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DILEMMA OF NAME-RECOGNITION: WHY AND WHEN TO USE NEW COMBINATIONS OF SCIENTIFIC NAMES

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***Abstract.*—Recent changes in many scientific names have caused confusion for many non-systematists. We suggest wider use of the category of subgenus as a compromise between the simultaneous needs that exist at the present time: nomenclatural stability for the vast variety of users of scientific names, and phylogenetic correctness for systematists and others concerned.**

Key Words.—taxonomic changes; nomenclatural stability; subgenera; name usage

Recently, several long-accepted scientific names of numerous genera with world-wide or hemispheric distribution were split into two or more genera. Although most of these better represent the intricate relationships among groups of species within a genus in the broad sense (*sensu lato*), many biologists (especially those lacking taxonomic training) become confused by new taxonomic changes and are now uncertain how or what nomenclature is acceptable. An insurgence of new names has appeared with the increasing role of molecular genetic techniques and their inherent role in expressing phylogenetic relationships through genus-group names.

Examples of recent changes in nomenclature include revisions of *Eumeces* (Griffith et al. 2000; Schmitz et al. 2004), *Cnemidophorus* (Reeder et al. 2002), *Elaphe* (Utiger et al. 2002), and several changes in amphibian genera including *Bufo, Eleutherodactylus* and *Rana* (Frost et al. 2006). Each of these examples demonstrates one or more occasions where a long-known generic name perforce was restricted to the populations of a relatively small area including the range of the type species. The generic names of remaining new taxonomic subdivisions were either given new original names or provided resurrected ones from previous synonyms.

Frost et al. (2006) is an excellent example and includes a number of nomenclatural changes among North American anurans (Table 1). They split *Bufo* (*sensu lato*) into three genera, substitute *Craugastor* for *Eleutherodactylus* and *Lithobates* for some *Rana*, and revive *Syrrhophus.* Among these genera, *Bufo* and *Rana* have been previously accepted, well-known, and regularly used for over two centuries. During that time, zoologists produced an enormous literature-base referenced via these previously stable designations.

TABLE 1. Examples of prior and new names for North American anurans as proposed by Frost et al. (2006).

Earlier Name	New Combination
Eleutherodactylidae	
Eleutherodactylus augusti	*Craugastor augusti*
Eleutherodactylus guttilatus	*Syrrhopus guttilatus*
Bufonidae - true toads	
Bufo americanus	*Anaxyrus americanus*
Bufo boreas	*Anaxyrus boreas*
Bufo marinus	*Chaunus marinus*
Bufo alvarius	*Cranopsis alvaria*
Ranidae - true frog	
Rana catesbeiana	*Lithobates catesbeianus*
Rana chiricahuensis	*Lithobates chiricahuensis*
Rana aurora	*Rana aurora* [no change]
Rana boylii	*Rana boylii* [no change]

Concomitantly, nomenclatural changes have sometimes been widely disturbing to biologists, and perhaps this consternation is not necessary. More importantly, many fields of biology (e.g., physiology, medicine) have been accustomed to use of those names. Now must they, as well as field biologists, change all these names, especially when the change may have minor or nil importance to their fields? Here we offer an alternative.

Taxonomic nomenclature serves the primary function of name recognition and a secondary function of phylogenetic relationship. Taxonomic specialists are most concerned with the secondary function whereas other biologists are more concerned with the primary function of these designations. Splitting generic names in these cases serves only the *secondary* function of zoological nomenclature: to reveal relationships of species at a finer level than which biologists have been long accustomed. It does not serve the *primary* function of zoological nomenclature: name recognition.

Those two functions (relationship, name recognition) are inherent in the official "binominal" classification system (actually binary) in the fourth edition of the International Code of Zoological Nomenclature (Ride et al. 1999), hereinafter "the Code". The specific epithet (e.g., *pipiens* in the species name *Rana pipiens*) is attached permanently to its taxonomic category and remains valid barring problems for priority, as well as uncertainty of application to a given species. One name cannot be universally sufficient for name-recognition. A minimum of one other word is necessary to group species by binominal nomenclature into manageable units. The generic name serves that fundamental function, but it lends additional meaning in assembling species according to their phylogeny.

The degree to which phylogeny is reflected in generic names is subjective. The Code says nothing about evolutionary origin because that is a zoological, not nomenclatural, decision. Any of several generic names could be used in conjunction with a given specific epithet, without changing the latter's role as the ultimate recognition name; only the grouping name has changed. Obviously the name that functions to group related species should be kept as stable as possible, so that name recognition is minimally disrupted. As arbiters of nomenclature, taxonomists bear the responsibility of serving the needs for efficient name constancy of their fellow biologists and the needs of

phylogeneticists to show evolutionary relationships of species to a reasonable degree.

We recommend a compromise to serve the needs of both of these important groups. The Code does provide for such a compromise, whereby the impact on stability of species names that result from the partitioning of any given genus can be greatly minimized by the optional subgenus category. As stated in the Code, names of subgenera, when used, follow in parentheses the generic name, providing the combination such as: the Marine Toad, *Bufo (Chaunus) marinus*. This option provides flexibility of the genus-group category without upsetting constancy of the species name.

The proposal of names at the subgeneric level is optional for the partitions of genera *sensu lato*, and the subsequent use of them. Thus one may use the name *Bufo marinus* without challenging the validity of the subgenus *Chaunus*. Although the partitions of *Bufo* and *Rana* in Frost et al. (2006) were proposed at the generic level, that does not prevent future workers from regarding them as subgenera. Thus the options exist, under the Code, to cite the names newly revived or created for the subdivisions of these two genera as genera or subgenera, and if the latter to use them only in circumstances where phylogeny is of concern, not necessarily in others.

This is a long-needed compromise between nomenclature's primary (name recognition) and secondary (phylogeny) roles. A century or more has passed without need for this compromise because most biologists were taxonomists. Today only a fraction of biologists are trained in systematics and even fewer conduct research in this area. When most users of names are taxonomists, name-recognition is not a major concern. When the primary users are non-taxonomists, as in modern times, name stability increases in importance.

Unofficially, custom plays an important role in what is acceptable or not acceptable. Customs stabilize, but also stultify. Subgenera have not been popular in the past, but changing times suggest that they could be an important component providing both phylogenetic correctness and name stability in modern systematics.

Those workers who prefer to retain current generic names in their broad sense are completely within their rights to do so, under the Code, and certainly no confusion is caused thereby. However, approval by others of these individual rights is ultimately vital. The compromise here suggested is fully justified, in our opinion, but it is operative only if accepted by those most concerned with phylogeny and the most recent scientific discoveries, as well as by those most concerned with stability. Individual rights need general acceptance.

A broad-based survey of preference by all users of the names under consideration would undoubtedly strongly favor stability. Taxonomic specialists have been slow to accept their responsibility to such users equally as well as to their responsibility to convey new knowledge of phylogeny. Acceptance of subgenera as a concession to all users is their part in the suggested compromise.

We appeal to the compilers of checklists that serve as name standards to recognize the need for the suggested compromise and incorporate subgeneric names in their listings, thereby validating the option of use of them, or not, by writers of every variety.

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Hobart Muir Smith (long sleeve plaid shirt) was born Frederick William Stouffer in Stanwood, IA on 26 September 1912, the sixth child of Harry and Blanche Stouffer, farmers who soon moved to Ohio. After Harry was killed in WWI, the children were orphaned and young Frederick was adopted by Charles and Frances Muir Smith, postal worker and teacher, respectively, who changed the boy's name to Hobart and took him to Oklahoma (Shawnee and Okmulgie) and later to Bentonville, Arkansas, where Hobart went to high school. He was sent to Kansas State University in 1928, where he majored in entomology, graduating with that major in 1932. During this time, Hobart met an older student, Howard Gloyd, and accompanied him on several summer field trips, discovering a new fascination with herps as well as a new intellectual orientation which included Gloyd telling HMS to look up a young professor, Edward Taylor, at the University of Kansas. The rest of Hobart's career from his Ph.D. in 1935 is generally well known, as is his hyperscrivenous reputation, with 1602 titles on his vita and some ten more in press, including two books with Julio Lemos-Espiñal. Asked to identify his most important publications, he quickly pointed to the Handbook of Lizards (1946) and the three checklists to Mexican herps (1943, 1948, 1950). With a smile and a raised eyebrow he also mentioned that the Golden Nature Guide has sold over a million copies. (Contributed by David Chiszar).

David Alfred Chiszar (short sleeve shirt) was born at a military base in Sergeant's Bluff, IA, 21 October 1944, to Alfred and Florence Chiszar, but the birth was officially recorded in Sioux City. He was moved to the family home in Perth Amboy, NJ, when Alfred was shipped to Europe as an Army Air Corps aviator. After WWII, Alfred worked for General Motors Corp. and later operated a Gulf filling station and mechanic shop, while Florence operated a confectionary store. The family continued these businesses for many years, but moved to Woodbridge, NJ, where David went to high school. Degrees in psychology came from Rutgers (BA 1966, Ph.D. 1970) and it was in 1970 that he met Hobart at the University of Colorado. Collaborative field and laboratory work followed, continuing to the present. Experiments on strike-induced chemosensory searching in rattlesnakes occupied much of their time, but they managed to make numerous field-collections trips within Colorado, surrounding states, and Mexico.