Priority and Stability in Zoological Nomenclature: Resolution of the Problem of Article 23b at the Monaco Congress

For years, major groups within the zoological community were not entirely satisfied with the balance of power, as expressed in the old International Rules of Zoological Nomenclature (officially the "Règles"), between achievement of stability through a strict priority approach (that is, the oldest name ever given to an organism should be the only name ever lawfully used for it) and arriving at essentially the same goal by means of conservation of certain names, if well known (or similar reason), in spite of their being junior synonyms of older names. In the new Code, published in 1961 (and again, with little change, in 1964), the celebrated (or infamous, depending on one's point of view) Article 23b represented a fresh attempt at achieving stability in nomenclature without causing undue controversy. Unfortunately, considerable unhappiness persisted—for example, the reports and comments by Mayr *et al.* (*1*), Collette *et al.* (*2*), and Mayr (*3*), and many published in outlets of less wide distribution—and the serious problem was left for resolution by the 17th International Congress of Zoology, convening in Monaco this past September.

Full and official reports of the several actions of the International Commission on Zoological Nomenclature (ICZN), of the Section on Nomenclature, and of the Congress itself will appear elsewhere in due time; the purpose of this comment is to give immediate assurance to the zoological community at large (since so few persons attended the Congress) that a "compromise" solution of the problem posed above was indeed reached, resolving the matter in a way that will surely be most satisfactory to the vast majority of zoologists the world over, no matter what group of organisms they are working with (*4*).

Commissioner W. D. L. Ride, of Australia, is to be credited with the skillful drafting of revisions of Articles 23, 79, and 80 which, following full discussion, were unanimously accepted by the ICZN, similarly approved by the Section on Nomenclature, and ratified by the entire Congress in its final plenary session on 30 September 1972, and which neatly put to rest the major dissatisfaction, or potential dissatisfaction, of various groups of taxonomists with the 1961 version of Article 23b, its recently proposed revisions, or its complete deletion. The new provisions legally take effect when they have been published in the *Bulletin of Zoological Nomenclature*. Only selected portions (*5*) of two of the three newly revised Articles peculiarly appropriate to the present notice are directly quoted below; the reader is urged to read the entire texts, with their supporting details, examples, and other such material when they appear in a forthcoming number of the *Bulletin*.

Article 23 (a-b). *Purpose.* The Law of Priority is to be used to promote stability and is not intended to be used to upset a long-established name in its accustomed meaning, through the introduction of an unused name which is its senior synonym. A zoologist who considers that the application of the Law of Priority would in his judgment disturb stability or universality or cause confusion is to maintain existing usage and must refer the case to the Commission for a decision under the Plenary Powers [Art. 79].

Article 79 (b). *Suppression of unused senior synonyms.* Where an application is made to the Commission for the suppression of a name on the grounds that it is an unused name, that is, a senior synonym of a name in general current use, a *prima facie* case that stability is threatened will be made if it can be shown that the senior name is not known to have been used during the immediately preceding fifty years and that the name it would replace has been applied to a particular taxon, as its presumably valid name, by at least five different authors and in at least ten publications during the same period.

Article 80 simply explains that when a case is under consideration by the Commission, existing (that is, the most common) usage is to be maintained until the decision of the ICZN has been published.

Thus it would appear that all "working zoologists" will now have clear-cut guidelines in what formerly might have been judged unclear or disputable cases; and that the primary aim of the Code itself, as so well expressed in its preamble, "to promote stability and universality in the scientific names of animals, and to ensure that each name is unique and distinct," has been judiciously maintained.

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2. B. B. Collette, D. M. Cohen, J. A. Peters, *ibid.* **177**, 452 (1972).
3. E. Mayr, *ibid.*, p. 453.
4. This action of mine has the approval of R. V. Melville, secretary to the ICZN; several of the senior commissioners, including the acting president, Dr. L. B. Holthuis, who were asked to comment on a draft of my manuscript; and Dr. D. S. Farner, president of the Section on Nomenclature at the Monaco Congress.
5. Quoted portions of the newly revised Articles of the Code were selected by me, present as a commissioner of the ICZN at all of the meetings on nomenclature convened at the Congress; but the selection also has the tacit approval of the persons indicated in the preceding note. The present paper, however, is not to be cited as the authoritative publication on these revisions of the Code. In the case of Article 23, the new "a-b" incorporates and/or replaces the former "a" and the controversial "b"; the single paragraph is designated "a-b" to avoid renumbering all subsequent paragraphs, which remain essentially unchanged. In Article 79, only paragraph "b" is new, so other parts are not quoted here. In the case of Article 80, two subsections were added to clarify the meaning of the Article's present introductory paragraph; since the latter (paraphrased in the text of this paper) remains unchanged, inclusion here of the new explanatory information seems unnecessary.

30 October 1972

Fluidity of Simple Liquids—Reply to a Criticism

Eicher and Zwolinski (*1*) published a comment on "Limitations of the Hildebrand-Batschinski shear viscosity equation." They write for the kinematic viscosity $\nu^{-1} = a_3/\rho + a_4$ (ρ is density), fix values of a_3 and a_4 by the method of least squares, and report substantial deviations of calculated from experimental values of viscosity in the cases of *n*-hexane and three other liquids.

I wish to remark, first, that my equation for fluidity (*2*) differs significantly from that of Batschinski, both in the physical meaning of its constants, B and V_0, and in relating fluidity to relative rather than absolute expansion.

Second, the simplest and most enlightening way to test the validity of an equation such as mine is to plot the best available experimental values of the fluidity, ϕ, against the molar volume, V. A large-scale plot of values of the fluidity of *n*-hexane from −90° to +70°C, from tables by F. D. Rossini *et al.* (*3*), shows points that fall on a straight line with scarcely visible deviations.

A paper on "Fluidity: A general theory," by J. H. Hildebrand and R. H. Lamoreaux, has been published (*4*).

It contains values of B and V_0 for scores of liquids, all determined from straight-line plots, with many illustrations of the physical meaning of these constants.

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4. J. H. Hildebrand and R. H. Lamoreaux, *Proc. Nat. Acad. Sci. U.S.A.* **69**, 3428 (1972).

3 October 1972

Rats Drink Less Cool Water: A Change in the Taste of Water?

Kapatos and Gold (*1*) have reported data of great importance for water intake—rats consumed less water when the water was cooled. These investigators state that some species, including man and rat, "lack water-sensitive taste receptors" so that the decrement in consumption of cool water in their study would necessarily have been mediated by nontaste, perhaps thermal, receptors. However, water does produce taste responses in man and rat under some conditions (*2, 3*). In addition, many fibers sensitive to taste are also sensitive to temperature (*4*). In the rat, most of these fibers sensitive to taste and temperature are responsive to cooling (*5*). This suggests that taste information might have helped to mediate the behavior observed by Kapatos and Gold, that is, cooling the water may have changed its taste.

The early failures to find responses to water in the rat chorda tympani taste nerve (*6*) apparently resulted because adaptation was not recognized as an important variable. Responses to water in the rat, as well as in other species, depend on the preceding adaptation state of the tongue (*3, 7*); that is, responses occur to water following NaCl or water following acid rather than to water per se. The taste of water has also been shown to be dependent on the adapting solution in man (*2*). Water following NaCl tastes bitter-sour, water following acid tastes sweet, and so forth.

In behavioral experiments the rat's tongue is adapted to saliva with a sodium content equivalent to 0.005 to 0.01M NaCl (*8*). Thus the fibers of interest for behavioral studies are those that respond to water following NaCl. Such fibers have not been observed in the rat chorda tympani but they have been observed in the rat glossopharyngeal nerve (*3, 9*).

Another source of information about water is potentially available in the taste system of the rat. Saliva stimulates NaCl-sensitive fibers. Water removes the saliva, producing decrements in these responses (*10*). Although we do not know if such decrements can mediate sensations, the possibility should not be overlooked.

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Bartoshuk appears to be suggesting that the reason thirsty rats drink more warm water than cool water may be that they prefer the taste of warm water. Until recently this preference explanation seemed unlikely, as thirsty rodents prefer cooling air (*1*) and cool metal (*2*). Furthermore, we obtain parallel suppressions of fluid intake whether we cool tap water, distilled water (*3*), or isotonic saline (*4*). Nevertheless, the possibility of a preference for warm fluids remained. We have recently completed preference studies and can now report on the preference for water as a function of water temperature and thirst (*5*).

Rats were given two-bowl, drinkometer-monitored preference tests. As we predicted, most rats deprived of water for 23⅔ hours preferred cool (6°C) to warm (36°C) water. Contrary to our prediction, the preference for cool water lasted only for the first 2 to 6 minutes of the 20-minute drinking session. After the first 2 to 6 minutes the preference shifted to warm water. By the end of the 20-minute preference test, intake of warm water exceeded that of cool water. Mendelson (*6*) has reported similar findings. In a variable-interval, bar-press situation, where very little water was actually consumed, thirsty rats pressed more for cool water, while in 20-minute, two-bowl preference tests warm water was preferred.

The initial preference for cool water is consistent with the preference by thirsty rodents for mouth cooling when no hydration is possible, as is the case in air-licking and licking cool metal. The subsequent shift to a preference for warm water could be responsible for the enhanced intake of warm water that we reported.

As Bartoshuk appears to suggest, suppression of water intake by cool water may be mediated by a preference for warm water. However, when only one water temperature is available on a given day, cool water suppression (relative to warm) begins immediately, that is, during the period of cool water preference (*4*). It is our suggestion that suppression of the intake of cool water is due to an increased capability of cool water to satiate thirst, rather than to an aversive taste.

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