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EPONYMS, EDI AND TERMINOLOGY PLANNING IN THE BIOLOGICAL SCIENCES

Abstract Traditional practices for naming species in the biological sciences often incorporate eponyms. However, the group of honourees is not very diverse, and many individuals have links to colonization. A grassroots movement is emerging within the biological sciences to give new scientific and/or common names to species that bear harmful eponyms. Approaches to renaming species include updating terminology planning processes, using more diverse and inclusive eponyms, re-instating pre-colonial names, and replacing eponyms with transparent terms. Many of these activities are in collaboration with Indigenous communities, as well as with other types of experts and the broader public. It is important for terminologists to be aware of these developments because they are well positioned to contribute to such discussions moving forward.

Keywords binomial nomenclature; common names; eponyms; retro-terminologization; scientific names; terminology planning; transparency

1. Introduction

Recent years have seen an increased awareness across multiple sectors of society about the particular damage caused by harmful naming practices related to settler colonialism, and renaming buildings, streets, awards, etc., can be viewed as part of a broader movement to increase social justice and to improve various dimensions of equity, diversity, and inclusion (EDI).

While names are distinct from terms (the former designate individual objects or people and the latter designate concepts or general notions), re-designation is relevant to Terminology. Terminology is the study of and the field concerned with the collection, description processing and presentation of terms (i.e., lexical items belonging to specialized areas of usage of one or more languages) (Sager, 1990). As noted by Sager (1990, p. 62), "most new terms are formed as and when new concepts are created in such circumstances as new discoveries, restructuring of existing knowledge, incidental observations or planned industrial developments," meaning that terms are often chosen by scientists rather than by terminologists. As a result, "the linguistic sign for a concept can be quite arbitrarily chosen and often is" (Sager, 1990, p. 62).

In the biological sciences, scientists regularly use eponyms when naming species. In hindsight, it is clear that this practice has perpetuated harm, such as when the person honoured is associated with colonialism. There is now a grassroots movement to redress this situation, and this article will explore the re-designation practices that are emerging in the biological sciences to replace undesirable eponyms. The article first outlines how eponymous terms can enter specialized communication and why this can be problematic. Next, the focus moves specifically to eponymous naming practices in the biological sciences and the resulting impact. Finally, several approaches for rectifying the use of eponyms are considered.

While much of the naming and re-designation of species in the biological sciences has been carried out by scientists rather than terminologists, terminologists need to be aware of these activities since many species have a common name in the local language in addition to a scientific name. Terminologists may be asked to support terminology planning for these common names, so they must understand the approaches that are being employed, and know whether or not these appear to be successful. Such insights can help to inform future EDI-oriented terminology work, whether in the biological sciences or in other domains.

2. Eponyms Used in Specialized Communication

Historically, a common method of term formation is the eponymic compound, which combines the name of a person or place with a substance, material, object, instrument, method, process, measure, etc. (Sager, 1990, p. 77). This practice has led to many inventions being named after their inventors (e.g., *Faraday cage, Ferris wheel, Phillips screwdriver, Rorschach test*). One drawback of eponymic compounds is that they are not transparent because they do not express the essential characteristics of the concept that they designate. This makes it hard for people to understand the nature of the concept simply by looking at the term. For instance, compare the limited information conveyed by the eponymic compound *Phillips screwdriver*.

Beyond lack of transparency, eponymic naming practices can also create EDI issues. For instance, as pointed out by Enserink (2013), "Historically, many infectious disease agents - or the diseases themselves - have been named after the place where they were first found. Increasingly, however, scientists and public health officials have shied away from that system to avoid stigmatizing a particular country or city." Such stigmatization led to racism towards Asian people during the COVID-19 pandemic, when informal terms such as China flu or Wu Flu (derived from the name of the city of Wuhan) emerged to refer to COVID-19 (Lee & Johnstone, 2021). Selecting a non-stigmatizing name for the novel coronavirus was a priority for the International Committee on Taxonomy of Viruses (ICTV), who moved quickly to establish the terms SARS-CoV-2 (to refer to the virus) and COVID-19 (to refer to the disease caused by the virus) before the stigmatizing alternatives could take hold (Gorbalenya et al., 2020). This lesson was learned the hard way through previous instances where a stigmatizing term could not be dislodged, such as in the cases of Middle East Respiratory Syndrome (MERS) and the Spanish Flu (Lee & Johnstone, 2021). Although it can be challenging to dislodge established terms, it is not impossible. At present, a grassroots EDImotivated effort is gaining traction within the biological science community to rename species whose eponymic references are considered harmful because they are linked to colonialism.

2.1 Traditional Approach to Naming Species

In the early days of naming plants and animals, the focus was on designating local flora and fauna, and the names were often descriptive (e.g., *whitefish* – a fish with white flesh). However, during the period of exploration, when an interest in global biodiversity began to emerge, these descriptive terms often became long and unwieldy as people sought to distinguish local species from similar relatives found elsewhere by adding additional descriptors (Winston, 2018). For example, in the 1600s, one type of *whitefish* was designated by the following Latin phrase that describes the shape and location of fins, the body length and width, and the mouth: *Gadus, dorso tripterygio, ore cirrato, longitudine ad latitudinem tripla, pinna ani prima ossiculorum trigiata* (Heard & Mlynarek, 2023, p. 2).

In the mid-1700s, Swedish biologist Carl Linnaeus systematized and formalized a new approach to scientific nomenclature that is still in use today: binomial nomenclature. This system uses a two-part Latin name to designate plants and animals: a single word for the genus followed by a single word for the species. Under this binomial nomenclature system, the unwieldy description for the fish mentioned above became simply *Merlangius merlangus*. A key feature of Linneaus's system was that it decoupled naming from description. In other words, while the Linnaean binomials *may* be descriptive (e.g., referring to animal's shape), they do not *need* to be. According to Heard and Mlynarek (2023), this decoupling fundamentally changed the approach to naming species and opened the door to eponyms.

As explained by Winston (2018), binomial nomenclature caught on quickly and was almost universally adopted by Western science. Indeed, this system has been used to name hundreds of thousands of species. However, problems did arise, such as different groups of scientists assigning different scientific names to the same species. To prevent this, in the 19th century, a series of international codes emerged as a means of regulating nomenclature. The codes have gone through multiple revisions and versions, but they are still in use today. For instance, there is an International Code for Zoological Nomenclature and an International Code for Botanical Nomenclature, as well as three other codes for the naming of cultivated plants, bacteria and viruses. As Winston (2018) outlines, each code is accompanied by a protocol that scientists must follow to propose, to select, or on occasion, to replace scientific names. This is effectively a sort of terminology planning and management system for the biological sciences. As outlined by Sager (1990, p. 96), the following steps are required before a name can be fully accepted into a biological nomenclature:

- 1. The name must be constructed according to the rules.
- 2. Prior names must be considered since the oldest legitimate and properly constructed name claims precedence under the "Law of Priority".
- 3. The name must be accompanied by a complete description of the new species (i.e., list of attributes).
- 4. The name must be published in an established journal.

2.2 Eponyms in Scientific Names and Common Names

While binomial nomenclature is used to assign a unique Latin scientific name to a species, this species will likely have a common name in other languages too. For example, *Ursus maritimus* is the scientific name for the animal that is better known by most people by a common name, such as *polar bear* in English, *ours blanc* in French, or *Eisbär* in German. Eponyms can be integrated into the scientific name, the common name, or both.

In scientific names, the decoupling of naming and description paved the way for the use of eponyms. Linnaeus himself introduced a few eponymous terms, which he used mainly to pay homage to important scientists who had advanced the field, such as Matthias L'Obel and Jan Commelin, whose names are incorporated into the nomenclature through the genus names *Lobelia* and *Commelina* respectively (Heard & Mlynarek, 2023). However, while Linnaeus was restrained in his use of eponyms, their use has since proliferated, and not everyone who has been honoured was an eminent scientist (Poulin et al., 2022).

Meanwhile, a common name might be a (partial) translation of the Latin scientific name, and if that scientific name contains an eponym, this could be transferred to the common name. For example, the flowering plant *Lobelia erinus* is commonly referred to simply as *lobelia*. However, in other cases, the scientific name and the common name can be completely distinct, meaning that a scientific name that does not incorporate an eponym can be associated with a common name that does include an eponym. For instance, the bird *Nucifraga columbiana* is commonly known as *Clark's nutcracker* in English (named for William Clark who first spotted it during the Lewis and Clark Expedition), meaning that it has an eponymous common name, even though the scientific name contains no eponym.

Sometimes the scientific and common names may contain different eponyms, which happens in the case of *Ichterus parisorum*. This bird's scientific name honours the Paris brothers, who were French financiers in the early 1700s, while the bird's common name in English is *Scott's oriole*, named for Winfield Scott, a Confederate Army general during the U.S. Civil War.

3. Issues Identified With the Use of Eponyms

For several reasons, activists in both the scientific community and the general population have begun to advocate for changes to eponymous scientific and common names. Firstly, as noted above, eponyms are less transparent than descriptive names. Goldsmith (2023), among others, has pointed out that using descriptive common names rather than eponyms makes it easier for people to remember these names and understand some concrete details about the species. In turn, this is one way to improve public engagement, which is an essential step for future conservation efforts (AOS, 2023; Guedes et al., 2023).

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Beyond transparency, social justice and EDI-oriented initiatives provide other excellent motivations for re-examining the use of eponyms. Indeed, within the grass roots of the scientific community, the practice of eponymous naming has come under scrutiny, mainly for two related reasons:

First, the *set* of people 'honoured' ... by eponymous names does not yet do a good job of representing the diversity of the human species. Second, some of the *individual* people chosen for eponymy are at least in hindsight regrettable choices. (Heard & Mlynarek, 2023, p. 6)

When considered globally, the set of eponymous terms demonstrate clear patterns: most refer to white men from the Global North (Heard & Mlynarek, 2023). For instance, Pillon (2021) investigated naming traditions for endemic plants of New Caledonia, an archipelago in the South Pacific that is recognized as a biodiverse region with many plants not found elsewhere. New Caledonia was colonized by and has been administered by France since 1853. Pillon's (2021) study shows that 25% of the endemic taxa are named after people, and of these, 63% are named for French botanists. Swiss, German and British scientists are also honoured, particularly those who had travelled to the islands to collect specimens that were then taken back to their home countries for further study. Meanwhile just 7% of the species were named for New Caledonians.

Regarding gender, Pillon (2021) estimates that only 6% of the eponymous names of the plants in New Caledonia refer to women. Likewise, Figueiredo and Smith (2010) found that in the plant group *Aloe*, the number of species named for male scientists outnumber those named for women scientists by more than ten to one. Poulin et al. (2022, p. 7) make a similar observation about the naming of new species of parasites, noting

women researchers are under-represented among species named after eminent scientists. This is true across all parasite or host taxa, with the gender bias showing no evidence of improving over time in the past two decades. [...] The gender bias observed is certainly not owing to a shortage of excellent female taxonomists.

When it comes to the individuals whose names have been incorporated into eponymic species names, we find some very unworthy individuals, including Adolf Hitler (*Anophthalmus hitleri* or Hitler's beetle), as well as George Hibbert (e.g. *Hibbertia hypericoides*), a wealthy patron of botany who was also a prominent slave-trader and slave-owner (Hammer & Thiele, 2021; Heard & Mlyarnek, 2023). Likewise, the common names of species such as Couch's kingbird are associated with colonizers who facilitated the displacement of Indigenous people from their homelands in the U.S. between 1830 and 1850 along a route now known as the Trail of Tears (Goldsmith, 2023).

Finally, some scientists use eponyms to make jokes, to dishonour rivals, or for other less-than-noble reasons (Heard & Mlynarek, 2023). This does not always sit well with other scientists, who feel that "The Earth's biodiversity is part of a global heritage that should not be trivialized by association with any single human individual" (Guedes et al., 2023, p. 1159).

4. Approaches to Rectifying the Use of Eponyms

Activists in the scientific and broader community are calling for problematic names to be corrected, and for new naming guidelines to be developed. However, this movement is still in its early stages, and there is not yet consensus on the best ways of doing so. Overall, there appears to be goodwill to address the issues, but concerns that have been raised include the potential for introducing confusion into scientific exchanges, as well as the cost of updates (Ceríaco et al., 2023). Below we outline some emerging strategies for dealing with eponyms, as well as proposals for new naming techniques.

4.1 Updating Terminology Planning Processes

Firstly, as noted above, it is important to recognize that terminology planning is already a well-established activity in the biological sciences, with goals that include promoting terminological stability and precision. The previously mentioned International Committee on Taxonomy of Viruses (ICTV) is one such example, and this committee has developed guidelines for naming viruses. In the field of botany, the International Code of Nomenclature for algae, fungi, and plants – known informally as the Shenzhen *Code* – is the set of rules and recommendations that govern the scientific naming of all organisms traditionally treated as algae, fungi, or plants. Currently, the official rules enshrined in the Code do not permit renaming species that have a troubling or inappropriate name. Several botanists (e.g. Smith & Figueiredo, 2021) have therefore proposed additions and amendments to various articles in the Code that would allow names that are insulting, offensive or culturally inappropriate to be rejected in favour of more suitable names. Hammer and Thiele (2021, p. 1392) have gone even further by recommending that a new Permanent Nomenclature Committee be established a Nomenclature Committee on Culturally Offensive or Inappropriate Names - to be elected by an International Botanical Congress in order to govern the application of the proposed articles.

Meanwhile, the American Ornithological Society (AOS) – a U.S.-based global network of scientists and bird lovers working together to advance the scientific study and conservation of birds – has also proposed some updates for terminology planning activities. In a press release on November 1, 2023, the AOS announced that it "will conduct an open, inclusive, and scientifically rigorous pilot program in 2024 to develop its new approach to English bird names in the U.S. and Canada" (AOS, 2023). As part of this pilot program, the AOS will establish a new committee to oversee the assignment of all English common names for species within the AOS's jurisdiction. This committee will have a broad participation by including not only individuals with expertise in ornithology and taxonomy, but also those with expertise in communication and social sciences, as well as members of the general public.

Similarly, the Entomological Society of America's (ESA) mission includes establishing effective communication between scientists, policy makers and the public. However, some eponymous names currently hinder effective communication. To address

problematic names, the ESA established a task force in 2021 and launched the Better Common Names Project, which has a terminology planning component with a fivestep process for proposing and adopting better insect names (Lancette, 2021).

In Hawai'i, a cultural working group was established by locals in 2012 to advocate on behalf of Native Hawaiians (Gregg, 2021). Motivated by a desire to revitalize the Hawaiian language, the cultural group has since formed a nomenclature subcommittee, which brings together elders, cultural practitioners, scholars, resource managers and scientists with a view to giving Hawaiian names to plants and animals in the region. Under the auspices of terminology planning, which may be more formalized in some communities and less formalized in others, the following three general practices have emerged as approaches for dealing with eponyms: using more diverse and inclusive eponyms; re-instating former terms; and replacing eponyms with more transparent terms.

4.2 Using More Diverse and Inclusive Eponyms

While some activists argue that all existing eponyms should be replaced and no new eponyms should be permitted moving forward (e.g., Guedes et al., 2023), others see a complete ban on eponyms as a missed opportunity to empower in-country researchers to name their own biodiversity in a way that honours and celebrates local figures. Orr et al. (2023, p. 1168) even go so far as to note that the elimination of locally selected eponyms could sow discontent among these communities, noting that "One might even consider a ban on eponyms itself colonialistic without consideration or due compensation for the hundreds of years that colonizing countries pursued such goals unchecked."

Some communities are instead electing to diversify the profile of those for whom species are named (Antonelli et al., 2023). According to Pillon (2021), not only does the (re-)naming of species provide an opportunity to acknowledge more broadly the diversity of individuals who have contributed to our understanding of the natural world, it may also aid ecological conservation. With this in mind, Pillon (2021) recommends that species should be named with a view toward how these names will be perceived by the local communities involved.

4.3 Re-Instating Former Terms

Numerous species were claimed as new discoveries by explorers and colonial settlers, even though these were already known to the Indigenous communities. Some scientists advocate for restoring Indigenous names in taxonomy, noting that such names can often be knowledge conduits, conveying information about history, place, and belonging. For instance, Gillman & Wright (2020) argue that although the "Law of Priority" (see section 2.1) is a fundamental element of the binomial nomenclature system, the chronological precedence of Indigenous names has no standing or priority under current taxonomic codes, even though these names often convey indepth knowledge relating to the species. Gillman & Wright (2020) propose taxonomic

rule changes to promote retrospective name changes that establish, on the basis of precedence, pre-existing Indigenous names for species where possible. As a key first step, Gillman & Wright (2020) call for a general debate on the merits of such an approach, emphasizing that the voices of Indigenous scientists and their communities must be central to this debate.

As for common names, members of a cultural group in Hawai'i conduct research to identify the original names for local species that were lost when the Hawaiian language was repressed during the long period of Western encroachment (Gregg, 2021). In 2017, a member researched *Tristram's storm petrel* (named after a British scientist) and uncovered the traditional name for this bird – *'akihike'ehi'ale* – in a Hawaiian scholarly text dating from 1860. This traditional name has now been reinstated.

This approach may soon happen at scale as Indigenous communities around the world continue reclaiming their languages, so it is worth discussing this approach in Terminology, perhaps using *retro-terminologization* to describe the practice. The notions *terminologization* and *de-terminologization* are already used to describe cases where general language words move into specialized language, and vice versa (Infoterm, 2005). *Retro-terminologization* could describe cases where an original term that had been set aside is later restored to use.

4.4 Replacing Eponyms With Transparent Terms

Because eponyms are not transparent, some groups are replacing them with descriptive names. For instance, in 2020, the AOS chose to replace the common name *McGown's longspur* (originally named for John P. McGown, a naturalist who later joined the Confederate Army during the U.S. Civil War) with the more transparent term *thick-billed longspur* (AOS, 2023).

Just as pre-existing Indigenous names can be reinstated, so too can Indigenous knowledge be used to form new names (Veale et al., 2019). Hágaster & Wrazildo (2020) took this approach to find a name for a species of orchid discovered in Venezuela. The Indigenous community proposed the name *Epidendrum katarun-yariku* because, in the Pemón Arekuna language, *katarun* means high and *yariku* means flower – a nod to the fact that this species only grows on the high cliffs. Meanwhile, Gregg (2021) reports that the cultural group in Hawaii has adopted a similar strategy, working with elders to create new common names for regional birds. In this way, *Christmas shearwater* has been replaced by 'ao'ū, an onomatopoeic name that evokes the bird's nocturnal flight call, while the *Bonin petrel* has been given the new name *nunulu*, which is a Hawaiian word meaning warbling.

5. Conclusions and Future Directions

Eponyms can inflict harm and can hinder precise communication through nontransparency. The grassroots movement to decolonize species' names in the biological sciences and to make them more diverse and inclusive is gaining traction, but there is not yet consensus and major changes will take time. Currently, the movement to replace harmful eponyms is coming from within the biological sciences, where bodies are already in place to guide terminology planning. However, scientific names are often accompanied by common names, which may also need to be replaced. Several projects are underway that welcome input from specialists in different areas (including language) as well as from the community more broadly. With their expertise in term formation, terminologists could contribute to the discussions.

This article focuses on biological sciences, but eponym use may need to be re-examined elsewhere (e.g., medicine). Moreover, eponyms are just one type of problematic term. Smith and Figueiredo (2021) identify practices leading to biased terms and have submitted a proposal to permanently and retroactively eliminate racist scientific names from the nomenclature. Others challenge ableist and sexist terms (Parsley, 2020; Rummy & Rummy, 2021). There is still work to do at the intersection of Terminology and EDI, but as Cheng et al. (2023) note, identifying harmful terms may not be easy since meaning changes across languages, cultures, contexts and time. Terminologists, who have experience working in multilingual and multicultural contexts along with methodological expertise for identifying conceptual characteristics and proposing transparent terms, can help to make specialized communication more inclusive.

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