomina which are available under the Rules (e.g. Kaiser *et al.* 2013; Kaiser 2014), or concerning gender agreement between generic substantives and specific epithets (see Löbl 2015*b*), are not acceptable, even if supported by groups of zoologists (such as the Societas Europaea Lepidopterologica in the latter case), and the efforts of other zoologists to comply with the Rules (e.g. Orr & Fliedner 2011) should be supported.

This difference between Rules and Recommendations is not always well understood by taxonomists. For example, in the recent years a debate straddled the community of zootaxonomists regarding the possibility, so far allowed by the *Code*, to describe new species on the basis of photographs of non-preserved specimens. This practice was considered by a large number of practising taxonomists as inadequate, unnecessary, and potentially harmful for biological sciences (Ceríaco *et al.* 2016), and the very strong majority of the community was in favour of modifying this Rule, either completely or partially (for example in allowing this only under very strict conditions of control). Despite these claims from the community, the Commission (Anonymous 2017) decided not to modify the Rules in the least and settled for emitting new Recommendations in this respect. Although Krell & Marshall (2017), the former being a member of the Commission, expressed their great satisfaction at this conclusion, and seemed to believe that the latter would please all participants to the debate, it cannot do so because the decision to describe a new taxon without any specimen still remains at the discretion of the authors of the nomen. The only decision which could have satisfied both groups of taxonomists, and which would have shown respect for the opinion clearly expressed by the overwhelming majority, would have been to implement a ***Regulated Exception***, not a Recommendation, for example in stating that the decision to accept erection and naming of a new taxon without ***voucher*** should be taken by the Commission or by an ad hoc committee, but not left in the hands of authors, whose personal motivations (whatever they are) may strongly interfere with their decision.

In conclusion, the LZC decided to highlight in the *Zoocode* the distinction between Rules and Recommendations by adopting formal definitions, given in the Glossary below, for the terms and expressions Principle, Rule, Regulated Exception and Recommendation.

3.3.2. LZC decision

The new wording of the Preamble of the *Zoocode* (see below) was adopted in two distinct LZC Sessions: the Session 15 closed on 31 December 2017 (Dubois & Aescht 2019*b*) and the Session 36 closed on 1st August 2019 (Dubois & Aescht 2019*w*).

To make the status of Recommendations fully clear to the readers of the *Zoocode*, the latter will differ from the current *Code* in that the main body of the text will not include any Recommendation, but that all the latter will be relegated to its Appendices, with the clear statement that they are not part of the Rules.

3.4. The Nomenclatural Process

3.4.1. Justification of this Proposal

The aim of the *Zoocode* is to provide clear international Rules for establishing the valid nomina of zoological taxa. An important feature of this text, which distinguishes it from the current *Code*, is its acknowledgement that the establishment of the valid nomen of a zoological taxon is the result of a process involving successive discrete stages. Although it has existed 'surreptitiously' since the beginning of international nomenclatural Rules (Blanchard 1905), this ***Nomenclatural Process*** was first identified as such only recently by Dubois (2005*a–d*). Initially, only three stages (availability, allocation and validity) were recognised, but a refinement of the system allowed to distinguish an additional stage (registration), and to recognise that two stages (availability and validity) should be further subdivided (Dubois 2011*a*, 2015*b*: 27–34).

The existence and relevance of this process was recognised from the start at the Linz 2014 meeting and by the LZC. It is the foundation on which the Principles of the *Zoocode* presented below are organised and the general plan of the *Zoocode* is based. The Chapters of the latter will be sorted in several Sections corresponding to the stages and substages of this process. These successive steps can be summarised as follows.

[K1] ***Availability and assignment***. The *Code* provides strict Rules for the nomenclatural ***availability*** of nomina and ***onomatergies*** (nomenclatural acts). Stating that a nomen or act is available means that it does **exist** in zoological nomenclature and can therefore be taken into account for the next steps of the nomenclatural process. Nomenclatural availability depends on **criteria**. Different criteria are provided for publications, nomina and onomatergies. The criteria of nomenclatural availability are different for nomina of taxa at different ranks (species, genera, families, orders, etc.). Nomenclatural availability thus depends on the 'set' of nomina to which a given nomen is assigned. It is therefore necessary to have precise criteria for establishing whether a given nomen (e.g., **AMPHIBIA**, *RANIDAE* or *Rana*) is a nomen of rank e.g. genus, family or class. The criteria of nomenclatural ***assignment*** of nomina provided by the current *Code* are clearly insufficient and confusing, and we propose more precise criteria for the *Zoocode*.

[K2] ***Allocation***. Once made available, a new nomen must be clearly **allocated** to one or several taxa. Under the *Code* this taxonomic ***allocation*** is not made through ***descriptions***, ***diagnoses***, ***definitions*** or other ***intensional*** systems, but through ***ostension*** through so-called 'name-bearing types', which are of different kinds for the nomina of species, genera and families and their related ranks.

[K3] ***Validity and correctness***. Once nomenclaturally available and taxonomically allocated, a nomen is **potentially valid** for one or several taxa. This depends on the existence or absence of **conflicts** of ***homonymy*** or/and ***synonymy***. Whenever such conflicts do exist, the *Code* provides Rules allowing to establish the ***valid nomen*** of any given taxon. A valid nomen can exist under different 'forms' or paronyms. The *Code* provides Rules allowing to establish the ***correct paronym*** of any given taxon at any given rank.

[K4] ***Registration***. This fourth operation was recognised as a distinct 'stage' of the *Code* by Dubois (2010*a*) and later implemented in the 2012 Amendment of the *Code* (Anonymous 2012). ***Registration*** of works, nomina and ***onomatergies*** can be made a posteriori (***post-registration***), for ancient works (through the *Official Lists* and *Indexes*, and recently through *LANs*), or a priori (***pre-registration*** through *Zoobank*, for recent works published online). It may interfere with the three stages mentioned above and it concerns only some nomina, unlike all of them for the other three stages, thus is not really a 'stage' of the same nature and generality as [K1] to [K3].

Distinguishing these stages allows to have a rational method for establishing the valid and correct nomen of any given taxon. Failing to do so, e.g. by confounding the stages of availability and validity, a quite frequent error indeed, leads to loss of time and energy, if not to nomenclatural mistakes. The current version of the *Code* encourages such confusion through its largely illogical plan (Dubois 2011*a*: 13–15). This document consists in 18 Chapters, a Glossary and two

Appendices. Among the 18 Chapters, three (1, 17 and 18) deal with general matters, nine (2, 3, 4, 5, 7, 8, 9, 10 and 11) with availability, four (13, 14, 15 and 16) with allocation and two (6 and 12) with validity. This order of Chapters is fully illogical and testifies to a basic misunderstanding of the logical structure of the Nomenclatural Process. To take just one example, Chapter 6 of the *Code* on validity comes long before Chapters 13–16 on allocation, but it is impossible to decide on the validity of a nomen if one does not know to which taxon or taxa it applies! Therefore, understanding the logical structure of the Nomenclatural Process should have drastic consequences on the basic plan of the *Code*, its division in Sections and Chapters, and the order of these Chapters.

3.4.2. LZC decision

In its Session 5, closed on 26 April 2016 (Dubois & Aescht 2016*g*), the LZC decided to recognise the four stages of the Nomenclatural Process characterised above and their divisions as the basic structure of the *Zoocode*. In its Session 37, closed on 6 September 2019 (Dubois & Aescht 2019*x*), it decided to add six diagrams, after the Preamble of the *Zoocode*, to illustrate this Process.

These diagrams (Fig. 3–8, see below in Chapter 1 of the *Zoocode*), initially published by Dubois & Ohler (1997), Dubois (2007*a*) and Dubois (2011*a*), show in a schematic way the four steps of the Nomenclatural Process and the 'organic' relationships between the nomina, their different statuses and the onomatergies connecting them. They consist in a much more elaborate version of the sketch appearing in page 123 of the current *Code*, which itself, although this is not acknowledged in the *Code*, was derived in part from the works of Hobart M. Smith (particularly Smith 1949, 1962 and Blackwelder *et al.* 1950). This sketch was in fact very useful to grasp at a glance the 'economy' (structure and dynamics) of the *Code*, much quicker than through reading pages of detailed explanations. Unfortunately it is nowhere referred to in the *Code* itself and is even accompanied by the following legend: "This summary is purely for guidance, and does not form part of the *Code*", so that few zootaxonomists seem to be aware of its existence and use it indeed as a guidance, as stressed for example by the still frequent confusions between the concepts of availability and validity in the taxonomic literature.

These six diagrams allow to have a synthetic overview of the organisation and functioning of the Rules. They are here recognised as part not only of the *Zoocode* proper, but even of its foundations, just like the Preamble and the Principles.

An important aspect of these diagrams is that nowhere they point to 'authorship' of nomina and ***onomatergies*** as an important information in the Nomenclatural Process. Contrary to what many taxonomists, as well as the Commission, believe, authorship is irrelevant to nomenclatural assignment, availability, allocation, validity and correctness of nomina. This suggests that the importance of authorship, summarised in the term 'mihilism' (Bruun 1950; Dubois 2008*b*, 2015*a*), which is largely undue, should be drastically de-emphasized in the *Code* and that nomina should rather be cited naked, or simply followed by the publication date but no authorship. This would completely deflate the struggles of egos for recognition as authors of nomina, which is at the root of the recent polemics on 'taxonomic vandalism' that are currently causing a great harm to the image of zoological nomenclature. This would also solve the problem raised recently by unnecessarily long authorships, which are a new plague of zoological nomenclature. This problem will be again addressed below.

3.5. Principles of the Linz *Zoocode*

A nomenclatural *Code* is not a simple collection of independent Articles. These Articles follow a general 'philosophy', which is expressed in the Preamble of the work, and 'concentrated' in a few general 'Principles'. The current version of the *Code* officially recognises only six such Principles: those of 'Binominal Nomenclature', 'Coordination', 'First Reviser', 'Homonymy', 'Priority' and 'Typification'. However, in fact the *Code* follows several other 'unstated' Principles, such as those of 'Nomenclatural Foundation' or of 'Synonymy' (parallel to that of 'Homonymy'). The non-recognition of these Principles as such in the *Code* is a source of unclarity and confusion and bars some taxonomists from understanding some aspects of the functioning of the *Code*. The LZC started from the analysis of these questions carried out by Dubois (2011*a*, 2013), and in the end recognised seventeen Principles, which we regard as the founding Principles of the *Zoocode*. They are distributed in five categories: GEN, General Principles (two); AVA, Principles regulating the nominal-series assignment and nomenclatural availability (four); ALL, Principle regulating the taxonomic allocation of nomina (one); VAL, Principles regulating the validity of nomina and the correctness of paronyms (nine); REG, Principle regulating the registration of nomina, onomatergies and graphies (one).

3.5.1. General Principles

3.5.1.1. GEN 1. The Principle of Zoological Nomenclature Independence

3.5.1.1.1. Justification of this Principle

Some confusions are quite frequent in zootaxonomic publications, particularly of two kinds: [L1] the equation of zoological taxonomy (the characterisation and classification of animal taxa, which relies on its own paradigms, concepts and methods) with zoological nomenclature (the naming of the taxa recognised by taxonomists as regulated by formal Rules); [L2] the intermingling of zoological nomenclature with other biological nomenclatures (e.g., the misleading assumption that the Rules of homonymy apply between nomina of zoological taxa and those of non-animal taxa, or the idea that nomina can be made nomenclaturally available through intensional 'phylogenetic' definitions of the taxa, as is the case in the *Phylocode*).

The purpose of the *Zoocode* is to provide formal Rules for the steps of the Nomenclatural Process described above. The Nomenclatural Process is independent from the taxonomic process, i.e., it does not interfere with taxonomic thought and actions, and therefore does not prescribe the choice of a taxonomic paradigm or of criteria for the recognition, discrimination or definition of taxa. It is also completely independent from all other codes of nomenclature in force for other living beings (e.g., algae, fungi, plants, procaryotes or viruses) or based on other basic premises incompatible with those of the *Zoocode* (e.g., the *Phylocode*).

The recognition of Zoological Nomenclature Independence as one of the founding Principles of the *Zoocode* is meant at avoiding or reducing such confusions.

3.5.1.1.2. Current situation in the *Code*

Not stated as a Principle, but appears in Article 1.4 concerning [L1].

3.5.1.1.3. LZC decision

LZC Session: 8.
Date of adoption: 18 January 2017.
Publication: 21 July 2017 (Dubois & Aescht 2017*c*).

3.5.1.2. GEN 2. The Principle of Nomenclatural Foundation

3.5.1.2.1. Justification of this Principle

A rather frequent error in zootaxonomic publications stems from the idea that the ***nomenclatural status*** of a nomen can be modified subsequently to its original publication, particularly by the author(s) of the latter, or even in some cases by other subsequent individual authors. This may result in changes in the spellings or onomatophores of nomina, in the relative precedence between synchronous nomina, etc. All these subsequent changes in the nomenclatural status of nomina are invalid under the *Code*. The only situations in which the nomenclatural status of a nomen can be modified in publications subsequent to the original one are when this is necessary to resolve an ambiguity: e.g., choice of a single ***lectophoront*** ('lectotype') among ***symphoronts*** ('syntypes') which are considered, after the original publication, to belong in different species or subspecies, or designation for a genus of a single ***nucleospecies*** ('type species') among several ***prenucleospecies*** ('originally included species') which happen to belong to different genera or subgenera, or choice of the ***euprotograph*** ('correct original spelling') among ***symprotographs*** ('multiple original spellings'), etc. In such cases, any subsequent author is entitled to clarify the nomenclatural situation through an ***airesy*** ('first reviser action'). But in all other cases, the only possibility to modify the nomenclatural status of a nomen is through an action of the Commission under its Plenary Power. The recognition of the Principe of Nomenclatural Foundation as one of the basic Principles of the *Zoocode* is meant at avoiding or reducing such errors.

3.5.1.2.2. Current situation in the *Code*

Not stated as a Principle, but implicitly followed throughout the *Code*.

3.5.1.2.3. LZC decision

LZC Session: 9.
Date of adoption: 29 August 2016.
Publication: 21 July 2017 (Dubois & Aescht 2017*d*).

3.5.2. Principles regulating the nominal-series assignment and nomenclatural availability

3.5.2.1. AVA 1. The Principle of Nominal-Series

3.5.2.1.1. Justification of this Principle

In order to be available in zoological nomenclature, a nomen must be referred from the start (i.e., from the original publication where it is first proposed), to a ***nomenclatural rank*** and a ***nominal-series***. Once introduced in a nominal-series, it cannot be transferred to another one. This means that a nomen proposed for a genus or for a family cannot be used later for an order or a class: if an identical or similar nomen is used later by an author for a taxon referred to the rank order or class, it must be treated as a distinct nomen, with its own author and date, even if it was considered by this author as 'the same' nomen.

In the recent decades, several authors (e.g: Bănărescu 1973; Schaefer 1976; Dubois 1988, 2005*b*–*c*, 2006*a*; Smith 1988; Sundberg & Pleijel 1994; Minelli 2000; Pleijel & Rouse 2003; Kluge 2005; Laurin 2005, 2010; Bertrand *et al*. 2006; Hillis 2006; Avise & Liu 2011) have independently (at least often without quoting each other) drawn attention to the fact that nomenclatural ranks are subjective and arbitrary, have no general biological or evolutionary meaning, and are not 'equivalent' by any criterion across different taxonomic groups. Some have deduced from this undeniable fact that ranks are 'useless', 'harmful' or even 'dangerous' in zoological taxonomy because they do not warrant comparisons between taxa of same rank in different groups. It is quite true that ranks do not allow such comparisons, but this is not their function. This would be a problem only if ranks were considered to have an **absolute** meaning, as if they were permanently attached to taxa and expressed their 'nature' or 'essence', in biological or historical-chronological terms (Dubois 2005*c*, 2006*c*, 2007*a*). But this essentialist interpretation is based on a misunderstanding and on a confusion between the concepts of ***nomenclatural rank*** and ***taxonomic category*** or, to put it differently, between **absolute** and **relative** ranks, the former being based on **concepts**, **defined** through biological, evolutionary or other **criteria**, whereas the latter just reflect the place of taxa in a **nomenclatural hierarchy** the function of which, under a paradigm of phylogenetic taxonomy, is to express the taxonomic and hypothetical cladistic **relationships** between taxa. There exists no general definition of the 'concepts' of family or of order. The belief in absolute ranks takes its roots in a gradist/phenetic, not evolutionary, conception of taxonomy. In real classifications, the same nomen, referring to the same taxon, often moves from a rank to another within its nominal-series to follow the changes in our phylogenetic hypotheses and taxonomic hierarchies, and the same taxon may even move from a nominal-series to another, but then with a different nomen. Taxonomic hierarchies as reflected in nomenclatural ranks are "organisational models of relationships" (Knox 1998) that are extremely useful to account for relationships among entities in a hierarchical system. Whether a given higher taxon is treated as a superfamily, an order or a class is largely a matter of tradition and of general consensus among specialists of the group concerned at a given time, but ranks do not and cannot carry any information on the 'amount of divergence' (measured by whatever criterion), on the 'biological diversity' of taxa (Van Valen 1973; Giribet *et al.* 2016), on their 'patterns of evolution' (Dubois 1988) or on the 'time elapsed since separation' between taxa throughout the tree of life (Schaefer 1976; Dubois 1988, 2008*d*: 56–57; Avise & Johns 1999).

These questions were studied in detail by Dubois (2005*c*, 2006*a*, 2007*a*, 2008*d*, 2011*a*, 2015*b*; Dubois & Raffaëlli 2012), who distinguished several kinds of nomenclatural systems: [M1] truly ***unranked*** ones, such as the *Phylocode* or that of Zhang (2011) in which the term 'phylum' is used indiscriminately for hierarchically related taxa; [M2] ***pseudoranked*** ones, such as those analysed by Dubois (2008*d*: 69–80), in which ranks are used, but in an inconsistent manner; and [M3] genuine ***ranked*** ones, in which each level in a given hierarchy is afforded a different rank. This latter system is respected only partially in the current *Code*, which ignores the ranks above superfamily and below subspecies. Its use is advocated in the *Zoocode*, but in a more consistent and complete manner, for the whole hierarchy of zoological taxa.

The main purpose of nominal-series and ranks is simple but very important: it is to provide a hierarchical organisation of nomina of taxa that reflects the structure of the taxonomic hierarchy,

which in its turn can reflect the topology of the phylogenetic 'tree' on which the taxonomy is usually based nowadays. This use of nomenclatural ranks allows a given classification and the 'tree' on which it is based to be ***bijective***. This complies with the requirement formulated long ago by Hennig (1950, 1966, 1974) that taxonomy should reflect the topology of the phylogenetic 'tree', instead of 'phenetic resemblance' or the so-called 'importance' of divergences between taxa.

We support the use of a fully ranked nomenclatural system in the *Zoocode* for four complementary reasons:

[N1] It maintains a continuity with the Rules of the *Code* until now. Our purpose is not to 'revolutionise' the *Code*, which in our opinion relies on good basic concepts and principles and has been used in innumerable publications that should still be considered relevant and useful, but to improve it.

[N2] Coupled with the Principle of Nominal-Series and that of Coordination discussed below, the nomenclatural system based on ranks is ***polysemic*** and therefore allows ***nomenclatural parsimony*** (see below). Changing from a ranked to an unranked system would require to create hundreds of thousands of new nomina, for no benefit in terms of universality in communication about taxa.

[N3] Ranks are arbitrary devices which, if used consistently, allow to express hypotheses of phylogenetic relationships through following a simple Rule, that of always affording the same rank to sister-taxa being immediately subordinate to the same superordinate taxon.

[N4] Additionally, ranks have a distinct, but very important, function, that of facilitating the storage and retrieval of taxonomic information, especially in large databases, as shown in our Fig. 6 (see below in Chapter 1 of the *Zoocode*). Depriving taxonomists from this tool would be of no benefit of any kind.

But for ranks to be able to play the very important role highlighted above under [N3], they must be used consistently. This means that a family cannot be subordinate to a genus, or even a genus to another genus, and even, to be fully consistent, that a taxon should never be ***parordinate*** (i.e., 'sister-taxon' in a given phylogeny) to a taxon of a different rank: if in a taxonomic hierarchy a family appears as the sister-taxon of a genus, then the mention of the ranks 'genus' and 'family' becomes completely uninformative—which would support the ideas of those who advocate the use of unranked or pseudoranked nomenclatural systems.

Therefore, for a consistent and informative use of nomenclatural ranks, there should be no overlap in the taxonominal hierarchy between ranks, and, a fortiori and even more importantly, between nominal-series.

In order to avoid such problems, the solution proposed in the *Zoocode* is to require such a consistent use in the original publication where a new nomen is proposed, failing to follow this requirement resulting in the ***unavailability*** of the new nomina hence proposed. The writing proposed below for this Principle takes this requirement into account, and the latter is meaningful and useful only if it applies to all zootaxonomic works since 1758.

Such a requirement may appear very drastic to some, but in its nature it is similar to the denial of nomenclatural availability to works where the *Code*'s Principle of Binominal Nomenclature was not respected (Article 11.4).

We consider that implementing this Principle in the *Zoocode* has the potential to considerably clarify the use of ranks in zoological nomenclature and to be a strong reply to those who consider that ranks are useless, not to say harmless, in zoological nomenclature and that so-called 'Linnaean nomenclature' is inappropriate for naming taxa within a frame of 'phylogenetic taxonomy'.

3.5.2.1.2. Current situation in the *Code*

Not stated as a Principle, but some of the conditions listed below are briefly mentioned in Article 1.2.2 (page 3) and followed throughout the *Code*.

3.5.2.1.3. LZC decision

LZC Session: 11.
Date of adoption: 6 November 2016.
Publication: 21 July 2017 (Dubois & Aescht 2017*f*).

3.5.2.2. AVA 2. The Principle of Binomina

3.5.2.2.1. Justification of this Principle

It is often stated that zoological nomenclature as regulated by the *Code* is '**the** binominal nomenclature'. This qualification is misleading in two respects: because it is not the only nomenclatural system having recourse to binominal formulae to designate objects, and because, under the *Code*, binominal nomenclature applies only to nomina of rank species, all nomina of higher ranks being ***uninomina***, and the nomina of subspecies being ***trinomina***.

For these two reasons, the LZC proposes to use simply the denomination ***Principle of Binomina***, which is short and clear enough. A revised definition of this Principle is provided below.

This Principle is an important one of the *Code*. It allows to 'protect' the users of this nomenclatural system from the intrusion of uninominal designations for species, which would be a great source of nomenclatural confusion.

3.5.2.2.2. Current situation in the *Code*

Principle of Binominal Nomenclature (Articles 4–6, 11.4; pages 4–6, 10–11).

3.5.2.2.3. LZC decision

LZC Session: 17.
Date of adoption: 2 February 2018.
Publication: 28 October 2019 (Dubois & Aescht 2019*d*).

3.5.2.3. AVA 3. The Principle of Coordination

3.5.2.3.1. Justification of this Principle

This Principle was first introduced in the *Règles Internationales de Nomenclature Zoologique* during the Copenhagen 1953 Congress of Zoology (Hemming 1953: 33). It states that, within a

nominal-series, any nomen introduced for a taxon at any rank is deemed to have been simultaneously introduced for any other (more or less inclusive) taxon at any other rank of the same nominal-series. All these different uses of the nomen are not different nomina, but different ***parohypses*** (Dubois 2010*b*) of the same nomen, which all have the same onomatophore, author and date. Strangely, and as a result of its atomised plan, although this Principle applies equally to the three nominal-series recognised by the *Code*, the latter text, instead of presenting it once and for all, presents it repeatedly, in each of these series, as if there were three distinct Principles. This is one of the consequences of the current plan of the *Code*, in which the Principles are scattered all along the text and the Glossary, instead of being presented first in an introductory chapter as proposed for the *Zoocode*. A single definition of the ***Principle of Coordination*** which applies to these three series (see Dubois 2011*a*, 2013) is proposed below.

The consequence of this Principle is that, whenever a taxon contains several subtaxa referred to the same nominal-series, one of these subordinate taxa bears the same nomen as its ***superordinate*** one. In such cases, the nomenclature is ***polysemic***, i.e., the same nomen applies to several taxa being in direct hierarchical relationship. The respective advantages (***nomenclatural parsimony***) and disadvantages (***nomenclatural ambiguity***) of this partially polysemic system were discussed by Dubois (2008*d*). One undeniable fact is that, with the growing use of online research engines, many non-taxonomists may look for nomina on the web, and, missing the basic background, may not be able to distinguish between ‘genus *Rana*’ and ‘subgenus *Rana*’ (Hillis 2006; Dubois 2007*b*). It would be quite easy to modify the *Code* in order to make it shift from a partially polysemic system (because of this Principle) to a fully ***monosemic*** one (Dubois 2008*d*), but this would have two severe drawbacks: [O1] it would require the creation of thousands of new nomina for zootaxonomy; [O2] in the family-series it would result in the impossibility of naming some taxa, which include a single valid genus (see Dubois & Aescht 2019*f*). It seems therefore preferable to keep the polysemic system implemented by the Principle of Coordination for the three nominal-series covered by the current *Code*. However, a different approach seems justified in the class-series, which will be covered by the *Zoocode* in contrast with the current *Code*.

Various questions related to the Principle of Coordination were discussed by Dubois & Aescht (2019*f*). In conclusion, a new wording was adopted by the LZC for this Principle.

3.5.2.3.2. Current situation in the *Code*

Principle of Coordination (Article 36, page 45; Article 43, page 48; Article 46, page 50).

3.5.2.3.3. LZC decision

LZC Session: 19.
Date of adoption: 1 February 2018.
Publication: 28 October 2019 (Dubois & Aescht 2019*f*).

3.5.2.4. AVA 4. The Principle of Neonymy

3.5.2.4.1. Justification of this Principle

3.5.2.4.1.1. Introduction

There is no 'Principle of Neonymy' in the current *Code*, but various Rules, scattered in different Articles of this text, constitute the basis for such a Principle. There is a strong need for a distinct, well-formulated Principle, dealing with the status of modified spellings for existing nomina or of fully new nomina proposed to replace existing ones. Such a Principle should be clear enough to allow unambiguous distinction between several 'similar' situations among which the current *Code* allows ambiguity. These problems were discussed at length in several previous publications (Dubois 1987, 2000, 2006*a*, 2010*b*, 2011*a*, 2012, 2013, 2017*a–b*), which are much too long to be repeated here in detail. Several kinds of problems can be identified in this domain (for details, see Dubois & Aescht 2019*g*).

3.5.2.4.1.2. Conceptual problems

[P1] The distinctions between the two main categories of modified spellings ('demonstrably intentional changes', called 'emendations'; and 'not demonstrably intentional', i.e. involuntary, changes, called 'incorrect subsequent spellings') and then between the two main categories of emendations ('justified' and 'unjustified'), which are confusing in the *Code*.

[P2] The too restrictive and questionable definition of the concept of 'demonstrably intentional' in Article 33.2.1 of the *Code*, mentioning only three possible criteria to recognise that a change of spelling was voluntary from the part of the author who introduced it, which creates more problems than it solves.

[P3] The definitions given in Articles 12.2.3 and 13.1.3 of the concept of 'new replacement name' or 'nomen novum', which are not fully operational, leading to different interpretations of the same situation.

[P4] The fact that the *Code* treats 'unjustified emendations' and 'nomina nova' as completely distinct situations, although they are just the two ends of a continuum, which precludes a clear distinction between them in some cases. These two situations should be considered simple weakly differentiated subcategories of a single category, so that the same nomenclatural Rules must apply to both, which is not true in the present *Code* in several cases, in particular those covered by Articles 33.2.3.1 and 35.4.1.

[P5] The absence in the *Code* of the concept of 'alternative nomina', proposed in the same work for the same taxon, which have the same onomatophore, author and date.

3.5.2.4.1.3. Terminological problems

[Q1] The confusing terminology used in the *Code* for 'nomen novum' and 'new replacement name' on one side, and 'substitute name' on the other, all the more that the formula 'nomen substitutum', has long been used in the taxonomic literature for the concept now called 'nomen novum'. In order to remove these ambiguities, the LZC proposes to remove from the *Zoocode* the formulae 'nomen novum', 'new replacement name' and 'substitute name' and to adopt instead the terms ***neonym*** (for 'nomen novum') and ***diadochonym*** (for 'substitute name'), with precise definitions given in our Glossary.

[Q2] The fact that the nomenclatural categories of 'nomen novum' and 'unjustified emendation' of the *Code* are much more similar and closely related than what the *Code*'s terminology suggests, being in fact two weakly differentiated subcategories of a single category, that of neonym. It is

therefore suggested to make this relationship much clearer and evident by using respectively the two terms ***alloneonym*** and ***autoneonym*** for these two subcategories.

[Q3] The absence in the *Code* of terms or formulae for the three following concepts: [Q3a] that of a new nomen introduced in the taxonomic literature for a brand new taxon, not to replace an existing nomen; [Q3b] that of a nomen which has been replaced by a neonym; and [Q3c] that of two distinct, alternative nomina proposed in the same work for the same taxon. It is here proposed to adopt respectively the terms ***poieonym***, ***archaeonym*** and ***allelonym*** for these three concepts.

3.5.2.4.1.4. Conclusion

To solve these problems, a Principle of Neonymy is recognised in the *Zoocode* and several new terms are adopted for its Glossary.

3.5.2.4.2. Current situation in the *Code*

Not stated as a Principle, but some of the conditions listed here are mentioned in Articles 67.8 (page 68) and 72.7 (page 78).

3.5.2.4.3. LZC decision

LZC Session: 20.
Date of adoption: 15 February 2018.
Publication: 28 October 2019 (Dubois & Aescht 2019*g*).

3.5.3. Principle regulating the taxonomic allocation of nomina

3.5.3.1. ALL 1. The Principle of Onomatophores

3.5.3.1.1. Justification of this Principle

The second stage of the Nomenclatural Process is that of the ***allocation*** of nomina to taxa. It is not obtained through a ***definition*** of the taxon, but through the use of a tool specific to biological nomenclature, traditionally called 'type' or 'name-bearing type'. For reasons discussed by Dubois & Aescht (2019*e*) and summarised above, the term 'type' and all its derivatives should be abandoned in zoological nomenclature. As we have seen above, the terms adopted for the *Zoocode* to designate this nomenclatural tool are ***onomatophore*** (general term), ***onymophoront*** (name-bearing specimen) and ***nucleomen*** (name-bearing taxomen or nominal taxon). Under the *Zoocode*, a nomen applies, within the frame of any given ***ergotaxonomy***, to any taxon which includes its onomatophore. In this system, also used in the Codes of botany, bacteriology and virology, allocation of nomina to taxa does not rely on ***intensional*** or ***extensional definitions***, but on ***inclusive ostension*** (Keller *et al.* 2003: 99; Dubois 2005*c*, 2006*c*, 2007*a*, 2008*d*). The function of an onymophoront is not to act as a ***semaphoront***, but simply to implement an objective, material and permanent link between a natural population of organisms, as represented by a specimen (or a series of specimens) drawn from it, and

a nomen or several nomina, in the case of a hierarchy of nomina of different nominal-series that ultimately refer to the same specimen(s) (Dubois & Ohler 1997; see Figure 2). Therefore, the nomenclatural system of the *Code* is not 'typological', as the 'types' it uses are not meant as being 'typical' of the taxon they represent but simply at pointing unambiguously to an organism or a set of organisms as bearing a given nomen. For this reason, the *Code* should not mention paratypes, paralectotypes and allotypes, which do not play any role in the allocation of nomina to taxa. It should also stop recognising hapantotypes: from a nomenclatural point of view, protists should be treated like all other animals, and their nomina should rely on one of the four categories of onymophoronts recognised by the *Code*.

A single Principle of the *Code* refers to this stage of 'allocation of nomina' of the nomenclatural process: the so-called 'Principle of Typification'. In order to continue the extirpation of the root 'type' from the Rules, it was renamed ***Principle of Onomatophores*** and slightly reworded by Dubois (2011*a*).

The Principle of Onomatophores is a basic one of zoological nomenclature, that has been ignored or misunderstood by the proponents of alternative nomenclatural systems like the *Phylocode* which rely instead on definitions of the taxa for the taxonomic allocation of nomina. Onomatophores are the unique system through which validity of nomina can be objectively established in case of synonymy (see below under 'Principle of Synonymy').

3.5.3.1.2. Current situation in the *Code*

Principle of Typification (Art. 61, p. 63–64).

3.5.3.1.3. LZC decision

LZC Session: 21.
Date of adoption: 6 March 2018.
Publication: 28 October 2019 (Dubois & Aescht 2019*h*).

3.5.4. Principles regulating the validity of nomina and the correctness of paronyms

3.5.4.1. Introduction

Contrary to availability and allocation, validity of nomina is not 'absolute' and 'strictly nomenclatural', i.e. 'purely **technical**', but depends on the ***ergotaxonomy*** adopted by an author, i.e. on **scientific** criteria with which the nomenclatural Rules do not and should not interfere.

In zoological nomenclature, the term ***validity*** refers to the fact that a ***nomen*** is the (only) one that should be used for a given taxon within the frame of a given ***ergotaxonomy***; and ***correctness*** designates the ***spelling***, ***rank*** and, if appropriate, ***combination***, or more exactly ***onymorph*** (i.e., association of terms in a specific or subspecific plurinomen, whether considered by the *Code* as the same or different combinations) under which this nomen should be used in this context.

Nomenclatural Rules for validity are required because, in order for zoological nomenclature to play properly its role of providing unambiguous and universal nomina for communication about the taxonomic concepts of taxa, a given nomen should designate a single taxon (or a set of closely related ***coordinated*** taxa), and a given taxon should bear a single nomen. In other words, in order to

be functional, the nomenclatural system must provide solutions to the problems of ***homonymy*** and ***synonymy*** which are inevitable whenever the numbers of names and of objects named or to be named are high.

Homonymy and synonymy are not unique to zoological nomenclature: they are common features of all communication devices based on words. In common language, no special rules of validity are required for the proper use of terms. But in a scientific discipline like taxonomy, which has to deal with millions of concepts (the taxa) and terms (the nomina), both homonymy and synonymy are unacceptable. Both would be at the root of ambiguities and confusions which could have dramatic consequences (e.g., in the cases of organisms involved in human or animal diseases, infection, parasitism, etc.). This applies to all taxa at all ranks of the ***taxonominal*** (taxonomic and nomenclatural; Dubois 2011*b*) hierarchy. In order to avoid homonymy and synonymy, Rules are necessary to decide which among any two (or more) competing available nomina is/are to be rejected as invalid and which one remains potentially valid (if not invalid for some other reasons).

For managing such cases, the *Code* recognises three Principles (of Homonymy, Priority and First Reviser). This treatment is insufficient and unsatisfactory for two distinct reasons:

[R1] The situations of homonymy and synonymy are situations of conflicts for validity between two (or more) nomina which are exactly parallel. They are particular cases of a more general situation which is not acknowledged as such in the *Code*, and both are in fact solved by the *Code* in most cases by either of the two Principles of Priority and First Reviser. The latter two Principles are therefore 'general' and apply both to homonymy and synonymy, but also to several other onomatergies including conflicts in the designation of onomatophores or conflicts of spelling. Therefore, if conflicts of homonymy deserve to be designated as a 'Principle of Homonymy', a logical treatment of this problem requires also the recognition of a 'Principle of Synonymy', and for more clarity these two concepts should be recognised, not as widely distinct problems, but as the two 'faces' of the same problem, that of 'conflict for validity', which also requires recognition of a distinct Principle.

[R2] The *Code* also provides a few Rules which allow to solve homonymy or synonymy in some cases but are not covered by the two Principles of Priority and First Reviser and which also require recognition of distinct Principles, namely those of 'rank precedence' and 'prevailing usage', which are not recognised as Principles in the *Code* although they are implicitly in force in the current edition of the *Code*.

To solve the problems mentioned above, the LZC adopted the proposals of Dubois (2011*a*, 2013) in this domain, which require to recognise more concepts, terms and Principles than in the current *Code*. They consist in several aspects:

[S1] the recognition of a general concept of ***zygoidy*** (nomenclatural conflict for validity), with three categories (***zygonymy***, ***zygography*** and ***zygophory***);

[S2] the recognition of three Principles regarding the validity of nomina: [S2a] a general one, the ***Principle of Zygoidy*** (absent in the *Code*); and [S2b] two particular ones, the ***Principle of Synonymy*** (absent in the *Code*) and the ***Principle of Homonymy*** (present in the *Code*), which provide parallel statements regarding the unacceptability of these two sources of ambiguity and confusion in zoological nomenclature;

[S3] the recognition of three Principles which provide solutions to the conflicts of zygonymy and zygophory: [S3a] the ***Principle of Priority*** (present in the *Code*), used for solving an a posteriori problem resulting from the competition between two or more nomina or onomatergies published at different dates; and [S3b] the ***Principle of Airesy*** ('Principle of First Reviser' in the *Code*) and [S3c] the ***Principle of Proedry*** (absent in the *Code*), used for solving an ambiguity or conflict that stems from the creation of a nomen or nomina published at the same date;

[S4] the recognition of the ***Principle of Nomography*** (absent in the *Code*), which provides solutions to the conflicts of zygography;

[S5] the recognition of ***Principle of Sozoidy*** (absent in the *Code*), which provides solutions to the problems related to 'widespread usage';

[S6] finally, the recognition of the ***Principle of Archoidy*** (absent in the *Code*), which allows action of the Commission (or its successor body) under the Plenary Power.

As will be shown below, some of these Principles apply in some cases not only in the third stage of the Nomenclatural Process (validity) but also in the first floor (availability) in case of competing original spellings or allelonyms and in the second floor (allocation) in case of competing onomatophore designations.

3.5.4.2. VAL 1. The Principle of Zygoidy

3.5.4.2.1. Justification of this Principle

The LZC adopted Dubois's (2013) nomenclatural concept of ***zygoidy*** (based on the Greek term ζυγός, *zugos*, 'yoke') to designate all situations of nomenclatural conflict between two nomina, spellings or onomatophore designations 'placed under the same yoke', that is, being potentially the valid nomen, spelling or onomatophore. This concept is the basis for the new ***Principle of Zygoidy***. Three main categories of zygoidy can be distinguished: ***zygonymy***, ***zygography*** and ***zygophory***.

Zygonymy basically designates a kind of relationship between two ***nomina***. The two members of any such pair of nomina remain permanently connected, like oxen under a yoke, but by a situation of 'conflict' or 'competition', not of 'collaboration'. These nomina are involved in a conflict regarding ***validity***: this may be a conflict of ***homonymy*** or ***synonymy***, rarely of both. Although typically this relation exists between two nomina, this can be expanded to more than two items: the appropriate procedure in such cases consists in treating successively the relationship between A and B, then between B and C, A and C, etc. (see Dubois 2010*b*: 18).

As for ***zygography***, this concept applies to any conflict between two or more ***spellings*** of a given nomen, only one of which must remain the ***correct*** one for a given nomen at a given rank recognised as valid in a given ***ergotaxonomy***.

Finally, ***zygophory*** designates any situation of conflict between two distinct onomatophore designations or restrictions published to solve the resulting nomenclatural ambiguity. Such onomatophore restrictions or designations can be known as situations of ***airetophory*** (Dubois 2013): e.g., subsequent designations of ***onymophoronts*** for species-series nomina, or subsequent designations of ***nucleomina*** for nomina of the other nominal-series.

The resolution of the conflicts of zygoidy can be made under two distinct modalities: it can be 'automatic' and require only from competent taxonomists to follow 'passively' but strictly the Rules of the *Code* (in cases of simple use of Priority or 'rank precedence'), or it can require an active intervention of taxonomists (in cases of 'First Reviser' action or of use of the concept of 'widespread usage').

3.5.4.2.2. Current situation in the *Code*

Absent.

3.5.4.2.3. LZC decision

LZC Session: 23.
Date of adoption: 6 March 2018.
Publication: 28 October 2019 (Dubois & Aescht 2019*j*).

3.5.4.3. VAL 2. The Principle of Homonymy

3.5.4.3.1. Justification of this Principle

Homonymy is a common language term but in the *Code* it has a peculiar definition, that differs according to the nominal-series at stake. In the genus- and family-series, homonymy simply concerns nomina, but in the species-series it concerns combinations, not epithets taken separately. In the genus-series it points only to situations where two nomina are strictly identical (exactly same spelling or ***homography***). In the species- and family-series, it also does, but it may also point to a few situations where the nomina differ by one or several letters: [T1] in the species-series, specific epithets originally spelt differently (with different endings) for having been originally combined with generic nomina of different grammatical genders, whenever transferred into the same and single genus or into homographic genera; [T2] in the species-series, spellings "deemed to be identical" listed in Art. 58 of the *Code* (***paromographs***); and [T3] in the family-series, different spellings derived from distinct generic nomina having the same stem (based on the homographic genitives of either homographic or non-homographic generic nomina) but bearing different endings for being referred to different ranks. In contrast, in the genus-series, homography applies, and any one-letter difference is enough to avoid homonymy between two nomina. The status of homonymy in the class-series will be discussed elsewhere.

Regarding their consequences for the validity of nomina, two main categories of homonymy may be distinguished in zoological nomenclature:

[U1] ***Hadromonymy*** is fixed once and for all and is definitive: the ***junior*** homonym is definitively invalid. This concerns all cases of homography in the genus-series, where it is absolute. In the family-series, it is relative, as it bears only on the stem of the nomen of the nucleogenus, not on its ending, and may be qualified as ***rhizomography***. In the species-series, hadromonymy exists and derives from the fact that the original combination in which an epithet was first published preoccupies permanently this combination in its nominal genus. In this later respect, the current *Code* is inconsistent, a quite complex question that is discussed in detail in Dubois & Aescht (2019*k*) and which will have to be addressed again later.

[U2] In contrast, in ***asthenomonymy***, the homonymy is relative and may be reversible. It exists only in the species-series. In this case, two epithets are identical (except possibly in their ending) or deemed to be so, but they were originally published combined with two distinct generic substantives, and they became homonyms only when both were subsequently referred to the same genus. As long as this is the case, the junior one is invalid, but, if they are again referred to two different genera (either the original ones, or others), they are no more homonyms and the junior one may become valid again.

Two final points are worth noting here:

[V1] The concept of homonymy in zoological nomenclature applies only within its realm, and independently in the different nominal-series. It does not apply to identity or similarity with nomina in other taxonomic domains, for which the term ***hemihomonymy*** is appropriate (Starobogatov 1984, 1991; Shipunov 2011).

[V2] Although it would seem that in zoological nomenclature two nomina which are strictly identical cannot be but homonyms, this is not the case under the current *Code*. Article 57.8.1 states that homonymy between identical epithets in (original or subsequent) combination with homonymous generic substantives established for different nominal genera "is to be disregarded" (Dubois & Aescht 2019*l*). This Rule will be discussed in detail when we address the Articles of the *Zoocode*, but for the time being it is enough to use the term ***pseudomograph*** to designate species-series epithets which are identical or 'deemed to be so' but referred to different homonymous nominal genera, and which should therefore **not** be **treated as** homonyms although they **are** indeed so.

3.5.4.3.2. Current situation in the *Code*

Principle of Homonymy (Art. 52, p. 56).

3.5.4.3.3. LZC decision

LZC Sessions: 24–25.
Date of adoption: 21 April 2018.
Publication: 28 October 2019 (Dubois & Aescht 2019*k–l*).

3.5.4.4. VAL 3. The Principle of Synonymy

3.5.4.4.1. Justification of this Principle

As we have seen above, the LZC decided to recognise, beside the Principle of Homonymy, a ***Principle of Synonymy***, which provides parallel statements regarding the unacceptability of these two sources of ambiguity and confusion in zoological nomenclature.

The term ***synonymy*** is used in taxonomy in two main distinct senses: [W1] to point to the fact that two distinct nomina designate the same taxon; [W2] to designate a list of nomina complying with this definition, but also, very often, of ***aponyms*** of these nomina and of mere citations of the latter (***chresonyms***). In order to avoid any confusion, in what follows the term synonymy is reserved to the first sense above, whereas in the second situation the terms ***synonymic list***, ***paronymic list***, ***chresonymic list*** or ***logonymic list*** are used (see Dubois 2000 for explanations).

Three main kinds of synonymy exist in zoological nomenclature (Dubois 2000, 2011*a*, 2012, 2013): [X1] ***isonymy*** ('objective synonymy' in the *Code*); [X2] ***allelonymy*** (alternative nomina proposed synchronously for the same taxon in the same publication), which is in fact a subcategory of isonymy; and [X3] ***doxisonymy*** ('subjective synonymy' in the *Code*).

In the species-series, isonyms are nomina whose onomatophores (onymophoronts) are the same specimen(s). In the other nominal-series, isonyms are nomina whose onomatophores are either [Y1] the same nucleomina or [Y2] different nucleomina which ultimately are based on the same onymophoront(s). The last situation occurs for example when two genera are based on two distinct nucleospecies but when the latter are based on the same onymophoront(s).

Isonymy is a purely nomenclatural and stable relationship between nomina. It does not depend on the subsequent opinion, decision or interpretation of any taxonomist. It remains true whatever taxonomic frame (***ergotaxonomy***) is adopted by an author. Therefore, in all cases the resolution of a

case of zygonymy among isonyms is final, stable and irreversible (except through an action of the Commission).

Doxisonyms are nomina that have different onomatophores but that are considered to apply to the same taxon following taxonomic opinions or interpretations. In the species-series, doxisonyms are nomina based on different onymophoronts, whereas in the other nominal-series they are nomina based on different nucleomina based ultimately on different onymophoronts. Such synonymies depend on judgements and opinions about [Z1] the ergotaxonomic frame adopted as valid by an author, and [Z2] the taxonomic allocation of the two (or more) onymophoronts at stake. They are therefore unstable and much more labile than isonymies, but they nevertheless also depend on onomatophores, not on taxonomic definitions of nomina. The resolution of zygonymy among doxisonyms is therefore potentially reversible (including through an action of the Commission). A doxisonymy subsists in the long term only if a consensus exists about it within the community of taxonomists.

The three categories of synonyms are drastically different, and it is not sufficient, e.g., in a logonymic list, to state that a nomen is an 'invalid synonym' of another one. For a taxonomic work to be of good quality, the LZC recommends to precise whether it is an allelonym, an isonym or a doxisonym of the latter, and, in the latter case, to provide at least one reference to a work where this doxisonymy was first proposed or adopted.

For this reason also, the use of the mathematical sign "=", meaning equality, is not appropriate in zoological nomenclature, whether in texts or in logonymies, as it does not distinguish between these situations. To make this distinction clear, the LZC proposes to use the following two signs: "≡" for isonymy (including allelonymy) and "≈" for doxisonymy.

3.5.4.4.2. Current situation in the *Code*

Part of the Principle of Priority (Art. 23, p. 24).

3.5.4.4.3. LZC decision

LZC Session: 28.
Date of adoption: 24 May 2018.
Publication: 28 October 2019 (Dubois & Aescht 2019*o*).

3.5.4.5. VAL 4. The Principle of Priority

3.5.4.5.1. Justification of this Principle

In order to solve conflicts of zygoidy, an important first distinction must be made between situations of original ambiguity stemming from the ***synchronous*** publication of competing nomina, onomatergies or spellings, which will be solved in most cases by the Principle of Airesy ('First Reviser'), and situations of subsequent ambiguity resulting from their ***allochronous*** publication, which will be solved in most cases by the Principle of Priority. Let us first start here with the latter Principle.

The Principle of Priority is a clear, unambiguous and fair Principle (Dubois 2010*d*). It states that between two competing allochronous nomina or onomatergies, the ***senior*** one (first published)

remains potentially valid whereas the ***junior*** one (published later) is rejected as invalid. Its consistent use for more than one century by thousands of taxonomists has greatly contributed to the clarification and stabilisation of zoological nomenclature. In order to use it correctly, it is important to be able to ascertain the ***publication dates***, as understood in the *Code*, of the works at stake.These dates may be known with a varied level of precision (see Dubois & Aescht 2019*p*), and this has become much more problematic since the *Code* allows the possibility to make new nomina available in online publications (see e.g.: Dubois *et al.* 2013, 2015*a–b*; Dubois & Aescht 2016*d*, 2019*c*).

As shown by Dubois (2013), the Principle of Priority must be used to solve most conflicts of allochronous zygonymy (conflicts between nomina for nomenclatural validity) and zygophory (conflicts between airetophories for nomenclatural validity), as well as some conflicts of allochronous zygography (conflicts between spellings for nomenclatural correctness). They were discussed in more detail in Dubois & Aescht (2019*p*).

Exceptions to the use of this Principle in cases of allochronous zygoidy are rather rare, and fall under the realms of Regulated Exceptions, 'massive usage' and action of the Commission. They will be addressed below under the Principles of Nomography, Sozoidy and Archoidy.

In conclusion, a new wording is proposed below for the Principle of Priority in the *Zoocode*. This is just a general Principle, which fixes the frame within which the detailed Rules regarding Priority will be given in the *Zoocode*. A few terminological novelties used in the text above are listed in the Glossary below.

3.5.4.5.2. Current situation in the *Code*

Part of the Principle of Priority (Art. 23, p. 24)

3.5.4.5.3. LZC decision

LZC Session: 29.
Date of adoption: 31 May 2018.
Publication: 28 October 2019 (Dubois & Aescht 2019*p*).

3.5.4.6. VAL 5. The Principle of Airesy

3.5.4.6.1. Justification of this Principle

The term ***airesy*** was introduced by Dubois (2013; see Dubois & Aescht 2019*p*) to replace by a single word the expression 'first reviser', which is not only longer but also misleading, as there is never a 'second reviser'. Besides, the author of an airesy was called ***arbiter***. The ***Principle of Airesy*** ('Principle of First Reviser' in the *Code*) comes in force to settle ***precedence*** in case of conflict of ***zygoidy*** between two nomina (***zygonyms***), spellings (***zygographs***) or onomatophore designations (***zygophory***) for the same nomen published synchronously (simultaneously). This Principle is the counterpart of the Principle of Priority. Both are meant at solving an ambiguity, among onomatergies published either at the same date (Principle of Airesy) or at different dates (Principle of Priority).

This Principle has not always existed as a general Principle of the *Code* applying to all ambiguous nomenclatural situations, and some authors still do not seem to be aware of its existence.

For example, to decide, among competing nomina or spellings published simultaneously, and applying to the same taxon, which one has precedence and must be considered valid (nomen) or correct (spelling), a Rule of 'page' or 'line' precedence once existed, from 1905 to 1953, in the *Règles Internationales de la Nomenclature Zoologique* (Blanchard 1905, Anonymous 1950) that were in force before the *Code*, but it has not been so since its suppression in 1953 (Hemming 1953: 66–67). However, some taxonomists still use it (see Nemésio 2007). Another alternative (and reasonable) Rule was once suggested (Follett 1955: 21) for identifying the correct spelling among multiple original spellings, namely that if a competing spelling "resulted from an inadvertent error", it was to be rejected as incorrect, but this was never implemented in the *Code* (Dubois 2010*b*). The reinstatement of the 'Principle of First Reviser' (already present in 1905, but not as the only Rule) in the *Copenhagen Decisions on Zoological Nomenclature* (Hemming 1953) was an important progress to make the *Code* a fully operational system of objective, automatic and unambiguous set of Rules. As mentioned above, it applies in three distinct domains: zygonymy, zygography and zygophory.

As concerns zygography, the last two editions of the *Code* (Anonymous 1985, 1999) introduced changes in Articles 32, 34, 35, 39, and above all in Article 24, which raise many problems that were discussed in detail by Dubois (2010*b*).

The concept of ***airetophory*** designates published actions taken by arbiters to clarify situations of nomenclatural ambiguity due to incompleteness or even absence of original onomatophore designations for nomina.

In conclusion, a new wording is proposed below for the Principle of Airesy in the *Zoocode*. A few related terminological novelties are also proposed for our Glossary.

3.5.4.6.2. Current situation in the *Code*

Principle of the First Reviser (Article 24.2.1, p. 30).

3.5.4.6.3. LZC decision

LZC Session: 30.
Date of adoption: 11 June 2018.
Publication: 28 October 2019 (Dubois & Aescht 2019*q*).

3.5.4.7. VAL 6. The Principle of Proedry

3.5.4.7.1. Justification of this Principle

The term ***proedry*** was introduced by Dubois (2013; see Dubois & Aescht 2019*k*) to account to an 'unstated' Principle of the *Code*. It appears surreptitiously in its Article 24 on "Automatic determination of precedence of names", which states that whenever homonyms or synonyms are introduced simultaneously, but proposed at different ranks within their nominal-series, the nomen proposed at higher rank takes precedence, and that this also applies in case of simultaneous but different onomatophore designations for coordinated nomina at different ranks. This statement is (unnecessarily) repeated for homonyms in the three nominal-series recognised by the *Code* in Articles 55.5, 56.3 and 57.7, and for competing onomatophore designations (zygophories) for the

same nomen at different ranks in Article 61.2.1. Such situations do not correspond to the Principles of Priority, Airesy and Sozoidy (see below), and deserve to be recognised as a Principle of its own, the ***Principle of Proedry***. A precise formulation of this Principle is provided below.

It should be noted that this simple Principle applies only between zygonymous nomina of the same nominal-series proposed in the same publication or in distinct synchronic publications. It does not apply between zygonyms published at different dates. In this respect, Article 35.5, introduced in the 1999 edition of the *Code*, has nothing to do with this Principle. It states that if after 1999 a family-series nomen 'in use' for a taxon is found to be older than a nomen 'in prevailing usage' for a taxon at a higher rank, the older nomen should not displace the younger one. This Rule relies on the problematic concept of 'prevailing usage' and is highly questionable for this simple reason. It is highly confusing for any taxonomist not being very well acquainted with the taxonomy of a zoological group and its history, who will have difficulties understanding why, for example, a subfamily bears a nomen older than that of the family in which it is included, and who will then suspect the possible existence of a mistake in the family-series nomenclature of the zoological group in question—all the more that genuine errors in the family-series nomenclature are much more common than in the two lower nominal-series, in part because many zoologists are not even aware that the *Code* applies to nominal-series nomina. This Article exists in the 1999 edition of the *Code* only for family-series nomina, but not for genus-series and species-series nomina, which is inconsistent and illogical (but would be even more problematic).

3.5.4.7.2. Current situation in the *Code*

Not stated as a Principle, but implemented as a Rule in Articles 24.1 (p. 30), 55.5 (p. 58), 56.3 (p. 58), 57.7 (p. 60) and 61.2.1 (p. 64).

3.5.4.7.3. LZC decision

LZC Session: 31.
Date of adoption: 4 August 2018.
Publication: 28 October 2019 (Dubois & Aescht 2019*r*).

3.5.4.8. VAL 7. The Principle of Nomography

3.5.4.8.1. Justification of this Principle

A common confusion in zoological nomenclature is that between ***nomen*** and ***spelling*** or orthography (Dubois 2010*b*, 2011*a*). Many authors and especially online databases erroneously include variant spellings of a nomen as 'synonyms' in its 'synonymy' or better ***synonymic list*** (Dubois 2000). The Commission itself has often and regularly made this mistake in 'suppressing' spellings as if they were nomina having an independent nomenclatural status (see Dubois & Aescht 2019*s*). But a spelling is not a nomen, it is just an 'avatar' (***paragraph***) of a nomen, and all parographs of a nomen have the same author, date and onomatophore. Therefore, ***invalidation*** ('suppression') of a nomen results also in the invalidation of all its parographs, which need not (and in fact cannot) be invalidated individually. The nomen itself only has a real 'nomenclatural author' or better ***auctor*** (Dubois 2013). Each of its parographs, including its apographs, only has a 'first-

user' (Dubois 2000) or ***scriptor*** (Dubois 2015*a*), not an auctor. Therefore, parographs (and more generally paronyms) are not synonyms and should not appear in synonymic lists sensu stricto, but only in ***logonymic lists***, which include nomina (synonyms) but also paronyms and chresonyms (for details see Dubois 2000, 2010*b*, 2011*a*).

The nomenclatural concept of ***zygography*** was introduced by Dubois (2013). It refers to the situation where a given nomen appeared in the literature under several spellings (***parographs***), and where it may be wondered which one is correct and should be used for a given taxon at a given rank. The three following kinds of parographs should be distinguished: ***protographs*** (unique original spellings), ***symprotographs*** (multiple original spellings) and ***apographs*** (subsequent spellings). There are two main categories of conflicts of zygography: conflicts of ***symprotography*** (presence of two or more alternative spellings for the nomen of the same taxon at the same rank in the original publication where the nomen was introduced) and all other cases of conflicts of ***parography*** (involving either the protograph and one of its apographs, or two apographs). Because of the existence of the Principle of Coordination in the three nominal-series governed by the *Code*, a given nomen may be in valid use at one or several ranks, and invalid at others. In the family-series only, the rank of the taxon is indicated by its ending, so in this case the same nomen may have different correct spellings if it is considered valid at different ranks.

Dubois (2013) proposed to recognise a ***Principle of Nomography*** for the Rules that concern the correct spellings of nomina. As a result of the Principles of Nomenclatural Foundation and of Priority, the ***eugraph*** (correct spelling) of a nomen is usually its protograph, but in some cases the latter may be an 'incorrect original spelling' that must be replaced by one of its apographs. Besides, a protograph may have to be changed when the taxonomic status of the taxon it designates changes, e.g. when a species-series epithet is transferred from a genus to another, or when a family-series nomen is transferred from one rank to another.

In its Session 32 (Dubois & Aescht 2019*s*), the LZC provided a very detailed analysis of many problems related with the spellings of nomina. In order to point to genuine problems posed by the current Rules, concrete examples of various situations were provided, as well as of the problems posed by mandatory spelling corrections of ***nothoprotographs*** and mandatory ending corrections in cases of taxonomic changes. These detailed discussions showed that the current Rules of the *Code* regarding spellings are quite unclear, ambiguous and in some cases illogical. As a matter of fact, this domain is one of the most complex ones of nomenclatural Rules, which appears not to have been devoted enough attention and work in the past. These problems are so complex and intricated that at this stage we cannot yet produce final ideas and conclusions, but the present Session presents first thoughts and suggestions which the LZC intends to pursue further. These questions go beyond the present discussion devoted to the Principles of the *Zoocode* and will have to be discussed further by the LZC when we address the Articles of the *Zoocode*, but it is already clear that important changes in these Rules will have to be considered for implementation in the *Zoocode*. Dubois & Aescht (2019*s*) summarised their discussion by a series of general and particular statements, summarised below.

[AA1] In a given ***ergotaxonomy***, any taxon at a given rank can have only one valid nomen, its ***kyronym***, characterised by its author, date and onomatophore.

[AA2] A nomen can appear in the literature under different categories of spellings (***parographs***): [AA2a] its single original one (***protograph***); or [AA2b] several original ones (***symprotographs***) among which an ***airesy*** may select one as ***lectoprotograph*** and reject the other(s) as ***leipoprotograph(s)***; or [AA2c] one or several subsequent one(s) or ***apograph(s)***.

[AA3] The definitions given in Article 33 of the current *Code* for "emendation" and "incorrect subsequent spelling" are not fully operational and unambiguous. Besides, in the general taxonomic literature, the traditional term 'emendation' is of unclear meaning, as it is used both for changes in

the ***intension*** and/or ***extension*** of taxa (often indicated by the use of the term 'sensu') and for changes in the spelling of nomina, and its undifferentiated use both in taxonomy and nomenclature should be discouraged (see Dubois 2012). Well-defined terms like ***autoneonym***, ***apograph*** or ***ameletograph*** should be used instead.

[AA4] In a given ***ergotaxonomy***, any ***kyronym*** at a given rank can have a single correct spelling or ***eugraph***—except in a few peculiar situations concerning species-series epithets, where the *Code* allows to consider different 'variant spellings' or ***paromographs*** as valid (Article 58). All other spellings used for this taxon at this rank are ***nothographs***. The situation is not identical in the three nominal-series discussed in the *Code*.

[AA5] In the genus-series, the eugraph always consists in the spelling of the whole parograph.

[AA6] In the species-series, the eugraph of the epithet depends on the ***onymorph*** under which it is used. It consists either [AA6a] in the spelling of the whole parograph, whenever the epithet is invariable (being a term in apposition or in the genitive), or [AA6b] in the correct stem of the nomen (being an adjective or a past participle) to which a variable ending indicating grammatical gender and number is added.

[AA7] In the family-series, the eugraph consists in the correct stem of the nomen (***eurhizograph***) to which a ***suffix*** is added. This suffix is either mandatory in the ***fully regulated ranks*** of the family-series (family, superfamily, subfamily, tribe and subtribe), or left to the freedom of taxonomists in the other ranks of this nominal-series (***partially regulated ranks***), provided it is stated to indicate nominative plural (see also in this respect Dubois & Aescht 2019*n*).

[AA8] Because of the ***Principle of Priority***, the eugraph of a given nomen at a given rank is usually its protograph or lectoprotograph. However, according to the ***Principle of Nomography***, in a few particular situations the eugraph is a ***nomograph***, a spelling distinct from the protograph. Under the *Code*, these kinds of spelling changes are not only 'justified' (an unclear term, in fact, as many so-called 'justifications' can be put forward for any action), they are ***mandatory***. The protograph must thus be replaced by one of its apographs in the following situations: [AA8a] ***mandatory spelling correction*** ('justified emendation' in the *Code*) of the stem of a ***nothoprotograph*** (inadvertent spelling error in the protograph or lectoprotograph); [AA8b] ***mandatory ending correction*** ('mandatory change' in the *Code*) of an eugraph made necessary to comply with either [AA8b$_1$] the grammatical gender of the generic substantive (in the species-series) or [AA8b$_2$] the ending required by the Rules for nomina referred to fully regulated ranks of the family-series. Altogether, these two categories of spelling change can be known as ***nomographic corrections***.

[AA9] Two Articles of the current *Code* (33.2.3.1 and 35.4.1) introduced Regulated Exceptions for "unjustified emendations" or "incorrect spellings" being "in prevailing usage", which are "deemed" to be "justified emendations". These Articles are of difficult implementation as, unlike Article 23.9, they do not rely on an operational concept of "prevailing usage". Furthermore, they result in transforming some ***autoneonyms*** into ***nothapographs*** and in validating automatically the latter against Priority, which is inconsistent with Article 33 of the *Code*.

[AA10] In all cases, the Commission is entitled to use its Plenary Power to modify the spelling of a nomen or to validate for this nomen a spelling used by previous authors.

[AA11] Another category of spelling change is not really a correction but belongs in the domain of airesy. It applies whenever two or more symprotographs appeared together in the original publication where a nomen was introduced for a taxon of a given rank. This situation is parallel to that of allelonymy in zygonymy. As all symprotographs are synchronous, the Principle of Priority cannot be used to fix precedence among them and the Principle of Airesy must be called upon in its place. The spelling chosen then became the 'correct original spelling' or ***lectoprotograph***, whereas any rejected spelling became an 'incorrect original spelling' or ***leipoprotograph***. A new kind of airesy among symprotographs was introduced in Article 24.2.4 of the last edition of the *Code*: it

states that whenever an original ***auctor(s)*** of the nomen, in a subsequent publication, only mentioned one of the symprotographs, this author is **deemed** to have realised an airesy and to have **chosen** this spelling as the correct original one. Dubois (2010*b*, 2013) proposed the following designations and acronyms for the different categories of ***airesies*** concerning symprotographs resulting from this new Rule: ***External Airesy*** (ETA) for a traditional airesy taken under Article 24.2.3 by an author or authors not being the original one(s), and ***Internal Airesy*** (ITA) for an airesy taken under Art. 24.2.4 by the original auctor(s), which may be either ***Explicit*** (EPITA) or ***Implicit*** (IPITA). We refer to Dubois (2010*b*) and Dubois & Aescht (2019*s*) for detailed analyses showing that this new Rule caused new problems that could easily have been avoided by making it only proactive.

[AA12] Under Article 32.2.1 of the current *Code*, in case of symprotography the lectoprotograph can be fixed only through an airesy which leaves full choice to the arbiter, but this is inconsistent with Article 32.5.1 which states that an 'incorrect original spelling' must be corrected. In this respect, the suggestion of Follett (1955: 21) mentioned above, according to which, among symprotographs, 'incorrect spellings' should be rejected, appears to be a better solution, but in the *Zoocode* another possibility should be implemented, according to which under the standard Rules of nomography if one of the symprotographs is correct (being a ***meletograph***) and the other one(s) incorrect (being an ***ameletograph***), the establishment of the former as the eugraph should be mandatory and not left to the freedom of an arbiter.

These statements are too long and too detailed to constitute under this form the ***Principle of Nomography***. The latter is here restricted to the cases of mandatory corrections covered in Articles 19, 33.2.2 and 34 of the current *Code*; it will probably have to be expanded later to include other situations. Anyway these comments will form the basis for the detailed Articles of the *Zoocode* regarding spellings. The new wording of the Principle of Nomography proposed below is compatible with these statements.

3.5.4.8.2. Current situation in the *Code*

Not stated as a Principle, but implemented as Rules in Articles 19 (p. 21), 27 (p. 32), 28 (p. 32), 32.2 (p. 39), 32.5 (p. 39–42), 33.2 (p. 42), 34 (p. 43–44) and 58.

3.5.4.8.3. LZC decision

LZC Session: 32.
Date of adoption: 11 March 2019.
Publication: 28 October 2019 (Dubois & Aescht 2019*s*).

3.5.4.9. VAL 8. The Principle of Sozoidy

3.5.4.9.1. Justification of this Principle

The *Code* gives a strong, and arguably undue, place in its Preamble and Rules to 'nomenclatural stability', as if this was of paramount importance. As discussed already in many publications (e.g. Dubois 1998), this aim is unjustified as a large part of the nomenclatural changes required by the *Code* result from taxonomic changes, and requiring 'taxonomic stability' would amount to ask for a freezing of the scientific activity of taxonomists. Furthermore, in many cases the *Code* requires

'stability' for nomina that have been used a handful of times only, but just in order to satisfy the egos of certain authors (Dubois 2010*d*). Finally, the requirement for stability at all costs constitute a potential threat against natural history museums (Dubois 2010*c*). This being said, it is true that in some cases a strict obedience to the Rules would have damageable consequences on communication about taxa within the scientific community and outside of it: it would be absurd to have to rename the well-known species *Tyrannosaurus rex*, *Drosophila melanogaster* or *Homo erectus* for simple reasons of priority of publication involving the 'rediscovery' or 'reinterpretation' of obscure old works. Rules are therefore needed to cope with such problems, but they must be well-thought and 'reasonable', i.e. aiming at protecting only **really well-known nomina or spellings**. The *Code* is not quite clear in this respect. An additional problem of the *Code* is that some of its Rules in this domain are contradictory and incompatible with other Rules of the same *Code*, as will be shown below. This question must therefore be addressed carefully. This was done in a very detailed manner by the LZC in its Session 33 (Dubois & Aescht 2019*t*). Below we provide only a summary of these findings.

In some cases, rediscovery of a long-forgotten nomen may disclose the existence of a problem of zygonymy (homonymy or synonymy) that had escaped the attention of all authors until then. This is the case when the rediscovered nomen proves to be a senior or seniorised homonym or synonym of a nomen in wide use, especially when this use extends beyond specialised taxonomic publications and concerns the general scientific literature or even the public domain. In the latter case, it is justified to maintain the 'widespread usage', but this can be done only at the expense of tolerating exceptions to the Rules of the *Code*.

3.5.4.9.1.1. Article 23.9

The way of dealing with such situations has changed several times along the history of the *Code* (see Dubois 2011*a*: 28–29). In the edition of the *Code* currently in force, Article 23.9 on 'Reversal of precedence' allows in certain conditions to conserve the 'prevailing usage' of a junior zygonym through its validation as a 'nomen protectum' ('protected nomen') against a 'nomen oblitum' ('forgotten nomen').

This Rule, which did not exist in the previous editions of the *Code*, states that when a senior homonym or synonym has not been used as a ***valid*** nomen after 1899 (Article 23.9.1.1) and its junior synonym or homonym has been used as ***valid*** for the same taxon in at least 25 works published by at least 10 authors in the immediately preceding 50 years and encompassing a span of not less than 10 years (Article 23.9.1.2), the junior synonym or homonym must be maintained as valid (Article 23.9.1). Article 23.9.2 then states that its implementation requires the ***publication*** of an ***explicit*** statement that the senior nomen qualifies as a nomen oblitum and the junior one as a nomen protectum, this latter statement being supported by the publication of "evidence that the conditions of Article 23.9.1.2 are met", which requires the provision of a list of at least 25 works corresponding to the criteria listed above. Article 23.9.2 adds: "In the case of subjective synonymy, whenever the names are not regarded as synonyms the older name may be used as valid". This important precision explains why this special procedure is called 'reversal of ***precedence***' and not '***suppression*** of older synonym or homonym': in such a case, the senior nomen is just 'silenced' or 'juniorised' (Dubois 2000: 47) relative to the junior one, but it is not 'suppressed'; it remains available but may be reinstated as valid if the taxonomic interpretations change.

Article 23.9 in is current wording raises several problems, that had already been pointed (Dubois 1997, 2005*c*, 2006*a*, 2010*c*–*d*, 2011*a*, 2015*b*, 2016) and were highlighted again by Dubois & Aescht (2019*t*):

[AB1] The requirement that the senior nomen should have been considered ***valid*** after 1899 excludes de facto all nomina that have been regularly cited as nomenclaturally ***available*** but ***invalid***, for example for being considered doxisonyms (subjective synonyms), and that therefore did not at all correspond to the concept of 'forgotten nomen'—a strange Rule indeed, which appears to be based on a confusion between the concepts of availability and validity! A strict following of this 'strange Rule' would result as rejecting as a nomen oblitum a nomen that has been cited dozens or hundreds of times in synonymies, where it had been placed on the basis of obsolete data or reasoning, a rather frequent situation in taxonomy but which is drastically different from that discussed here of a nomen that had indeed been ignored for more than a century and rediscovered only recently. For this reason, it is clear that in this Article the term 'valid' should be replaced by the term 'available'.

[AB2] The conditions of Article 23.9 are extremely lax, as a number of 25 publications of all kinds (including checklists or catalogues, or works all written by authors belonging in a single laboratory or research team) is very quickly obtained, even for completely obscure nomina, that for example no participant in a World Congress of Zoology except the specialists of the group would ever had heard of. In fact, as stressed by Dubois (2005*c*: 409), "there is a real intellectual dishonesty in both stating that nomenclatural stability is necessary for non-systematists, users of taxonomies, but then to provide evidence for a 'need of protecting usage' based on purely taxonomic or phylogenetic publications". These very permissive conditions, allowing suspension of priority and recourse to 'usage' in many cases where this usage exists only in the taxonomic specialised literature, amounts in fact to stating that the *Code*'s Rules have no real structuring role even for the professionals of taxonomy, and weakens considerably the value of the *Code* in the eyes of all non-specialists. With this article, taxonomists are clearly encouraged to do hasty and careless nomenclatural work (Dubois 2005*c*, 2010*c–d*).

[AB3] Ohler & Dubois (2018) argued that it is unfortunate that, when implementing this new Rule, the Commission, instead of coining a new term, decided to 'recycle' the formula 'nomen oblitum', which had been used in the *Code* between 6 November 1961 and 1 January 1973, but in a different sense (see Article 23.12), and then removed from the *Code*. In particular, in this previous use this formula could apply to any nomen, whether senior or junior homonym or synonym, whereas in the new sense this formula can be used only to invalidate a ***senior*** unused synonym or homonym of a well-known nomen, but not to 'suppress' a nomen, just because it is 'old' and 'forgotten', but which then does not threaten any other valid nomen. Some recent authors did not realise this distinction and used the formula in its previous sense, not in its current one. Such a mistake is just an avatar of a more general one, which consists in believing that nomina considered once as subjective synonyms are forever expelled from zoological nomenclature—a misunderstanding which is at the source of many nomenclatural errors.

[AB4] The recourse to Article 23.9 is an ***onomatergy*** (nomenclatural act). As such, to be ***available***, this onomatergy must be ***published***, in the strict sense given to this term in Article 8 of the *Code*. This excludes oral communication in meetings or in private conversations, letters or emails, as well as electronic communication through blogs, websites, or any kind of 'electronic publications' not registered in *Zoobank* and failing to respect the criteria of the 2012 Amendment of the *Code* (Anonymous 2012). Besides, to be valid, this nomenclatural act must be published following the requirements of Articles 23.9.1.2 and 23.9.2. In particular, a list of at least 25 works corresponding to these criteria must be provided. If this is not done, the onomatergy is null and void, which means that the regular Rules of the *Code* must be followed and normal precedence should not be reversed.

[AB5] Reversal of precedence is just one among several ways in which a nomen can be invalidated, which include also Priority, Airesy and Proedry. But, except in cases of ***hadromonymy*** and ***isonymy***, this invalidation remains reversible, in the case of change of generic allocation of a species or of re-evaluation of a doxisonymy. Thus, although invalidated by reversal of precedence, a

nomen remains available—just like in the case of invalidation by priority or airesy bearing on doxisonyms. It is therefore wrong to claim that such a nomen is unavailable, as it is sometimes observed in the taxonomic literature.

[AB6] Dubois & Ohler (2018) went further and remarked that Article 23.9, as it is currently written, is liable to cause additional problems because its implementation does not depend on an automatic Rule but on the 'good will' of some authors. Its application would be automatic if it said that, whenever a junior homonym or synonym has been mentioned more than 25 times and the senior nomen has not been mentioned until a given date, the senior synonym is ipso facto invalidated, but this is not what it says, as an action by an author is required. The author who discovered the forgotten nomen may not decide to use Article 23.9 to reject it and may use it as valid, and the *Code* is silent on the consequences of this fact: does this use validate this senior nomen (thus nullifying the possibility to use 23.9 later since the condition 23.9.1.1 is no more complied with), or does it leave open the possibility that later another author could use this Article? But then, if this possibility existed, this would be a potential source of strong nomenclatural instability, as it would open the door to the subsequent invalidation of the senior nomen at any time, even after several or even many uses of the latter as valid over several or many years. To avoid this problem, the act of validation or invalidation of the senior nomen should be possible only once, at the time of the first discovery or establishment of the homonymy or synonymy.

[AB7] In conclusion, Article 23.9 as it is currently written poses a series of problems and it should be modified. Dubois & Ohler (2018) made precise proposals in this respect. This question will be carefully addressed by the LZC when when come to the discussion of the Rules of the *Zoocode* regulating validity.

3.5.4.9.1.2. Other Articles of the *Code* dealing with usage

The conditions of Article 23.9 are therefore arguably very lax and permissive and tend to encourage hasty and careless nomenclatural work by taxonomists. Furthermore, they rely on a definition of 'prevailing usage' which is different from that of this expression given in the Glossary of the *Code* (which also fails to mention the formula 'reversal of precedence'). There, 'prevailing usage' of a nomen is defined as the usage "which is adopted by at least a substantial majority of the most recent authors concerned with the relevant taxon, irrespective of how long ago their work was published". This vague definition is based on undefined terms. When is a majority 'substantial'? How is 'most recent' defined? Who are the authors 'concerned with the relevant taxon'? This definition is therefore not operational (Dubois 2010*b*: 13−14, 2010*d*: 262−263, 2017*b*: 24; Löbl 2015*b*), and the mention of the formula 'prevailing usage' in other Articles of the *Code* is confusing.

Although the term 'reversal of precedence' is not mentioned in these cases, they also rely on the unclear concept of 'prevailing usage'. Their existence is a nuisance for an automation of the management of nomenclatural Rules, especially through computerisation of the *Code* and online applications, as discussed e.g. by Dubois (2013). The Articles concerned are 23.12, 35.5, 40.2 and 59.3, which result in validating automatically some junior synonyms against Priority, and 33.2.3.1 and 35.4.1, which result in transforming some autoneonyms into nothapographs and in validating automatically the latter against Priority (see details in Dubois 2013 and Dubois & Aescht 2019*t*). In both latter cases an 'unjustified emendation', which according to the Rules of the *Code* is a nomen distinct from the original one, having its own author and date, takes precedence over the latter (and even 'steals' its authorship and date) in order to maintain the 'prevailing usage' of the nomen (without stating in which sense the latter expression is to be taken here). It is then suddenly deprived of its independent availability and is 'downgraded' from the status of neonym to that of simple

apograph. This contributes to the widespread confusion between nomina and spellings often discussed in the literature and in our Sessions. This bizarre situation results from changes in the Articles 32, 33, 35 and 40 introduced in the 'third edition' of the *Code* (Anonymous 1985) and maintained in the current edition. They were discussed in full details by Dubois (2013: 10–13). The complete deletion of these exceptions will be considered as an option for the *Zoocode*.

Regarding the role of 'usage' for spellings, the situation is quite similar to that concerning nomina. Although it does not recognise 'reversal of precedence' as a Principle, the *Code* in its last edition mentions on several occasions exceptional situations in which a widespread spelling is to be seniorised against its original spelling which normally should have priority. Like in the case of nomina, the meaning of the unclear expression 'prevailing usage' in these Articles is not precised. This concerns Articles 29.5 and 33.3.1, as well as 33.2.3.1 and 35.4.1: these results in validating some nothapographs against both Priority and sometimes Nomography (see details in Dubois 2013 and Dubois & Aescht 2019*t*).

3.5.4.9.1.3. Sozoidy

Because of the ambiguities, obscurities and internal contradictions of the *Code* pointed above and of the generally very permissive interpretation of 'widespread usage' in this text, more stringent conditions for accepting exceptions to the 'normal' Rules of the *Code* were proposed by Dubois (2005*b–c*, 2006*a*, 2010*c–d*, 2011*a*, 2015*b*, 2016; Dubois & Raffaëlli 2012; Dubois & Ohler 2018), first for class-series nomina, and later expanded to all zoological nomina. They are based on precise ***categories of usage*** for the nomina of taxa. These categories rely on higher numerical requirements concerning the usage of nomina in scientific (both taxonomic and non-taxonomic) publications. Only nomina that have a ***really important*** use inside but also outside systematics (***sozonyms***; Dubois 2005*b–c*) ought to be 'protected' whenever this widespread use proves to be invalid according to the normal Rules of the *Code*. The presence of the to-be-protected nomen in the ***titles*** of publications is seen as a guarantee that this nomen is well-known, not only of specialists, but also of the 'general public'. Whereas the *Code* does not include a 'principle of prevailing usage', Dubois (2011*a*) formulated a ***Principle of Sozonymy***, expanded later (Dubois 2013) into a general ***Principle of Sozoidy***, which provides a general framework for the resolution of problems caused by threats to the standard nomenclatural Rules for well-known nomina (***sozonymy***), spellings (***sozography***) and airesies (***sozairetophory***).

Three categories of usage are particularly useful for implementation of this Principle for nomina: the general ones of ***sozonym*** and ***distagmonym*** (Dubois 2005*b–c*), and that of ***sozodiaphonym***, which is relevant only in class-series nomenclature (Dubois & Raffaëlli 2012; Dubois 2005*b–c*) and is not discussed further here.

Sozonyms are nomina that have had since 1900 a ***real massive usage*** in the general scientific literature, i.e., not limited to the specialised taxonomic literature, while no other nomen had a large usage for the same taxon: this justifies their 'protection against Priority'. ***Distagmonyms*** are nomina which have not had such a large usage since 1900. The criterion retained to define 'real massive usage' of a nomen is that it has been used as the only one for a taxon, either in its Latin form or under a non-Latinised form, in the ***titles of at least 100 scientific publications*** (books, book chapters or periodical articles) after 31 December 1899. This amounts to a hardening of the conditions of Article 23.9. The details and justifications of these conditions were discussed in detail by Dubois (2005*c–d*, 2006*a*, 2010*d*, 2015*b*, 2016). A sozonym, if it is not a junior homonym of another sozonym, must be conserved against its senior synonyms. As for distagmonyms, in the nominal-series covered by the

Code (SS, GS and FS), they should follow the 'normal' Rules of validity, with precedence fixed by Priority, Airesy or Proedry.

Dubois (2013) suggested that the Principle of Sozoidy should also be applied to the management of spellings under the *Code* (***sozography***). According to this Principle, a spelling that has had ***real massive usage*** (as defined above) for a given nomen in the taxonomic and non-taxonomic scientific literature, whereas no other spelling of this nomen has had such a usage, should be protected (seniorised) even if it would not be the valid one following the Principles of Priority or of Airesy, provided it agrees with the Rules concerning Nomography in the nominal-series at stake.

Finally, Dubois (2013) suggested that the same mode of reasoning should be applied to two or more zygophories (alternative airesies applying to the same nomen) if one of them results in the validation of a sozonym. This procedure was called ***sozairetophory***.

This question is not discussed further here, but will be so when we address the Articles of the *Zoocode* devoted to 'usage', but these considerations were useful to guide us for the writing of the Principle of Sozoidy.

In conclusion, a new wording is proposed below for the Principle of Sozoidy in the *Zoocode*. This is just a general Principle, which fixes the frame within which the detailed Rules regarding Sozoidy will be given in the *Zoocode*. A few terminological novelties, used in the text above as well as in previous Proposals for some of them, are also proposed for our Glossary.

3.5.4.9.2. Current situation in the *Code*

Not stated as a Principle, but some of the conditions listed here appear in Art. 23.9 on 'reversal of precedence' (p. 27–29) and in the Glossary about 'prevailing usage' (p. 121).

3.5.4.9.3. LZC decision

LZC Session: 33.
Date of adoption: 29 March 2019.
Publication: 28 October 2019 (Dubois & Aescht 2019*t*).

3.5.4.10. VAL 9. The Principle of Archoidy

3.5.4.10.1. Justification of this Principle

3.5.4.10.1.1. Archoidy

So far, we examined a series of Principles which govern, more or less 'officially' or 'surreptitiously', the functioning of the *Code*, and which are meant at doing so 'officially' in the *Zoocode*. Beside a few general ones, these Principles, and the Rules that rely on them, are meant at solving the main questions or problems that may arise during the application of the nomenclatural Rules in zootaxonomy, and they indeed allow to solve most of them. But there always remains a small residue of cases that cannot be resolved satisfactorily through the use of the normal Rules of the *Code* and which result in nomenclatural ambiguity, uncertainty or conflict, and are liable to disturb the universality of zoological nomenclature and to cause confusion. For such situations, the *Code* allows to have recourse to a particular 'rescue option', the 'Plenary Power' of the Commission.

This Plenary Power allows the Commission "to suspend the application in a particular case of any provision of the *Code*", and therefore to solve all kinds of problems, dealing with the availability, assignment, allocation, validity and correctness of zoological nomina.

The *Code* presents this Plenary Power in its Article 78.1 and describes its use in Article 81. However, it does not consider it as a 'Principle'. It is here suggested that this possibility to modify, ignore or delete some of the Rules of the *Code*, which normally are binding for all zoologists including the members of the Commission, is an important feature of the *Code*, and should be recognised as a Principle of its own.

To designate this Principle, the new term ***archoidy***, derived from the Greek verb ἄρχω (*archo*), 'to rule, to govern', was proposed by the LZC in its Session 34 (Dubois & Aescht 2019*u*). The same stem had already been used by Dubois (2011*a*) to designate the status of some nomina resulting from two of the possible consequences of the use of the Plenary Power, namely ***archexoplonym*** for a nomen that was **permanently** invalidated (juniorised) in favour of another nomen through the use of the Plenary Power, and ***archypnonym*** for a nomen that was **conditionally** invalidated (juniorised) in favour of another nomen also through this use.

To go further on this matter, we need a few recent terms, which allow to designate briefly some nomenclatural concepts which otherwise require using long expressions or periphrases. The first one is the term ***onomatergy*** (Dubois 2013: 3; Dubois & Aescht 2019*t*) for a shorter designation of what the *Code* calls ***nomenclatural act***. There are two main categories of onomatergies: [AC1] one which consists in the establishment or **introduction** of a new nomen (***poieonym*** or ***neonym***; see Dubois & Aescht 2019*g*), for which the new term ***catastasy*** (Dubois 2013: 3) is available; [AC2] and one which consists in a 'first reviser action' or ***airesy*** (Dubois 2013: 3; Dubois & Aescht 2019*j*), which results in the **modification** of the nomenclatural status of an already available nomen.

Archoidy is nothing but a special kind of ***onomatergy***, taken under the Plenary Power, which supersedes a previous onomatergy taken under the regular Rules of the *Code*. It can also be divided in two subcategories: [AD1] ***archocatastasy***, in which the Plenary Power is used to modify the availability or validity of an already available nomen; and [AD2] ***archairesy***, in which the Plenary Power is used to modify some of nomenclatural attributes of a nomen, particularly its onomatophore. Most actions taken so far under the Plenary Power are archairesies, but archocatastasy has also sometimes occurred, for example in the not so rare cases when the Commission has afforded under the Plenary Power the status of available nomen to an apograph (subsequent spelling) of an available nomen, e.g. when it 'suppressed' such apographs (which as such did not have an independent nomenclatural existence): in order to 'suppress' them, the Commission must be construed as having first 'established' them! Finally, the new term ***archokyronym*** was proposed here to designate an archexoplonym or archypnonym validated under the Plenary Power through invalidation of another nomen.

In conclusion, the LZC decided to add a new ***Principle of Archoidy*** in the *Zoocode*, and to adopt a few related terminological novelties, listed in the Glossary below. All these terms, as well as additional ones, will prove useful later, when we work on the Rules of the *Zoocode* themselves.

3.5.4.10.1.2. Governance of the Plenary Power

At the present stage of the work of the LZC, we are facing several uncertainties, concerning the future dates of completion of the work of the LZC concerning the *Zoocode* and of that of the Commission concerning the '5th edition' of the *Code*. Depending on the answers to these questions, the LZC might follow different pathways and take different decisions, extending from the dissolution of the LZC if the latter agrees with the next version of the *Code*, to the decision not to

follow the new *Code* and to implement and follow the *Zoocode* as an independent text (like the *Phylocode*) and encourage zoologists to do so. We currently have no way to know which course will be followed. Consequently, we have to leave open the question of knowing which will be the international body that will be in charge of implementing the Plenary Power: will it be the Commission, as currently understood, or a modified version of the Commission, resulting from the next version of the *Code*, or a new Committee or even a new system, established under the *Zoocode*?

Furthermore, it is not certain that the best solution is to entrust the Plenary Power to the same body as that in charge of updating the *Code*. In the recent decades, as documented in several publications (e.g Dubois 2010*b–d*, 2011*a*, 2017*b*; Dubois & Raffaëlli 2009; Dubois *et al.* 2013, 2015*a–b*) and LZC Sessions, the Commission has taken several ill-guided decisions under the Plenary Power, thus questioning its ability to solve such cases. The slowness of action of the Commission on many cases, and the fact that a portion of them is simply abandoned without vote and without explanation (e.g., recently, the *DICROGLOSSIDAE* case: see Ohler & Dubois 2014, Ohler *et al.* 2014, Dubois & Aescht 2019*s*) also raises concern.

Should we have a unique and permanent body to deal with all cases submitted to a decision through the Plenary Power, or a different body for each case, including co-opted, nominated or elected experts of the zoological group or of the kind of nomenclatural problem at stake? Should we consult the zoological community through internet or otherwise?

In fact, it is the whole governance of zoological nomenclature that should be reconsidered, not only concerning the updating of the *Code*, but also the decisions taken under the Plenary Power, as well as the governance of the *BZN*, with genuine peer review and absence of censorship.

The LZC plans to elaborate proposals on these matters. Some ideas in this respect were already discussed at the 2014 Linz meeting where the LZC was founded (see above and Dubois *et al.* 2016). In the meanwhile, in our current wording of the Principles of the *Zoocode*, the term 'the Commission' will be replaced by the formula 'the Commission (or its successor body)', the latter meaning 'its successor internationally accepted regulatory body that will be in charge of implementing the Plenary Power whenever necessary under the next edition of the *Code* or under the *Zoocode*'.

3.5.4.10.2. Current situation in the *Code*

Not stated as a Principle, but Articles 78–82 provide the relevant information on the Plenary Power and its use by the Commission.

3.5.4.10.3. LZC decision

LZC Session: 34.
Date of adoption: 12 June 2019.
Publication: 28 October 2019 (Dubois & Aescht 2019*u*).

3.5.5. Principle regulating the registration of nomina, onomatergies and graphies

3.5.5.1. REG 1. The Principle of Registration

3.5.5.1.1. Justification of this Principle

3.5.5.1.1.1. Introduction

Although this concept is not defined in its text or in its Glossary, the *Code* makes use of the concept of ***registration***, i.e. the recording of a publication, of a nomen or of an onomatergy, into a dedicated international nomenclatural database, either published on paper or produced and made available to users electronically. This recording is meant at stating and fixing the status of this publication, nomen or onomatergy, concerning the following points: its nomenclatural availability (available or unavailable work, nomen or airesy), its taxonomic allocation (for a nomen) and its validity and correctness (valid or invalid nomen or airesy; correct or incorrect spelling).

In its current form, the *Code* covers three kinds of registrations:

[AE1] The registration of works, nomina or onomatergies either as available or/and valid (in the *Official Lists*) or unavailable or/and invalid (in the *Official Indexes*), sometimes accompanied by changes in the taxonomic allocation of nomina through changes in their onomatophores, resulting in some cases but not always from implementation of the Plenary Power of the Commission.

[AE2] Starting with the 1999 *Code*, registration of nomina mentioned in *Lists of Available Names* (*LANs*) validated by the Commission.

[AE3] Starting with the 2012 Amendment, registration in *Zoobank* of works published online after 2011.

Whereas [AE1] and [AE2] can be designated as situations of ***post-registration*** (occurring after publication of a nomen), [AE3] may be known as ***pre-registration*** because it must have occurred before the publication of the nomen or onomatergy in order for the latter to be available. Let us consider these three situations successively.

3.5.5.1.1.2. Post-registration of archoidy

Any decision taken by the Commission under its Plenary Power (***archoidy***) has force of law for all subsequent users of the nomina at stake. It would therefore be very useful to keep an indexed memory of all these acts in a database. This was the idea behind the creation of the *Official Lists and Indexes of Names and Works in Zoology* embracing all Opinions and Directions adopted by the Commission since 1913, but unfortunately the situation of these documents is currently not satisfactory. These decisions were published first by the Smithsonian Institution, then by the Commission, mostly in the periodical *Opinions and Declarations*, to provide precise and smoothed versions of all the previous decisions of the Commission in its early years, including the entries on the *Official Lists* and *Official Indexes* and their corrections. Unfortunately, this approach was not continued consistently, so that nowadays a complete updating of this information would require again a considerable work.

The numerous decisions of the Commission under its Plenary Power are not referred to in the *Code*. A list of Opinions on a site and links to them is missing. Hence, any working taxonomist may ignore bona fide such decisions, then take onomatergies being contradictory to the latter, and a long time may sometimes be spent before the problem is found by the community, making its resolution difficult.

On the whole, the quality of indexation of nomenclatural information has severely decreased in the recent decades. The fact that the *Zoological Record*, founded in 1864 and which for more than a century was of easy and free access to all researchers in academic libraries, has now extremely high subscription rates (online) that few institutions, let alone individuals, can afford to pay, makes the problem even worse.

Therefore, although the principle of entrusting the Commission with the Plenary Power to solve special problems seems sound and does not raise theoretical problems, its practical implementation does. The existence of an indexed memory of all these acts in a database, which should be permanently updated and made available free of charge to all potential users, would be necessary. In the absence of such a comprehensive database, the recourse to the Plenary Power may in some case be a source of additional problems.

Another genuine problem with decisions taken under the Plenary Power is that they may turn to be obsolete or counter-productive in the long run. Nomina which were once considered doxisonyms may later be considered to apply to distinct taxa, and if some of them have been invalidated ('suppressed') under the Plenary Power they may then be missing to address new nomenclatural problems. This is particularly the case for family-series nomina: when a family-series taxon including a single valid genus is recognised nowadays as valid, if its nomen has been invalidated the taxon will be left without the possibility to name it, except through a new decision of the Commission.

To avoid such problems, whenever possible, the Plenary Power should be used in order to allow for a ***reversal*** of the situation, through ***conditional*** rather than permanent invalidation of nomina or onomatergies.

Another conclusion of these observations is that the recourse to the Plenary Power should be limited to the ***strict minimum***, and that in many cases the solution of the problem should rely on the use of the standard Rules of the *Code*. Consequently, the **conditions of admissibility** for submission of new cases to the Commission and for their publication in the *BZN* should be made much stricter than they are nowadays. In this respect, the disappearance in the 1999 edition of the *Code* of the paragraph 79.c of the 1985 edition, dealing with the information that should be provided by zoologists submitting an application to show that there exists indeed a "prima facie case that stability is threatened" is certainly not to be viewed as a progress.

3.5.5.1.1.3. Post-registration of nomina in *LANs*

As discussed in the 2014 Linz Meeting (see above and Dubois *et al.* 2016), there are strong reasons to be very reluctant to accept the current text in the *Code* regarding the *Lists of Available Names* (*LANs*). Such lists could be very useful as a **help** for taxonomists, but **should not be closed**. A new wording of the 1999 Rules should state that *LANs* are provisional lists that can be updated from time to time, following an appropriate procedure, in order to include more recent nomina but also older nomina, the availability under the *Code*'s Rules of which is unchallenged, that had been forgotten or deliberately discarded in the previous version and 'rediscovered' later. There will always be such nomina. The problems here are economic and politic, as preparing such lists requires manpower and a feedback from the community, and, whereas funds may be available to develop the technical conception and implementation of taxonomic databases, no funding is available for such a 'trivial' intellectual work.

Except **perhaps** in very small zoological groups, the idea that *LANs* can be complete and 'closed' in a reasonable period of time is unrealistic, as long as no specific funds are available to pay some competent zootaxonomists to work mostly on this for years, and not in 'holes' in their work schedule as 'side activities'. The rotifer *LAN* embraces nomina only before 1 January 2000 and required about 10 years of discussion; nevertheless, as shown by online discussions on forums, it still raises problems. Thus, the appropriate interpretation that should be given to *LANs* in the future would seem to be that, whereas nomina **present** on these lists are indeed to be treated as available, nomina that are **absent** from these lists should never be considered ipso facto as unavailable, but

their availability should be scrutinised seriously on a case by case basis as they have always been so far by zootaxonomists.

Among the problems covered by such lists, one is their taxonomic coverage: what about nomina that were not included in a *LAN* because they were then not considered to apply to the taxa covered by the *LAN* but the taxonomic status was later modified? We are here in a domain of interference between nomenclature and taxonomy which is problematic in view of the basic Principle of Zoological Nomenclature Independence.

There are other problems with *LANs*, which were discussed in the 2014 Linz Meeting, such as the relationships between availability and validity, the nominal-series coverage of the *LANs* (including or not class-series and variety-series nomina?), the presence/absence of all paronyms of nomina in the list, the presence/absence of unavailable nomina of the taxonomic group at stake, not to mention the problems raised by the exceedingly numerous nomina published by a few authors, the nomenclatural availability of which is questionable, e.g. because it is not clear if they were indeed published on paper, a problem which will become more and more important in the coming years (Dubois *et al.* 2013). Finally, of course, in order to build reliable *LANs*, the criteria of availability of online-only publications should be clearly solved, which leads us to the third point of this discussion. As a guiding principle, we should never forget that, as taxonomists, the first goal of our work should be science, not to please administrative, political or commercial bodies, and in this context, no vote of the Commission and no fixed LAN will hold if they are based on wrong premises. The community of researchers should always feel free to exert its power to ignore or correct such errors when necessary.

3.5.5.1.1.4. Pre-registration of electronic works in *Zoobank*

The problems of science do not occur in an 'abstract' or ideal world, but are tightly connected with economic, social and political problems (for a detailed discussion see Dubois & Aescht 2019*v*).

For private publishers, the transfer of most scientific journals to electronic format has considerably reduced the editorial costs and increased the profits. But in the domain of taxonomy and nomenclature, the impact of this change has clearly been devastating, especially in view of the recent social incitation, not to say obligation, for researchers to publish in some 'famous' electronic journals. The scientific quality of taxonomic papers, especially those having nomenclatural consequences, has dramatically decreased in the two recent decades, simply because most of these journals are 'generalist' ones and do not have competent editors in this domain. Among and after others, Hofstetter *et al.* (2019: 271) recently made very insightful comments on this topic, including: "The recent publication pressure is also largely responsible for what has been referred to as 'predatory publishing' […] implicating journals for which science is a business like any other commercial endeavor and, therefore, quantity is preferred over quality […]. Many papers get published this way with no or little peer review as long as the authors will honour the (often excessive) page charges […]. Such journals insist on acceptation of papers, irrespective of bad taxonomy or bad phylogenetic analyses, and reprimand reviewers for excessive severity […])."

The 2012 Amendment on electronic publications has been a major failure (Dubois *et al.* 2013; Dubois & Aescht 2016*d,h*, 2017*h*, 2019*c*; Dubois 2017*d*). It has already resulted in the publication of hundreds of nomina nuda, and, even worse, of nomina and onomatergies the status of which is, and will probably remain for long or for ever, unclear: for example those which have been or will be published online in a non-available form (e.g., before 2012, or after 2011 but without proper pre-registration) and for which it is unclear if a paper-published version, **obtainable free of charge or by purchase**, actually exists (as some of those discussed in Dubois *et al*. 2013), or those which have

been published online after pre-registration but under several versions that differ in format and content (Dubois & Aescht 2019*c*). The Commission's reply to Dubois *et al*. (2013) consisted in saying that the authors of this paper were wrong, without addressing any of the precise questions raised. For example, in this reply, the Commission (Anonymous 2014: 4–5) first wrote: "The production of paper copies does not give availability to an electronic work or any names and other nomenclatural acts contained in it." This supports the interpretation of Dubois *et al.* (2013) that the 'famous five' paper versions of some PDFs, printed on personal computers and deposited by some journals in a few libraries did not qualify as available publications. But then, the Commission added (page 5): "Paper copies **conforming to Article 8** [*stress ours*] **may** [*stress ours*] form a separate edition that on its own makes names and acts available—independent of whether an electronic version exists. The paper copies in this situation are not facsimiles and are not 'reproductions obtained on demand of an unpublished work' (Article 9.12), and they cannot be deemed unavailable on this basis." This sentence contains two unclarities: what does "conforming to Article 8" mean in this sentence? What about the requirement of Article 8.1.2 that, for nomenclatural availability, a work "must be obtainable, when first issued, free of charge or by purchase"? And what does "may" mean in this sentence? In which cases **does** a printed document indeed qualify as an available publication and in which cases does it qualify as a facsimile? We are still left without 'reply' to this question, and the same applies to other questions raised in the 2013 paper.

It is difficult not to think that the financial interests of online publications may be an important factor of the rush for online publication of nomenclatural works. These financial interests were made quite clear by a member of the Commission (Krell 2015) who stated that following the arguments of the 2013 paper would delay the publication dates of papers first distributed as online ***preliminary versions*** and would render "journals with a print version less attractive as outlets for taxonomic research" than journals having only an online version. This raises the question of the purpose of the *Code*: is it to help taxonomists in their daily work or to help for the promotion for some journals in giving them some advantage in the commercial competition among publishers?

In a world that would not be governed by profit, electronic dissemination of publications and information could have been very useful to researchers in the field of taxonomy. For this, there was no need to accept electronic publication of new nomina and onomatergies. Maintaining the obligation to publish them on paper would have avoided the cornucopia of problems mentioned above, which will be impossible to eradicate completely if electronic, i.e. temporary, modifiable and possibly short-lived, documents remain the basis for nomenclatural availability. Be it as it may, the clock of history has turned, and it will probably be impossible to go back to a world where nomenclatural availability cannot be provided electronically, so that we will have to do with electronic publications. We are therefore bound to search for the lesser evil, for implementation in the *Zoocode*.

Some supporters of *Zoobank* seem to be disposed to get rid of any publication and to restrict nomenclature to a registration office, opening a pathway to a future where 'registered = available'. The problems posed by these projects are multifold. There are good reasons not to have confidence in [AF1] the 'fixed format and content' of electronic documents; [AF2] the long-term permanency of *Zoobank* or at least of its open access; [AF3] the long-term permanency of the electronic 'archives' supposed to store the PDFs of the relevant publications; and [AF4] more generally, the long-term permanency of internet, especially at a time when the whole human civilisation is threatened with collapse (Ehrlich & Ehrlich 2013; Ripple *et al*. 2017). Let us consider these four points successively (for more details, see Dubois & Aescht 2019*v*).

[AF1] This problem is heavy and has clearly been underestimated by the Commission, especially in view of the fact that different documents can bear the same DOI and *Zoobank* LSID (see Dubois *et al.* 2013). The greatest reservations are justified towards the concept of 'publication

of record', in which the format and content are labile (e.g. concerning the pagination, thus considering, against all evidence, that two, or more, documents having different, even if slightly, formats and contents are 'the same'). In fact and fortunately, this 'invention' has not been implemented in the *Code* and is therefore not *Code*-compliant, despite being now referred to by more and more authors and even journals.

[AF2] Serious doubts on the long-term permanency of *Zoobank* are in order. And even if *Zoobank* had some long-term permanency, there is not the slightest certainty that access to it will remain free, especially if the Commission's current financial problems increase. A database containing information on millions of nomina and onomatergies would have a gigantic commercial value in the century of the crisis of biodiversity. It would be of no surprise if we were suddenly told that the costs of production and maintenance of *Zoobank* are too high for the Commission and that access to the information on this database will now have to depend on payment by the users (renamed 'customers'). And this might occur even if the quality of *Zoobank* did not improve, remaining a non-curated database, missing a control of the quality, reliability and pertinence of the information uploaded by taxonomists or editors on this database, which is currently the case. All these elements being taken into account, the defiance towards *Zoobank* is fully justified.

[AF3] Similarly, it should be stressed that there is not the slightest guarantee of long-term permanency of the 'archives' where copies of the PDFs of the papers pre-registered in *Zoobank* are supposed to be stored for an indefinite duration, especially when they depend on commercial companies that may decide at any time that the costs-benefits balance of such a storage is not worth pursuing it.

[AF4] Finally, the long-term permanency of internet itself is far from being a certainty, contrary to what many seem to believe, especially in the period of massive ecologico-economico-socio-political crisis that our society will see in the shortly coming decades, which may include wars and other social disasters. Considering online publications, many paper copies of each document, distributed over the whole planet (see e.g. Dubois 2010*a*) would be a much better guarantee of sustainability for scientific works in the long run than all the electronic databases of the world, which, except those which are in Faraday cages, can be erased instantaneously by voluntary or involuntary exposure to powerful magnetic fields.

For all these reasons, and a few minor ones not developed here, the proposal to shift nomenclatural availability from publication to electronic registration should not be supported, as taxonomists would then only be left with a 'virtual' and fragile system of reference for their work.

In such conditions, what should we propose in the frame of the *Zoocode* project for electronic-only publications?

A first point is that, regarding nomenclatural availability of publications, the *Zoocode*'s Appendix should include a **strong recommendation** to publish new nomina and onomatergies in real paper publications, **in the hands of editors competent in nomenclature**, rather than in online journals having incompetent editors in this domain (see e.g. Dubois 2003 and Dubois *et al.* 2018). But this will not be enough. The question of electronic-only publications needs to be addressed in detail. For this, the following points can be considered, having several dimensions:

[AG1] The current double system of paper publication or electronic publication for the availability of nomina and onomatergies should be perpetuated.

[AG2] A more stringent and demanding system of pre-registration of nomina and acts in *Zoobank* should be implemented, including not only the reference and date of the electronic publication but also a **facsimile extract** of the latter once published, showing its **relevant parts** that make the new nomen or act available. As these would be only short extracts, this would not infringe the copyright laws which make it currently impossible (beside the space limitations of the latter) to store the PDFs of all the papers in *Zoobank* itself.

[AG3] In order to provide nomenclatural availability, this pre-registration entry should include the following pieces of information: [AG3a] the exact date of online distribution of the **final** version of the e-publication (rejecting the fuzzy concept of 'publication of record'), and a statement that it meets the criteria of Article 8.1; [AG3b] its effective author, scriptor or arbiter; [AG3c] the nominal-series as default field; [AG3d] if relevant, the new nomen as appearing in the e-publication, with its unique correct original spelling; [AG3e] a facsimile of the diagnosis including sufficient information for the availability of the nomen, or another element playing the same role (such as a statement of this nomen being a neonym); [AG3f] for a genus-series nomen, its etymology or the statement that it is an arbitrary combination of letters, its stem and its grammatical gender; [AG3g] details on the identity and ***accessibility*** of all onymophoronts (not only neophoronts).

[AG4] A regular paper publication of all the new nomina and acts published electronically during a given period in the whole world should be produced, under the control of the Commission or directly published by it, or of another non-profit international body, in special acts that would be deposited in at least 10 to 40 academic libraries distributed over all continents and regions of the world.

Another problem regarding the availability of paper versions of works obtained through the printing (usually on personal printers) of PDFs published electronically (either before or at the same time) that was discussed at length by Dubois *et al.* (2013) is whether these versions, which may be regarded as mere facsimiles of the original unavailable electronic PDFs, qualify indeed as publications as defined in Article 8.1. This regards particularly their ***obtainability***, when first issued, free of charge or by purchase, by all persons or institutions interested, and not only **deposited** in a few libraries. In order to circumvent this problem, the possibility could be contemplated that, to be accepted as an available paper publication, sister or not to a registered electronic publication, a work should have an ISSN or ISBN number **different** from that of the latter if relevant. Such a requirement would be a new constraint for paper publications, which of course should not be retroactive but start on a given date. It should not be a general requirement, which would create a new problem, as many books, and even periodicals in some countries at least, currently miss such numbers, which would make them unavailable for nomenclatural purposes, just as a side-effect of the development of online publications. A better approach would seem to be to require this only in the case of existence of two distinct, electronic and paper, versions of the same work. This question will have to be tackled by the LZC when the details of the Articles dealing with the availability of publications are discussed.

The concept of ***Principle of Registration*** was first mentioned by Dubois (2011*a*, 2013). However, as written there, the statement of this Principle covered only a part of the phenomena that can be understood under the term 'registration', i.e. online registration of nomenclatural information to protect it from oblivion and rejection. As shown above, this concept can concern also the registration of nomina or onomatergies validated or invalidated by the Commission under the Plenary Power, as well as the pre-registration of nomina and acts to be published electronically, in order to make them available under the 2012 Amendment.

The new writing of this Principle proposed below takes these elements into account. Of course, it only provides general guidelines concerning registration and does not go into the details of the Rules in this domain, which will be discussed by the LZC later.

3.5.5.1.2. Current situation in the *Code*

Absent.

3.5.5.1.3. LZC decision

LZC Session: 35.
Date of adoption: 8 July 2019.
Publication: 28 October 2019 (Dubois & Aescht 2019*v*).

4. CHAPTER 1 OF THE LINZ *ZOOCODE*

4.1. Preamble of the Linz *Zoocode*

The aim of the *Zoocode* is to provide an explicit, precise and objective nomenclatural system for the unambiguous and universal naming of all zoological taxa recognised by taxonomists, so that, in the frame of a given classification, the nomen of each taxon is unique and distinct. All its provisions are subservient to those ends and none restricts the freedom of taxonomic thought or actions.

Nomenclatural accuracy, reliability, automaticity and universality require the strict respect of the Principles and Rules of the *Zoocode* regarding the nomenclatural availability, taxonomic allocation and nomenclatural validity of nomina. The basic Principle for validity is Priority of publication. This Principle may be overcome in exceptional cases and in specified conditions to conserve nomina that are very well known, also outside the community of taxonomists in society at large, but are threatened by senior homonyms or synonyms.

Precision and consistency in the use of terms are essential to a code of nomenclature. The meanings given to terms used in the *Zoocode* are those shown in its Glossary.

The *Zoocode*'s provisions, which have a 'legislative' value, consist in [1] this Preamble, [2] the seven diagrams describing the Nomenclatural Process followed consistently in the *Zoocode*, and which is the basis for the plan and chapters of this text, [3] all the Principles and Rules presented in the Chapters and Articles below, including their examples, as well as [4] its Glossary. These four items are integral parts of the *Zoocode*'s provisions. On the other hand, the Recommendations offered in Appendix of the *Zoocode* have no binding or legislative value, and the decision taken by some zootaxonomists not to follow them has no nomenclatural consequence and can be ignored by others.

4.2. The Nomenclatural Process

The Nomenclatural Process that leads from the publication of a new nomen to its establishment as the valid or an invalid one for a given taxon within the frame of an ***ergotaxonomy*** is shown in the seven diagrams of Figures 2–8, which are integral part of the *Zoocode*.

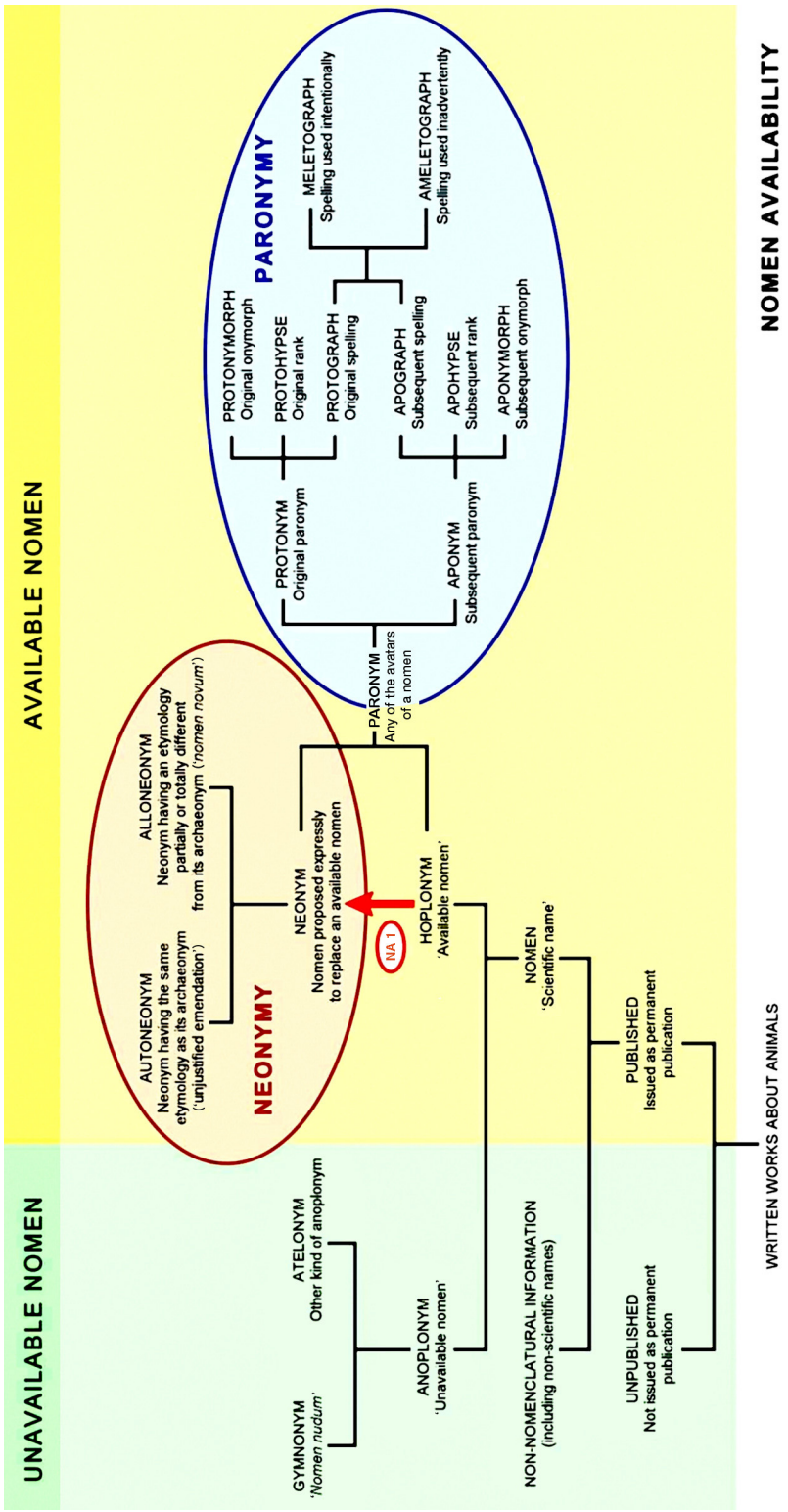

FIGURE 2. Nomenclatural availability of nomina.
The main categories of nomina involved in the first stage of the *Nomenclaturral Process* (***availability***, including nominal-series ***assignment***). Black lines connect categories with subcategories, whereas the red arrow indicates an nomenclatural act or onomatergy (NA 1, replacement of a hoplonym by a neonym). (Modified from Figure 1 in Dubois 2011*a*: 99).

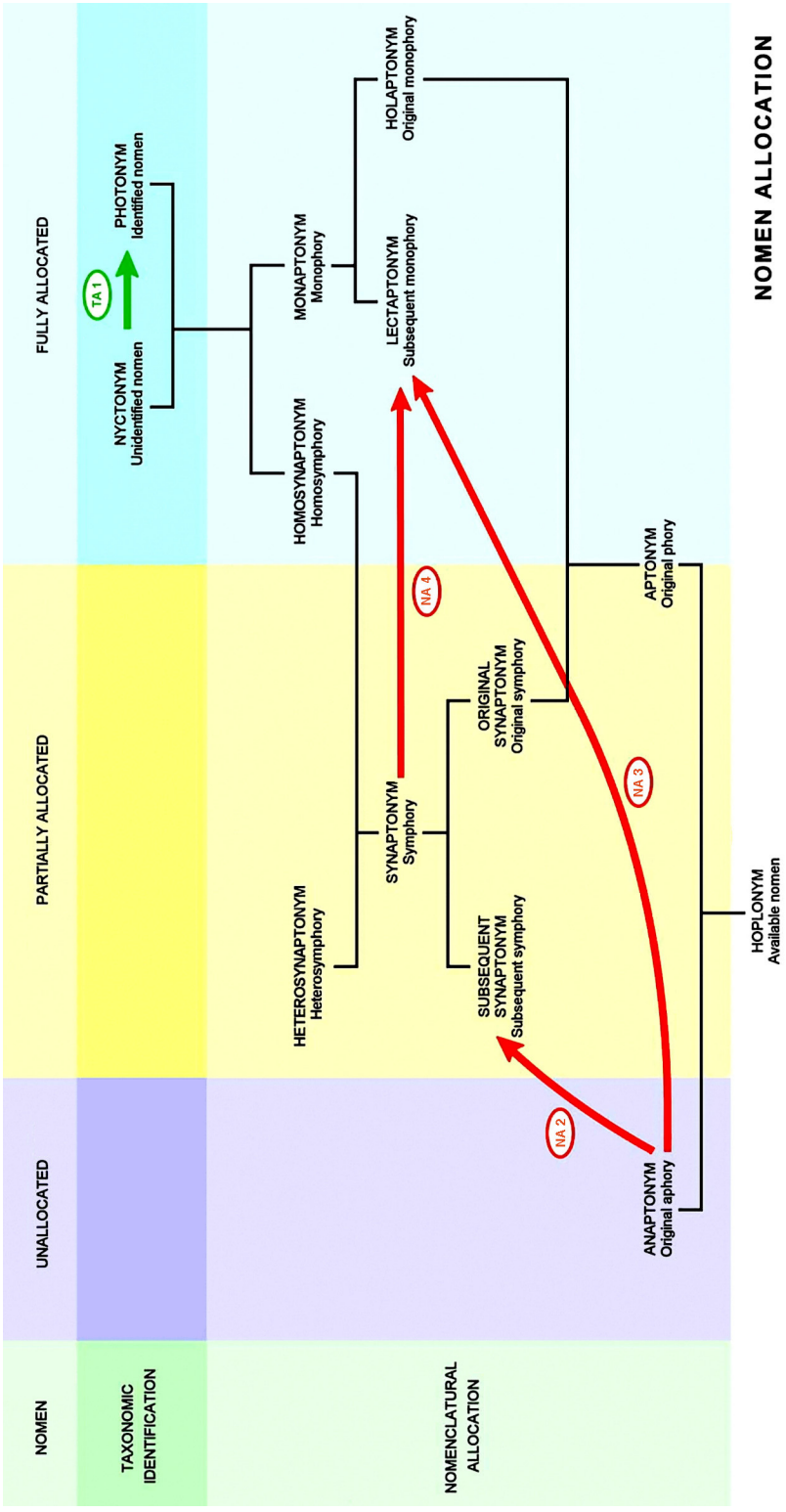

FIGURE 3. Taxonomic allocation of nomina.
The main categories of nomina involved in the second stage of the ***Nomenclatural Process*** (***allocation***). Black lines connect categories with subcategories, whereas the red arrows indicate nomenclatural acts or onomatergies (NA 2, designation of synaptonyms for an anaptonym; NA 3, designation of a lectaptonym for an anaptonym; NA 4, choice of a lectaptonym among synaptonyms) and the green arrow a taxonomic act (TA 1, identification of a monaptonym). (Modified from Figure 4 in Dubois 2011*a*: 102).

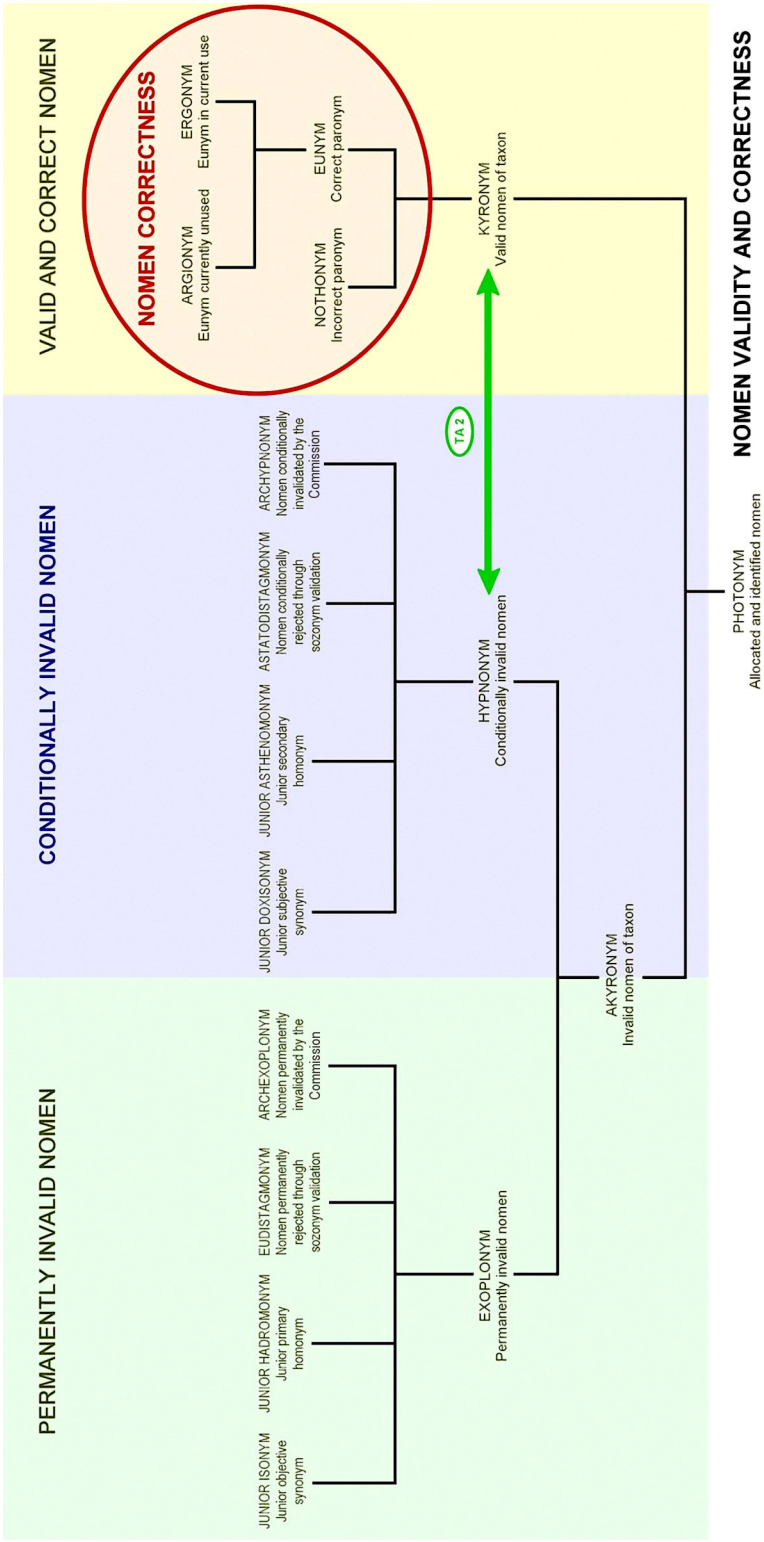

FIGURE 4. Nomenclatural validity and correctness of nomina.
The main categories of nomina involved in the third stage of the *Nomenclatural Process* (***validity and correctness***). Black lines connect categories with subcategories, whereas the green arrow indicates a reversible taxonomic act (TA 2, doxisonymisation of two nomina). (Modified from Figure 5 in Dubois 2011*a*: 103).

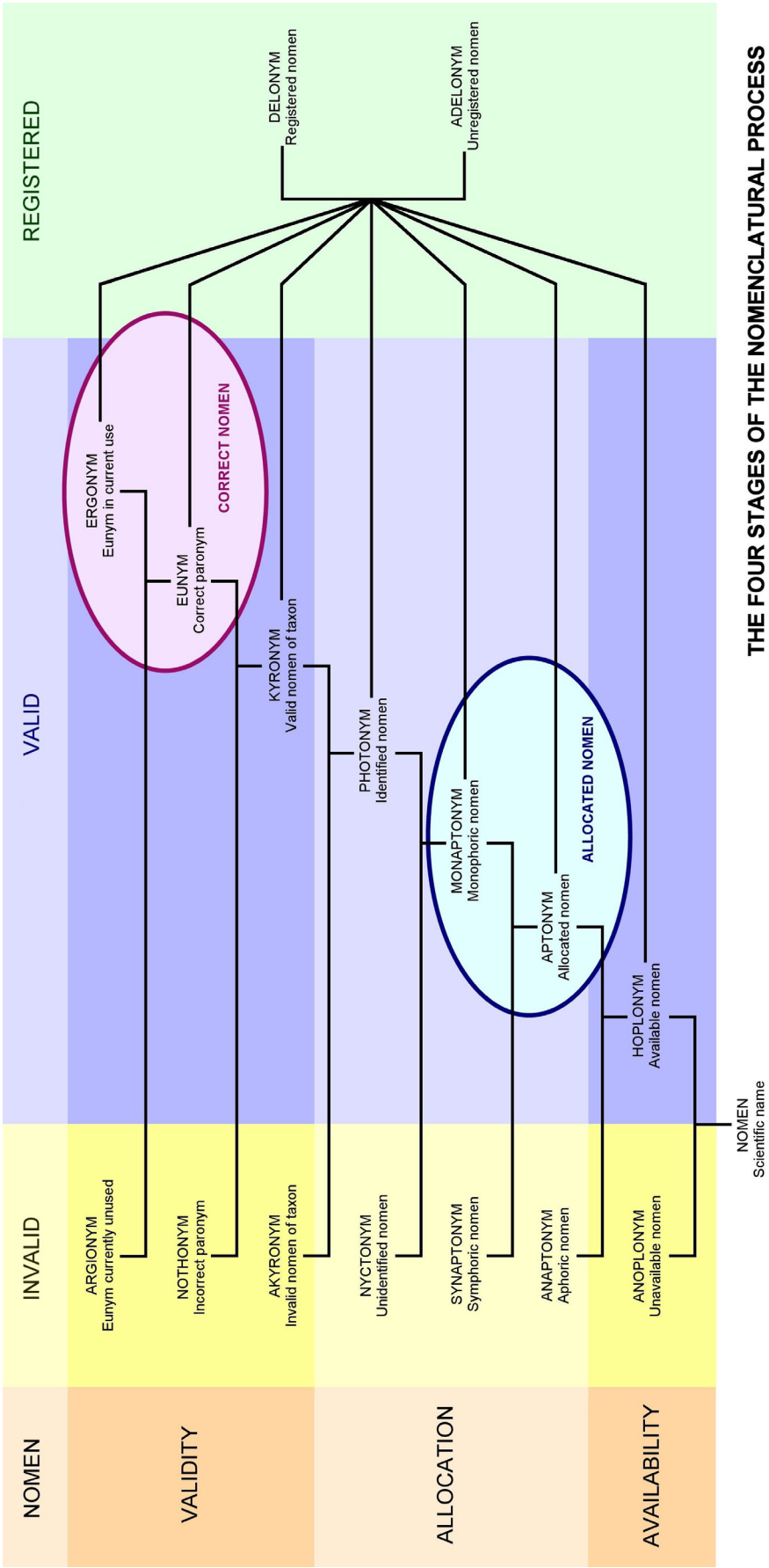

FIGURE 5. The main stages of the Nomenclatural Process.
The four stages of the *Nomenclatural Process* (***availability***, ***allocation***, ***validity and correctness***, ***registration***). Black lines connect categories with subcategories. (Modified from Figure 6 in Dubois 2011*a*: 104).

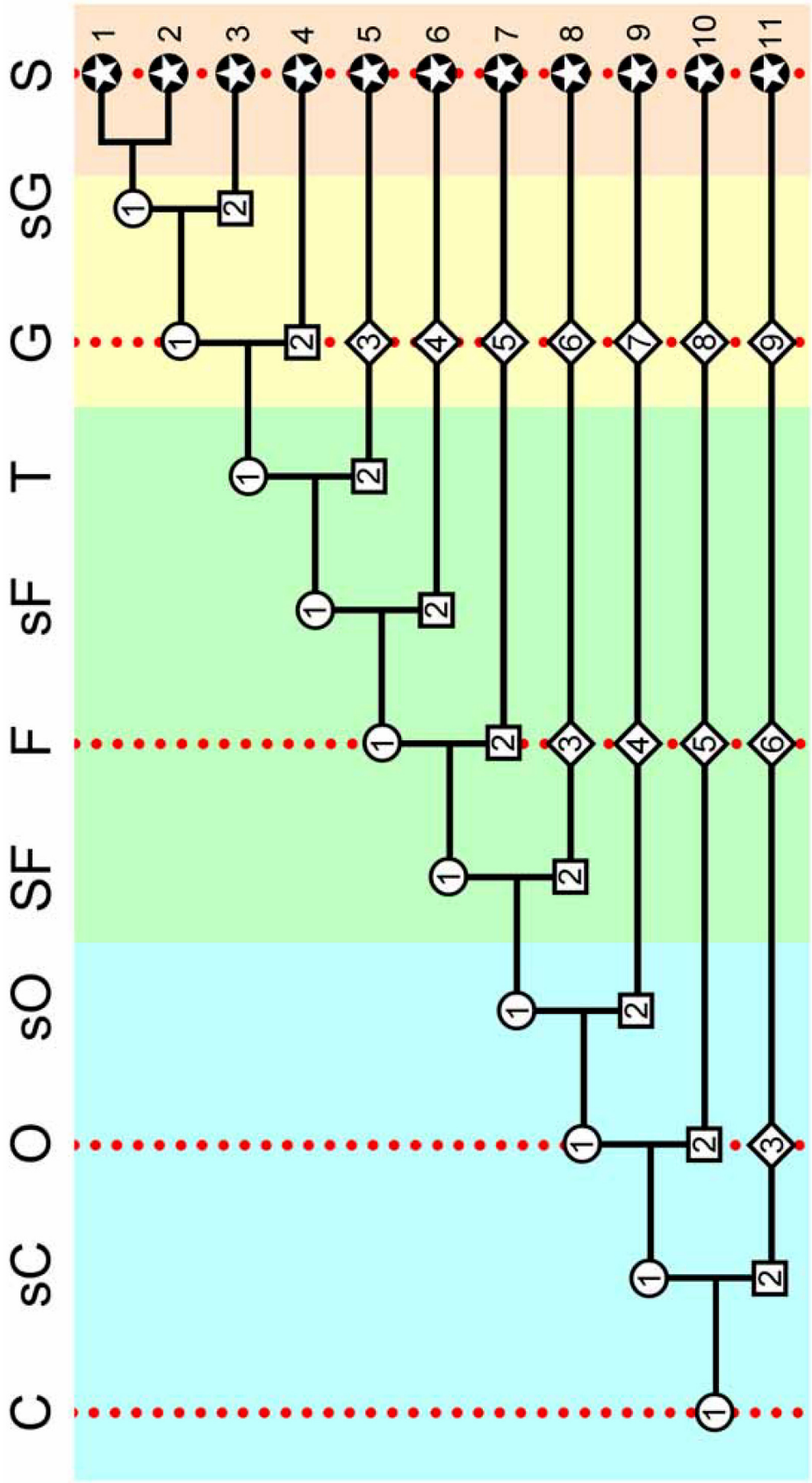

FIGURE 6. Compulsory and optional nomenclatural ranks in zoological nomenclature.
In this figure based on a hypothetic phylogeny, nomenclatural ranks as designated in the upper line are as follows: C, classis; sC, subclassis; O, ordo; sO, subordo; SF, superfamilia; F, familia; sF, subfamilia; T, tribus; G, genus; sG, subgenus; S, species. Background colours indicate the nominal-series in which these ranks belong: blue, class-series; green, family-series; yellow, genus-series; salmon, species-series. Red stippled lines correspond to five major compulsory ranks that must be named in all cases (for details, see Dubois 2007a: 48–50). The reasons for naming these taxa are as follows: [1] star in circle, terminal taxon (species); [2] circle, taxon that must be named because it includes several subtaxa; [3] square, taxon that must be named, although it includes only one species, because, according to the phylogeny presented, it is sister-group to at least one taxon indicated by a circle; [4] diamond, taxon that is not supported by cladistic data, but that must be named for purpose of allowing the nomenclatural hierarchy to play its role of system of storage and retrieval of information. (From Figure 1 in Dubois 2007a: 49).

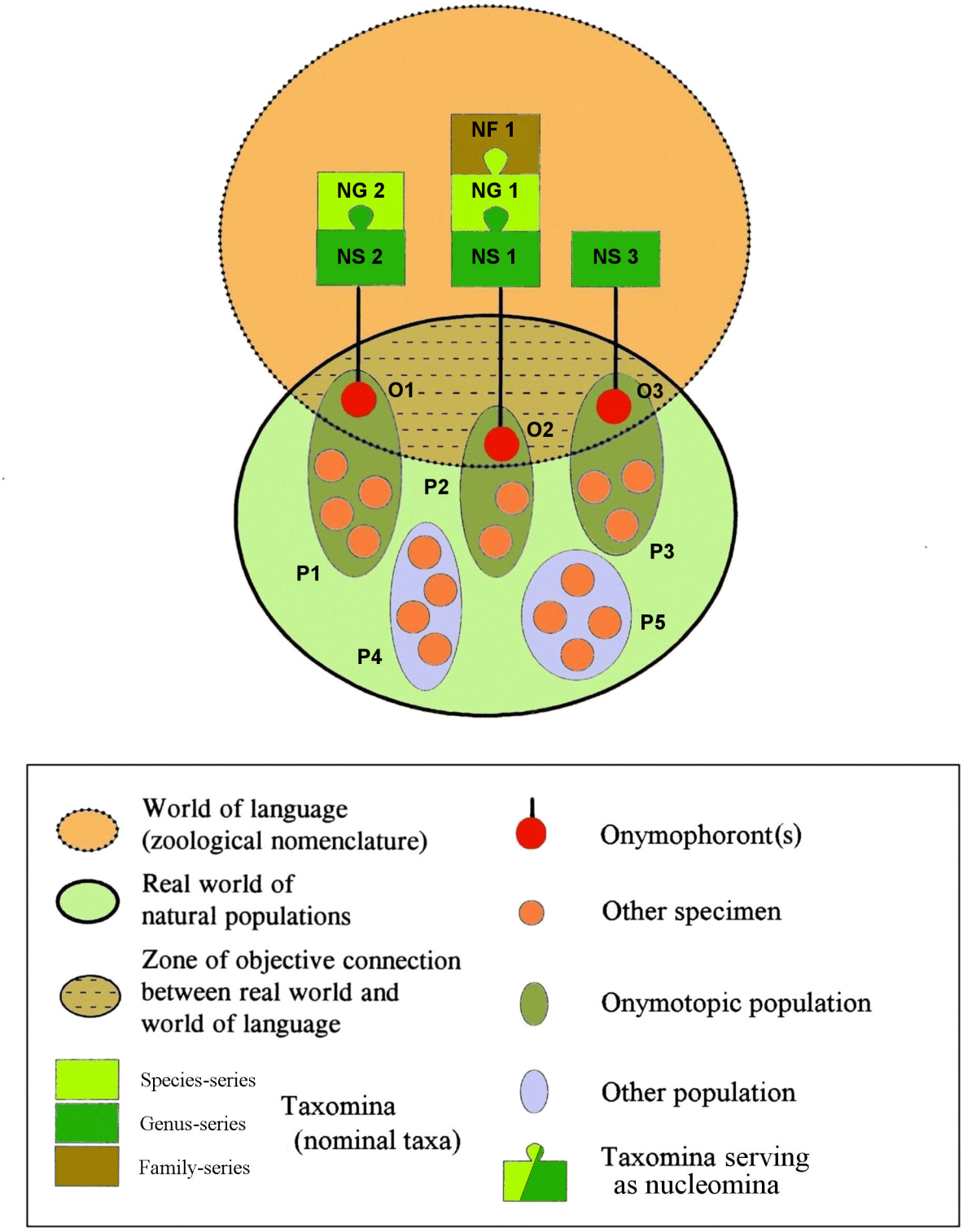

FIGURE 7. Onomatophores.
The role of onomatophores as an objective connection between the real world of populations of organisms and the world of language (zoological nomenclature). NF 1, nominal family; NG 1 and NG 2, nominal genera, one of which (NG 1) is also a nucleogenus; NS 1 to NS 3, nominal species, two of which (NS 1 and NS 2) are also nucleospecies; O1 to O3, onymophoronts; P1 to P5, natural populations. (Modified from Figure 1 in Dubois & Ohler 1997: 304).

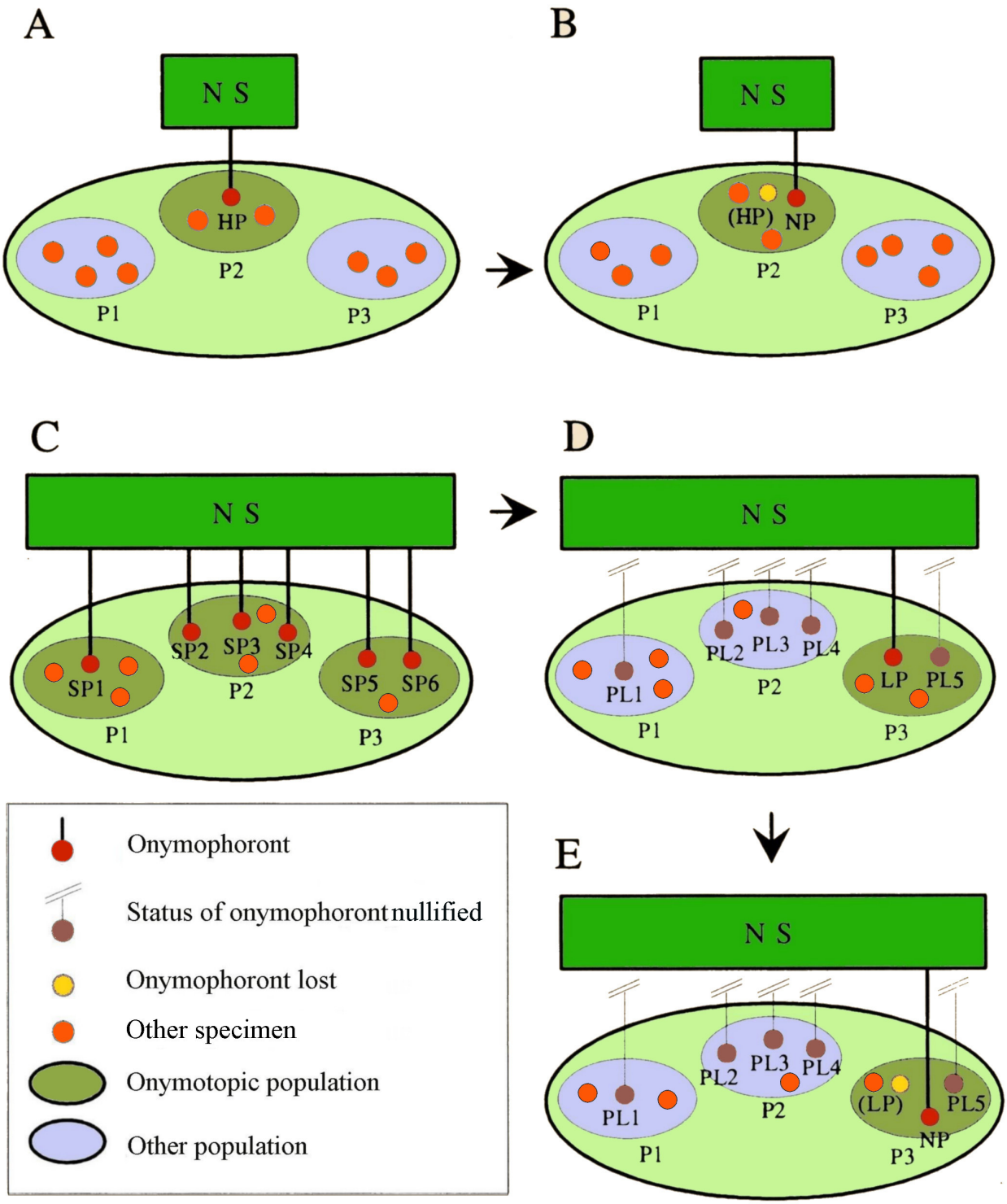

FIGURE 8. Onymophoronts.
The different categories of onymophoronts in zoological nomenclature. HP, holophoront; LP, lectophoront; NP, neophoront; NS, nominal species; P1 to P3, natural populations; PL1 to PL5, exonymophoronts; SP1 to SP6, symphoronts. The figure only shows examples among various other possible situations: for example, exonymophoronts are eligible for neophoront designation in case of loss of first neophoront. (Modified from Figure 2 in Dubois & Ohler 1997: 309).

4.3. Principles of the Linz *Zoocode*

4.3.1. General Principles

4.3.1.1. GEN 1. The Principle of Zoological Nomenclature Independence

The purpose of the *Zoocode* is to provide formal Rules for the following steps of the Nomenclatural Process: [1] the nomenclatural availability of publications, nomina (including nominal-series assignment) and onomatergies (nomenclatural acts); [2] the taxonomic allocation of nomina to taxa recognised by taxonomists; [3] the validity (including correctness) of nomina for the taxa recognised in any formal classification; [4] the registration of the publications, nomina and onomatergies, which may be specified as mandatory or optional. The Nomenclatural Process is independent from taxonomy, i.e. it does not interfere with taxonomic thought and actions, and therefore does not prescribe the choice of a taxonomic paradigm or of criteria for the recognition, discrimination or definition of taxa. It is also completely independent from all other codes of nomenclature in force for other living beings (e.g., algae, fungi, plants, procaryotes or viruses) or based on other basic premises incompatible with those of the *Zoocode* (e.g., the allocation of nomina to taxa through intensional definitions of the latter).

4.3.1.2. GEN 2. The Principle of Nomenclatural Foundation

The nomenclatural status of a nomen is fixed once and for all in the original publication where the nomen is introduced. Except in the cases that fall under the provisions of the Principle of Airesy, this status cannot be modified by subsequent actions of individual zoologists, but only by the Commission or its successor body acting under its Plenary Power.

4.3.2. Principles regulating the nominal-series assignment and nomenclatural availability (Figures 2, 5, 6)

4.3.2.1. AVA 1. The Principle of Nominal-Series (Figure 6)

The *Zoocode*'s nomenclatural hierarchy covers all taxa recognised by taxonomists in the animal kingdom. This hierarchy is divided in five nominal-series: the variety-, species-, genus-, family- and class-series, each of which includes several nomenclatural ranks. The latter are relative ranks. They differ from taxonomic categories or absolute ranks in that they are not based on concepts, defined through biological, evolutionary or other criteria, but are just arbitrary devices used to express the hierarchical taxonomic relationships between taxa, which are meant at reflecting the hypothetical cladistic relationships between them.

Within each series, zootaxonomists can recognise as many ranks as needed, if necessary using special terms (e.g., phalanx or exerge) or prefixes (e.g., sub- or super-) to distinguish them. To become available, a new nomen must be introduced in a work that qualifies as an available publication for the purpose of zoological nomenclature. In this publication, it must be unambiguously referred, either implicitly (before ***a date to be fixed***) or explicitly (after ***a date to be fixed***) to one of these nominal-series. It must follow the Principle of Binomina regarding the number of its words and the Rules of formation of nomina applying to the nominal-series at stake, and the

nominal-series must not overlap hierarchically, i.e. the following conditions must be respected: [1] a nomen referred to a nominal-series and rank should not be introduced subordinate to a nomen referred to a lower nominal-series or rank (e.g. a taxon of rank order cannot be subordinate to a taxon of rank family, a taxon of rank family cannot be subordinate to a taxon of rank genus or subfamily); [2] nomina at different ranks should never be parordinate, i.e., any two taxa subordinate to the same superordinate taxon must be ascribed the same nomenclatural rank, in the same nominal-series; [3] any taxonominal hierarchy must include taxa at seven compulsory ranks (species, genus, family, order, class, phylum and regnum), all other ranks being optional; [4] optional ranks should be used only when at least one parordinate taxon of the same rank is recognised in the same ergotaxonomy; [5] the interposition within a nomenclatural hierarchy of 'informal taxa' at 'informal ranks', or as 'unranked taxa', not being referred to any of the nominal-series and ranks recognised by the *Zoocode*, are incompatible with the latter, and such nomina are nomenclaturally unavailable.

Finally, it must comply with the Rules of availability of nomina.

Any new nomen failing to comply with at least one of the conditions above is nomenclaturally unavailable.

4.3.2.2. AVA 2. The Principle of Binomina

The nomen of a taxon of rank species is a binomen, i.e., a combination of a generic substantive and a specific epithet. The nomen of a taxon of rank subspecies is a trinomen, including a subspecific epithet after the specific epithet. The nomina of all taxa above the species-series are uninomina, i.e., they consist in a single word. Nomina of subgenera, aggregates of species and aggregates of subspecies are uninomina that, when used in a binomen or trinomen, must be interpolated in parentheses between those of their superordinate and subordinate taxa; such nomina are not counted in the number of words of a binomen or trinomen.

An epithet must be either a noun in the genitive or in apposition, or an adjective or a participle agreeing in grammatical gender with the generic substantive. A generic or subgeneric substantive must be a noun in the nominative singular. A family-series nomen must be a noun in the nominative plural based on the stem of an available generic substantive then considered as valid, and followed by an ending which indicates the rank in which it is used. A class-series nomen must be a noun in the nominative plural. Epithets must begin with a lower-case letter, and all other nomina with an upper-case letter.

4.3.2.3. AVA 3. The Principle of Coordination

In the family-, genus- and species-series, a nomen introduced for a taxon at any rank of the nominal-series is deemed to be simultaneously introduced for any other taxon at any other rank of the same nominal-series. Whenever indeed used for such other taxa, these are not different nomina but different paronyms of the same nomen, having the same onomatophore, author and date, but having different scriptors. They are modified whenever appropriate, either in their spelling (in the family-series) or in their onymorph (in the species-series), but not in the genus-series.

The Principle of Coordination does not apply in the class-series, except in the case of a taxon that includes only one taxon of the just subordinate rank (e.g., a class with a single order), in which cases both taxa bear the same nomen, with the same onomatophore, author and date.

Whenever an author wishes to mention the nomina of several hierarchically related taxa in a single expression, underscores can be used to connect several nomina of the same nominal series, starting with that applying to the highest ranked taxon.

Examples: '*Rana_Rana*' for 'genus *Rana*, subgenus *Rana*'; '*Rana_*' for 'genus *Rana*'; '*_Rana*' for 'subgenus *Rana*'.

4.3.2.4. AVA 4. The Principle of Neonymy

The publication of the explicit replacement of an available nomen by a different nomen results in the introduction in zoological nomenclature of a neonym, which has the same onomatophore as the replaced nomen (archaeonym) but a different author and a different date. A neonym having the same etymology as its archaeonym is an autoneonym, whereas a neonym having a partially or completely different etymology is an alloneonym.

Allelonyms are alternative nomina published in the same work for the same taxon. They have the same onomatophore, author and date.

4.3.3. Principle regulating the taxonomic allocation of nomina (Figures 3, 5, 7, 8)

4.3.3.1. ALL 1. The Principle of Onomatophores

Each nomen has, actually or potentially, an onomatophore, i.e., an objective standard of reference of inclusive ostension whereby the taxonomic allocation of the nomen can be determined. In any given ergotaxonomy, the nomen can be potentially applied to any taxon that includes its onomatophore. In the species-series, onomatophores are specimens (onymophoronts), whereas in the genus- and family-series they are nomina (nucleomina): nucleospecies in the genus-series and nucleogenera in the family-series.

4.3.4. Principles regulating the validity of nomina and the correctness of paronyms (Figures 4, 5)

4.3.4.1. VAL 1. The Principle of Zygoidy

Within the frame of a given ergotaxonomy, a taxon at a given rank must bear a single nomen with a single spelling. Different situations of conflict of zygoidy may be distinguished: [1] zygonymy: conflict between homonymous or synonymous nomina competing for validity; [2] zygography: conflict between spellings competing for correctness; and [3] zygophory: conflict between onomatophore restrictions or designations competing for validity. These conflicts must be resolved, according to the situation, through use of the appropriate one among the following five Principles: Priority, Airesy, Proedry, Nomography and Sozoidy.

4.3.4.2. VAL 2. The Principle of Homonymy

Whenever two nomina of the same nominal-series are strictly identical (homographs) or deemed to be identical under the Rules of the *Code* (rhizomographs or paromographs), only one can be

potentially valid (if not invalid for another reason). In the genus- and family-series, homonymy is absolute and irreversible (hadromonymy), but in the species-series it can be either absolute and irreversible (hadromonymy) or relative and reversible (asthenomonymy).

The potentially valid nomen among homonyms is determined, according to the situation, by one of the Principles regulating nomenclatural precedence among nomina involved in a relation of zygoidy.

The Principle of Homonymy does not apply [1] between homonymous epithets combined with homonymous but distinct generic substantives (pseudomographs); [2] between nomina of distinct nominal-series (hemihomonyms).

4.3.4.3. VAL 3. The Principle of Synonymy

Whenever two nomina of the same nominal-series are based on the same onomatophore (isonyms, which include allelonyms) or considered as synonyms in a given ergotaxonomy despite being based on different onomatophores (doxisonyms), only one can be potentially valid (if not invalid for another reason).

The Principle of Synonymy only applies between nomina of the same nominal-series, not of distinct ones (synotaxy).

4.3.4.4. VAL 4. The Principle of Priority

In any situation of allochronous zygoidy, the first published zygonym (homonym or synonym), zygograph (competing parograph) or zygophory (competing airetophory) has precedence, except if the Principles of Nomography or Sozoidy apply.

The Principle of Priority only applies between nomina of the same nominal-series, not of distinct ones.

4.3.4.5. VAL 5. The Principle of Airesy

In any situation of synchronous zygoidy, precedence among zygonyms (homonyms or synonyms), zygographs (competing parographs of a nomen) or zygophories (competing airetophories for a nomen) is fixed by the action of an arbiter publishing an explicit act of airesy, i.e. seniorisation of one item and juniorisation of the other(s), removing this ambiguity. This airesy is definitive and irreversible by subsequent actions of individual authors. It may however be superseded by other Principles of Validity.

The Principle of Airesy only applies between nomina of the same nominal-series, not of distinct ones.

4.3.4.6. VAL 6. The Principle of Proedry

Whenever zygonyms (homonyms or synonyms) are introduced simultaneously, but proposed at different ranks within their nominal-series, the nomen proposed at higher rank has precedence. The same applies between synchronous zygophories (competing airetophories) if they concern taxa at different ranks: the designation made for the taxon at higher rank has precedence.

The Principle of Proedry only applies between nomina of the same nominal-series, not of distinct ones, and only between nomina published exactly at the same date.

4.3.4.7. VAL 7. The Principle of Nomography

In a given ergotaxonomy, any kyronym at a given rank can have a single correct spelling (eugraph), which can be either its protograph or one of its apographs, particularly in cases of mandatory spelling or ending correction. In the species-series, the eugraph consists in the spelling of the whole parograph, including its mandatory ending correction if relevant. In the genus-series, the eugraph consists in the spelling of the whole parograph. In the family-series, the eugraph consists in the correct stem of the nomen (eurhizograph) to which a suffix is added. This suffix is either mandatory in the fully regulated ranks of the family-series (family, superfamily, subfamily, tribe and subtribe), or left to the freedom of taxonomists in the other ranks of this nominal-series, provided it is stated to indicate nominative plural.

4.3.4.8. VAL 8. The Principle of Sozoidy

In any nominal-series, among two or more zygonyms (homonyms or synonyms), whenever one qualifies as a sozonym, i.e., has been used since its introduction either universally or significantly in the systematic and non-systematic scientific literature (i.e., appearing in the titles of at least 100 publications after 31 December 1899) whereas none of its zygonyms has been used so for the same taxon or closely related taxa, it must be given precedence for validity (if not invalid for another reason) over its senior or seniorised zygonym(s). The same applies to two or more zygographs (competing parographs of a nomen) if one of them qualifies as a sozograph, i.e., complies with the same criteria, or to two or more zygophories, if one of them qualifies as a ***sozairetophory***, i.e. results in the validation of a sozonym.

The Principle of Sozoidy only applies between nomina of the same nominal-series, not of distinct ones.

4.3.4.9. VAL 9. The Principle of Archoidy

In case of nomenclatural ambiguity, uncertainty or conflict, liable to disturb the universality of zoological nomenclature and to cause confusion, the Commission or its successor body may be conferred Plenary Power to take a specific action aiming at solving the problem. In order to do so, it is entitled to set aside, as needed, any existing Rule of the *Zoocode* (except those concerning the powers and duties of the respective internationally accepted regulatory body).

4.3.5. Principle regulating the registration of nomina, onomatergies and graphies (Figure 5)

4.3.5.1. REG 1. The Principle of Registration

The nomenclatural status of publications, nomina, spellings and onomatergies may be fixed and registered online, and therefore protected from oblivion and rejection, in an international open database recognised by the Commission or its successor body as appropriate for this purpose, and

mirrored in regular paper publications under the responsibility of the Commission. Three kinds or categories of registrations exist: [1] post-registration of decisions of the Commission under the Plenary Power regarding nomenclatural availability (of works, nomina and/or onomatergies), taxonomic allocation (of nomina) and validity and correctness (validity of nomina and/or onomatergies; correctness of spellings of nomina); [2] post-registration of availability/unavailability of nomina duly listed in *LANs* (which however has no bearing on the availability/unavailability of nomina missing in these lists); [3] pre-registration on *Zoobank*, respecting all the *Code*'s requirements in this respect, of new works, nomina and onomatergies before online publication of the work.

5. CONCLUSION

The *Code* was not built at once, but was the result of a long historical process (Melville 1995; Dubois 2011*a*). The first classifications of animals and plants were published without statements about the 'rules' followed to build them. In zoology, although the tenth edition of the *Systema Naturae* of Linnaeus (1758) was arbitrarily fixed as the beginning of scientific nomenclature, this author had already published his ideas about 'nomenclatural rules' previously (Linnaeus 1735, 1736*a–b*). Several authors (e.g. Rafinesque-Schmaltz 1814, Rafinesque 1815) later proposed their own 'systems', until a British committee tried to unify these systems (Strickland *et al.* 1843). Finally, after a long debate, an international committee established by Raphaël Blanchard published in France the first international comprehensive proposal (Blanchard 1905), which for the first time was written in three languages (French, English and German). This document, the *Règles Internationales de la Nomenclature Zoologique*, was in fact the first edition of the current *Code*. It was followed by the *Copenhagen Decisions on Zoological Nomenclature* (Hemming 1953) and by four editions of the complete bilingual (English and French) *Code* (Anonymous 1961, 1964, 1985, 1999), and in the meanwhile by various 'Declarations' and Amendments published isolatedly. The decision to renumber the first bilingual edition published in 1961 in England the 'first edition' of the *Code* was misleading as it is just a revised version of the *Règles*, and the current Commission is just the continuation of the committee established by Blanchard.

The historical continuity between these successive documents is important. Even if the nomenclatural Rules currently followed by zootaxonomists are now quite different from those followed at the beginning of the 20th century, there is a historical continuity between them. In order to make this continuity visible, the Commission has cared for keeping the same plan in all these documents, and, as far as possible, the same numbers for these Articles. This has had a practical advantage for practicing zootaxonomists, allowing them to 'recognise' these Articles despite their changes. But this has had a negative consequence: that of freezing the structure of the *Code*. Unfortunately, as first pointed out by Dubois (2008*a,c*, 2011*a*), this structure is not good at all, being illogical and preventing taxonomists from grasping the fact that the Rules follow a clear Nomenclatural Process with four main stages and additional substages (Dubois 2005*a–d*).

In the recent decade, the Commission has been very 'shy' and has cared from not introducing major changes in the *Code*, except for some 'technical' aspects, dealing mostly with new modes of publications (optical disks in Anonymous 1999; electronic publications in Anonymous 2012), and in both cases with quite questionable results. But few other basic questions were the matter of decisions, and many conceptual problems of the *Code*, including those raised in the present document, remain unsolved. The well-known reluctance of the Commission (see e.g. Dubois

2005*b*–*c*, 2017*b*; Laurin 2008) to listen to the comments and suggestions of colleagues who are not part of this exclusive group may have played a role in this respect.

Following the paper by Dubois (2011*a*), the 2014 Linz meeting (Dubois *et al.* 2016) allowed an international group of practicing taxonomists to meet and discuss openly these questions. During the Linz meeting, André Nemésio from Brazil presented a lecture in which he argued that: [AH1] the Commission is unbalanced, being Europe- and USA-centered; as such, it does not adequately represent the international community of zootaxonomists; [AH2] commissioners are not elected by the international community of taxonomists, but first co-opted by previous commissioners and later only 'sanctioned' by the International Union of Biological Sciences (IUBS); [AH3] the legitimacy of the Commission is therefore questionable and the establishment of a new, open society allowing free discussions and proposals should be seriously considered[1].

The main result of the Linz meeting was the establishment of a permanent committee, the Linz *Zoocode* Committee, which decided to work on proposals of drastic changes in the *Code*, in the aim to submit it to the international community of zoologists, as other taxonomists have done in the past (e.g.: Green 1925; Dennler 1939; Simpson 1940, 1960; Williams 1940; Smith 1949, 1962; Blackwelder *et al.* 1950; Follett 1955; Schopf 1960; Smith & Smith 1973; Smith & Pérez-Higareda 1986).

The first outcomes of the work of this Committee are presented in the present paper. They include the Preamble and the Principles of the *Zoocode*, the description of the Nomenclatural Process and a first instalment of the *Zoocode*'s Glossary.

These proposals are hereby made public in order to solicit comments and suggestions from all members of the international community of zootaxonomists. We hope that some at least of our suggestions will soon be incorporated in the *Code*, and that for the other ones a fruitful, free and public discussion will develop among the community, the Commission and the LZC. Of course, we are conscious that a 'schism' between two competing codes, like that which already occurred between the *Code* and the *Phylocode*, would be detrimental to zoological nomenclature and, by way of consequence, to the science of biology as whole. But on the other hand we think the questions we raised in the present document (and in some others listed in Table 1 above) are really important questions, and that sweeping them aside without discussion, as was done by the Commission in many cases, e.g. for the points raised by Dubois *et al.* (2013), is also harmful to zoological nomenclature and to biology, and is in fact unacceptable.

The LZC is not a closed group. It is open to all zootaxonomists who share its concerns and aims, and who agree with the main consensual premises outlined in Chapter 2 above under the points [B1] to [B7]. All interested colleagues are welcome to apply for co-option by the Committee as additional members, either as active members or as observers.

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1. The question of 'legitimacy' is a complex one, which has strong societal and political implications and would require a long discussion by itself, but it is clear that, in the end, the legitimacy of people or groups of people who consider themselves entitled to speak 'in the name of others' cannot be decreted 'from the top' and stands only as long as the community that they pretend to 'represent' agrees to follow them.

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7. APPENDIX 1. GLOSSARY OF THE *ZOOCODE* (FIRST INSTALMENT)

Technical nomenclatural terms used in the *Zoocode* and their correspondence with terms used in the *Code*, if available

Structure of entries

Grammatical category of term
a: adjective
ab: abbreviation
av: adverb
e: expression composed of several terms
n: noun
p: past participle
pl.: plural
v: verb

Domain of application of term
AL: taxonomic allocation
AS: nominal-series assignment
AV: nomenclatural availability
CO: nomenclatural correctness
NO: all nomenclatural stages
TA: taxonomy
VA: nomenclatural validity
XE: term used in other domains but not in zoological nomenclature

Etymology of term (only for technical terms coined especially for nomenclature and taxonomy)
G: Greek
L: Latin

Abbreviation and definition of term, with comments and/or mention of related terms if relevant
ANG: Angionym: term designating a superordinate class
ANT: Antonym: term of opposite meaning
END: Endonym: term designating a subordinate class
ETY: Etymology of term
SYN: Synonym: term of same meaning

Reference to first publication of the term

Equivalent term or expression used in the* Code *for the same concept, if available

Adoption by the LZC of the term for the* Zoocode *and its Glossary
Date of adoption of the term and its definition by the LZC for the *Zoocode* and its Glossary, followed by the reference of the publication of this decision in *Dumerilia.*

Use of italics and bold
Bold characters are used only for the titles of entries. In definitions, terms in ***bold italics*** are defined elsewhere in this Glossary, but terms between 'simple quotation marks' are not. Terms in *italics* are involved in the etymology of a term used here.

Access, *v*. ● See ***Accessibility***.

Accessibility, *n.* (***access***, *v*; ***accessible***, *a*). ● AV. ● Of a preserved specimen kept in a collection: the possibility for a qualified taxonomist to examine and study it. ● Common language term, introduced in zoological nomenclature with a formal definition by Dubois & Aescht (2017*g*). ● *Code*: no term. ● 01.03.17 (Dubois & Aescht 2017*g*).

Accessible, *n.* ● See ***Accessibility***.

Act, *n.* ● NO. ● See ***Onomatergy***.

Action, *n.* ● NO. ● See ***Onomatergy***.

Actual combination, *e.* ● NO, TA. ● A combination that appears in a publication, either as complete (the generic substantive being written in full) or incomplete (the generic substantive being mentioned only by its initial). ● Dubois & Aescht 2019*k*: 75. ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*k*).

Adelonym, *n.* ● RE. ● G: ἀ- (*a-*), 'without'; δηλος (*delos*), 'visible, evident, plain, clear'; ὄνομα (*onoma*), 'name'. ● Unregistered nomen, thus unprotected against potential invalidation through ***sozonym*** or ***sozodiaphonym*** validation. ● **ANT**: ***delonym***. ● Dubois 2011*a*: 77. ● *Code*: no term. ● 06.09.19 Dubois & Aescht (2019*x*).

Airesy, *n.* ● NO. ● **ETY**: G: αἵρεσις (*airesis*), 'choice, election'. ● A category of ***onomatergy***: any action of resolution of uncertainties and ambiguities which may have remained after a ***catastasy*** (original publication of a nomen): e.g., designation of a single specimen or nominal taxon as onomatophore of a nomen introduced without this information. Airesies consist either in choices between several possibilities or in the brand new introduction of missing information: e.g., listing subsequently included specimens or nominal taxa in a nominal taxon which until then missed them. Choices made in airesies are left to the freedom of individual authors, but in some cases the *Zoocode* provides Recommendations in this respect (e.g., the Recommendations of [Article 74 of the *Code*, to be renumbered] concerning the designations of lectotypes). Once published, an airesy is irreversible and cannot be modified by individual authors but only through archoidy. ● Dubois 2013: 3, 6. ● *Code*: first reviser action. ● 06.03.18 (Dubois & Aescht 2019*j*).

Airetophory, *n.* ● AL. ● **ETY**: G: αιρετός, *airetos*, 'chosen, elected'; φέρω, *phero*, 'I bear, I carry'. ● A category of ***airesy***. Subsequent restriction or designation of onomatophore for a nomen. ● Dubois 2013: 5. ● *Code*: no term. ● 06.03.18 (Dubois & Aescht 2019*j*).

Akyronym, *n.* ● VA. ● G: ἄκῡρος (*akyros*), 'invalid, incorrect'; ὄνομα (*onoma*), 'name'. ● Invalid ***hoplonym*** for a given ***ergotaxon*** in a given ***ergotaxonomy***. ● **ANT**: ***kyronym***. ● Dubois 2000: 51. ● *Code*: no term. ● 11.03.19 (Dubois & Aescht 2019*s*).

Allelonym, *n.* ● AV. ● **ETY**: G: ἀλλήλων (*allelon*), 'the one… the other…'; ὄνομα (*onoma*), 'name'. ● One of two (or several) synonymous nomina used both (or all) as valid for the same taxon (having the same content) in the same publication. ● Dubois 2006*a*: 183, 2011*a*: 41. ● *Code*: no term. ● 15.02.18 (Dubois & Aescht 2019*g*).

Allelonymy, *n.* ● AV, VA, TA. ● A category of ***synonymy***: the fact that two (or several) alternative nomina (***allelonyms***) are proposed or adopted as valid for the same taxon in the same publication. ● Dubois 2013: 15. ● *Code*: no term. ● 24.05.18 (Dubois & Aescht 2019*o*).

Allocate, *v.* ● AL. ● See ***Allocation***.

Allocated, *p.* ● AL. ● Qualification of a nomen (***aptonym***) that conforms to the conditions of taxonomic allocation as regulated by the *Zoocode*. ● **ANT**: ***unallocated***. ● Dubois 2005*c*: 396. ● *Code*: no term. ● 26.04.16 (Dubois & Aescht 2016*g*).

Allocation, *n* (***allocated***, *p*; ***allocate***, *v*). ● AL. ● ***Onomatergy*** regulated by the *Zoocode* by which a nomen becomes attached to a taxon or several taxa in zoological nomenclature, under a given system of allocation of nomina to taxa (e.g., through ***onomatophores*** or through 'phylogenetic definitions'). In the *Zoocode*, this act gives its name to the second floor or stage of the ***Nomenclatural Process***. ● Dubois 2005*c*: 369. ● *Code*: no term. ● 26.04.16 (Dubois & Aescht 2016*g*).

Allochronous, *a.* ● AV, VA. ● **ETY**: see ***allochrony***. ● In the context of zoological nomenclature, the fact that two publications were publicly distributed at different dates. ● **ANT**: ***synchronous***. ● Common language term; Dubois 2013. ● *Code*: no term. ● 15.02.18 (Dubois & Aescht 2019*g*); 31.05.18 (Dubois & Aescht 2019*p*).

Allochrony, *n* (***allochronous***, *a*). ● AV, VA. ● **ETY**: ἄλλος (*allos*), 'other'; χρόνος (*chronos*), 'time'. ● Distinct events that occurred at different dates. ● **ANT**: ***synchrony***. ● Common language term; Dubois & Aescht 2019*g*: 50, 51. ● *Code*: no term. ● 15.02.18 (Dubois & Aescht 2019*g*).

Alloneonym, *n.* ● AV. ● **ETY**: G: ἄλλος (*allos*), 'other'; νέος (*neos*), 'new'; ὄνομα (*onoma*), 'name'. ● ***Neonym*** having a partially or totally different etymology from its ***archaeonym***, i.e., not directly derived from it through unjustified emendation. ● **ANT**: ***autoneonym***. ● Dubois 2000: 52. ● *Code*: new replacement name, nomen novum. ● 15.02.18 (Dubois & Aescht 2019*g*).

Ameletograph, *n.* ● AV. ● **ETY**: G: ἀμελής (*ameles*), 'inattentive, careless'; γράφω (*grapho*), 'I write'. ● Spelling of a nomen used inadvertently in a publication by an author, editor or publisher. ● **ANT**: ***meletograph***. ● Dubois 2000: 54 (as ***ameletonym***), 2010*b*: 7. ● *Code*: no term. ● 11.03.19 (Dubois & Aescht 2019*s*).

Ameletonym, *n.* ● See ***Ameletograph***.

Anaptonym, *n.* ● AL. ● **ETY**: G: ἀν- (*an-*), 'without'; ἅπτω (*apto*), 'I fasten, I attach, I fix'; ὄνομα (*onoma*), 'name'. ● Nomenclaturally unallocated nomen according to the Rules of the *Zoocode* for not being clearly attached to an

onomatophore. ● **ANT**: ***aptonym***. ● Dubois 2011*a*: 25, 78. ● *Code*: one of the meanings of the ambiguous designation 'nomen dubium'. ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*x*).

Angionym, *n.* ● NO. ● **ETY**: G: ἀγγεῖον (*aggeion*), 'hull, capsule'; ὄνομα (*onoma*), 'name'. ● [1] General meaning: term designating a superordinate class. [2] Specialised meaning in nomenclature: nomen which applies to an ***angiotaxon*** in a given ***ergotaxonomy***. ● Dubois & Aescht 2019*k*: 75. ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*k*).

Angiotaxon, *n.* ● TA. ● **ETY**: G: ἀγγεῖον (*aggeion*), 'hull, capsule'; τάξις (*taxis*), 'order, arrangement'. ● Any taxon which is superordinate to another taxon (its ***endotaxon***) in a given ***ergotaxonomy***. ● Dubois 2005*c*: 406. ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*k*).

Anoplonym, *n.* ● AV. ● **ETY**: G: ἄνοπλος (*anoplos*), 'unarmed'; ὄνομα (*onoma*), 'name'. ● Published but nomenclaturally unavailable nomen according to the Rules of the *Code*. ● **ANT**: ***hoplonym***. ● Dubois 2000: 50. ● *Code*: unavailable name. ● 21.04.18 (Dubois & Aescht 2019*k*).

Antonym, *n.* ● XE. ● **ETY**: G: ἀντί (*anti*), 'against, in front of'; ὄνομα (*onoma*), 'name'. ● Any of two words having opposite meanings. ● Term in traditional use in general language, grammar and linguistics. ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*k*).

Aphoric, *a.* ● See ***aphory***. ● 06.09.19 (Dubois & Aescht 2019*x*).

Aphory, *n* (***aphoric***, *a*). ● AL. ● **ETY**: G: ἀ- (*a*-), 'without'; φέρω (*phero*), 'I bear'. ● Qualification of a nomen created without any ***onomatophore***. ● Dubois 2005*c*: 404. ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*x*).

Apoasthenomonym, *n.* (***apoasthenomonymy***, *n*). ● AV, VA. ● **ETY**: G: ἀπό (*apo*), 'from, away from'; ἀσθενής (*asthenes*), 'weak'; ὁμός (*homos*), 'the same'; ὄνομα (*onoma*), 'name'. ● Any of two (or more) ***asthenomonyms*** subsequently referred to the same ***mutogenus*** not being the ***priscogenus*** of any of them. Under the *Zoocode*, the junior one is invalid as long as both epithets remain referred to this mutogenus as their ***rectogenus***. ● Dubois & Aescht 2019*k*: 76. ● *Code*: secondary homonym (in part). ● 21.04.18 (Dubois & Aescht 2019*k*).

Apoasthenomonymy, *n.* ● AV, VA. ● **ETY**: see ***apoasthenomonym***. ● The fact that two distinct nomina are ***asthenomonyms***. ● Dubois & Aescht 2019*k*: 76. ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*k*).

Apograph, *n.* ● NO. ● **ETY**: G: ἀπό (*apo*), 'away from, far from'; γράφω (*grapho*), 'I write'. ● Any subsequent ***parograph*** of an existing nomen. ● **ANT**: ***protograph***. ● Dubois 2010*b*: 6. ● *Code*: subsequent spelling. ● 01.02.18 (Dubois & Aescht 2019*f*); 21.04.18 (Dubois & Aescht 2019*k*).

Apohadromonym, *n.* (***apohadromonymy***, *n*). ● AV, VA. ● **ETY**: G: ἀπό (*apo*), 'from, away from'; ἁδρός (*hadros*), 'robust'; ὁμός (*homos*), 'the same'; ὄνομα (*onoma*), 'name'. ● Any of two (or more) ***hadromonyms*** among which the junior one was subsequently referred to a ***mutogenus*** and ***rectogenus*** being the ***priscogenus*** of the senior one. Under the *Zoocode*, the junior one is permanently invalid. ● Dubois & Aescht 2019*k*: 76. ● *Code*: secondary homonym (in part). ● 21.04.18 (Dubois & Aescht 2019*k*).

Apohadromonymy, *n.* ● AV, VA. ● **ETY**: see ***apoasthenomonym***. ● The fact that two distinct nomina are ***apoasthenomonyms***. ● Dubois & Aescht 2019*k*: 76. ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*k*).

Apohypse, *n.* ● AV. ● **ETY**: G: ἀπό (*apo*), 'away from, far from'; υψος (*hupsos*), 'height'. ● Any subsequent ***parohypse*** of a nomen. ● **ANT**: ***protohypse***. ● Dubois 2010*b*: 6. ● *Code*: no term. ● 01.02.18 (Dubois & Aescht 2019*f*).

Aponym, *n.* ● AV, CO. ● **ETY**: G: ἀπό (*apo*), 'away from, far from'; ὄνομα (*onoma*), 'name'. ● Any subsequent ***paronym*** of an existing nomen, modified in spelling (***apograph***), rank (***apohypse***) and/or, if relevant, onymorph (***aponymorph***). An aponym is introduced by its ***scriptor***. ● **ANT**: ***protonym***. ● Dubois 2000: 51. ● *Code*: no term. ● 31.03.16 (Dubois & Aescht 2016*e*).

Aponymorph, *n.* ● AV, CO. ● **ETY**: G: ἀπό (*apo*), 'away from, far from'; ὄνομα (*onoma*), 'name'; μορφή (*morphe*), 'form, shape'. ● Any subsequent ***paronymorph*** of a nomen. ● **ANT**: ***protonymorph***. ● Dubois 2010*b*: 6. ● *Code*: no term. ● 01.02.18 (Dubois & Aescht 2019*f*).

Aptonym, *n.* ● AL. ● **ETY**: G: ἅπτω (*apto*), 'I fasten, I attach, I fix'; ὄνομα (*onoma*), 'name'. ● Nomenclaturally allocated nomen according to the Rules of the *Zoocode*, i.e., being clearly attached to an ***onomatophore***. ● **END**: ***monaptonym*** and ***synaptonym***. ● **ANT**: ***anaptonym***. ● Dubois 2011*a*: 25, 79. ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*x*).

Arbiter, *n.* ● NO. ● **ETY**: L: *arbiter*, 'umpire, arbitrator'. ● Author of an ***airesy***, i.e. an ***onomatergy*** resolving a conflict of ***zygoidy***. ● Dubois 2013: 3. ● *Code*: first reviser. ● 31.05.18 (Dubois & Aescht 2019*p*).

Archaeonym, *n.* ● AV. ● **ETY**: G: ἀρχαῖος (*arkhaios*), 'ancient'; ὄνομα (*onoma*), 'name'. ● Original nomen that has been replaced by a ***neonym***. ● Dubois 2005*b*: 88, 2006*a*: 169, 182. ● *Code*: no term. ● 15.02.18 (Dubois & Aescht 2019*g*).

Archairesy, *n.* ● NO. ● **ETY**: G: ἄρχω (*archo*), 'to rule, to govern'; αἵρεσις (*airesis*), 'choice, election'. ● A category of ***archoidy***: any modification of the nomenclatural status of an available nomen (***airesy***) resulting from an action of

the Commission under the Plenary Power. ● Dubois & Aescht 2019*u*: 146. ● *Code*: no term. ● 12.06.19 (Dubois & Aescht 2019*u*).

Archexoplonym, *n.* ● AV. ● **ETY**: G: ἄρχω (*archo*), 'to rule, to govern'; ἔξοπλος (*exoplos*), 'disarmed'; ὄνομα (*onoma*), 'name'. ● ***Exoplonym*** the availability or validity of which was **permanently** removed by the Commission under the Plenary Power, through one of the following actions: [1] removal of availability of the publication where this nomen had been established; [2] removal of availability of the nomen itself; [3] availability of nomen maintained but removal of its validity (***juniorisation***) in order to validate another nomen. ● Dubois 2011*a*: 28, 79. ● *Code*: no term. ● 12.06.19 (Dubois & Aescht 2019*u*).

Archocatastasy, *n.* ● NO. ● **ETY**: G: ἄρχω (*archo*), 'to rule, to govern'; ὄνομα (*onoma*), 'name'; ποίησις (*poiesis*), 'making, creating'. ● A category of ***archoidy***: the establishment of a new available nomen (***catastasy***) resulting from an action of the Commission under the Plenary Power. ● Dubois & Aescht 2019*u*: 146. ● *Code*: no term. ● 12.06.19 (Dubois & Aescht 2019*u*).

Archoidy, *n.* ● NO. ● **ETY**: G: ἄρχω (*archo*), 'to rule, to govern'; εἶδος (*eidos*), 'aspect, shape'. ● Modification of the nomenclatural status of a nomen resulting from a specific action of the Commission under the Plenary Power. ● Dubois & Aescht 2019*u*: 146. ● *Code*: no term. ● 12.06.19 (Dubois & Aescht 2019*u*).

Archokyronym, *n.* ● VA. ● **ETY**: G: ἄρχω (*archo*), 'to rule, to govern'; κύριος (*kyrios*), 'proper, correct'; ὄνομα (*onoma*), 'name'. ● ***Kyronym*** as a result of an ***archoidy*** through removal of validity to another nomen. ● Dubois & Aescht 2019*u*: 146. ● *Code*: no term. ● 12.06.19 (Dubois & Aescht 2019*u*).

Archypnonym, *n.* ● VA. ● **ETY**: G: ἄρχω (*archo*), 'to rule, to govern'; ὕπνος (*hypnos*), 'sleep, sleepiness'; ὄνομα (*onoma*), 'name'. ● ***Hypnonym*** **conditionally** invalidated (juniorised) as a result of a specific action of the Commission under the Plenary Power. ● Dubois 2011*a*: 28, 79. ● *Code*: no term. ● 12.06.19 (Dubois & Aescht 2019*u*).

Argionym, *n.* ● CO. ● **ETY**: G: ἀργίᾱ (*argia*), "idleness, inaction"; ὄνομα (*onoma*), "name". ● ***Eunym*** currently unused in any ***ergotaxonomy***. ● **ANT**: ***ergonym***. ● Dubois 2000: 55. ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*x*).

Assigned, *p.* ● AS, AV. ● Qualification of a nomen that conforms to the conditions of nomenclatural ***assignment*** as regulated by the *Zoocode*. ● **ANT**: ***unassigned***. ● Common language term, introduced in zoological nomenclature by Dubois (2015*b*). ● *Code*: no term. ● 26.04.16 (Dubois & Aescht 2016*g*).

Assignment, *n.* ● AS, AV. ● ***Onomatergy*** regulated by the *Zoocode* by which a nomen is referred to a ***nominal-series*** (e.g., through original statement of the auctor of the nomen or through objective criteria). In the *Zoocode*, this act gives part of its name to the first floor or stage of the ***Nomenclatural Process***. ● Common language term, introduced in zoological nomenclature by Dubois (2015*b*). ● *Code*: no term. ● 26.04.16 (Dubois & Aescht 2016*g*).

Astatodistagmonym, *n.* ● VA. ● **ETY**: G: ἄστατος (*astatos*), "unstable, uncertain"; δισταγμός (*distagmos*), "doubt, uncertainty"; ὄνομα (*onoma*), "name". ● Category of ***distagmonym***: nomen **conditionally** rejected through ***sozonym validation***. ● **ANT**: ***eudistagmonym***. ● Dubois 2011*a*: 79. ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*x*).

Asthenomonym, *n.* ● AV, VA. ● **ETY**: G: ἀσθενής (*asthenes*), 'weak'; ὁμός (*homos*), 'the same'; ὄνομα (*onoma*), 'name'. ● Any of two (or more) available species-series epithets that are conditional ***homonyms*** for being ***homographs*** or ***paromographs*** (but not ***pseudomographs***) and having been introduced for distinct taxomina and originally referred to different ***priscogenera*** but subsequently referred to the same ***mutogenus*** not being the first published among them, as long as both epithets remain referred to this mutogenus as their ***rectogenus***. ● **END**: ***apoasthenomonym*** and ***protoasthenomonym***. ● Dubois 2000: 57. ● *Code*: secondary homonym (in part). ● 21.04.18 (Dubois & Aescht 2019*k*).

Asthenomonymy, *n.* ● **ETY**: see ***Asthenomonym***. ● The fact that two distinct nomina are ***asthenomonyms***. ● Dubois 2011*a*: 27. ● *Code*: secondary homonymy (in part). ● 21.04.18 (Dubois & Aescht 2019*k*).

Atelonym, *n.* ● AV. ● **ETY**: G: ἀτελής (*ateles*), 'unfinished, invalid'; ὄνομα (*onoma*), 'name'. ● A particular case of ***anoplonym***: published but nomenclaturally unavailable nomen according to the *Code*, for not being conform to the provisions of Articles 10, 11 and 14 to 20. ● Dubois 2011*a*: 19, 79. ● *Code*: unavailable name. ● 08.06.16 (Dubois & Aescht 2016*h*).

Auctor, *n.* ● NO, TA. ● In the context of zoological nomenclature, name(s) of the person(s) to whom a published work, nomen or onomatergy is credited, i.e., whose name(s) appear(s) as signatory in the work itself—not through subsequent investigation. ● Dubois 2013: 3. ● *Code*: author. ● 11.03.19 (Dubois & Aescht 2019*s*).

Autoneonym, *n.* ● AV. ● **ETY**: G: αὐτός (*autos*), 'same'; νέος (*neos*), 'new'; ὄνομα (*onoma*), 'name'. ● ***Neonym*** having the same etymology as its ***archaeonym***, i.e., directly derived from it through unjustified emendation. ● **ANT**: ***alloneonym***. ● Dubois 2000: 52. ● *Code*: unjustified emendation. ● 15.02.18 (Dubois & Aescht 2019*g*).

Availability, *n.* ● AV. ● Statement regulated by the *Zoocode* according to which a nomen is introduced in zoological nomenclature complying with the conditions of the *Zoocode* (***hoplonym***) or by which an ***airesy*** is made ***effective***. This act gives part of its name to the first floor or stage of the ***Nomenclatural Process*** (Dubois 2005*a–d*). ● **ANT**: ***unavailability***. ● Term in traditional use in zoological nomenclature. ● *Code*: availability. ● 26.04.16 (Dubois & Aescht 2016*g*).

Available, *a.* ● AV. ● Qualification of a nomen (***hoplonym***) or of an ***airesy*** that conforms to the conditions of nomenclatural ***availability*** as regulated by the *Zoocode*. ● **ANT**: ***unavailable***. ● Traditional term in nomenclature. ● *Code*: available, potentially valid. ● 26.04.16 (Dubois & Aescht 2016*g*).

Avatar, *n.* ● NO, TA. ● **ETY**: Sanskrit: अवतार (*ava-tara*), 'successive incarnation of a divinity'. ● One of several forms or manifestations that an entity (object, person, organism, concept, term, etc.) has taken or can take. In zoological nomenclature, one of the forms that a nomen can take, regarding its spelling, rank and/or onymorph. ● Common language term, recently introduced in zoological nomenclature (Dubois 2005*c*: 396). ● *Code*: no term. ● 31.03.16 (Dubois & Aescht 2016*e*).

Bidirectional ostension, *e.* ● AL. ● Composite system of ***ostension*** by ***inclusion*** and ***exclusion***, pointing both to one or several member(s) and non-member(s) of a class (such as a taxon) (see Dubois 2006*c*: 25). ● Dubois 2007*a*: 46. ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*x*).

Bijective, *a.* ● AL. ● **ETY**: L: *bis*, 'twice'; *iniectio*, 'forcing a fluid into a body'. ● Relation between two domains which follows a function of **bijection**, i.e. of one-to-one correspondence (every element of one domain is related exactly to one element of the other domain). ● Mathematical term coined by the Bourbaki group (Bourbaki 1970), introduced in zoological taxonomy by Dubois & Aescht (2019*f*). ● *Code*: no term. ● 01.02.18 (Dubois & Aescht 2019*f*).

Binomen (pl. ***binomina***), *n.* ● AV, CO. ● **ETY**: L: *bis*, 'twice'; *nomen*, 'name'. ● Nomen of rank species, composed of two terms, the generic ***substantive*** and the specific ***epithet***. ● Traditional term in zoological nomenclature. ● *Code*: binomen. ● 02.02.18 (Dubois & Aescht 2019*d*).

Binominal, *a.* ● NO. ● **ETY**: see ***Binomen***. ● Qualification of a nomenclatural system like that of the *Zoocode*, in which taxa of the rank species, and only them, are designated by binomina. ● *Code*: no term. ● 02.02.18 (Dubois & Aescht 2019*d*).

Catastasy, *n.* ● NO. ● **ETY**: G: καταστάσις, *katastasis*, 'action of establishing, introducing, instituting'. ● A category of ***onomatergy***: any published founder action of establishing a new nomen. ● Dubois 2013: 3. ● *Code*: no term. ● 29.03.19 (Dubois & Aescht 2019*t*).

Character, *n.* ● TA, AV. ● Any intrinsic feature of organisms used for recognizing, comparing, differentiating or classifying taxa. In a given taxon, the same character may occur under several distinct alternative ***character states***. ● Traditional term in zoological taxonomy. ● *Code*: character. ● 06.04.17 (Dubois & Aescht 2017*i*).

Character state, *e.* ● TA, AV. ● Any form that a particular character can take. ● Traditional term in zoological taxonomy. ● *Code*: no term. ● 06.04.17 (Dubois & Aescht 2017*i*).

Chresonym, *n.* ● TA. ● **ETY**: G: χρῆσις (*chresis*), 'use'; ὄνομα (*onoma*), 'name'. ● Subsequent use or citation of a nomen under any of its avatars or ***paronyms*** (***parographs***, ***parohypses*** or ***paronymorphs***). ● Dubois 1982: 267. ● *Code*: no term. ● 24.05.18 (Dubois & Aescht 2019*o*).

Chresonymic list, *e.* ● TA. ● **ETY**: see ***Chresonym***. ● List of ***chresonyms***. ● Smith & Smith 1973: 445 (as 'chresonymy'). ● *Code*: no term. ● 24.05.18 (Dubois & Aescht 2019*o*).

Chresonymy, *e.* ● See ***Chresonymic list***.

Class-series (CS), *e.* ● NO. ● In the nomenclatural hierarchy, the ***nominal-series*** ranked above the ***family-series***, which is not fully regulated by the *Code.* It includes nomina of taxa at the ranks of phylum, class, order, and any additional ranks that may be required. ● Dubois 2000: 40. ● *Code*: no term. ● 06.11.16 (Dubois & Aescht 2017*e*).

Combination, *n.* ● NO, TA. ● **ETY**: L: *combinatio*, 'mating, assemblage of objects by two'. ● A category of ***onymorph***: any ***paronym*** of a nomen implying association between a generic ***substantive*** and a specific or subspecific ***final epithet***, irrespective of potential other words in the binomen or trinomen. ● **END**: [1] ***primary combination*** and ***secondary combination***; [2] ***actual combination*** and ***virtual combination***. ● Term in traditional use in zoological nomenclature. ● *Code*: combination. ● 31.03.16 (Dubois & Aescht 2016*e*); 21.04.18 (Dubois & Aescht 2019*k*).

Comprehension, *n.* ● See ***Intension***. ● 06.09.19 (Dubois & Aescht 2019*x*).

Connector, *n.* ● NO. ● Group of letters (e.g., *-AID*, *-OID*, *-ID*, *-IN*, *-IT*) connecting (if present) the ***stem*** of a family-series nomen (based on a genus-series nomen) to its ***suffix***. ● Alonso-Zarazaga 2005: 191; Dubois 2006*a*: 211; Dubois & Aescht 2019*n*: 103. ● *Code*: no term. ● 27.05.18 (Dubois & Aescht 2019*n*); 11.03.19 (Dubois & Aescht 2019*s*).

Coordinated, *p.* ● AV. ● In the context of zoological nomenclature, qualification of a nomen which exists under several ***paronyms*** that are in a relation of ***coordination***. ● Traditional term in zoological nomenclature. ● *Code*: no term. ● 01.02.18 (Dubois & Aescht 2019*f*).

Coordination, *n.* ● AV. ● In the context of zoological nomenclature, the fact that any nomen created for a taxon at any rank within a nominal-series is deemed to have been simultaneously created for all taxa of other (higher or lower) ranks within that nominal-series including its onomatophore that might have to be recognised. ● Traditional term in zoological nomenclature. ● *Code*: coordination. ● 01.02.18 (Dubois & Aescht 2019*f*).

Correct, *a.* ● CO. ● In the context of zoological nomenclature, qualification of a nomen (***eunym***) that conforms to the Rules of the *Zoocode* regarding spelling, rank and, if relevant, onymorph. ● **ANT**: ***incorrect***. ● Traditional term in nomenclature. ● *Code*: correct. ● 26.04.16 (Dubois & Aescht 2016*g*).

Correctness, *n.* ● CO. ● Qualification of a valid nomen (***kyronym***) which bears a ***paronym***—i.e. a spelling (***parograph***), rank (***parohypse***) and, if relevant, onymorph (***paronymorph***)—that is in agreement with the Rules of the *Zoocode*. In the *Zoocode*, this act gives part of its name to the third floor or stage of the ***Nomenclatural Process*** (Dubois 2005*a–d*). ● **ANT**: ***incorrectness***. ● Traditional term in nomenclature. ● *Code*: no term. ● 26.04.16 (Dubois & Aescht 2016*g*).

CS, *ab.* ● See ***Class-series***.

Date, *n.* ● See ***Publication date***.

Define, *v.* ● See ***Definition***.

Definition, *n.* (***define***, *v.*). ● TA, NO. ● A statement in words of ***character states***, which, in combination, are considered to uniquely distinguish a taxon from at least one other taxon of the same rank, the latter being explicitly mentioned. ● Traditional term in zoological taxonomy. ● *Code*: definition. ● 06.04.17 (Dubois & Aescht 2017*i*).

Delonym, *n.* ● RE. ● **ETY**: G: δηλος (*delos*), 'visible, evident, plain, clear'; ὄνομα (*onoma*), 'name'. ● Registered nomen, thus protected against potential invalidation through ***sozonym*** or ***sozodiaphonym*** validation. ● **ANT**: ***adelonym***. ● Dubois 2011*a*: 81. ● *Code*: no term. ● 06.09.19 Dubois & Aescht (2019*x*).

Description, *n.* (***describe***, *v*). ● TA, AV. ● A statement in words of some taxonomic ***character states*** of a specimen. ● Traditional term in zoological taxonomy. ● *Code*: description. ● 06.04.17 (Dubois & Aescht 2017*i*).

Designate, *v.* ● See ***Designation***.

Designation, *n.* (***designate***, *v*). ● AL. ● The onomatergy of an author or of the Commission or its successor body in electing, by an explicit statement, the ***onomatophore*** of a newly (original designation) or previously established (subsequent designation) taxomen. See also ***Act***, ***Election*** and ***Indication***. ● Term of traditional use in zoology or in philosophy, but used by Dubois (2006*a*) in a precise technical meaning. ● *Code*: typification. ● 01.03.17 (Dubois & Aescht 2017*g*).

Diadochonym, *n.* ● NO. ● **ETY**: G: διάδοχος (*diadochos*), 'successor'; ὄνομα (*onoma*), 'name'. ● Any nomen, either previously introduced but until then considered invalid, or new (***neonym***), used to replace a nomen that has been found to be invalid (e.g., for being a junior homonym) or incorrectly used (for being wrongly allocated to a taxon). ● Dubois 2012: 64. ● *Code*: substitute name. ● 15.02.18 (Dubois & Aescht 2019*g*).

Diagnosis, *n* (pl. ***diagnoses***) (***diagnostic***, *a*). ● TA, AV. ● **ETY**: G: διάγνωσις (*diagnosis*), 'distinction, discrimination'. ● An ***intensional*** definition of a taxon based on ***character states*** that are considered to be differential for the taxon, i.e., shared by all members of the taxon and absent in all non-members. ● Traditional term in taxonomy. ● *Code*: diagnosis. ● 06.04.17 (Dubois & Aescht 2017*i*).

Distagmonym, *n.* ● VA. ● **ETY**: G: δισταγμός (*distagmos*), 'doubt, uncertainty'; ὄνομα (*onoma*), 'name'. ● Nomen that has *not* had a universal or significant use in non-systematic literature after 31 December 1899 (i.e., that did not appear in at least 100 titles of publications since then). ● **ANT**: ***sozonym***. ● Dubois 2005*b*: 86, 2005*c*: 412. ● *Code*: no term. ● 29.03.19 (Dubois & Aescht 2019*t*).

Doxisonym, *n.* (***doxisonymisation***, *n*; ***doxisonymy***, *n*). ● VA, TA. ● **ETY**: G: δόξα (*doxa*), 'opinion'; ἴσος (*isos*), 'equal'; ὄνομα (*onoma*), 'name'. ● A category of ***synonym***: any of two or more nomina based on different onomatophores but considered, for subjective (taxonomic) reasons, to denote the same taxon, whose ***inclusive extension*** includes both their onomatophores. ● Dubois 2000: 57. ● *Code*: subjective synonym. ● 06.03.18 (Dubois & Aescht 2019*h*); 24.05.18 (Dubois & Aescht 2019*o*).

Doxisonymisation, *n.* ● VA, TA. ● See ***doxisonym***. ● Explicit published statement that two nomina are ***doxisonyms***. ● 06.09.19 Dubois & Aescht (2019*x*).

Doxisonymy, *n.* ● VA, TA. ● **ETY**: see ***Doxisonym***. ● A category of ***synonymy***: the fact that two distinct nomina of the same nominal-series (***doxisonyms***) having different onomatophores are considered to denote the same taxon in a given ***ergotaxonomy*** for subjective reasons, i.e., on the basis of a taxonomic interpretation. Doxisonymy between

two nomina may be represented by the sign '≈'. ● Dubois 2008*d*: 53. ● *Code*: subjective synonymy. ● 06.03.18 (Dubois & Aescht 2019*h*); 24.05.18 (Dubois & Aescht 2019*o*).

Effective, *a*. ● AL. ● Qualification of an ***onomatergy*** that makes it actual under the Rules of the *Zoocode*. ● Traditional term in common language, introduced in zoological nomenclature by Dubois & Aescht (2019*x*: 167). ● *Code*: no term. ● 06.09.19 Dubois & Aescht (2019*x*).

Election, *n*. (***elect***, *v*). ● AL. ● A general term for the determination of an onomatophore, whether by original designation or by any other means. See also ***Designation*** and ***Monophory***. ● Traditional term in nomenclature. ● *Code*: no term. ● 01.03.17 (Dubois & Aescht 2017*g*).

Ending, *n*. ● NO. ● For the purpose of zoological nomenclature, the letter or group of letters at the end of a nomen. In the species- and genus-series, the ending is composed of the ***suffix*** alone; in the family-series, the ending indicates the rank of the taxon and is composed of the ***connector*** (if present) and the ***suffix***. ● **END**: ***fixed ending*** and ***variable ending***. ● Term of grammar, in traditional use in biological nomenclature, redefined by Dubois & Aescht 2019*n,s*). ● *Code*: ending. ● 27.05.18 (Dubois & Aescht 2019*n*); 11.03.19 (Dubois & Aescht 2019*s*).

Endonym, *n*. ● NO. ● **ETY**: G: ἔνδον (*endon*), 'inside of'; ὄνομα (*onoma*), 'name'. ● [1] General meaning: term designating a subordinate class. [2] Specialised meaning in nomenclature: nomen which applies to an ***endotaxon*** in a given ***ergotaxonomy***. ● Dubois & Aescht 2019*k*: 76. ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*k*).

Endotaxon, *n*. ● TA. ● **ETY**: G: ἔνδον (*endon*), 'inside of'; τάξις (*taxis*), 'order, arrangement'. ● Any taxon which is subordinate to another taxon (its ***angiotaxon***) in a given ***ergotaxonomy***. ● Dubois 2005*c*: 406. ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*k*).

EPITA, *ab*. ● See ***Explicit internal airesy***. ● 11.03.19 (Dubois & Aescht 2019*s*).

Epithet, *n*. ● NO. ● Specific or subspecific ***nomen***, never bearing a capital, being part of a ***binomen*** or ***trinomen***. ● Traditional term in zoological nomenclature. ● *Code*: species-group name [English text]; nom du niveau espèce [French text]. ● 02.02.18 (Dubois & Aescht 2019*d*).

Ergonym, *n*. ● CO. ● **ETY**: G: ἔργον (*ergon*), 'work, action'; ὄνομα (*onoma*), 'name'. ● ***Eunym*** currently used in all or some ergotaxonomies. ● **ANT**: ***argionym***. ● Dubois 2000: 54. ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*x*).

Ergotaxon, *n*. ● NO, TA. ● **ETY**: G: ἔργον (*ergon*), 'work, action'; τάξις (*taxis*), 'order, arrangement'. ● Any taxon with a given ***extension*** (i.e., members, circumscription) recognised as valid by a given author in a given ***ergotaxonomy***. ● Dubois 2005*c*: 405. ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*x*).

Ergotaxonomy, *n* (***ergotaxonomic***, *a*). ● TA, NO. ● **ETY**: G: ἔργον (*ergon*), 'work, action'; τάξις (*taxis*), 'order, arrangement'; νόμος (*nomos*), 'law, rule'. ● Any classification considered valid in a certain work by a given author. ● Dubois 2005*c*: 406. ● *Code*: no term. ● 15.02.18 (Dubois & Aescht 2019*g*).

ETA, *ab*. ● ***External airesy***. ● 11.03.19 (Dubois & Aescht 2019*s*).

Eudistagmonym, *n*. ● VA. ● **ETY**: G: εὖ (*eu*), 'well, easily'; δισταγμός (*distagmos*), 'doubt, uncertainty'; ὄνομα (*onoma*), 'name'. ● Category of ***distagmonym***: nomen **permanently** rejected through ***sozonym validation***. ● **ANT**: ***astatodistagmonym***. ● Dubois 2011*a*: 82. ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*x*).

Eugraph, *n*. ● **ETY**: G: εὖ (*eu*), 'well, easily'; γράφω (*grapho*), 'I write'. ● Correct spelling of a nomen for a given taxon in a given ***ergotaxonomy***. This spelling may be imposed by the *Code* to a given nomen, superseding its ***protograph*** if necessary: [1] either for being the ***nomograph*** of the nomen in two situations: [1a] ***mandatory spelling correction*** ('justified emendation') because the protograph is an 'incorrect original spelling'; [1b] ***mandatory ending correction*** ('mandatory change') because the ending of the protograph must be corrected as a result of a change combination in the species-series or of rank in the family-series; [2] or following a decision of the Commission under the Plenar Power. ● **ANT**: ***nothograph***. ● Dubois 2010*b*: 7, 40. ● *Code*: correct original spelling, justified emendation, mandatory change. ● 06.09.19 (Dubois & Aescht 2019*x*).

Euhypse, *n*. ● CO. ● **ETY**: G: εὖ (*eu*), 'well, easily'; ὑψος (*hupsos*), 'height'. ● Correct rank of a nomen for a given taxon in a given ***ergotaxonomy***. ● Dubois 2010*b*: 7. ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*x*).

Euhadromonym, *n*. ● AV, VA. ● **ETY**: G: εὖ (*eu*), 'well, easily'; ἁδρός (*hadros*), 'robust'; ὁμός (*homos*), 'the same'; ὄνομα (*onoma*), 'name'. ● Any of two (or more) genus-series or family-series ***hadromonyms***. Under the *Zoocode*, the junior one is permanently invalid. ● Dubois & Aescht 2019*k*: 76. ● *Code*: homonym. ● 21.04.18 (Dubois & Aescht 2019*k*).

Eunym, *n*. ● VA. ● **ETY**: G: εὖ (*eu*), 'well, easily'; ὄνομα (*onoma*), 'name'. ● Correct ***paronym*** (***eugraph***, ***euhypse*** and, if relevant, ***eunymorph***) of a nomen for a given taxon in a given ***ergotaxonomy***. ● **ANT**: ***nothonym***. ● Dubois 2000: 54. ● *Code*: no term. ● 11.03.19 (Dubois & Aescht 2019*s*).

Eunymorph, *n.* ● CO. ● **ETY**: G: εὖ (*eu*), 'well, easily'; ονομα (*onoma*), 'name'; μορφή (*morphe*), 'form, shape'. ● Correct onymorph of a nomen for a given taxon in a given ***ergotaxonomy***. ● Dubois 2010*b*: 7. ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*x*).

Euprotograph, *n.* ● VA, CO. ● **ETY**: G: εὖ (*eu*), 'well, easily'; πρωτος (*protos*), 'first, earliest'; γράφω (*grapho*), 'I write'. ● Correct original protograph for the nomen of a given taxon at a given rank in a given ***ergotaxonomy***. ● **ANT**: ***nothoprotograph***. ● [Dubois & Aescht 2019*s*: 122]. ● *Code*: correct original spelling. ● 11.03.19 (Dubois & Aescht 2019*s*) [implied by the use of ***nothoprotograph***].

Eurhizograph. ● VA, CO. ● G: εὖ (*eu*), 'well, easily'; ρίζα (*rhiza*), 'root, stem'; γράφω (*grapho*), 'I write'. ● Spelling of a partially regulated family-series nomen based on the correct spelling of its stem, followed by an ending indicating plural not being one of those used for the fully regulated family-series nomina. ● Dubois & Aescht 2019*s*: 129. ● *Code*: no term. ● 11.03.19 (Dubois & Aescht 2019*s*).

Exclusive extension, *e.* ● AL. ● System of ***extension*** by exclusion, listing all non-member(s) of a class (such as a taxon). ● Dubois 2005*c*: 379. ● *Code*: no term. ● 13.02.18 (Dubois & Aescht 2019*e*).

Exclusive ostension, *e.* ● AL. ● System of ***ostension*** by exclusion, pointing to one or several non-member(s) of a class (such as a taxon). ● Dubois 2006*c*: 25. ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*x*).

Exonymophoront, *n.* ● AL. ● G: ἐκ, ἐξ (*ek, ex*), 'out of, from'; ὄνομα (*onoma*), 'name'; φέρω (*phero*), 'I bear'; ὄν, ὄντος (*on*, *ontos*), 'being, individual'. ● A specimen that was originally one of the symphoronts of a species-series nomen, but that lost its status of onymophoront following the designation of another symphoront as lectophoront. ● Dubois 2005*c*: 403. ● *Code*: paralectotype. ● 06.09.19 (Dubois & Aescht 2019*x*).

Exoplonym, *n.* ● VA. ● **ETY**: G: ἔξοπλος (*exoplos*), 'disarmed'; ὄνομα (*onoma*), 'name'. ● ***Akyronym*** permanently invalidated, either as a result of the Rules of the *Code* or of an ***archoidy***. ● Dubois 2000: 51. ● *Code*: no term. ● 12.06.19 (Dubois & Aescht 2019*u*).

Explicit internal airesy (EPITA), *e.* ● VA, CO. ● An ***internal airesy*** which is **explicit** i.e., all competing spellings being mentioned and one of them being designated as correct. ● Dubois 2013: 12. ● *Code*: no term. ● 11.03.19 (Dubois & Aescht 2019*s*).

Extension, *n* (***extensional***, *a*; ***extensionally***, *av*). ● AL. ● System of allocation of a nomen to a concept or class (such as a taxon) through providing a list of all objects that satisfy the ***intensional definition*** of a concept (***inclusive extension***), or that do not satisfy it (***exclusive extension***). ● Traditional term in philosophy, logics and didactics (see Dubois 2005*b*: 74, 2005*c*: 379). ● *Code*: no term. ● 13.02.18 (Dubois & Aescht 2019*e*).

Extensional definition, *e.* ● AL. ● Definition of a concept or class (such as a taxon) based on ***extension***. ● Traditional term in philosophy, logics and didactics (see Dubois 2005*c*: 379). ● *Code*: no term. ● 13.02.18 (Dubois & Aescht 2019*e*).

External airesy (ETA), *e.* ● VA, CO. ● An ***airesy*** taken in case of ***zygography*** under Article 24.2.3 of the *Code* [to be renumbered in the *Zoocode*] by an author or authors not being the original ***auctor(s)*** of the nomen. To be valid, an external airesy must be **explicit**, i.e., both competing spellings must be mentioned and one of them must be unambiguously designated as correct. ● Dubois 2013: 12. ● *Code*: no term. ● 11.03.19 (Dubois & Aescht 2019*s*).

Family-series (FS), *e.* ● NO. ● In the nomenclatural hierarchy, the highest-ranking ***nominal-series*** fully regulated by the *Code*. It includes nomina of taxa at the ranks of family, subfamily, tribe, subtribe, superfamily, and any additional ranks that may be required. ● Dubois 2000: 40. ● *Code*: family group [English text]; niveau famille [French text]. ● 06.11.16 (Dubois & Aescht 2017*e*).

Final epithet, *e.* ● NO.● Epithet designating a taxon, either of specific or of subspecific rank, which is the lowest ranked one in a given classification. ● Term in use in botanical nomenclature (Turland *et al.* 2018), introduced in zoological nomenclature by Dubois (2011*a*: 58, 83). ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*k*).

First reviser, *e.* ● NO.● See ***Arbiter***.

First-user, *e.* ● AV. ● See ***Scriptor***.

Fixed ending, *e.* ● NO. ● Ending of a nomen that is not liable to change according to the ergotaxonomy adopted. This includes in particular the following two situations: [1] species-series epithet in the genitive case: ***suffix*** reflecting in some cases the genders and numbers of the persons or places referred to by the epithet; [2] genus-series substantive: ***suffix*** indicating its grammatical gender. ● Dubois & Aescht 2019*n*: 103. ● *Code*: no term. ● 27.05.18 (Dubois & Aescht 2019*n*); 11.03.19 (Dubois & Aescht 2019*s*).

FRR, *ab*. ● See ***Fully regulated family-series ranks.***

FS, *ab*. ● See ***Family-series***.

Fully regulated family-series ranks, *e.* ● NO. ● Ranks of the family-series for which ***mandatory endings*** are prescribed by the *Code* (Articles 29.2 and 34.1): superfamily (-*OIDEA*), family (-*IDAE*), subfamily (-*INAE*), tribe (-*INI*) and subtribe (-*INA*). ● Dubois & Aescht 2019*s*: 128.● *Code*: no term. ● 11.03.19 (Dubois & Aescht 2019*s*).

Generic substantive, *e*. ● NO. ● Generic or subgeneric ***nomen***, always bearing a capital, being part of a ***binomen*** or ***trinomen***. ● Dubois 2000: 40. ● *Code*: generic name, genus name, name of a genus. ● 02.02.18 (Dubois & Aescht 2019*d*).

Genus-series (GS), *e*. ● NO. ● In the nomenclatural hierarchy, the ***nominal-series*** ranked between the ***species-series*** and the ***family-series***. It includes taxa at the ranks of genus and subgenus. ● Dubois 2000: 40. ● *Code*: genus group [English text]; niveau genre [French text]. ● 06.11.16 (Dubois & Aescht 2017*e*).

GS, *ab*. ● See ***Genus-series***.

Gymnonym, *n*. ● AV. ● **ETY**: G: γυμνός (*gymnos*), 'naked'; ὄνομα (*onoma*), 'name'. ● A particular case of ***anoplonym***: published but nomenclaturally unavailable nomen according to the *Code*, for failing to comply with the provisions of Articles 12 or 13 (i.e., missing a diagnosis or description, and in some cases an onomatophore). ● Dubois 2000: 49–50. ● *Code*: nomen nudum. ● 06.09.19 (Dubois & Aescht 2019*x*).

Hadromonym, *n*. ● AV, VA. ● **ETY**: G: ἁδρός (*hadros*), 'robust'; ὁμός (*homos*), 'the same'; ὄνομα (*onoma*), 'name'. ● Any of two or more available nomina introduced for distinct taxomina and being permanently ***homonyms*** for being either: [1] in the family-series, ***rhizomographs***; or [2] in the genus-series, ***homographs***; or [3] in the species-series, epithets being ***homographs*** or ***paromographs*** (but not ***pseudomographs***) originally referred to the same ***priscogenus***. ● **END**: ***apohadromonym***, ***euhadromonym*** and ***protohadromonym***. ● Dubois 2000: 57. ● *Code*: [1] and [2] homonym; [3] primary homonym and secondary homonym (in part). ● 21.04.18 (Dubois & Aescht 2019*k*).

Hadromonymy, *n*. ● AV, VA. ● **ETY**: see ***Hadromonym***. ● The fact that two distinct nomina are ***hadromonyms***. ● Dubois 2011*a*: 27. ● *Code*: (primary) homonymy. ● 21.04.18 (Dubois & Aescht 2019*k*).

Hemihomonym, *n*. ● AV, VA. ● **ETY**: G: ἥμισυς (*hemisus*), 'half'; ὁμός (*homos*), 'the same'; ὄνομα (*onoma*), "name". ● Any of two or more distinct nomina that are homographs but that belong in different nominal-series (in zoology) or which depend on different Codes (e.g., zoological, botanical and bateriological). ● Shipunov 2011: 65. ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*k*).

Hemihomonymy, *n*. ● **ETY**: see ***Hemihomonym***. ● The fact that two distinct nomina are ***hemihomonyms***. ● Starobogatov 1984, 1991: 8. ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*k*).

Heterosymphory, *n*. ● AL. ● **ETY**: G: ἕτερος (*eteros*), 'other, different'; σύν (*syn*), 'together'; φέρω (*phero*), 'I bear'. ● Qualification of a nomen created with or supported by an onomatophore composed of an heterogeneous (composed of specimens or taxomina currently referred to different taxa) series of specimens (in the species-series) or of taxomina (in the other three nominal-series). ● Dubois 2011*a*: 102. ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*x*).

Heterosynaptonym, *n*. ● AL. ● **ETY**: G: ἕτερος (*eteros*), 'other, different'; σύν (*syn*), 'together'; ἅπτω (*apto*), 'fasten, attach, fix'; ὄνομα (*onoma*), 'name'. ● ***Synaptonym*** considered taxonomically heterogeneous (composed of specimens or taxomina currently referred to different taxa). ● **ANT**: ***homosynaptonym***. ● Dubois 2011*a*: 25, 84. ● *Code*: one of the meanings of the ambiguous designation 'nomen dubium'. ● 06.09.19 (Dubois & Aescht 2019*x*).

Holaptonym, *n*. ● AL. ● **ETY**: G: ὅλος (*holos*), 'complete, entire'; ἅπτω (*apto*), 'fasten, attach, fix'; ὄνομα (*onoma*), 'name'. ● ***Monaptonym*** whose ***monophoric*** onomatophore (***holophoront***, ***nucleospecies*** or ***nucleogenus***) was ***designated*** in the original publication where the nomen was created. ● Dubois 2011*a*: 25, 84. ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*x*).

Holophoront, *n*. ● AL. ● **ETY**: G: ὅλος (*holos*), 'complete, entire'; φέρω (*phero*), 'I bear'; ὄν, ὄντος (*on*, *ontos*), 'being, individual'. ● Single specimen originally ***designated*** as ***onymophoront*** of a species-series nomen. ● Dubois 2005*c*: 403. ● *Code*: holotype. ● 06.03.18 (Dubois & Aescht 2019*h*).

Holoprotograph, *n*. ● AV. ● **ETY**: G: ὅλος (*olos*) 'whole, complete'; πρῶτος (*protos*), 'first, earliest'; γράφω (*grapho*), 'I write'. ● A category of ***protograph***: unique original spelling of a nomen. ● **ANT**: ***symprotograph***. ● Dubois & Aescht 2019*o*: 112. ● *Code*: original spelling. ● 31.05.18 (Dubois & Aescht 2019*o*).

Homograph, *n*. (***homographic***, *a*; ***homography***, *n*). ● AV, VA. ● **ETY**: G: ὁμός (*homos*), 'the same'; γράφω (*grapho*), 'I write'. ● Any of two or more distinct ***nomina*** (having different auctors, dates and onomatophores) ***of the same nominal-series*** having the exactly same spelling (even if having different grammatical genders). ● Term in traditional use in common language, introduced in zoological nomenclature by Dubois (2012: 64). ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*j*).

Homographic, *a*. ● AV, VA. ● **ETY**: see ***Homograph***. ● Term having the exactly same spelling as another one. ● Dubois 2012: 64. ● 21.04.18 (Dubois & Aescht 2019*j*).

Homography, *n*. ● AV, VA. ● **ETY**: see ***Homograph***. ● The fact that two distinct nomina are ***homographs***. ● Dubois 2012: 64. ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*j*).

Homonym, *n* (***homonymous***, *a*; ***homonymy***, *n*). ● AV, VA. ● **ETY**: G: ὁμός (*homos*), 'the same'; ὄνομα (*onoma*), 'name'. ● In zoological nomenclature, any of two or more distinct ***hoplonyms*** (having different authors, dates and

onomatophores) **of the same *nominal-series*** having identical spellings or spellings deemed to be ***homonymous*** under the *Code*. ● **END**: [1] ***homograph***, ***rhizomograph*** and ***paromograph***; [2] ***asthenomonym*** and ***hadromonym***. ● Term in traditional use in common language and in zootaxonomy. ● *Code*: homonym. ● 06.02.17 (Dubois & Aescht 2017*h*); 21.04.18 (Dubois & Aescht 2019*k*).

Homonymous, *a.* ● **ETY**: see ***Homonym***. ● In zoological nomenclature, the qualification of two distinct nomina of the same nominal-series that are ***homonyms*** under the *Code*. ● Term in traditional use in common language and in zootaxonomy. ● *Code*: homonymous. ● 21.04.18 (Dubois & Aescht 2019*j*).

Homonymy, *n.* ● AV, VA. ● **ETY**: see ***Homonym***. ● In zoological nomenclature, the fact that two distinct nomina of the same nominal-series are ***homonyms*** under the *Code*. ● Term in traditional use in common language and in zootaxonomy. ● *Code*: homonymy. ● 26.04.16 (Dubois & Aescht 2016*g*); 21.04.18 (Dubois & Aescht 2019*j*).

Homosymphory, *n.* ● AL. ● **ETY**: G: ὁμός (*homos*), 'the same'; σύν (*syn*), 'together'; φέρω (*phero*), 'I bear'. ● Qualification of a nomen created with or supported by an onomatophore composed of either an indissoluble or an homogeneous series of specimens or of taxomina. ● Dubois 2011*a*: 102. ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*w*).

Homosynaptonym, *n.* ● AL. ● **ETY**: G: ὁμός (*homos*), 'the same'; σύν (*syn*), 'together'; ἅπτω (*apto*), "fasten, attach, fix"; ὄνομα (*onoma*), "name". ● ***Synaptonym*** which is either indissoluble or considered taxonomically homogeneous. ● **ANT**: ***heterosynaptonym***. ● Dubois 2011*a*: 25, 84. ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*w*).

Hoplonym, *n.* ● AV. ● **ETY**: G: ὅπλον (*hoplon*), 'tool, arm, weapon'; ὄνομα (*onoma*), 'name'. ● Nomenclaturally available nomen according to the Rules of the *Code*. ● **ANT**: ***anoplonym***. ● Dubois 2000: 50. ● *Code*: available name. ● 21.04.18 (Dubois & Aescht 2019*k*).

Hypnonym, *n.* ● VA. ● **ETY**: G: ὕπνος (*hypnos*), 'sleep, sleepiness'; ὄνομα (*onoma*), 'name'. ● ***Akyronym*** **conditionally** invalidated (i.e., liable to be reinstored as valid as a result of taxonomic changes), either as a result of the Rules of the *Code* or of an ***archoidy***. ● **END**: ***archypnonym***, ***astatodistagmonym***, ***junior asthenomonym*** and ***junior doxisonym***. ● Dubois 2000: 51. ● *Code*: no term. ● 12.06.19 (Dubois & Aescht 2019*t*).

Hypodigm, *n.* ● TA. ● **ETY**: G: ὑπό (*hypo*), 'below'; δεῖγμα (*deigma*), 'proof, sample, specimen'. ● Set of specimens used by a taxonomist to recognise and describe a new species-series taxon. ● Simpson 1940: 418. ● *Code*: no term. ● 13.02.18 (Dubois & Aescht 2019*e*).

Identification, *n.* ● AL. ● Taxonomic act that refers a nomen to a known ***ergotaxon*** in a given ***ergotaxonomy***. ● Traditional term in taxonomy. ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*x*).

Identified, *p.* ● AL. ● Qualification of a nomen (***photonym***) that has been referred to a known ***ergotaxon***. ● **ANT**: ***unidentified***. ● Traditional term in taxonomy, redefined with a precise meaning dealing with taxonomic allocation of nomina by Dubois (2011*a*: 85). ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*x*).

Implicit internal airesy (IPITA), *e.* ● VA, CO. ● An ***internal airesy*** which is **implicit** i.e., only one of the competing spellings being mentioned, which is considered by the *Code* to designating it as correct. ● Dubois 2013: 12. ● *Code*: no term. ● 11.03.19 (Dubois & Aescht 2019*s*).

Inclusive extension, *e.* ● AL. ● System of ***intension*** by inclusion, listing all member(s) of a class (such as a taxon). ● Dubois 2005*c*: 379. ● *Code*: no term. ● 13.02.18 (Dubois & Aescht 2019*e*).

Inclusive ostension, *e.* ● AL. ● System of ***ostension*** by inclusion, pointing to one or several member(s) of a class (such as a taxon). ● Dubois 2006*c*: 25. ● *Code*: no term. ● 13.02.18 (Dubois & Aescht 2019*e*).

Incorrect, *a.* ● CO. ● In the context of zoological nomenclature, qualification of a nomen (***nothonym***) that fails to conform to the Rules of the *Zoocode* regarding spelling, rank and, if relevant, onymorph. ● **ANT**: ***correct***. ● Traditional term in nomenclature. ● *Code*: incorrect. ● 26.04.16 (Dubois & Aescht 2016*g*). [implied by the use of ***correct***].

Incorrectness, *n.* ● CO. ● Qualification of an available nomen (***kyronym***) which bears a ***paronym***—i.,e., a spelling (***paragraph***), rank (***parohypse***) and, if relevant, onymorph (***paronymorph***)—that is not in agreement with the Rules of the *Zoocode*. ● **ANT**: ***incorrectness***. ● Traditional term in nomenclature. ● *Code*: no term. ● 26.04.16 (Dubois & Aescht 2016*g*). [implied by the use of ***correctness***].

Indication, *n.* ● AV. ● A reference to a previously published information or to an ***onomatergy*** which, in the absence of a description, definition or diagnosis, provides availability to a new nomen, if it satisfies the relevant provisions of Articles 10 and 11 (if published before 1931) and 16.2 (if published before 2000) of the *Code*. ● *Code*: indication. ● 06.09.19 (Dubois & Aescht 2019*x*).

Intension, *n* (***intensional***, *a*; ***intensionally***, *av.*). ● AL. ● Set of properties or attributes that characterise a concept or a class. ● Traditional term in philosophy, logics and didactics (see Dubois 2005*b*: 74, 2005*c*: 379). ● **SYN**: ***comprehension***. ● *Code*: no term. ● 13.02.18 (Dubois & Aescht 2019*e*).

Intensional definition, *e*. ● AL. ● Definition of a concept or class (such as a taxon) based on intension. ● Traditional term in philosophy, logics and didactics (see Dubois 2005*c*: 379). ● *Code*: no term. ● 13.02.18 (Dubois & Aescht 2019*e*).

Internal airesy (ITA), *e*. ● VA, CO. ● An ***airesy*** taken in case of ***zygography*** under Article 24.2.4 of the *Code* [to be renumbered in the *Zoocode*] by the original ***auctor(s)*** of the nomen. ● **END**: ***explicit internal airesy*** and ***implicit internal airesy***. ● Dubois 2013: 12. ● *Code*: no term. ● 11.03.19 (Dubois & Aescht 2019*s*).

Invalid, *a*. (***invalidate***, *v*; ***invalidation***, *n*; ***invalidity***, *n*). ● VA. ● In the context of zoological nomenclature, qualification of a nomen (***akyronym***) that does not conform to the conditions of nomenclatural validity as regulated by a code such as the *Zoocode*, or that has been invalidated by the Commission. ● **ANT**: ***valid***. ● Traditional term in zoological nomenclature. ● *Code*: invalid. ● 26.04.16 (Dubois & Aescht 2016*g*) [implied by the use of ***valid***].

Invalidate, *v*. ● VA. ● Common language term, proposed by Dubois (2000: 46) to designate the action of withdrawing the availability or validity to a hoplonym either by an author following the Rules of the *Zoocode* or by the Commission under the Plenary Power. ● *Code*: suppress. ● 28.12.17 (Dubois & Aescht 2019*c*).

Invalidation, *n*. ● VA. ● Common language term, proposed by Dubois (2000: 46) to designate the result of the action of withdrawing the availability or validity to a hoplonym either by an author following the Rules of the *Zoocode* or by the Commission under the Plenary Power. ● *Code*: suppression. ● 21.04.18 (Dubois & Aescht 2019*l*).

Invalidity, *n*. ● VA. ● Statement regulated by the *Zoocode* according to which a nomen is determined not to be the one that must be used for to a taxon or several taxa in zoological nomenclature. ● **ANT**: ***validity***. ● Traditional term in zoological nomenclature. ● *Code*: invalidity. ● 26.04.16 (Dubois & Aescht 2016*g*) [implied by the use of ***validity***].

IPITA, *ab*. ● ***Implicit internal airesy***. ● 11.03.19 (Dubois & Aescht 2019*s*).

Isonym, *n*. ● VA. ● **ETY**: G: ἴσος (*isos*), 'equal'; ὄνομα (*onoma*), 'name'. ● A category of ***synonym***: any of two or more nomina of the same nominal-series based on the same onomatophore. ● **END**: ***allelonym***. ● Dubois 2000: 57. ● *Code*: objective synonym. ● 06.03.18 (Dubois & Aescht 2019*h*); 24.05.18 (Dubois & Aescht 2019*o*).

Isonymy, *n*. ● VA, TA. ● **ETY**: see ***Isonym***. ● A category of ***synonymy***: the fact that two distinct nomina of the same nominal-series denote the same taxon in a given ergotaxonomy for objective reasons, i.e., for having the exactly same onomatophore. Isonymy between two nomina may be represented by the sign '≡'. ● Dubois 2006*a*: 182. ● *Code*: objective synonymy. ● 06.03.18 (Dubois & Aescht 2019*h*); 24.05.18 (Dubois & Aescht 2019*o*).

ITA, *ab*. ● ***Internal airesy***. ● 11.03.19 (Dubois & Aescht 2019*s*).

Junior, *a*. ● NO. ● In the context of zoological nomenclature, and concerning a nomen, an airetophory or or a spelling: published at a date subsequent to that of publication of another nomen, onomatergy or spelling, qualified as ***senior***. ● Traditional term in nomenclature. ● *Code*: junior. ● 31.05.18 (Dubois & Aescht 2019*p*).

Juniorisation, *n* (***juniorise***, *v*). ● NO. ● In the context of zoological nomenclature, and concerning a conflict of zygoidy between synchronous nomina, spellings or airetophories, ***airesy*** by which a nomen, spelling or airetophory is denied precedence in favour of another one, which is then ***seniorised*** relative to it. ● Dubois 2000: 47. ● *Code*: no term. ● 11.06.18 (Dubois & Aescht 2019*q*).

Juniorise, *v*. ● See ***Juniorisation***.

Key rank, *e*. ● NO, TA. ● Main nomenclatural rank of traditional use in zoological nomenclature: e.g., classis, ordo, familia, tribus, genus, species. ● **ANT**: ***subsidiary rank***. ● Common language terms; Dubois 2006*a*. ● Dubois 2006*a*: 208. ● *Code*: no term. ● 27.05.18 (Dubois & Aescht 2019*n*).

Kyronym, *n*. ● VA. ● **ETY**: G: κύριος (*kyrios*), 'proper, correct'; ὄνομα (*onoma*), 'name'. ● Valid nomen for a given ergotaxon in a given ergotaxonomy. ● **ANT**: ***akyronym***. ● Dubois 2000: 51. ● *Code*: valid name. ● 11.03.19 (Dubois & Aescht 2019*s*).

Lectaptonym, *n*. ● AL. ● **ETY**: G: λεκτός (*lektos*), 'chosen, picked out'; ἅπτω (*apto*), 'fasten, attach, fix'; ὄνομα (*onoma*), 'name'. ● ***Monaptonym*** whose ***monophoric*** onomatophore (***lectophoront***, ***neophoront***, ***nucleospecies*** or ***nucleogenus***) was ***designated*** in a publication subsequent to that where the nomen was created. ● Dubois 2011*a*: 25, 86. ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*x*).

Lectophoront, *n*. ● AL. ● **ETY**: G: λεκτός (*lektos*), 'chosen, picked out'; φέρω (*phero*), 'I bear'; ὄν, ὄντος (*on*, *ontos*), 'being, individual'. ● Single specimen subsequently chosen in a series of ***symphoronts*** for designation as ***onymophoront*** of a species-series nomen. ● Dubois 2005*c*: 403. ● *Code*: lectotype. ● 06.03.18 (Dubois & Aescht 2019*h*).

Lectoprotograph, *n*. ● AV. ● **ETY**: G: λεκτός (*lectos*), 'chosen'; πρῶτος (*protos*), 'first'; γράφω (*grapho*), 'I write'. ● Any original spelling among ***symprotographs*** validated by an ***airesy*** under Article 24.2. ● Dubois 2010*b*: 15. ● *Code*: correct original spelling. ● 15.02.18 (Dubois & Aescht 2019*g*); 31.05.18 (Dubois & Aescht 2019*p*).

Leipoprotograph, *n.* ● AV. ● **ETY**: G: λείπω (*leipo*), 'I leave, I abandon'; πρῶτος (*protos*), 'first'; γράφω (*grapho*), 'I write'. ● Any original spelling among ***symprotographs*** rejected by an ***airesy*** under Article 24.2. ● Dubois 2010*b*: 15. ● *Code*: incorrect original spelling. ● 15.02.18 (Dubois & Aescht 2019*g*); 31.05.18 (Dubois & Aescht 2019*p*).

Logonymic list, *e.* ● NO, TA. ● **ETY**: G: λόγος (*logos*), 'speech, discourse'; ὄνομα (*onoma*), 'name'. ● Any list of nomina, including ***synonyms***, ***aponyms*** and/or nomen uses or citations (***chresonyms***). ● Dubois 2000: 59 (as logonymy). ● *Code*: no term. ● 24.05.18 (Dubois & Aescht 2019*o*).

Logonymy, *n.* ● See ***Logonymic list***.

Mandatory, *a.* ● NO. ● Required by the nomenclatural Rules. ● *Code*: mandatory. ● 11.03.19 (Dubois & Aescht 2019*s*).

Mandatory ending correction, *e.* ● CO. ● Correction of the ending of a nothograh required by the nomenclatural Rules. ● Dubois 2013: 11. ● *Code*: mandatory change. ● 11.03.19 (Dubois & Aescht 2019*s*).

Mandatory spelling correction, *e.* ● CO. ● Correction of a nothograh or of its the stem required by the nomenclatural Rules. ● Dubois 2013: 11. ● *Code*: justified emendation. ● 11.03.19 (Dubois & Aescht 2019*s*).

Meletograph, *n.* ● AV. ● **ETY**: G: μελέτη (*melete*), 'attention, care'; γράφω (*grapho*), 'I write'. ● Spelling of a nomen used voluntarily in a publication by an ***author***, ***scriptor***, editor, printer or publisher. ● **ANT**: ***ameletograph***. ● Dubois 2000: 54 (as ***ameletonym***), 2010*b*: 7. ● *Code*: no term. ● 11.03.19 (Dubois & Aescht 2019*s*).

Meletonym, *n.* ● See ***Meletograph***.

Monaptonym, *n.* ● AL. ● **ETY**: G: μόνος (*monos*), 'single, unique'; ἅπτω (*apto*), 'fasten, attach, fix'; ὄνομα (*onoma*), 'name'. ● ***Aptonym*** whose onomatophore is ***monophoric***, being composed of a single specimen (in the species-series: ***holophoront***, ***lectophoront*** or ***neophoront***) or ***taxomen*** (in the three other nominal-series: ***nucleospecies*** in the genus-series, ***nucleogenus*** in the family-series and class-series). Two categories: ***holaptonym*** and ***lectaptonym***. ● **ANT**: ***synaptonym***. ● Dubois 2011*a*: 25, 86. ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*x*).

Monophoric, *a.* ● AL. ● See ***Monophory***. ● 06.09.19 (Dubois & Aescht 2019*x*).

Monophory, n (***monophoric***, *a*). ● AL. ● **ETY**: G: μόνος (*monos*), 'single, unique'; φέρω (*phero*), 'I bear'. ● Qualification of a nomen created with and supported by an onomatophore composed of a single specimen (in the species-series) or ***taxomen*** (in the three other nominal-series). ● Dubois 2005*c*: 404. ● *Code*: monotypy. ● 24.05.18 (Dubois & Aescht 2019*m*).

Monosemic, *a.* ● NO. ● In the context of zoological nomenclature, the qualification of either [1] a system that does not allow the same nomen to designate distinct taxa, or [2] any nomen being in this situation (see Dubois 2007*a*: 41). ● **ANT**: ***polysemic***. ● Term in traditional use in linguistics and grammar. ● *Code*: no term. ● 01.02.18 (Dubois & Aescht 2019*f*).

Monothetic diagnosis, *e.* ● AL. ● A diagnosis involving a unique combination of character states that are both necessary and sufficient for membership in the taxon. ● **ANT**: ***Polythetic diagnosis***. ● Sneath 1962; Van Regenmortel 2016; Dubois 2017*c*. ● *Code*: no term. ● 13.02.18 (Dubois & Aescht 2019*e*).

Mutogenus, *n.* ● VA. ● **ETY**: L: *muto*, 'I change'; *genus*, 'race, kind, genus'. ● Any generic substantive other than its ***priscogenus*** to which a species-series epithet may have been referred (whether as valid or as an invalid synonym) in a publication subsequent to that where it was made available. ● Dubois & Aescht 2019*k*: 77. ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*k*).

Name, *n.* ● Ambiguous term used in various senses in the *Code* (Dubois & Aescht 2016*e*): [1] scientific name (see ***Nomen***); [2] spelling; [3] rank; [4] combination; [5] 'vernacular' name; [6] name of an author in the sense given to this term in the *Code* (see ***Auctor***); [7] name of the first user of a new spelling, rank or combination for an available scientific name (see ***Scriptor***); [8] various other 'names' (or persons, localities, plants, etc.). ● Because of this ambiguity, the *Zoocode* does not use this term in the sense of 'scientific name' and replaces it by ***nomen*** (Dubois & Aescht 2016*e*).

Negogenus, *n.* ● VA. ● **ETY**: L: *nego*, 'I refuse, I reject'; *genus*, 'race, kind, genus'. ● Any generic substantive to which a species-series epithet (whether considered valid or not) was formerly referred but is no longer so in a given ergotaxonomy. ● Dubois & Aescht 2019*k*: 77. ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*k*).

Neonym, *n.* ● AV. ● **ETY**: G: νέος (*neos*), 'new'; ὄνομα (*onoma*), 'name'. ● Nomen proposed expressly to replace an available nomen (its ***archaeonym***), and having the same ***onomatophore***. ● **END**: ***alloneonym*** and ***autoneonym***. ● Dubois 2000: 52. ● *Code*: new replacement name, nomen novum, unjustified emendation. ● 15.02.18 (Dubois & Aescht 2019*g*).

Neonymy, *n.* ● AV. ● **ETY**: see ***Neonym***. ● The relationship between an archaeonym and its neonym. ● Dubois 2006*a*: 169. ● *Code*: no term. ● 15.02.18 (Dubois & Aescht 2019*g*).

Neophoront, *n.* ● AL. ● **ETY**: G: νέος (*neos*), 'new'; φέρω (*phero* φέρω (*phero*), 'I bear'; ὄν, ὄντος (*on*, *ontos*), 'being, individual'. ● Single specimen ***designated*** as ***onymophoront*** of a species-series nomen when the original or

subsequent ***onymophoront(s)*** is/are considered to have been lost or destroyed. ● Dubois 2005*c*: 403. ● *Code*: neotype. ● 06.03.18 (Dubois & Aescht 2019*h*).

New replacement name, e. ● See ***Neonym***.

Nomen (pl. ***nomina***), *n.* ● NO, TA. ● **ETY**: L: *nomen*, 'name'. ● Scientific name as defined, and regulated if relevant, by the *Code*. ● Dubois 2000: 39. ● *Code*: scientific name. ● 31.03.16 (Dubois & Aescht 2016*e*).

Nomen dubium, *e.* ● See ***Anaptonym***, ***Heterosynaptonym*** and ***Nyctonym***.

Nomen novum, *e.* ● See ***Neonym***.

Nomen nudum, *e.* ● See ***Gymnonym***.

Nomen oblitum, *e.* ● See ***Distagmonym***.

Nomen protectum, *e.* ● See ***Sozonym***.

Nomenclatural act, *e.* ● NO. ● See ***Onomatergy***.

Nomenclatural ambiguity, *e.* ● Any situation in which the nomenclatural status of a nomen is ambiguous. ● Dubois 2011*a*: 22. ● *Code*: no term. ● 01.02.18 (Dubois & Aescht 2019*f*).

Nomenclatural parsimony, *e.* ● The need of fewer nomina than taxa to name the latter. ● Dubois 2006*b*: 838, 2008*d*: 55, 61. ● *Code*: no term. ● 01.02.18 (Dubois & Aescht 2019*f*).

Nomenclatural Process, *e.* ● NO. ● The process through which the valid nomen of a taxon is established. It consists of four main stages, steps or 'floors': ***availability*** (including nominal-series ***assignment***), ***allocation***, ***validity*** (including ***correctness***) and ***registration***. ● Dubois 2005*c*: 381, 2011*a*: 11. ● *Code*: no term. ● 26.04.16 (Dubois & Aescht 2016*g*).

Nomenclatural rank, *e.* ● See ***Rank***.

Nomenclatural status of nomen, *e.* ● NO. ● The dimensions of the ***status of a nomen*** which depend only on nomenclatural Rules, and not on the ergotaxonomy adopted: nominal-series assignment and nomenclatural availability. ● Term in traditional use in zootaxonomy, precisely defined by Dubois (2017*b*: 36). ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*k*).

Nomina, *n.* ● NO. ● Plural of ***nomen***. ● 31.03.16 (Dubois & Aescht 2016*e*).

Nominal-series, *e.* ● NO. ● Any of the groups of coordinated nomina interacting for priority and validity regarding synonymy, homonymy and onomatergies (***species-series***, ***genus-series***, ***family-series***, ***class-series*** or ***variety-series***). ● Dubois 2000: 40. ● *Code*: group of names [English text]; niveau nomenclatural [French text]. ● 06.11.16 (Dubois & Aescht 2017*e*).

Nominal-set, *e.* ● NO. ● Any of the groups of nomina referred to the same nominal-series and the rank designation of which includes the same 'key' term: e.g., the family-set and the tribe-set within the family-series, including respectively the ranks family, subfamily and superfamily, and tribe and subtribe. ● Dubois & Aescht 2017*e*: 27. ● *Code*: no term. ● 06.11.16 (Dubois & Aescht 2017*e*).

Nominal taxon, *e.* ● See ***Taxomen***.

Nomograph, *n.* ● AV, VA. ● **ETY**: G: νόμος (*nomos*), 'law'; γράφω (*grapho*), 'I write'. ● Eugraph that is imposed by the *Zoocode* to a given nomen in a given ***ergotaxonomy***, superseding the ***protograph*** if necessary. Two situations: [1] ***mandatory spelling correction*** ('justified emendation') because the ***protograph*** is an 'incorrect original spelling'; [2] ***mandatory ending correction*** ('mandatory change') because the ***ending*** of the ***protograph*** must be corrected as a result of a change of combination in the species-series or of rank in the family-series. ● Dubois 2013: 10. ● *Code*: [1] justified emendation; [2] mandatory change. ● 31.05.18 (Dubois & Aescht 2019*p*); 11.03.19 (Dubois & Aescht 2019*s*).

Nomographic correction, *e.* ● AV, VA. ● **ETY**: see ***Nomograph***. ● Any correction in the spelling, stem or ending of a nothograph required by the nomenclatural Rules. ● Dubois 2013: 11. ● *Code*: no term. ● 11.03.19 (Dubois & Aescht 2019*s*).

Nomography, *n.* ● AV, VA. ● **ETY**: see ***Nomograph***. ● A Principle of the *Zoocode* according to which a spelling (***eugraph***) is imposed to a given nomen, superseding the ***protograph*** if necessary. ● Dubois 2013: 10. ● *Code*: no term. ● 31.05.18 (Dubois & Aescht 2019*p*).

Nothapograph, *n.* ● AV, CO. ● **ETY**: G: νόθος (*nothos*), 'wrong, illegitimate'; ἀπό (*apo*), 'away from, far from'; γράφω (*grapho*), 'I write'. ● Subsequent nothograph for a given taxon at a given rank in a given ***ergotaxonomy***. ● Dubois & Aescht 2019*s*: 130. ● *Code*: incorrect subsequent spelling. ● 11.03.19 (Dubois & Aescht 2019*s*).

Nothograph, *n.* ● CO. ● **ETY**: G: νόθος (*nothos*), 'wrong, illegitimate'; γράφω (*grapho*), 'I write'. ● A category of ***nothonym***: incorrect spelling of a nomen for a given taxon at a given rank in a given ***ergotaxonomy***. ● **ANT**: ***eugraph***. ● Dubois 2010*b*: 29. ● *Code*: incorrect spelling. ● 11.03.19 (Dubois & Aescht 2019*s*).

Nothohypse, *n.* ● CO. ● **ETY**: G: νόθος (*nothos*), 'wrong, illegitimate'; υψος (*hupsos*), 'height'. ● A category of ***nothonym***: incorrect rank of a nomen for a given taxon in a given taxonomy. ● **ANT**: ***euhypse***. ● Dubois 2010*b*: 7. ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*x*).

Nothonym, *n.* ● CO. ● **ETY**: G: νόθος (*nothos*), 'wrong, illegitimate'; ὄνομα (*onoma*), 'name'. ● Incorrect ***paronym*** (***nothograph***, ***nothohypse*** and/or ***nothonymorph***) of a nomen for a given taxon in an ***ergotaxonomy***. ● **ANT**: ***eunym***. ● Dubois 2000: 54. ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*x*).

Nothonymorph, *n.* ● CO. ● **ETY**: G: νόθος (*nothos*), 'wrong, illegitimate'; ονομα (*onoma*), 'name'; μορφή (*morphe*), 'form, shape'. ● A category of ***nothonym***: incorrect onymorph of a nomen for a given taxon in an taxonomy. ● **ANT**: ***eunymorph***. ● Dubois 2010*b*: 7. ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*x*).

Nothoprotograph, *n.* ● CO. ● **ETY**: G: νόθος (*nothos*), 'wrong, illegitimate'; πρῶτος (*protos*), 'first, earliest'; γράφω (*grapho*), 'I write'. ● Original nothograph for a given taxon at a given rank in an ***ergotaxonomy***. ● **ANT**: ***euprotograph***. ● Dubois & Aescht 2019*s*: 122. ● *Code*: incorrect original spelling. ● 11.03.19 (Dubois & Aescht 2019*s*).

Nucleogenus (pl. ***nucleogenera***), *n.* ● AL. ● **ETY**: L: *nucleus* (from *nux*, 'nut'), 'nucleus, core, stone'; *genus*, 'kind, family, race'. ● Genus-series ***taxomen*** serving as ***onomatophore*** of a family-series nomen. ● Dubois 2005*b*: 77, 2005*c*: 404. ● *Code*: type genus. ● 06.03.18 (Dubois & Aescht 2019*h*).

Nucleomen (pl. ***nucleomina***), *n.* ● AL. ● **ETY**: L: *nucleus* (from *nux*, 'nut'), 'nucleus, core, stone'; *nomen*, 'name'. ● Taxomen serving as ***onomatophore*** of a nomen of a nominal-series above the species-series. ● **END**: ***nucleogenus*** and ***nucleospecies***. ● Dubois 2005*b*: 77, 2005*c*: 403. ● *Code*: no term. ● 13.02.17 (Dubois & Aescht 2019*e*); 06.03.18 (Dubois & Aescht 2019*h*).

Nucleospecies, *n.* ● AL. ● **ETY**: L: *nucleus* (from *nux*, 'nut'), 'nucleus, core, stone'; *species*, 'idea, kind, species'. ● Species-series ***taxomen*** serving as ***onomatophore*** of a genus-series nomen. ● Dubois 2005*b*: 77, 2005*c*: 404. ● *Code*: type species. ● 06.03.18 (Dubois & Aescht 2019*h*).

Nyctonym, *n.* ● AL. ● **ETY**: G: νύξ, νυκτός (*nyx, nyctos*), 'night, darkness'; ὄνομα (*onoma*), 'name'. ● ***Monaptonym*** whose ***monophoric*** onomatophore (***lectophoront***, ***neophoront***, ***nucleospecies*** or ***nucleogenus***) cannot be referred to a known ***ergotaxon***. ● **ANT**: ***photonym***. ● Dubois 2011*a*: 54, 88. ● *Code*: one of the meanings of the ambiguous designation 'nomen dubium'. ● 01.08.19 (Dubois & Aescht 2019*w*).

Objective, *a.* ● NO. ● Actual, existing outside and independent of the mind. ● Common language term. ● *Code*: objective.

Obtainable, *a.* (***obtainability***, *n.*). ● AV. ● [1] In Articles 8.1.3 and 8.4.2.1 [to be renumbered] of the *Zoocode*: producible, that can be produced. [2] In Article 8.1.2 [to be renumbered] of the *Zoocode*: acquirable, that can be acquired. ● Common language term, introduced in zoological nomenclature with a formal definition by Dubois & Aescht (2017*h*). ● *Code*: no term. ● 06.02.17 (Dubois & Aescht (2017*h*).

Obtained, *p.* ● AV. ● In Article 9.12 [to be renumbered] of the *Zoocode*: produced and acquired. ● Common language term, introduced in zoological nomenclature with a formal definition by Dubois & Aescht (2017*h*). ● *Code*: no term. ● 06.02.17 (Dubois & Aescht (2017*h*).

Onomatergy, *n.* ● NO. ● **ETY**: G: ὄνομα (*onoma*), 'name'; εργον, *ergos*, 'work'. ● Any published action resulting in the establishment of a new nomen (***catastasy***) or in affecting the nomenclatural status of an available nomen (***airesy***). ● Dubois 2013: 3. ● *Code*: nomenclatural act. ● 29.03.19 (Dubois & Aescht 2019*t*).

Onomatophore, *n.* ● AL. ● **ETY**: G: ὄνομα (*onoma*), 'name'; φέρω (*phero*), 'I bear, I carry'. ● Objective standard of reference of ***inclusive ostension*** determining the taxonomic allocation of a nomen: within a given ***ergotaxonomic*** frame, the nomen can be potentially applied to any taxon that includes its onomatophore. In the species-series, onomatophores are specimens, whereas in the genus- and family-series they are nominal taxa (***taxomina***). ● **END**: ***nucleomen***, ***onymophoront***. ● Simpson 1940: 421. ● *Code*: type, name-bearing type. ● 13.02.18 (Dubois & Aescht 2019*e*); 06.03.18 (Dubois & Aescht 2019*h*).

Onymophoront, *n.* ● AL. ● **ETY**: G: ὄνομα (*onoma*), 'name'; φέρω (*phero*), 'I bear'; ὄν, ὄντος (*on*, *ontos*), 'being, individual'. ● Specimen(s) serving as onomatophore of a nomen of the species-series, which may be either single (***holophoront***, ***lectophoront*** or ***neophoront***) or multiple (***symphoronts***). ● Dubois 2005*b*: 77, 2005*c*: 403. ● *Code*: type specimen. ● 13.02.18 (Dubois & Aescht 2019*e*); 06.03.18 (Dubois & Aescht 2019*h*).

Onymorph, *n.* ● NO, TA. ● **ETY**: G: ὄνομα (*onoma*), 'name'; μορφή (*morphe*), 'form, shape'. ● Any particular association between genus-series ***substantive(s)*** and species-series ***epithet(s)***, used to designate a species-series taxon. A ***combination*** is a particular case of onymorph. ● Smith & Pérez-Higareda 1986: 422. ● *Code*: no term. ● 01.02.18 (Dubois & Aescht 2019*f*).

Onymotope, *n.* (***onymotopic***, a). ● AL. ● **ETY**: G: ὄνομα (*onoma*), 'name'; τόπος (*topos*), 'place'. ● Place of collection of the ***onymophoront(s)*** of a species-series taxomen. ● Dubois 2005*c*: 404. ● *Code*: type locality. ● 06.09.19 (Dubois & Aescht 2019*x*).

Onymotopic, *a.* ● AL. ● See ***Onymotope***. ● 06.09.19 (Dubois & Aescht 2019*x*).

Ostension, *n* (***ostensional***, *a*). ● AL. ● System of allocation of a nomen to a concept or class (such as a taxon) through pointing to an object being an example or member of the class (***inclusive ostension***), or a non-example or non-member of the class (***exclusive ostension***), or both (***bidirectional ostension***), without providing an intensional or closed extensional definition, or information on the boundaries the class. ● Traditional term in philosophy, logics and didactics (see Keller *et al.* 2003: 99; Dubois 2005*c*: 380, 2011*a*: 89). ● *Code*: no term. ● 13.02.18 (Dubois & Aescht 2019*e*); 06.03.18 (Dubois & Aescht 2019*h*).

Ostensional, *a.* ● AL. ● See ***Ostension***.

Parograph, *n.* ● AV, CO. ● **ETY**: G: παρά (*para*), 'near, beside, along'; γράφω (*grapho*), 'I write'. ● A category of ***paronym***: any spelling, either original (***protograph***) or subsequent (***apograph***), ever used in the literature for a nomen. ● Dubois 2010*b*: 6. ● *Code*: no term. ● 01.02.18 (Dubois & Aescht 2019*f*).

Parography, *n.* ● AV, CO. ● **ETY**: G: see ***Parograph***. ● Presence of two or more parographs for a nomen in the literature. ● Dubois & Aescht 2019*s*: 120, 131. ● *Code*: no term. ● 11.03.19 (Dubois & Aescht 2019*s*).

Parohypse, *n.* ● AV, CO. ● **ETY**: G: παρά (*para*), 'near, beside, along'; υψος (*hupsos*), 'height'. ● A category of ***paronym***: any of the avatars, either original (***protohypse***) or subsequent (***apohypse***), of the rank of a nomen. ● Dubois 2010*b*: 6. ● *Code*: no term. ● 01.02.18 (Dubois & Aescht 2019*f*).

Paromograph, *n.* ● AV, CO. ● **ETY**: G: παρά (*para*), 'near, beside, along'; ὁμός (*homos*), 'the same'; γράφω (*grapho*), 'to write'. ● Any of two or more distinct ***hoplonyms*** (having different auctors, dates and onomatophores) **of the same *nominal-series*** having the same etymology and meaning, and spellings deemed to be identical under [Article 58 of] the *Code*. ● Dubois 2012: 64. ● *Code*: variant spelling. ● 21.04.18 (Dubois & Aescht 2019*k*).

Paronym, *n.* (***paronymic***, *a*; ***paronymous***, *a*; ***paronymy***, *n*). ● AV, CO. ● **ETY**: G: παρά (*para*), 'near, beside, along'; ὄνομα (*onoma*), 'name'. ● Any of the avatars of a nomen, either original (***protonym***) or subsequent (***aponym***), and concerning its spelling (***parograph***), rank (***parohypse***) and/or, if relevant, ***onymorph*** (***paronymorph***). ● Dubois 2000: 53. ● *Code*: no term. ● 31.03.16 (Dubois & Aescht 2016*e*); 01.02.18 (Dubois & Aescht 2019*f*).

Paronymic list, *e.* ● NO, TA. ● **ETY**: see ***Paronym***. ● List of paronyms (protonym and aponyms) of a nomen. ● Dubois & Aescht 2019*o*: 108. ● *Code*: no term. ● 24.05.18 (Dubois & Aescht 2019*o*).

Paronymorph, *n.* ● AV, CO. ● **ETY**: see ***Paronym***. ● A category of ***paronym***: any of the avatars, either original (***protonymorph***) or subsequent (***aponymorph***), of the ***onymorph*** of a nomen. ● Dubois 2000: 53. ● *Code*: no term. ● 01.02.18 (Dubois & Aescht 2019*f*).

Paronymy, *n.* ● AV, CO. ● **ETY**: See ***Paronym***. ● The relationships between the **paronyms** of a nomen. ● Dubois 2000: 58 (in the sense of ***paronymic list***). ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*x*).

Parordinate. ● NO, TA. ● **ETY**: L: *par*, 'equal, same'; *ordo*, 'series, line, row, order'. ● Qualification of any of two or more taxa that have the same hierarchical rank and are **immediately *subordinate*** to the same ***superordinate*** taxon in a given ***ergotaxonomy***. ● Dubois 2006*b*: 827, 2007*a*: 33, 2008*d*: 60. ● *Code*: no term.

Partially regulated family-series ranks, *e.* ● NO. ● Ranks of the family-series for which the *Code* does not prescribe ***mandatory endings*** but only that their ending nominative indicates plural. ● Dubois & Aescht 2019*s*: 128. ● *Code*: no term. ● 11.03.19 (Dubois & Aescht 2019*s*).

Phory, *n.* ● AL. ● **ETY**: G: φέρω (*phero*), 'I bear'. ● Qualification of a nomen created with an ***onomatophore***. ● Dubois 2011*a*: 102. ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*x*).

Photonym, *n.* ● AL. ● **ETY**: G: φως, φωτός (*phos, photos*), 'light, day'; ὄνομα (*onoma*), 'name'. ● ***Monaptonym*** whose ***monophoric*** onomatophore (***lectophoront***, ***neophoront***, ***nucleospecies*** or ***nucleogenus***) is referred to a known ***ergotaxon***. ● **ANT**: ***nyctonym***. ● Dubois 2011*a*: 54, 89. ● *Code*: no term. ● 01.08.19 (Dubois & Aescht 2019*w*).

Poieonym, *n.* ● AV. ● **ETY**: ποιέω (*poieo*), 'to create' and ὄνομα (*onoma*), 'name'. ● Brand new nomen, not proposed to replace an existing one. ● **ANT**: ***neonym***. ● Dubois 2017*a*: 12. ● *Code*: no term. ● 15.02.18 (Dubois & Aescht 2019*g*).

Polysemic, *a.* ● AV. ● **ETY**: G: πολύς (*polys*), 'numerous'; σῆμα (*sema*), 'sign, mark'. ● In the context of zoological nomenclature, the qualification of either [1] a system that allows the same nomen to designate distinct taxa at different nomenclatural ranks within the same nominal-series, and standing in a situation of nomenclatural ***coordination***, or [2] any nomen being in this situation (see Dubois 2007*a*: 41). ● **ANT**: ***monosemic***. ● Traditional term in linguistics and grammar. ● *Code*: no term. ● 01.02.18 (Dubois & Aescht 2019*f*).

Polythetic diagnosis, *e.* ● AL. ● In taxonomy, a diagnosis of taxon involving a variable, but unique to the taxon, combination of alternative character states, none of which is necessarily present in every member of the taxon.

ANT: ***Monothetic diagnosis***. ● Sneath 1962; Van Regenmortel 2016; Dubois 2017*c*. ● *Code*: no term. ● 13.02.18 (Dubois & Aescht 2019*e*).

Population, *n*. ● AL. ● A set of conspecific syntopic and synchronic organisms that are in reproductive interactions in a given habitat/environment. ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*x*).

Post-registration, *n.* ● AV, VA. ● A category of ***registration*** of a nomen or an ***onomatergy*** that occurred **after** the publication of the latter, e.g. registration in one of the *Official Lists and Indexes of Names and Works in Zoology* (following or not an ***archoidy***) or registration in a *List of Available Names*. ● Dubois & Aescht 2019*v*: 148. ● *Code*: no term. ● 08.07.19 (Dubois & Aescht 2019*v*).

Precedence, *n.* ● VA. ● In zoological nomenclature, the fact that a nomen must be used as valid against its potential synonyms and homonyms, as a result of the Principles of Validity of the *Code*. ● Traditional term in zoological nomenclature. ● *Code*: precedence. ● 11.06.18 (Dubois & Aescht 2019*q*).

Prefix, *n.* ● NO. ● A letter or group of letters preceding a word having its independent existence in order to modify its meaning. ● Common language term. ● *Code*: prefix. ● 27.05.18 (Dubois & Aescht 2019*n*).

Preliminary version of work accessible electronically in advance of publication, *e.* ● AV. ● Any version of a work published online and which differs, even slightly (e.g., by even a single letter or a single modified element of layout, by the pagination or by the mention of an issue number), in content and/or layout from the final version of the same work subsequently published online. A preliminary version is nomenclaturally unavailable. It is accessible online only during a limited period, before being definitively replaced on a website by the final version, which then remains unchanged. To be available, this final version should be published as a PDF/A (Portable Document Format Archive) or any other format that allows keeping the document with a strictly fixed content and layout. ● Expression based on common language term, introduced in zoological nomenclature with a formal definition by Dubois & Aescht (2017*h*: 44). ● *Code*: no term. ● 06.02.17 (Dubois & Aescht 2017*h*).

Prenucleospecies, *n.* ● AL. ● **ETY**: L: *prae*, in the sense of 'before'; *nucleus*, 'nucleus, core, stone' (from *nux*, 'nut'); *species*, 'species'. ● One of several nominal species originally included in a new nominal genus or subgenus at its first publication (specific ***symphory***), before subsequent designation among them of a single nucleospecies. ● Dubois 2005*c*: 404. ● *Code*: originally included nominal species. ● 24.05.18 (Dubois & Aescht 2019*m*).

Pre-registration, *n.* ● AV, VA. ● A category of ***registration*** of a nomen or an ***onomatergy*** that occurred **before** the publication of the latter, e.g. registration in *Zoobank* before an electronic publication. ● Dubois & Aescht 2019*c*: 12. ● *Code*: no term. ● 28.12.17 (Dubois & Aescht 2019*c*).

Primary (generic) combination, *e.* ● AV, VA. ● The original association between a new ***final epithet*** and a generic ***substantive*** as it was first published (***priscogenus***). ● Dubois 1995*a*: 64. ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*k*).

Primary homonym, *e.* ● VA. ● See ***Hadromonym***.

Principle, *n.* ● NO. ● Within the frame of the *Zoocode*, a general statement of general value which applies to all relevant nomenclatural acts. ● *Code*: no definition. ● 01.08.19 (Dubois & Aescht 2019*w*).

Priority, *n.* ● VA. ● In the context of zoological nomenclature, the fact that a nomen, an onomatergy or a spelling published previously to another one has nomenclatural precedence on the latter. ● Traditional term in zoological nomenclature. ● *Code*: priority. ● 31.05.18 (Dubois & Aescht 2019*p*).

Priscogenus, *n.* ● AV, VA. ● **ETY**: L: *prisco*, 'primitive'; *genus*, 'race, kind, genus'. ● The generic substantive with which a new species-series epithet was combined in the publication where it was made available. ● Dubois & Aescht 2019*k*: 77. ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*k*).

Proedry, *n.* ● VA. ● **ETY**: G: προεδρία (*proedria*), 'precedence, first place'. ● Rule of nomenclatural rank precedence between synchronous synonyms or homonyms under the *Code* (Articles 24, 55.5, 56.3 and 57.7) which states that if one of these nomina was proposed at a higher rank than the other(s), it takes precedence over it/them. ● Dubois 2013: 7. ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*k*).

Protoasthenomonym, *n* (***protoasthenomonymy***, *n*). ● VA. ● **ETY**: G: πρωτος (*protos*), 'first, earliest'; ἀσθενής (*asthenes*), 'weak'; ὁμός (*homos*), 'the same'; ὄνομα (*onoma*), 'name'. ● Any of two (or more) ***asthenomonyms*** among which the senior one was subsequently referred to a ***mutogenus*** being the ***priscogenus*** of the junior one. Under the *Zoocode*, the junior one is invalid as long as both nomina remain referred to this mutogenus as their ***rectogenus***. ● Dubois & Aescht 2019*k*: 77. ● *Code*: secondary homonym (in part). ● 21.04.18 (Dubois & Aescht 2019*k*).

Protoasthenomonymy, *n.* ● VA. ● **ETY**: see ***Protoasthenomonym***. ● The fact that two distinct nomina are ***protoasthenomonyms***. ● Dubois & Aescht 2019*k*: 77. ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*k*).

Protograph, *n.* ● AV. ● **ETY**: G: πρωτος (*protos*), 'first, earliest'; γράφω (*grapho*), 'I write'. ● Original ***parograph*** of a nomen in the publication where it was originally introduced. ● **ANG**: ***protonym***. ● **END**: ***holoprotograph***,

symprotograph, ***lectoprotograph***, ***leipoprotograph***. ● **ANT**: ***apograph***. ● Dubois 2010*b*: 6. ● *Code*: original spelling. ● 01.02.18 (Dubois & Aescht 2019*f*); 21.04.18 (Dubois & Aescht 2019*k*).

Protohadromonym, *n.* (***protohadromonymy***, *n*). ● VA. ● **ETY**: G: πρωτος (*protos*), 'first, earliest'; ἁδρός (*hadros*), 'robust'; ὁμός (*homos*), 'the same'; ὄνομα (*onoma*), 'name'. ● Any of two (or more) ***hadromonyms*** originally referred to the same ***priscogenus***. Under the *Zoocode*, the junior one is permanently invalid. ● Dubois & Aescht 2019*k*: 77. ● *Code*: primary homonym. ● 21.04.18 (Dubois & Aescht 2019*k*).

Protohadromonymy, *n.* ● **ETY**: see ***Protohadromonym***. ● The fact that two distinct nomina are ***protohadromonyms***. ● Dubois & Aescht 2019*k*: 77. ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*k*).

Protohypse, *n.* ● AV. ● **ETY**: G: πρωτος (*protos*), 'first, earliest'; υψος (*hypsos*), 'height'. ● A category of ***protonym***: original rank of a nomen. ● **ANT**: ***apohypse***. ● Dubois 2010*b*: 6. ● *Code*: no term. ● 01.02.18 (Dubois & Aescht 2019*f*).

Protonym, *n.* ● AV, CO. ● **ETY**: G: πρῶτος (*protos*), 'first, earliest'; ὄνομα (*onoma*), 'name'. ● Original spelling (***protograph***), rank (***protohypse***) and/or, if relevant, onymorph (***protonymorph***) of a nomen. ● **ANT**: ***aponym***. ● Dubois 2000: 51. ● *Code*: no term. ● 31.03.16 (Dubois & Aescht 2016*e*).

Protonymorph, *n.* ● AV. ● **ETY**: G: πρωτος (*protos*), 'first, earliest'; ὄνομα (*onoma*), 'name'; μορφή (*morphe*), 'form, shape'. ● A category of ***protonym***: original onymorph of a nomen. ● **ANT**: ***aponymorph***. ● Dubois 2010*b*: 6. ● *Code*: no term. ● 01.02.18 (Dubois & Aescht 2019*f*).

PRR, *ab*. ● See ***Partially regulated family-series ranks***.

Pseudomograph, *n.* ● AV, VA. ● **ETY**: G: ψευδς (*pseudes*) 'lying, false'; ὁμός (*homos*), 'the same'; γράφω (*grapho*), 'to write'. ● Any of two or more distinct identical or 'deemed to be identical' (under [Article 58 of the *Code*]) epithets originally referred to genera designated by homonymous but distinct generic substantives. Under the *Zoocode*, such nomina, although homonyms, are not to be treated as such (i.e., the junior one is not made invalid by the existence of the senior one). ● Dubois & Aescht 2019*k*: 69, 77. ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*k*).

Pseudoranked, *p.* ● NO. ● **ETY**: G: ψευδς (*pseudes*) 'lying, false'; Frankish: *hring*, 'circle, ring', from Proto-Germanic *hringaz*, 'circle, ring, something curved'. ● Qualification of a nomenclatural system in which ranks of nomina are mentioned but used in an inconsistent manner, for example assigning different ranks to ***parordinate*** taxa, or having different hierarchies between the same ranks in different parts of the classification, or using ranks for some taxa but no rank for others, simply referred to as 'taxa' or 'clades'. Ranks used in such a system provide no information on the hierarchical relationships between nomina, and by way of consequence on the structure of the tree adopted as a basis for the taxonomy. ● Dubois 2007*a*: 34. ● *Code*: no term.

Publication, *n* (***published***, *p*). ● NO, TA. ● In the context of zoological nomenclature, issuing of a work conforming to the provisions of Articles 8–9 of the *Code* (i.e., mostly, printed with ink on paper and distributed as several identical copies, or released electronically after 2011; see Dubois 2015*b*: Appendix 2, Table 2). ● Traditional term in zoological nomenclature. ● *Code*: publication. ● 06.09.19 (Dubois & Aescht 2019*x*).

Publication date, *e.* ● NO. ● In the context of zoological nomenclature, the **actual** date of **public distribution** of a publication—not its date of writing, submission, acceptance, printing or any other date that may appear in the document itself. ● Term in traditional use in nomenclature. ● *Code*: date.

Published, *p.* ● Work issued conforming to the provisions of Articles 8–9 of the *Code*. ● See ***Publication***. ● 06.09.19 (Dubois & Aescht 2019*x*).

Rank, *n.* ● NO, TA. ● **ETY**: Frankish: *hring*, 'circle, ring', from Proto-Germanic *hringaz*, 'circle, ring, something curved'. ● The place of a nomen in a nomenclatural hierarchy or of a taxon in a taxonomic hierarchy. In the zoological *Code*, each rank is referred to a given ***nominal-series***. ● Traditional term in nomenclature and taxonomy, precisely defined by Dubois & Malécot (2005: 101) and Dubois (2005*c*: 412). ● *Code*: rank. ● 31.03.16 (Dubois & Aescht 2016*e*).

Ranked, *p.* ● NO. ● **ETY**: see ***Rank***. ● Qualification of a nomenclatural system in which ranks are assigned to the nomina of supraspecific and subspecific taxa. ● Traditional term in zoological nomenclature. ● *Code*: no term.

Recommendation, *n.* ● NO. ● A suggestion of 'good practice' which zootaxonomists are encouraged to follow, but failure to do so has no bearing on the availability or validity of onomatergies. A Recommendation has no juridical function and is therefore not part of the *Zoocode*. ● *Code*: recommendation. ● 01.08.19 (Dubois & Aescht 2019*w*).

Rectogenus, *n.* ● VA. ● **ETY**: L: *recto*, 'correct, right'; *genus*, 'race, kind, genus'. ● The generic substantive accepted in an ergotaxonomy as the valid one for the genus to which a species-series epithet is referred (whether as valid or as an invalid synonym). ● Dubois & Aescht 2019*k*: 77. ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*k*).

Referred to, *e.* ● AV. ● [1] For a nominal taxon, the statement in a publication that it is subordinate to another one of higher rank. The statement that a species-series epithet is referred to a nominal genus may be made through ***actual***

combination with the generic substantive or through ***virtual combination***, by simple mention that it belongs to this genus, whether considered as valid or as an invalid synonym. [2] For a specimen, the statement that it belongs to a taxon recognised in a given ergotaxonomy. ● Dubois & Aescht 2019*k*: 77. ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*k*).

Registered, *p.* ● RE. ● Qualification of a nomen (***delonym***) that conforms to the conditions of nomenclatural registration of the *Zoocode* (see Dubois 2010*b*). ● **ANT**: ***unregistered***. ● Traditional term in many domains. ● *Code*: no term. ● 08.06.16 (Dubois & Aescht 2016*h*).

Registration, *n.* ● RE. ● ***Onomatergy*** by which a nomen registered in an international nomenclatural database becomes permanently available in zoological nomenclature (***delonym***). Under the *Zoocode*, this act gives its name to the fourth floor or stage of the ***Nomenclatural Process*** (Dubois 2005*a–d*, 2010*a*). ● Traditional term in many domains. ● *Code*: registration. ● 26.04.16 (Dubois & Aescht 2019*g*).

Regulated Exception, *e.* ● NO. ● An exception to the Principles and standard Rules of the *Zoocode* tolerated by the latter but only under strictly codified conditions in a few particular situations: [1] concerning publication dates; [2] concerning quantitative criteria, such as numbers of authors or numbers of works (e.g. in the cases of reversal of precedence); [3] concerning special situations such as the difficulty or inappropriateness of the collection of specimens. Regulated Exceptions are not Recommendations but Rules which are fully governed by the *Zoocode*. ● Dubois & Aescht 2019*w*: 156. ● *Code*: no term. ● 01.08.19 (Dubois & Aescht 2019*w*).

Rhizomograph, *n.* ● AV, VA. ● **ETY**: G: ρίζα (*rhiza*), 'root, stem'; ὁμός (*homos*), 'the same'; γράφω (*grapho*), 'to write'. ● Any of two or more distinct ***protographs*** of the family or class-series having different spellings but derived from the same stem or from homographic terms. ● Dubois 2012: 64, (65). ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*k*).

Rhizomography, *n.* ● AV, VA. ● **ETY**: see ***Rhizomograph***. ● The fact that two distinct nomina are ***rhizomographs***. ● Dubois 2012: 65. ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*k*).

Rule, *n.* ● NO. ● Within the frame of the *Zoocode*, a specific mandatory prescription, compatible with its Principles, which applies in particular nomenclatural situations and cases, and regulates the relevant nomina and onomatergies. ● *Code*: rule. ● 01.08.19 (Dubois & Aescht 2019*w*).

Scientific name, *e.* ● NO, TA. ● See **Nomen**.

Scriptor, *n.* ● AV, CO. ● **ETY**: L: *scriptor*, 'writer, author'. ● In the context of zoological nomenclature, name(s) of the person(s) to whom the first use of an ***aponym*** is credited, i.e., whose name(s) appear(s) as ***signatory*** of the work where this aponym first appeared itself—not established through subsequent investigation. ● Dubois 2000: 42 (as 'first-user'), 2013: 3 (as 'primoscriptor'), 2015*a*: 15. ● *Code*: no term. ● 11.03.19 (Dubois & Aescht 2019*s*).

Secondary (generic) combination, *e.* ● AV, VA. ● Any subsequent association of a ***final epithet*** with a different generic substantive (***mutogenus***) different from that to which it was referred when it was first published (***priscogenus***). ● Dubois 1995*a*: 64. ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*k*).

Secondary homonym, *e.* ● VA. ● See ***Asthenomonym*** and ***Hadromonym***.

Semaphoront, *n.* ● TA. ● **ETY**: G: σῆμα (*sema*), 'sign, mark'; φέρω (*phero*),'I bear'; ὄν, ὄντος (*on*, *ontos*), 'being, individual'. ● Any specimen from a given population and of a given sex, stage and age, that bears an indefinite number of characters potentially usable in taxonomy. ● Hennig 1950, 1966. ● *Code*: no term. ● 06.03.18 (Dubois & Aescht 2019*h*).

Senior, *a.* ● NO. ● In the context of zoological nomenclature, and concerning a nomen, an onomatergy or a spelling: published at a date prior to that of publication of another nomen, onomatergy or spelling, qualified as ***junior***. ● Traditional term in nomenclature. ● *Code*: senior. ● 31.05.18 (Dubois & Aescht 2019*p*).

Seniorisation, *n* (***seniorise***, *v*). ● NO. ● In the context of zoological nomenclature, and concerning a conflict of zygoidy between synchronous nomina, spellings or airetophories, ***airesy*** by which a nomen, spelling or airetophory is granted precedence over another one, which is then ***juniorised*** relative to it. ● Dubois 2000: 47. ● *Code*: junior. ● 11.06.18 (Dubois & Aescht 2019*q*).

Signatory, *n.* ● NO, TA. ● Name(s) of the person(s) which appear(s) on the cover or at the beginning or end of a published work. ● Dubois & Aescht 2019*s*: 131. ● *Code*: author. ● 11.03.19 (Dubois & Aescht 2019*s*).

Sozairetophory, *n.* ● AL. ● **ETY**: G: σώζω (*sozo*), 'I keep, I protect'; αιρετός, *airetos*, 'chosen, elected'; φέρω, *phero*, 'I bear, I carry'. ● Subsequent restriction or designation of onomatophore for a nomen. ● Dubois 2013: 5. ● *Code*: no term. ● 29.03.19 (Dubois & Aescht 2019*t*).

Sozodiaphonym, *n.* ● VA. ● **ETY**: G: σώζω (*sozo*), 'I keep, I protect'; διάφωνος (*diaphonos*), 'discordant'; ὄνομα (*onoma*), 'name'. ● Nomen that has had an important use in non-systematic literature after 31 December 1899 (i.e., that appeared in at least 100 titles of publications since then), but alternatively to (an)other sozodiaphonym(s) for

the same taxon or closely related taxa. ● Dubois & Raffaëlli 2012: 90; Dubois 2016: 11. ● *Code*: no term. ● 29.03.19 (Dubois & Aescht 2019*t*).

Sozograph, *n.* ● CO. ● **Ety**: G: σῴζω (*sozo*), 'I keep, I protect'; γράφω (*grapho*), 'I write'. ● Spelling that has had a dominant usage for a nomen in scientific literature after 31 December 1899 (i.e., that appeared in at least 100 titles of scientific publications since then) whereas no other spelling has been used so for the same nomen, and which for this reason must be treated as the correct spelling of this nomen. ● Dubois 2013: 12. ● *Code*: no term. ● 29.03.19 (Dubois & Aescht 2019*t*).

Sozography, *n.* ● CO. ● **Ety**: see ***Sozograph***. ● Situation in zoological nomenclature where a given nomen has been used with different spellings in scientific literature, including one that has had a dominant usage. ● Dubois 2013: 8. ● *Code*: no term. ● 29.03.19 (Dubois & Aescht 2019*t*).

Sozoidy, *n.* ● VA, CO. ● **Ety**: G: σῴζω (*sozo*), 'I keep, I protect'; εἶδος (*eidos*), 'aspect, shape'. ● A Principle of the *Zoocode* according to which a nomen or a spelling in really important usage in the literature should be given precedence over a senior nomen or spelling. ● Dubois 2013: 8. ● *Code*: no general term, but 'reversal of precedence' applies to some cases of sozoidy. ● 31.05.18 (Dubois & Aescht 2019*p*).

Sozonym, *n.* ● VA. ● **Ety**: G: σῴζω (*sozo*), 'I keep, I protect'; ὄνομα (*onoma*), 'name'. ● Nomen that has had a universal or significant use in non-systematic literature after 31 December 1899 (i.e., that appeared in at least 100 titles of publications since then), whereas none of its synonyms has been used so for the same taxon or closely related taxa. Such a nomen must be validated even if this requires to make an exception to the Rules, e.g., against a senior synonym or homonym. ● Dubois 2005*b*: 86, 2005*c*: 412, 2016: 11. ● **Ant**: ***distagmonym***. ● *Code*: no term. ● 29.03.19 (Dubois & Aescht 2019*t*).

Sozonymy, *n.* ● VA. ● **Ety**: see ***Sozonym***. ● Situation in zoological nomenclature where, among two or more synonyms or homonyms, one qualifies as a ***sozonym***. In such cases, the sozonym must be given precedence for validity (if not invalid for another reason) over its senior synonym(s) or homonym(s). ● Dubois 2011*a*: 92. ● *Code*: prevailing usage. ● 29.03.19 (Dubois & Aescht 2019*t*).

Species-series (SS), *e.* ● NO. ● In the nomenclatural hierarchy, the lowest-ranking ***nominal-series*** which is fully regulated by the *Code*, ranked below the genus-series. It includes nomina of taxa at the ranks of species, subspecies, species aggregate and subspecies aggregate. ● Dubois 2000: 40. ● *Code*: species group [English text]; niveau espèce [French text]. ● 06.11.16 (Dubois & Aescht 2017*e*).

Specific epithet, *e.* ● NO. ● Epithet designating a taxon of specific rank. ● Traditional term in zoological nomenclature. ● *Code*: no term. ● 02.02.18 (Dubois & Aescht 2019*d*).

Spelling, *n.* ● AV, CO. ● The arrangement of letters that form a word. In nomenclature, the same nomen can take different spellings, its ***parographs***. ● Term in traditional use in common language and in nomenclature. ● *Code*: spelling. ● 31.03.16 (Dubois & Aescht 2016*e*).

SS, *ab.* ● See ***Species-series***.

Status of nomen, *e.* ● NO, TA. ● The status of a nomen regarding nominal-series assignment, nomenclatural availability, taxonomic allocation, taxonomic validity and nomenclatural correctness. ● **End**: ***nomenclatural status of nomen*** and ***taxonomic status of nomen***. ● **Syn**: ***taxonominal status of nomen***. ● Term in traditional use in zootaxonomy, precisely defined by Dubois (2017*b*: 35–37). ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*k*).

Stem, *n.* ● NO. ● For the purpose of zoological nomenclature, the first part of a nomen, which is invariable and which is followed by a ***fixed*** or ***variable ending***. In the family-series, the stem is usually the part of a genus-series nomen, derived from its Latin or Latinised genitive, to which is added a family-series ending; after 1999, it may also be the whole of this genus-series nomen, which is then treated as being an arbitrary combination of letters. In the species-series, epithets that are adjectives or past participles consist of an invariable stem, to which a variable ending indicating grammatical gender and number is added. For other species-series epithets, the whole nomen (stem and ending) is indeclinable. ● Term of grammar, in traditional use in biological nomenclature; Dubois & Aescht 2019*n*. ● *Code*: stem. ● 27.05.18 (Dubois & Aescht 2019*n*); 11.03.19 (Dubois & Aescht 2019*s*).

Subjective, *a.* ● NO. ● Based on or influenced by personal feelings, tastes or opinions. ● Common language term. ● *Code*: subjective.

Subordinate. ● NO, TA. ● **Ety**: L: *sub*, 'below'; *ordo*, 'series, line, row, order'. ● Qualification of a taxon that is at a lower hierarchical rank than another taxon, which is ***superordinate*** to it. ● Traditional term in zoological taxonomy and nomenclature. ● *Code*: subordinate.

Subsidiary rank, *e.* ● NO, TA. ● Nomenclatural rank related to a ***key rank*** (e.g., classis, ordo, familia, tribus, genus, species) by the adjunction of a ***prefix*** (e.g., super-, sub-, infra-). ● **Ant**: ***key rank.*** ● Common language terms; Dubois 2006*a*. ● *Code*: no term. ● 27.05.18 (Dubois & Aescht 2019*n*).

Subspecific epithet, *e*. ● NO. ● Epithet designating a taxon of subspecific rank. ● Traditional term in zoological nomenclature. ● *Code*: no term. ● 02.02.18 (Dubois & Aescht 2019*d*).

Substantive, *n.* ● NO. ● Generic or subgeneric ***nomen***, always bearing a capital, being part of a ***binomen*** or ***trinomen***. ● Dubois 2000: 40. ● *Code*: generic name, genus name, name of a genus. ● 02.02.18 (Dubois & Aescht 2019*d*).

Suffix, *n.* ● NO. ● For the purpose of zoological nomenclature, a letter or group of letters at the end of a nomen which may carry a standard, identified meaning or usage, such as indicating Latin cases (e.g. -*ae* or -*i*), or small size (e.g. -*ella* or -*ita*), or resemblance (e.g. -*oides* or -*ops*). In the species- and genus-series, the suffix when it exists is identical with the ending. In the family-series, the suffix is the letter or group of letters (e.g., -*AE*, -*I*, -*A*, -*EA*, -*IA*) indicating nominative plural in Latin and pointing to the rank of the taxon, following either directly the ***stem*** of a family-series nomen based on a genus-series nomen, or the ***connector*** which follows it, if present. ● Common language term; Alonso-Zarazaga 2005: 191 (as 'ending proper'); Dubois & Aescht 2019*n*: 103. ● *Code*: suffix. ● 27.05.18 (Dubois & Aescht 2019*n*); 11.03.19 (Dubois & Aescht 2019*s*).

Superordinate. ● NO, TA. ● **ETY**: L: *super*, 'above'; *ordo*, 'series, line, row, order'. ● Qualification of a taxon that is at a higher hierarchical rank than another taxon, which is ***subordinate*** to it in a given ***ergotaxonomy***. ● Traditional term in zoological taxonomy and nomenclature. ● *Code*: no term.

Symphoront, *n*. ● AL. ● **ETY**: G: σύν (*syn*), 'together'; φέρω (*phero*), 'I bear'; ὄν, ὄντος (*on*, *ontos*), 'being, individual'. ● One of several specimens originally used collectively as ***onomatophore*** of a species-series nomen. ● Dubois 2005*c*: 403. ● *Code*: syntype. ● 06.03.18 (Dubois & Aescht 2019*h*).

Symphoric, *a*. ● See ***Symphory***. ● 06.09.19 (Dubois & Aescht 2019*x*).

Symphory, *n* (***symphoric***, *a*). ● AL. ● **ETY**: G: σύν (*syn*), 'together'; φέρω (*phero*), 'I bear'. ● Qualification of a nomen created with or supported by an onomatophore composed of a series of specimens (in the species-series) or of taxomina (in the other three nominal-series). ● Dubois 2005*c*: 404. ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*x*).

Symprotograph, *n* (***symprotography***, *n*). ● AV. ● **ETY**: G: σύν (*syn*), 'together'; πρῶτος (*protos*), 'first, earliest'; γράφω (*grapho*), 'I write'. ● A category of ***protograph***: one of two or more alternative original spellings of a nomen. ● **ANT**: ***holoprotograph***. ● Dubois 2010*b*: 8, 42. ● *Code*: one of multiple original spellings. ● 15.02.18 (Dubois & Aescht 2019*g*); 31.05.18 (Dubois & Aescht 2019*p*).

Symprotography, *n.* ● AV. ● **ETY**: see ***Symprotograph***. ● Presence of two or more symprotographs for the nomen in the original publication where this nomen was introduced. ● Dubois & Aescht 2019*s*: 120. ● *Code*: no term. ● 11.03.19 (Dubois & Aescht 2019*s*).

Synaptonym, *n*. ● AL. ● **ETY**: G: σύν (*syn*), 'together'; ἅπτω (*apto*), 'fasten, attach, fix'; ὄνομα (*onoma*), 'name'. ● ***Aptonym*** whose onomatophore is ***symphoric***, being composed of more than one specimen or ***taxomen***. Synaptonyms may be **original** (***symphory*** fixed in the original publication) or **subsequent** (***symphory*** being subsequent to ***aphory*** in the original publication). They may also be indissoluble or considered taxonomically homogeneous (***homosynaptonyms***) or considered taxonomically heterogeneous (***heterosynaptonyms***). ● **ANT**: ***monaptonym***. ● Dubois 2011*a*: 25, 94. ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*x*).

Synchronous, *a.* ● AV, VA. ● **ETY**: see ***synchrony***. ● In the context of zoological nomenclature, the fact that two publications were distributed at the same date. ● **ANT**: ***allochronous***. ● Common language term; Dubois 2013. ● *Code*: no term. ● 15.02.18 (Dubois & Aescht 2019*g*); 31.05.18 (Dubois & Aescht 2019*p*).

Synchrony, *n* (***synchronous***, *a*). ● AV, VA. ● **ETY**: G: σύν (*syn*), 'together'; χρόνος (*chronos*), 'time'. ● Distinct events that occurred at the same date. ● **ANT**: ***allochrony***. ● Common language term; Dubois & Aescht 2019*g*: 50, 52. ● *Code*: no term. ● 15.02.18 (Dubois & Aescht 2016*g*).

Synonym, *n* (***synonymic***, *a*; ***synonymous***, *a*; ***synonymy***, *n*). ● VA, TA. ● **ETY**: G: σύν (*syn*), 'together'; ὄνομα (*onoma*), 'name'. ● Any of two or more distinct ***nomina*** of the same nominal-series considered, either for objective (***isonyms***) or for subjective (***doxisonyms***) reasons, to denote the same taxon in a given ergotaxonomic frame. ● Traditional term in zootaxonomy. ● *Code*: synonym. ● 31.03.16 (Dubois & Aescht 2016*e*); 24.05.18 (Dubois & Aescht 2019*o*).

Synonymic list, *e*. ● VA, TA. ● **ETY**: see ***Synonym***. ● List of synonyms. ● Traditional term in zootaxonomy. ● *Code*: no term. ● 31.03.16 (Dubois & Aescht 2016*e*); 24.05.18 (Dubois & Aescht 2019*o*).

Synonymous, *a*. ● VA, TA. ● **ETY**: see ***Synonym***. ● In zoological nomenclature, the qualification of two distinct nomina of the same nominal-series that are ***synonyms*** under the *Code*. ● Term in traditional use in common language and in zootaxonomy. ● *Code*: synonymous. ● 06.03.18 (Dubois & Aescht 2019*j*).

Synonymy, *n*. ● VA, TA. ● **ETY**: see ***Synonym***. ● The fact that two distinct nomina of the same nominal-series are considered to denote the same taxon in a given ergotaxonomy, either for objective (***isonymy***) or for subjective

(***doxisonymy***) reasons. ● Traditional term in zootaxonomy. ● *Code*: synonymy. ● 26.04.16 (Dubois & Aescht 2016*g*); 24.05.18 (Dubois & Aescht 2019*o*).

Synotaxy, *n.* ● VA, TA. ● **ETY**: G: σύν (*syn*), 'together'; τάξις (*taxis*), 'order, arrangement'. ● The fact that two distinct taxa of the same or different nominal-series are considered to correspond to the same taxon (same ***extension***) in a given ergotaxonomy. ● Dubois & Ohler 2019: 19. ● *Code*: no term. ● 24.05.18 (Dubois & Aescht 2019*o*).

Taxa. ● Plural of ***taxon***.

Taxomen (pl. ***taxomina***), *n.* ● NO. ● **ETY**: G: τάξις (*taxis*), 'order, arrangement'; L: *nomen*, 'name'. ● The permanent association between a ***nomen*** and an ***onomatophore***, allowing objective, non-ambiguous and stable allocation of nomina to taxa. ● Dubois 2000: 40. ● *Code*: nominal taxon. ● 06.03.18 (Dubois & Aescht 2019*h*).

Taxon (pl. ***taxa***), *n.* ● NO, TA. ● **ETY**: Gr.: τάξις (*taxis*), 'order, arrangement'. ● Any taxonomic unit recognised by a zoologist, whether named or not. ● Meyer 1926: 127. ● *Code*: taxon, taxonomic taxon. ● 31.03.16 (Dubois & Aescht 2016*e*).

Taxonomic act, *e.* ● NO. ● Any published action resulting in the establishment of a new taxon or in affecting the taxonomic status of an existing taxon. ● Common language terms. ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*x*).

Taxonomic category, *e.* ● TA. ● A set of taxa that share certain biological (e.g., crossability) or historical (e.g., geological age) characteristics (see e.g.: Dubois & Malécot 2005: 98; Dubois 2005*c*: 412–413, 2006*a*: 219–220, 2007*a*, 2008*d*). Taxonomic categories may be ***ranked*** (corresponding to nomenclatural ranks of the nomenclatural hierarchy: e.g., species, genus, tribe) or ***unranked*** (categories that do not correspond to nomenclatural ranks: e.g., semispecies, klepton, plesion). ● Traditional term in nomenclature and taxonomy. ● Dubois 2005*c*: 413. ● *Code*: no term.

Taxonomic status of nomen, *e.* ● NO, TA. ● The dimensions of the ***status of a nomen*** which depend both on nomenclatural Rules and on the ergotaxonomy adopted: taxonomic allocation, taxonomic validity and nomenclatural correctness. ● Term in traditional use in zootaxonomy, precisely defined by Dubois (2017*b*: 36–37). ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*k*).

Taxonominal, *a.* ● NO, TA. ● **ETY**: G: τάξις (*taxis*), 'order, arrangement'; L: *nomen*, 'name'. ● Taxonomic and nomenclatural. ● Dubois 2011*b*: 51. ● *Code*: no term. ● 06.03.18 (Dubois & Aescht 2019*j*).

The Commission or its successor body, *e.* ● NO. ● The International Commission on Zoological Nomenclature or its successor internationally accepted regulatory body that will be in charge of implementing the Plenary Power whenever necessary under the next edition of the *Code* or under the *Zoocode*. ● 12.06.19 (Dubois & Aescht 2019*u*).

Trinomen (pl. ***trinomina***), *n.* ● AV, CO. ● **ETY**: L: *tres*, 'three'; *nomen*, 'name'. ● Nomen of rank subspecies, composed of three terms, the ***generic substantive*** and the specific and subspecific ***epithets***. ● Traditional term in zoological nomenclature. ● *Code*: trinomen. ● 02.02.18 (Dubois & Aescht 2019*d*).

Trinomina, *n.* ● See ***Trinomen***. ● 02.02.18 (Dubois & Aescht 2019*d*).

Type, *n.* ● NO, TA. ● A common language term, the use of which in taxonomy and nomenclature is highly ambiguous. See ***hypodigm*** and ***onomatophore***, and Dubois & Aescht (2019*e*).

Unallocated, *p.* ● AL. ● Qualification of a nomen (***anaptonym***) that does not conform to the conditions of taxonomic allocation as regulated by the *Zoocode*. ● **ANT**: ***allocated***. ● Dubois 2005*c*: 396. ● *Code*: no term. ● 26.04.16 (Dubois & Aescht 2016*g*) [implied by the use of ***allocated***].

Unassigned, *p.* ● AS. ● Qualification of a nomen that does not conform to the conditions of nomenclatural ***assignment*** as regulated by the *Zoocode*, and is therefore ***unavailable***. ● **ANT**: ***assigned***. ● Common language term, introduced in zoological nomenclature by Dubois (2015*b*). ● *Code*: no term.

Unavailability, *n.* ● AV. ● Absence of a statement regulated by the *Zoocode* according to which a nomen is introduced in zoological nomenclature complying with the conditions of this code (***hoplonym***) or by which an ***airesy*** is made ***effective***. ● **ANT**: ***availability***. ● Term in traditional use in zoological nomenclature. ● *Code*: no term. ● 08.06.16 (Dubois & Aescht 2016*h*).

Unavailable, *a.* ● AV. ● Qualification of a nomen (***anoplonym***) that does not conform to the conditions of nomenclatural availability as regulated by a code. ● **ANT**: ***available***. ● Traditional term in zoological nomenclature. ● *Code*: unavailable. ● 08.06.16 (Dubois & Aescht 2016*h*).

Unidentified, *p.* ● AL. ● Qualification of a nomen (***nyctonym***) that cannot be referred to a known **ergotaxon**. ● **ANT**: ***identified***. ● Traditional term in taxonomy, redefined with a precise meaning dealing with taxonomic allocation of nomina by Dubois (2011*a*: 94). ● *Code*: no term. ● 06.09.19 (Dubois & Aescht 2019*x*).

Uninomen (pl. ***uninomina***), *n.* ● AL, CO. ● L: *unus*, 'one'; *nomen*, 'name'. ● Nomen of any rank composed of a single term. ● Traditional term in zoological nomenclature. ● *Code*: no term. ● 02.02.18 (Dubois & Aescht 2019*d*).

Unjustified emendation, *e.* ● See ***Autoneonym***.

Unpublished, *p*. ● Work issued not conforming to the provisions of Articles 8–9 of the *Code*. ● See ***Publication***. ● 06.09.19 (Dubois & Aescht 2019*x*).

Unranked, *p*. ● NO. ● **ETY**: Old English *un-*, prefix of negation; Frankish: *hring*, 'circle, ring', from Proto-Germanic *hringaz*, 'circle, ring, something curved'. ● Qualification of a nomenclatural system in which no ranks are assigned to the nomina of supraspecific taxa. ● Traditional term in zoological nomenclature. ● *Code*: no term.

Unregistered, *p*. ● RE. ● Qualification of a nomen (***adelonym***) that does not conform to the conditions of nomenclatural registration of the *Zoocode* (see Dubois 2010*b*). ● **ANT**: ***registered***. ● Traditional term in many domains. ● *Code*: no term.

Valid, *a*. (***validate***, *v*; ***validation***, *n*; ***validity***, *n*). ● VA. ● In the context of zoological nomenclature, qualification of a nomen (***kyronym***) that conforms to the conditions of nomenclatural validity as regulated by the *Zoocode*. ● **ANT**: ***invalid***. ● Traditional term in zoological nomenclature. ● *Code*: valid. ● 26.04.16 (Dubois & Aescht 2016*g*).

Validate, *v*. ● See ***Valid***.

Validation, *n*. ● See ***Valid***.

Validity, *n*. ● VA. ● Statement regulated by the *Zoocode* by which a nomen is determined to be the one that must be used for a taxon or several taxa in zoological nomenclature. This act gives its name to the third floor or stage of the Nomenclatural Process. ● **ANT**: ***invalidity***. ● Traditional term in zoological nomenclature. ● *Code*: validity. ● 26.04.16 (Dubois & Aescht 2016*g*).

Variable ending, *e*. ● NO. ● Ending of a nomen that is liable to change according to the ergotaxonomy adopted. Two situations: [1] species-series epithet being an adjective or a past participle: ***suffix*** indicating the grammatical gender of the epithet; [2] family-series nomen: ending indicating the rank, composed of two parts: the ***connector*** and the ***suffix*** proper. ● Dubois & Aescht 2019*n*: 103. ● *Code*: no term. ● 27.05.18 (Dubois & Aescht 2019*n*); 11.03.19 (Dubois & Aescht 2019*s*).

Variety-series (VS), *e*. ● NO. ● In the nomenclatural hierarchy, the ***nominal-series*** ranked below the ***species-series***, which is not fully regulated by the *Code.* It includes nomina of taxa at the ranks of variety, form and any additional ranks that may be required. ● Dubois & Malécot 2005: 102, Dubois 2005*c*: 408. ● *Code*: no term. ● 06.11.16 (Dubois & Aescht 2017*e*).

Virtual combination, *e*. ● NO, TA. ● A combination that does not appear in a publication but that is implied by the explicit statement that a species-series epithet (whether considered as valid or as an invalid synonym) is referred to a nominal genus. ● Dubois & Aescht 2019*k*: 77. ● *Code*: no term. ● 21.04.18 (Dubois & Aescht 2019*k*).

Voucher, *n*. ● NO, TA. ● Any reference specimen kept in a collection, whether an ***onymophoront*** or not. ● Traditional term used in biology. ● *Code*: no term. ● 24.05.18 (Dubois & Aescht 2019*m*).

VS, *ab*. ● See ***Variety-series***.

Zygograph, *n* (***zygography***, *n*). ● VA, CO. ● **ETY**: G: ζυγός, *zugos*, 'yoke'; γράφω, *grapho*, 'to write'. ● One of several spellings being potentially the correct one for the same nomen. ● Dubois 2013: 24. ● *Code*: no term. ● 06.03.18 (Dubois & Aescht 2019*j*).

Zygography, *n*. ● VA, CO. ● **ETY**: see ***Zygograph***. ● Qualification of all situations of nomenclatural conflict between several spellings being potentially the correct one for the same nomen. ● Dubois 2013: 5. ● *Code*: no term. ● 06.03.18 (Dubois & Aescht 2019*j*).

Zygoidy, *n*. ● VA. ● **ETY**: G: ζυγός (*zugos*), 'yoke'; εἶδος (*eidos*), 'aspect, shape'. ● Qualification of all situations of nomenclatural conflict between several nomina, spellings or onomatophore designations being potentially the valid one for the same taxon or nomen. ● Dubois 2013: 5. ● *Code*: no term. ● 06.03.18 (Dubois & Aescht 2019*j*).

Zygonym, *n* (***zygonymy***, *n*). ● VA. ● **ETY**: G: ζυγός, *zugos*, 'yoke'; ὄνομα, *onoma*, 'name'. ● Any nomen in a relation of ***zygonymy*** with another nomen. ● Dubois 2013: 24. ● *Code*: no term. ● 06.03.18 (Dubois & Aescht 2019*j*).

Zygonymy, *n*. ● VA. ● **ETY**: see ***Zygonym***. ● Qualification of all situations of nomenclatural conflict between several nomina being potentially the valid one for the same taxon or set of related coordinated taxa. ● Dubois 2013: 5. ● *Code*: no term. ● 06.03.18 (Dubois & Aescht 2019*j*).

Zygophory, *n*. ● VA. ● **ETY**: G: ζυγός, *zugos*, 'yoke' and φέρω, *phero*, 'I bear, I carry'. ● Qualification of all situations of nomenclatural conflict between several distinct onomatophore restrictions or designations being potentially the valid one for the same nomen. ● Dubois 2013: 5. ● *Code*: no term. ● 06.03.18 (Dubois & Aescht 2019*j*).

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