

Reflections

The decline of Ethics in Taxonomy

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Abstract

The quality and fundamental biological purpose of taxonomic papers have in average declined. This essay discusses several contributing factors, particularly the erosion of ethical standards. Key points addressed include: (1) contacting living authors to resolve taxonomic issues; (2) avoiding eponyms; (3) limiting the number of authors on taxonomic descriptions; (4) avoiding excessively long taxon names, especially eponyms; (5) providing well-developed taxonomic remarks; (6) maintaining orthodoxy in taxonomic writing; and (7) recognizing classification as a hierarchical system and restraining the impulse to describe high-level taxa unnecessarily. Some of these assertions are based on the ICZN Code of Ethics, reproduced herein. The final discussion emphasizes the importance of viewing Taxonomy as a specialized biological discipline.

Keywords: teaching, generations, research, scientific production, professionalism.

Introduction

Human beings are inherently social creatures. In order to coexist within a society, where absolute individual freedom is often incompatible with collective well-being, it becomes necessary to establish a set of rules. These rules can be categorized into legal, ethical, and moral frameworks, and are commonly formalized as codes of conduct.

Legal rules are mandatory; failure to comply typically results in punishment. Ethical and moral rules, on the other hand, are not necessarily obligatory, but they often inform and inspire legal norms. When applied, these principles contribute to a smoother and more harmonious coexistence among individuals. Interestingly, the specifics of legal and moral rules vary according to the cultural and social characteristics of each society. For instance, depending on the population and

cultural context, practices such as polygamy or even cannibalism may be either permitted or strictly prohibited.

Ethics, by contrast, represent a set of more universal principles. Although ethical norms are not always formally codified, they tend to be applied across most societies. In general, ethical guidelines are more rigorously observed in more developed societies. There is a widely accepted notion that the more developed a society is, the more ethically and morally oriented it tends to be.

Focusing on professional activities, I am particularly familiar with the medical profession, in which both legal obligations and ethical responsibilities play a central role. These two aspects are clearly defined and generally well respected, not only to avoid legal or administrative consequences, but also as key indicators of a professional's competence and integrity.

Narrowing the focus to biologists, their professional conduct is also governed by both legal and ethical rules. As mentioned earlier, legal requirements vary depending on the society in which the professional operates. Ethical principles, however, tend to be more universal, with many having been established and upheld by biologists throughout history. As in medicine, both legal and ethical standards aim to shape and guide professionals toward responsible and exemplary practice.

Taxonomy is a fundamental and essential branch of biology. It is governed by a comprehensive set of rules, including International Codes that guide, standardize, and unify many of the procedures within the field. While noncompliance with these Codes does not carry legal consequences, a researcher who publishes a taxonomic paper without adhering to them risks having their taxonomic acts deemed invalid by the academic community. Both the existence of the International Codes of Nomenclature and the voluntary adherence to them represent ethical commitments by biologists to ensure a universal and as stable as possible taxonomic framework.

Moreover, additional traditional ethic rules in taxonomy have existed and, in some cases, continue to exist. Over the four decades during which I have published in the field of taxonomy, I have observed a gradual and concerning erosion—and in some instances, a disappearance—of these ethical principles. I question whether this decline is truly the result of malice, incompetence, or poorly trained professionals. I truly do not think so. Rather, the underlying causes appear to be more complex, as will be explored in the conclusion of this paper.

Below, some of these taxonomic ethical precepts will be presented, followed by explanations of how they have not been consistently observed in recent publications, sometimes illustrated with selected examples. It is important to emphasize that this paper does not aim to criticize these examples individually; rather, they are used solely to highlight issues in biological communication, as discussed further below.

1) Contact living author to resolve any taxonomic issue

If a taxonomist identifies a taxonomic issue in another researcher's publication, the ethical procedure is, at a minimum, to contact the author directly. If resolving the issue is essential and urgent for your own research, you may negotiate a prompt resolution through one of the following approaches:

1. Allow the original author approximately one year to address the issue in an official publication;

2. Invite the author to collaborate as a coauthor on a joint paper resolving the issue, with you leading the project;
3. If the author is unresponsive or unwilling to participate through either of these options, clearly communicate your urgency to resolve the matter and your intention to publish soon. In such cases, it is appropriate to honor the original author in some manner, at minimum by acknowledging them in the acknowledgments section. If the original author is deceased, a common ethical practice is to honor the author by naming the taxon after him/her.

Common taxonomic issues include primary and secondary homonymies and synonymies. Regardless of how meticulous and careful a taxonomist is, it is inevitable that homonyms or synonyms will occasionally be published. Until recently, I was familiar with colleagues promptly informing the original author as soon as such issues were discovered. This happened to me on at least two occasions. For example, I described *Terebra reticulata* Simone & Verissimo, 1995, but after friends alerted me to the prior existence of *Terebra reticulata* Sowerby, 1840 (an obscure fossil species), the name was replaced by *Terebra crassireticula* Simone, 1999. Similarly, with *Eulimostraca subcarinata* Simone & Birman, 2006, both Anders Warén and Robert Robertson notified me about *Eulima subcarinata* d'Orbigny, 1842, which had since been transferred to the same genus. As a result, the latter became a homonym and was replaced by *Eulimostraca indomatta* Simone & Birman, 2007.

These two personal examples illustrate how the detection of taxonomic issues was typically communicated to the original author to resolve the problem. However, despite this familiar ethical practice, I recently encountered a different situation with *Microvoluta abrolhosensis* Fedosov et al., 2025, which replaced *Turricostellaria amphissa* Simone & Cunha, 2012. The latter became a secondary homonym of *Microvoluta amphissa* Bouchet & Kantor, 2004, following its transfer to the genus *Microvoluta*. While the taxonomic act itself was valid and correct, it was conducted without any prior notification—no email or warning was sent. This lack of communication raises, at least, concerns about how disconnected some recent taxonomists may be from traditional ethical procedures.

The International Commission on Zoological Nomenclature (ICZN) has the Appendix A (see below) titled 'Code of Ethics,' in which items 2 and 3 deals with the above mentioned questions.

2) Avoid eponyms

In zoology, an eponym refers to naming a taxon in honor of a person. For example, *Bursa lamarkii* (Deshayes, 1853) is a species named after Jean-Baptiste Pierre Antoine de Monet, Chevalier de Lamarck, while *Rissoina* d'Orbigny, 1841 is a genus named after Giuseppe Antonio Risso. These serve as illustrative examples of eponymous taxa honoring famous naturalists.

It is important to emphasize that naming a taxon is both an art and a scientific procedure. The given name will be eternal and universal, serving to identify a biological entity recognized by scientists and qualified individuals worldwide, indefinitely. Assuming the taxon has been well defined and delimited, its naming should be preceded by careful consideration of the most appropriate designation, taking into account the meaning, phonetics, and aesthetic qualities of the name.

Classical authors—from Linnaeus to Pilsbry, for example—demonstrated a clear concern for naming taxa based on essential characteristics of the species. This approach aligns with the traditional concept of the species epithet functioning as an adjective to the genus; for instance, *Barleeia rubra* denotes a red *Barleeia*. While classical authors did employ eponyms, their use was relatively infrequent, generally reserved for individuals closely associated with the studied taxon and usually limited to their surname.

Today, however, the landscape has shifted, and naming taxa after people has become almost the norm. The classical scientific approach of designating species names based on their defining characteristics has largely disappeared, replaced by a tendency to honor individuals who are often only tangentially or not at all related to the taxa under study. While the intent may be to pay tribute, such names are personal and momentary, resulting in universal and permanent names that lack scientific meaning. Consequently, the classical purpose and artistry of taxon naming have been lost. This practice, on the other hand, reflects egocentrism, immediacy, and a disregard for the significance of that scientific tradition.

Of course, naming a species or even a genus after a person is not inherently problematic—I have done so myself on occasion. However, as outlined above, this should be approached with careful judgment and clear criteria.

3) Avoid excessive multiple authors

Some prominent scientific taxonomic journals impose a limit of three authors on papers describing new taxa. This guideline stems from previous conventions that required the obligatory citation of authorities for genera and species upon their first mention. Although this mandatory citation is no longer required (Simone, 2025), it remains recommended at the first occurrence within a paper. The three-author limit is a reasonable rule, primarily because it facilitates citation by other researchers and secondarily because it is difficult to justify the necessity of more than three authors to thoroughly examine and describe the defining characters of a taxon.

Let us consider the following examples: the genera *Bathythala* Fedosov, Bouchet, Dekkers, Gori, S.-I. Huang, Kantor, Lemarcis, Marrow, Ratti, Rosenberg, R. Salisbury, Zvonareva & Puillandre, 2025; *Baenopsis* Korshunova, Martynov, Bakken, Evertsen, Fletcher, Mudianta, H. Saito, Lundin, Schrödl & Picton, 2017; and *Neoterebra* Fedosov, Malcolm, Terryn, Gorson, Modica, Holford & Puillandre, 2020. A similar case is the species *Bathythala antea* Fedosov, Bouchet, Dekkers, Gori, S.-I. Huang, Kantor, Lemarcis, Marrow, Ratti, Rosenberg, R. Salisbury, Zvonareva & Puillandre, 2025. It is unlikely that anyone finds it convenient or practical to cite such an extensive list of authors, let alone interpret its relevance or necessity. As every action tends to generate a reaction, and considering that authority citation is no longer mandatory, the natural outcome has been to revert to the classic usage of “et al.,” as in: *Bathythala* Fedosov et al., 2025; *Neoterebra* Fedosov et al., 2020; and *Bathythala antea* Fedosov et al., 2025. Those interested in the full list of contributors can easily find them in references or through online databases such as MolluscaBase.

When contributing to a multi-authored paper that includes the description of a new taxon, a parsimonious—and arguably ethical—approach is to restrict authorship of the taxon description itself to a smaller group. Thus, even if the paper as a whole includes a large number of contributors ($N \rightarrow \infty$), the authorship of the taxon name should be limited to one, two, or three individuals who were directly responsible for the taxonomic work. In this way, the taxon will be cited with only

those few names. Some may argue—perhaps out of excessive formality—that the taxon should be cited as being described by the smaller set of authors “IN” the full, multi-authored paper. However, this practice is largely unnecessary, especially since the standard use of “et al.” adequately resolves the issue for citation purposes.

Another related issue is the use of extremely long or hyphenated surnames, which can also create complications in citations. Such names often contribute to overly complex authorship listings and present practical challenges for referencing. For a more detailed discussion of this topic, see Simone (2025).

4) Avoid long taxon names, especially eponyms

A well-known anecdote in taxonomy involves the Polish naturalist Benedykt Dybowski, who, in the 1920s, described several amphipod crustaceans from Lake Baikal using exceptionally long scientific names. Some notable examples include: *Gammaracanthuskytodermogammarus lor-icatobaicalensis* (42 letters), *Rhodophthalmokytodermogammarus cinnamomeus* (41), *Toxophthalmoechinogammarus toxophthalmus* (39), *Zienkowitzikytodermogammarus zienkowiczi* (39), *Parapallaseakytodermogammarus abyssalis* (38), and *Crassocornoechinogammarus crassicorne* (37). These names, while technically valid, illustrate the potential impracticality and burden of excessively long taxon names, both for scientific communication and for standard citation practices.

All of these names were later invalidated by the International Commission on Zoological Nomenclature (ICZN) due to their unwieldy length. The excessive length was considered impractical and served as the primary justification for the ICZN's decision to replace them with shorter, more manageable alternatives—already in the 1920s. This action highlights the principle that scientific names should not be excessively long. In general, the shorter and more direct a scientific name is, the better—if for no other reason than to facilitate the work of fellow researchers.

Over time, the art of naming genera and species with simple, direct names has gradually declined. As noted in item 2 above, the use of eponyms has become increasingly common—almost the norm—and, more concerningly, not limited to surnames. In recent years, authors have begun incorporating full names of individuals into species epithets. Examples include *Haplocochlias risonideneryae*, *Marginella boetveldsmanni*, *M. jeffreysbayensis*, *M. richardsbayensis*, *Solatisonax rudigerbieleri*, and *Conasprella damasomonteiroi*. One cannot help but wonder what might come next—perhaps including social security numbers, passport IDs, or even ORCID identifiers?

I recall my own experience as a reviewer of a manuscript in which the author proposed the name *carlomagentadacunhai* to honor our friend Carlo Magenta da Cunha. I respectfully suggested shortening it to *cunhai*, explaining that the tribute would remain equally meaningful without creating a taxonomic “monster.” Fortunately, the author agreed.

Unless it is necessary to avoid homonymy, why not honor a person using only their surname? This has been the long-standing and dignified tradition in science.

5) Well-developed taxonomic remarks

Taxonomy is, by nature, a comparative science. The introduction of any new taxon—or the revision of an existing one—must be carried out within a conceptual framework of comparison. For instance, when a new species is proposed, it is expected to be thoroughly compared with known taxa to convincingly demonstrate that it represents a distinct entity deserving of a new name. Naturally, there is no need to compare the new taxon with all organisms globally. Best practice involves focusing on the most relevant and closely related taxa. In the case of a new species, comparisons should be directed primarily at other species within the same genus. If the genus is particularly large, it is acceptable to narrow the comparison to species within a specific geographic region or to a subset of the genus based on an internal classification.

The comparative elements of a taxonomic paper are sometimes repeated across different sections, which can be beneficial rather than redundant. These comparisons typically appear in the Diagnosis, in parts of the Description, within the Taxonomic Remarks—where specific features of the taxon are analyzed—and in the Final Discussion, which places the taxon in a broader biological or ecological context. This structure allows readers to access the essential differences and similarities of the taxon in multiple ways, depending on their focus or purpose.

However, this classical model is often not followed in contemporary taxonomic papers. Some studies limit comparisons to distant taxa, strategically omitting closer and more relevant ones that would be essential for proper evaluation. In more recent publications based solely on molecular data, comparisons are often absent altogether. When diagnoses are provided, they may consist only of complex formulas indicating nucleotide differences in DNA sequences. This approach may appear efficient—especially for those with easy access to a DNA sequencer and little interest in examining actual specimens—but it undermines the foundational comparative nature of taxonomy.

And so, taxonomy is slowly being eroded, replaced by something analogous—but not equivalent. The comparative framework has been reduced to a superficial formality, often included merely to satisfy the perceived requirement of the genre. Diagnoses are disappearing or being replaced by molecular “alphabet soup,” rendering them inaccessible to those without specialized tools. At broader taxonomic levels, classifications are increasingly based on phylogenies that lack clearly defined synapomorphies—the very features that should support each node or taxon (Mooi & Gill, 2010). One cannot help but feel nostalgic for a time when the goal of taxonomy was to bring order to the natural world, to promote stability and universality, and to ground its principles in observable, verifiable characters—achieved through rigorous intellectual effort.

6) Uphold orthodoxy in taxonomic papers

Rebellions by new generations are inevitable and natural. Youth often bring new methods and technologies, sometimes viewing previous generations as retrograde, obsolete, or, more euphemistically, “traditional.” This phenomenon is not negative—science, like any human endeavor, requires continual renewal, the incorporation of new tools, and fresh perspectives. It is important, however, to remember that this process is ongoing: today’s young researchers will eventually become tomorrow’s “traditional” scholars.

From personal experience—as someone who once was a rebel—I have come to appreciate the value of tradition. There are comfort and strength in maintaining a connection to established practices, which provide a solid foundation for scientific work.

If taxonomic papers are written and presented differently each time, with necessary data scattered throughout various sections—or sometimes missing altogether—then the resulting inconsistency creates an “autistic” (i.e., highly idiosyncratic) model of reporting. This makes it difficult for colleagues, the intended audience, to efficiently understand and extract key information from the paper, wasting valuable time and effort.

Conversely, if all taxonomic papers are structured and presented in a consistent manner, the target audience will find them much easier to read, interpret, and extract data from. Additionally, following an orthodox format reduces the likelihood of omitting important information. Therefore, taxonomy has a well-established traditional model for writing scientific papers, as explained in classic works such as Mayr (1969) and Papavero (1994).

A modest suggestion I offer to the new generation—and to amateurs interested in contributing to malacology—is to read classic works on zoological taxonomy (such as the two examples above) or, at the very least, to base their work on, or draw inspiration from, the papers of experienced taxonomists when preparing their taxonomic descriptions. It is not uncommon to encounter recent papers in which taxa are described in unconventional ways—sometimes relegated to footnotes, secondary appendices, or “supplementary material”—often missing important, even obligatory elements such as type designation, etymology, diagnosis, or type locality. Taxonomy deserves to be treated with respect of an autonomous scientific discipline. So, construct the taxonomic sections of your papers following orthodox conventions, even if you are not a professional taxonomist. Your fellow readers—the intended audience—will undoubtedly appreciate it.

7) Classification is a hierarchical organization – temper the urge to describe high categories

Nowadays, it seems common for researchers to describe new families, superfamilies, and even orders frequently. At this rate, every species might soon have its own order. The impulse to establish a higher taxonomic category is understandable and often compelling, especially when a researcher discovers a taxon markedly different from others. However, with the rise of molecular phylogenetics, many new branches are proposed rapidly, only to be later dissolved or reshuffled in subsequent studies based on additional gene data. For a more detailed discussion on this topic, see Simone (2024a).

Taxonomy has become quite chaotic, moving far from the goal of stability. A more prudent approach might involve tempering the impulse to name every temporary molecular branch and avoiding the excessive inflation of higher taxa. For instance, rather than creating a new family name, it is often more parsimonious to subdivide an existing family into subfamilies or tribes. This practice promotes greater stability and coherence in classification.

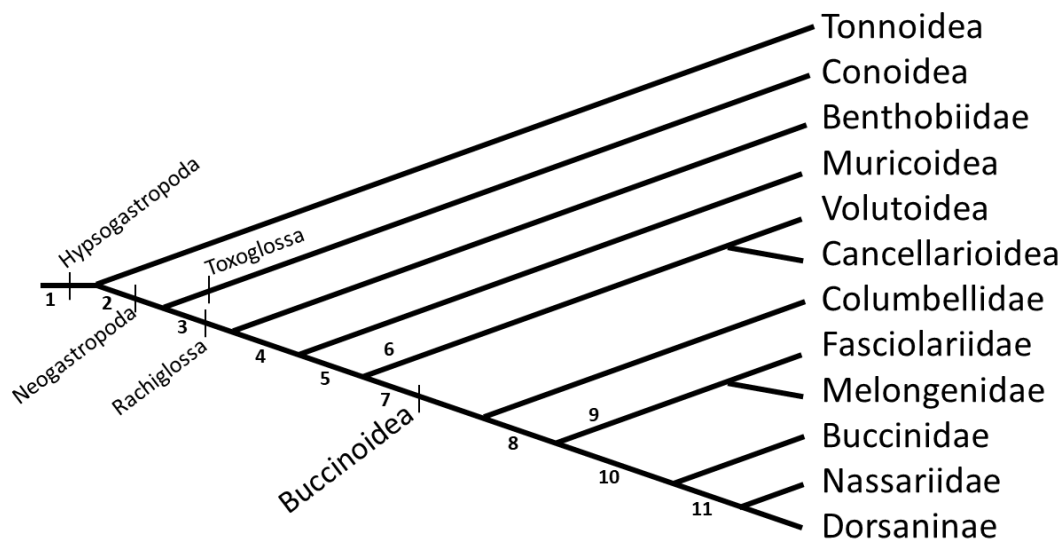
As an example of unnecessary hypertrophy in taxonomic divisions, consider the Neogastropoda, typically ranked as an order. Its subdivision has evolved through three notable phases:

- (A) Thiele (1931–1935): subdivided Neogastropoda into four superfamilies — Muricea, Buccinacea, Volutacea, and Toxoglossa.
- (B) Ponder (1973): subdivided it into three superfamilies — Muricea, Cancellariacea, and Conacea.

- (C) MolluscaBase (2025): subdivides Neogastropoda into eight superfamilies — Buccinoidea, Conoidea, Mitroidea, Muricoidea, Olivoidea, Pholidotomoidea, Turbinelloidea, and Volutoidae.

The increase from 3–4 superfamilies in earlier classifications to 8 in the current arrangement reflects a considerable expansion, distinguishing more narrowly defined taxa but lacking a clear hierarchical structure. Since hierarchy is the foundation of zoological classification, this indicates a fundamental flaw in the present system.

Over the past two decades, I have proposed a more resolved system (e.g., Simone, 2011, 2021), which is summarized in Figure 1 below:



1. Cladogram summarizing a suggestive relationship of the hypsgastropods, with special reference to the main neogastropod groups. It is mostly based on data from Simone (2011, 2021), Pastorino & Simone, 2021, and others.

This taxonomic scheme divides the order Neogastropoda into two suborders: Toxoglossa and Rachiglossa. Toxoglossa includes only one extant superfamily: Conoidea. Rachiglossa encompasses the remaining neogastropod superfamilies and families, organized hierarchically as shown in the Fig. 1. Since not all neogastropod families are included, no formal names have yet been proposed for these branches. Nevertheless, this cladogram, with each branch supported by synapomorphies documented in published studies (Simone, 2021), presents a much better-resolved hierarchical scheme than the current polytomy of eight branches accepted by MolluscaBase (2025). Why this improved scheme has not been adopted remains unclear.

In summary, I urge taxonomists and those engaging in taxonomy to resist the urge to describe new higher-level taxa hastily. Instead, focus on subdividing existing higher taxa and reinforcing hierarchical classification systems.

8) Reproduction of the ICZN Appendix A – Code of Ethics

<https://code.iczn.org/appendices/appendix-a-code-of-ethics/?frame=1>

1. Authors proposing new names should observe the following principles, which together constitute a "Code of Ethics".

2. A zoologist should not publish a new name if he or she has reason to believe that another person has already recognized the same taxon and intends to establish a name for it (or that the taxon is to be named in a posthumous work). A zoologist in such a position should communicate with the other person (or their representatives) and only feel free to establish a new name if that person has failed to do so in a reasonable period (not less than a year).

3. A zoologist should not publish a new replacement name (a *nomen novum*) or other substitute name for a junior homonym when the author of the latter is alive; that author should be informed of the homonymy and be allowed a reasonable time (at least a year) in which to establish a substitute name.

4. No author should propose a name that, to his or her knowledge or reasonable belief, would be likely to give offence on any grounds.

5. Intemperate language should not be used in any discussion or writing which involves zoological nomenclature, and all debates should be conducted in a courteous and friendly manner.

6. Editors and others responsible for the publication of zoological papers should avoid publishing any material which appears to them to contain a breach of the above principles.

7. The observation of these principles is a matter for the proper feelings and conscience of individual zoologists, and the Commission is not empowered to investigate or rule upon alleged breaches of them.

Final analysis

It is important to make it clear that at no point in this essay is there an intention to accuse anyone of incompetence or ill intent. The primary goal is to examine why there has been a decline—or at least a noticeable reduction—in adherence to ethical procedures and in the use of clear, straightforward taxonomic paper structures. Importantly, this trend is not limited to young researchers; even many experienced taxonomists who previously followed traditional practices have largely adopted this “new” approach.

This analysis should be understood within a broader context, which has been partially outlined elsewhere (e.g., Simone, 2020, 2021, 2023a, b, 2024b, c, 2025), and therefore will not be repeated here. To be direct, the phenomenon discussed in this essay is fundamentally linked to the low regard in which Taxonomy is held within the broader field of Biology. Although Taxonomy is governed by its own set of rules, codified in the International Code of Zoological Nomenclature (ICZN) (among other biological codes), these rules sometimes make the discipline appear more like a complex set of regulations than a true science. However, just as there is a field known as "Legal Science," Taxonomy is as intellectual and scientific as any other branch of biology. The formulation of its rules relies heavily on biological principles, and their application demands a deep biological expertise.

In submissions, it is not uncommon to encounter responses such as “our journal does not publish taxonomy,” “your paper would be more appropriate for a taxonomic journal,” or “the taxonomic section should be relegated to supplementary material,” and so on. Despite their enduring importance, taxonomic journals rarely have an Impact Factor above 1. Furthermore, although citing taxon authorities is highly recommended, they are often considered dispensable in reference lists. What effect do these attitudes have on the mindset of young researchers? Undoubtedly, they do little to foster appreciation or respect for taxonomy as a scientific discipline. There is a prevailing perception that taxonomy is a secondary and expendable tool—useful only as a preliminary step before engaging in what are considered the “real” or more important areas of biological research. As a result, it is often treated as a task that anyone can perform without much rigor, overlooking the critical need for skilled and meticulous taxonomists.

The main point is this: Taxonomy is a specialized branch of biology best performed by trained taxonomists. A taxonomist is someone with both the vocation and the technical, intellectual training for this field, who is accustomed to consulting and producing work specifically on taxonomic subjects. Similarly, specialists in other fields will produce taxonomic papers of comparable quality in their own areas of expertise. Therefore, each professional should focus on their own lane, allowing experts to handle their specialty. Of course, collaborative work is encouraged and often leads to high-quality publications.

If Taxonomy is treated as a second-class activity, why bother applying ethical procedures to it? Let’s just make it all a fuss! And then, when faced with the resulting mess—especially in tropical invertebrate taxonomy—someone suddenly cries out: “We must value Taxonomy!”

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