The Old Intelligencer

In Defence of Eponymy

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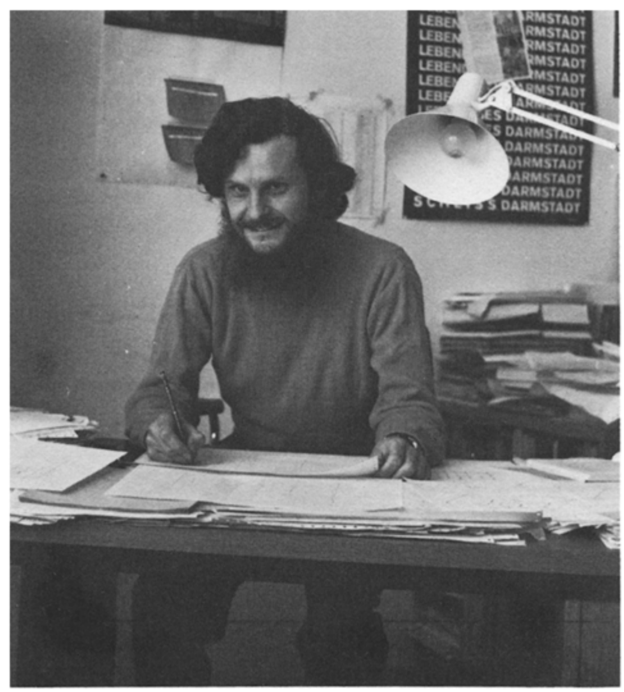
The polemic against eponymy in the Old Intelligencer (Volume 2, No. 4, p. 204) deserves rebuttal by all those who do not share its authors' bleak philosophy of a rigid and depersonalised mathematics fragmented into narrow specialities. The claim that eponyms "are in themselves meaningless, for they possess no descriptive content" certainly does not apply to the many cases where mention of mathematicians' names is sufficient to stimulate the associations of their fields of work, their schools, the theorems they proved, the problems they raised, and the ideas they introduced or popularised. To deny descriptive content here is to misunderstand the way language functions. On the other hand, the proposal that "a common word should be selected which has one or more connotations suggestive of the mathematical concept to be named, and this common word should then be assigned a precise technical meaning" has many disadvantages. One of the most serious from the (Atiyah! [1]) point of view of mathematics as a unified subject is that a single mathematical concept may appear in various guises in various branches of pure and applied mathematics, so that an appropriate vernacular description of one of its manifestations may be quite inappropriate, confusing, or meaningless as a description of the underlying idea in any of its other manifestations. A minor but typical example from personal experience concerns the choice of the eponymous term "Mal'cev varieties" for the classes of algebras studied in [2]. These classes are of interest to universal algebraists because congruences on such algebras are mutually permutable, to structural anthropologists because they model the logic of analogy, and to simplicial topologists because they are the classes of algebras in which all simplicial objects have the (eponymous) Kan property. The "Algebra Universalis" school's name "permutable varieties" for such classes (cf. [3]), fully in accord with Henwood and Rival's proposal, is totally baffling and devoid of descriptive power for topologists or structuralists unacquainted with the notion of a congruence on an algebra.



About the author

Jonathan Smith was a Research Fellow at Darwin College, Cambridge (England) from 1974 to 1977. He is now at the Technische Hochschule, Darmstadt. In Cambridge he wrote his thesis on "Centrality" as a student of J.H.Conway. The (deceased) mathematician he most admires is Cayley, his favorite open problem the Burnside problem, and his favorite theorem is the Bruck-Slaby Theorem on the local nilpotence of commutative Moufang loops (which can be found in R.H.Bruck's "A Survey of Binary Systems" or in Yu.I.Manin's "Cubic Forms"). Among his non-mathematical interests are railways, both full-size and model.

Eponyms have the advantage of translation-invariance throughout different languages and cultures. Henwood and Rival cite the title of the "marriage theorem" with approval, but a native English speaker might have difficulty recognising the "théorème du couplage" in a French text or the "Heiratssatz" in a German one. Then, what are the connotations of the "marriage problem" in a polygamic society ([4]), or of the "travelling salesman problem" in a communist society? By contrast, the English speaker could easily decode, say, what was meant eponymously calling a matrix "hermitowska" in a Polish mathematical text. It is a step in the right direction, too, when "Cayley-Diagramm" replaces "Dehnsches Gruppenbild" as the translation of "Cayley diagram".

Again, every time a common word is given a precise technical meaning, much of the freedom to use that word with its common meaning in technical writing is lost. Using words like "function" or "group" in their everyday senses within mathematical writing would require great care that no confusion with the technical meanings was possible. We can stand this happening to a few words, but if the custom became widespread mathematicians would end up completely tongue-tied, desperately searching through a thesaurus before making even the simplest utterance.

Another problem with the use of everyday words as mathematical terms is that it is hard to maintain a one-one correspondence between the words and the mathematical concepts. "Lattice" is a typical casualty here – does it refer to a discrete additive subgroup of $\mathbb{R}^n$, or to an algebra with a pair of idempotent, commutative, associative, and absorptive binary operations? Henwood and Rival would search in vain for the "pigeonhole principle" in [5], but they might find "Dirichlet's box principle" or even the "Schubfach prinzip" (sic). Of course, such ambiguities can arise with eponyms, too, as in the earlier example, but somehow it is easier to decide between "Cayley diagram" and "Dehnsches Gruppenbild" than between "pigeonhole principle" and "box principle".

A further advantage of eponyms is that they are generally more concise and easier to inflect than everyday words accurately applied to a mathematical context. Consider the example of "permutable variety" given above. This gains conciseness at the expense of accuracy, for it is not the varieties that may be permuted here, but the congruences on each algebra in the variety. The slightly less cryptic but still not completely precise "congruence-permutable variety" has already become quite a mouthful. The eponymic "Mal'cev variety" neatly sidesteps these problems, and one may easily pass to related concepts such as "Mal'cev operation" or "Mal'cev algebra".

Yet another difficulty in carrying out Henwood and Rival's proposal is that it may often be virtually impossible to give a good descriptive name to a mathematical concept, especially early in its life. Consider the example of a "Moufang loop", which was mainly characterised by the abstract and apparently amorphous identity $((xy)z)y = x(y(zy))$. These objects were studied for more than forty years before some work [6] was done that would suggest an appropriate descriptive name – "triality loop", by which time the eponym "Moufang loop" was firmly rooted. In view of Henwood and Rival's comments that mathematicians are lagging behind other scientists in eliminating eponymy, it is worth remarking that these other scientists also have to resort to it when they come up against the sort of abstractions that mathematicians regularly deal with.

Henwood and Rival mention the alternative of using neologisms based on Latin and Greek elements, but rightly dismiss it on the grounds that few mathematicians nowadays have the necessary classical education. The chances of being presented with such embarrassing bastards as "television", or of confusing "hyper-" with "hypo-", are just too great. A modern alternative that is gaining favour is the use of acronyms such as "HNN-extension" or "NP-complete". Besides a certain ugliness that can make English sound like Hakka dialect or stuttering, this method also has its dangers. At a conference in Czechoslovakia a few years ago a young mathematician was greatly puzzled by the amusement on the faces of his audience as he talked about certain commutative, idempotent, and associative groupoids as CIA-groupoids.

All in all, eponymy has many advantages which mathematicians would be foolish to deny themselves. Banning it would not ban trivial mathematics, but it would make mathematics more difficult to produce, to discuss, and to apply.

References

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