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## PRESIDENTIAL ADDRESS, 2000: NOMENCLATURAL NONSENSE— FLYING IN THE FACE OF A FARCICAL CODE

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[The following is a modified transcript of the presidential address delivered at the annual meeting of the Lepidopterists' Society, Wake Forest University, Winston-Salem, North Carolina, 29 July 2000. The original title was "Everything You Always Wanted to Know About Nomenclature, But Were Afraid to Ask." You may recreate the mood of the banquet by waiting until late in the evening, eating a large meal, and drinking several glasses of wine before reading.]

The presidential address typically represents one of those points in the meeting when time . . . seems . . . to . . . stand . . . still, especially for spouses and others who have been coerced into attending the meeting, or at least the banquet. And you know who you are. Well, I'll try my best to be mercifully brief. But I'll warn you right now, you're going to have to pay attention because there are a couple quizzes during the talk and there's a test at the end.

Well, if you ask any biology student what the most boring and mundane topic is that he or she has had to endure as part of his or her undergraduate or graduate career, most will answer with little hesitation that nomenclature and/or taxonomy are absolutely the worst. I mean, what could be more boring than studying the rules, regulations, and recommendations governing the formation and use of scientific names . . . in Latin? Well, this evening I hope to demonstrate to you that although the study and practice of taxonomy and nomenclature may seem boring, it actually may be joyous, intriguing, fascinating, and entertaining . . . or at least not as boring as it seems. So, if I can have the first carousel we'll get started. Don't worry, there's only one carousel. Actually, there's only about 50 slides; so, if you want, you can keep track of how near we are to the end.

Well, before I get started, allow me to digress . . . but just briefly, of course. Well, nowadays everybody uses a software package called PowerPoint® to make spiffy slides for presentations (Fig. 1), and I'm no different. And when I'm preparing my slides for a talk, the first thing I do is try to match the subject matter of my talk and the type of audience with the appropriate background pattern or color scheme, and this can be quite challenging because PowerPoint gives you a ton of snappy templates upon which to build your presentation. So, for example, if my talk is going to be real sciency, I might use a template like Fig. 2, matching the intellectual quality and scholarly content of the presentation. To me this slide just reeks "Trust me, I'm a doctor, I know what I'm talking about." If my talk has a more evolutionary, ecological, or biogeographic bend, then I might use something like Fig. 3. Here we've got these green and yellow eco-colors going for us; and we've got this faint silhouette of a tree in the background. This template says "I'm concerned with the environment; I'm eclectic; I think globally." If my subject matter is going to be more high-tech, maybe using mathematical modeling or statistics (as if), I might use a template like Fig. 4—simple but contemporary. What I'm looking for here is a slide that says "Hey, I got 1600 on the math part of my SATs and I know a lot more about statistics than you do." Well, finally, if I'm just going to give a regular old talk to a diverse audience, I might choose a template like Fig. 5—sort of plain and unpretentious, kind of understated. Well, after carefully reviewing these and other templates, I selected Fig. 6. Here we've got this little

bald guy up in the corner, obviously apprehensive about the subject matter of the talk, but we also have this confetti action going on here, indicating that we're going to have a good time. Okay, now back to the talk.

Well, T. S. Eliot must have been a great lover of cats, as illustrated by his book *Old Possum's Book of Practical Cats* (Eliot 1939). And this is the first stanza of a poem from that book entitled "The Naming of Cats." And I'll read it to you.

The naming of cats is a difficult matter,  
It isn't just one of your holiday games;  
You may think at first I'm mad as a hatter  
When I tell you a cat must have three different names.

Well if old T. S. had been a lepidopterist rather than a cat-lover, this poem may not have been that much different, and it might have gone something like this:

The naming of *moths* is a difficult matter,  
It isn't just one of your holiday games;  
You may think at first I'm mad as a hatter  
When I tell you a *moth* must have *two* different names.

Actually, he might have left it as three if he had worked on butterflies . . . but we won't go there.

The beginning of the "modern era" of scientific nomenclature is typically defined by Linnaeus' classic treatment, *Systema Naturae* 10th edition, published in 1758, long before the time of T. S. Eliot. Linnaeus' consistent use of Latin binomials—that is two names, a genus and a species—for all organisms in *Systema Naturae* established it as the "starting point" for our modern taxonomy. If you think about it, it's really pretty remarkable to have such a well defined milestone for any advancement in science, literature, or art. And probably because of this, Linnaeus has been dubbed "the father of modern biology"—so this binomial thing was really a pretty big deal.

But as you can imagine, it took a while for everyone to get on-board with this two-name taxonomy; and it wasn't until 1905 that a group of systematists drafted the first set of rules to guide the use of scientific names: [Fanfare] The *International Code of Zoological Nomenclature*. Over the past 100 or so years, these rules have become more standardized and rigorous through successive editions of the *Code*, four in all. A new and improved version of the *Code* was published just last year. It's a little larger than the previous edition, and the cover is a little greener. I'm not exactly sure what the significance of the change in color is, but you can bet that it was a hotly debated issue, as are all issues associated with changes in the *Code*. We now have this complete *Code* clearly describing what con-

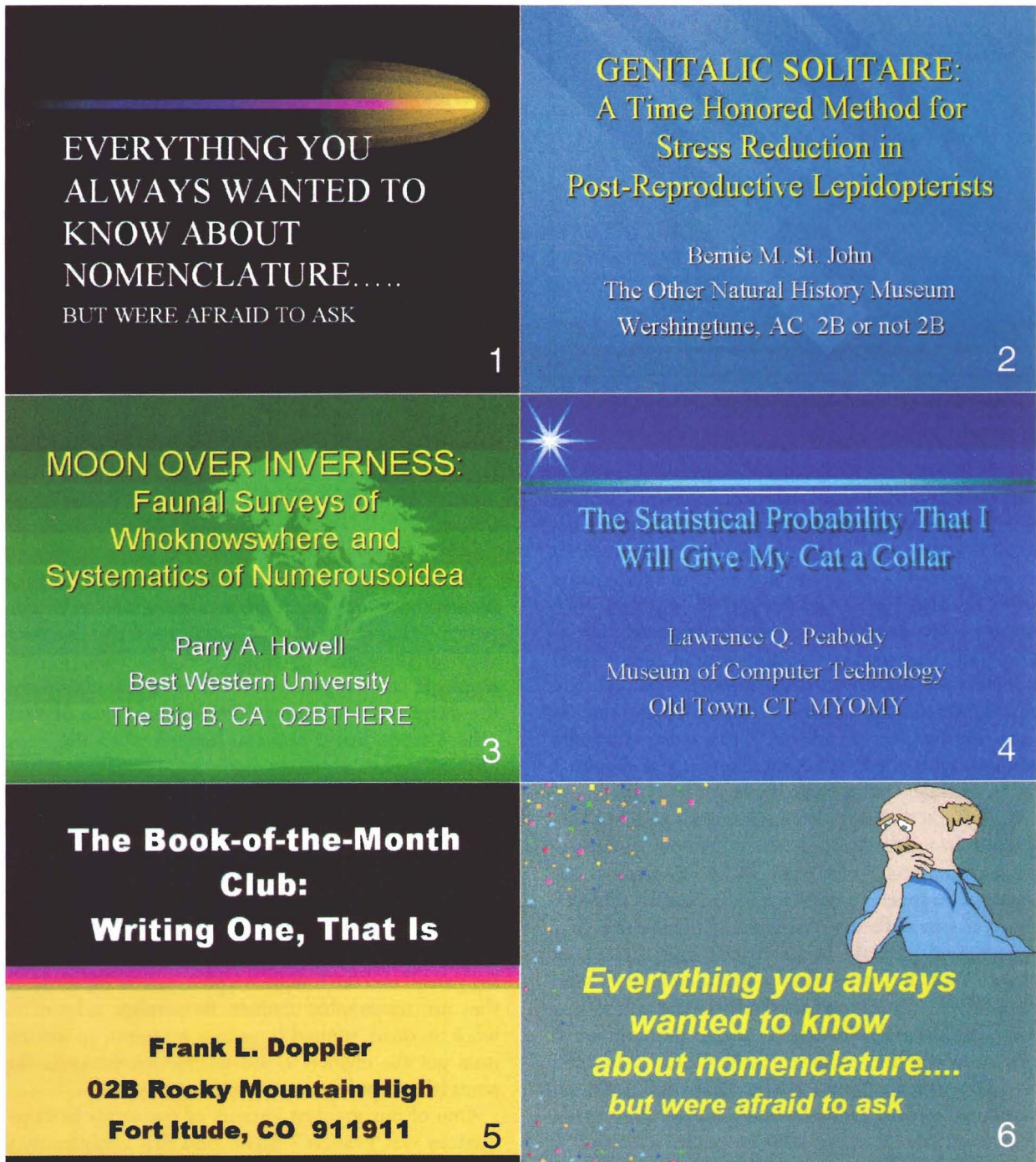
stitutes a valid name; defining priority, synonymy, and homonymy; detailing what constitutes publication; and addressing a host of other complications that may be encountered. There is actually a Commission of Zoological Nomenclature that reviews proposals and makes decisions regarding specific cases of usage when controversy arises.

Scientific names are supposed to be Latin or at least "latinized," which is fine for those with a classic education that included Latin. But for some of us cretins whose only experience with Latin is pig-Latin (in grade school), conformance with this tradition may be a major chore. Fortunately, over the years our nomenclature has become contaminated with names of various origins, including Greek, Spanish, English, and so forth, some of which are described, even by their authors, as "arbitrary combinations of letters" and by their critics as just plain nonsense. These authors have paved the way for those of us with limited skills in, and knowledge of Latin to propose new names for animals that may not be ideal, but are recognized as valid, nonetheless. Well, finally we get to the purpose of this address, and that is to provide you with a brief glimpse into the rules and recommendations that apply to the naming of animals, not just cats, relying primarily, of course, on Lepidoptera. We're going to examine three areas: patronyms, synonyms, and inappropriate names. So here we go. [Slide of a playground slide] Hmm. Well this is obviously the wrong slide.

Here we are. Let's start with Recommendation 25C: Responsibility of authors forming new names. "Authors should exercise reasonable care and consideration in forming new names to ensure that they are chosen with their subsequent users in mind and that, as far as possible [and this is the good part], they are appropriate, compact, euphonious [i.e., pleasant to the ear], memorable, and do not cause offence." It's this last phrase that I want you to remember for the test. Okay, here comes the meat.

#### WHAT IS A PATRONYM?

A patronym is a scientific name that honors a person by incorporating that person's name into the name of a genus, species, or subspecies. Here's one of the rules you need to follow. Article 31.1.2. "A species-group name . . . is to be formed by adding to the stem of that name 'i' if the personal name is that of a man, 'orum' if of men or man (men) and woman (women) together, 'ae' if of a woman, and 'arum' if of women . . ." This is one of the easiest ways to come up with latinized names for species, and I used it liberally when I started describing Lepidoptera about 20 years ago. For example, I named *Habrodais poodiae* for my wife



FIGS. 1–6. PowerPoint slides illustrating templates for various types of talks (see text for explanation).

Poody Brown, *Mitoura thornei* for one of my early mentors (Fred T. Thorne), and *Euphyes vestris harbisoni* (hmm, three names, must be a butterfly) for another of my early mentors—Charles Harbison. In later years I even became clever enough to use the “orum” form, so this species, *Cuproxena duckworthorum*, is

named for Donald and Sandra Duckworth. (Just sort of on the side, if your last name was Duckworth, would you name your son Donald? Isn't that a little like having the last name of Butterworth and naming your daughter Mrs.? Or having the last name of Wonderland and naming your daughter Allisen?) Anyway . . .

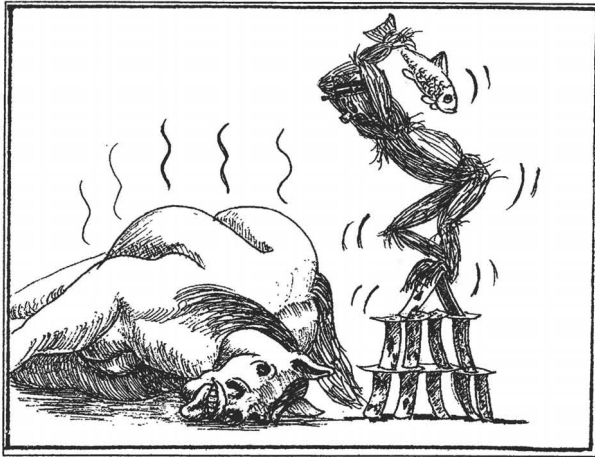


FIG. 7. Straw man on house of cards beating a dead horse with a red herring.

As your run-of-the-mill taxonomist, even I make a contribution to the study of tortricid moths from time to time. And once in a while some of our contributions are recognized by others in our field and they name a species after you. And here it is, my very own patronym—*Phtheochroa johnibrowni* Razowski, 1991—solid gold! This species was named after me by Josef Razowski—a Polish tortricid worker, wouldn't you know it. Actually, this is a pretty goofy-looking species name. Remember, you add an "i" to the end of a man's name, so with a last name like Brown, you shouldn't expect too many patronyms, if you get my drift.

Well, if you're one of those scientists who make **lots** of significant contributions, several people may name species after you. So for example, here's some of the Lepidoptera species named for Jerry Powell (Table 1), who is in our audience this evening. There are geometrids, and pyralids, and tortricids and all sorts of things. Well, if you're one of those scientists who makes lots of significant contributions and you're also really dead, there's virtually no end to the number of patronyms you may receive. Here's (Table 2) just the tortricid species named for Alex Diakonoff, a Dutch microlepidopterist whose work spanned the period from about 1940 to about 1990; he published over 250 papers on Lepidoptera, and he has a ton of things named after him.

Actually, I'll bet there are 15–20 folks here tonight with species named after them. I know there's one or more *leuschneri* (for Ron Leuschner), and we saw there are lots of *powelli*, and there's an *epsteini* and a *poguei*, but I think they're names of biting flies (ceratopogonids) rather than Lepidoptera, and there's a *millerorum* for Lee and Jackie Miller, and a *burnsorum* for John and Sarah Burns, and probably a whole

TABLE 1. A few of the many Lepidoptera patronyms for Jerry Powell.

<i>Coptodisca powellella</i> Opler (Heliozelidae)
<i>Gyros powelli</i> Munroe (Pyralidae)
<i>Stegea powelli</i> Munroe (Pyralidae)
<i>Pterotaea powelli</i> Rindge (Geometridae)
<i>Dorithia powellana</i> Brown (Tortricidae)
<i>Clepsis powelli</i> Razowski (Tortricidae)
<i>Henricus powelli</i> Razowski (Tortricidae)

bunch more that I don't know about. Okay, so we've got the concept of patronym nailed. So let's move on. But first, here's our first quiz. This quiz is for those young ladies in the audience 16 years or younger. Who is this devilishly handsome young lad? [Slide of Leonardo DiCaprio] [The voice of Astrid Caldas shouts out from the back of the room—Leonardo DiCaprio]. Okay. Any idea of his Latin binomen? How about *Homo sapiens*? Good.

#### WHAT IS SYNONYMY?

When a species of animal has been described or named more than once, the names are said to be synonyms—that is, both (or all) names refer to the same species. This can happen in a variety of ways. For example, it can happen when different scientists name the same species because they are unaware of each other's work. But it also can happen when the same scientist names a species more than once from different specimens because he doesn't recognize that they represent the same species. And this typically happens when species are real variable, that is, no two individuals look alike, or when they exhibit strong sexual dimorphism, that is, males and females look different. Most of you are probably familiar with the California dog face butterfly—the male has been called the "flying pansy" and the female is a plain yellow butterfly, so they are remarkably distinct. Remember, a lot of us work on dead, pinned bugs in a museum, so we seldom get the chance to see interaction between the sexes (the Lepidoptera sexes, that is).

One of our greatest authors of synonyms in Lepidoptera was Francis Walker. And this is obviously a very dubious honor. Walker was paid by the British Museum to catalogue their Lepidoptera collection, and when he came across species that he did not recognize, to describe them. Actually, he was paid by the species. Well, apparently Walker did not have that great of an eye for species because he described many of them multiple times. For example, Mike Pogue tells me that in the noctuid genus *Spodoptera*, an ugly bunch of cutworms, Walker described 48 different species, placing them in 10 different genera. Of these

TABLE 2. The Tortricidae patronyms for Alex Diakonoff.

<i>Bactra diakonoffi</i> Amsel
<i>Eucosma diakonoffi</i> Gibeaux
<i>Metaselena diakonoffi</i> Horak & Sauter
<i>Sycacantha diakonoffi</i> Kawabe
<i>Penthostola diakonoffi</i> Kawabe
<i>Statherotis diakonoffi</i> Kuznetsov
<i>Eboda diakonoffi</i> Razowski
<i>Torticibaltia diakonoffi</i> Skalski
<i>Diakonoffiana</i> Koçak
<i>Diakonoffiana</i> Kuznetsov

48 species, only 8 are recognized as valid today, so Walker is responsible for creating 40 synonyms in *Spodoptera* alone! Another example of Walker's keen eye is the species *Epiphyas postvittata* (Walker), the light brown apple moth, a leafrolling pest in many parts of the world. Granted, its pretty darn variable, and males look different from females. Walker described this species 9 times in three different genera—8 times in the same catalogue! All these names refer to the same species. And since a species can have only one unique name, only one is the correct name and the rest are synonyms, extra names that clutter the literature and cause confusion.

Now for a slightly more twisted example of synonymy, I'd like to tell you a little story about Edward Meyrick and William Kearfott. We'll start with Kearfott. William Kearfott was a physician who worked on American Tortricidae around the turn of the 20th century. And the names he proposed for new species are among those that are, well, shall I say, less than scholarly. Actually, Kearfott's names stand as a tribute to whimsy, whether intentionally or not. When faced with a large number of new species, most of us soon exhaust our imagination for names, leaning on old standard prefixes such as pro-, neo-, pseudo-, eu-, and so forth. Not Kearfott. Kearfott approached his new names in a very orderly fashion, apparently leaning heavily on his very thorough knowledge of the alphabet (you know, a, b, c, d . . .) and his keen ear for a good rhyme. Here are some real Kearfott species names (see Table 3): *bobana*, *cocana*, *dodana*, *fofana*, *gogana*, *hohana* . . .—stop me when you see a pattern. Well, for this set of names, Kearfott started a species name with every letter of the alphabet, except vowels, j, q, w, and x. So he got a lot of mileage from this one pattern—16 names. Here are more Kearfott names (Table 3): *fandana*, *gandana*, *handana*, *kandana* . . .; and who could forget the concise, euphonious, and memorable (Table 3) *gomonana*, *tomonana*, *vomonana*, *womonana*, *zomonana*, or *baracana*, *caracana*, *daracana*, *faracana*, *haracana*, *maracana*, *naracana*, *raracana*, and *yaracana*.

TABLE 3. A few of the many tortricid species names proposed by William Kearfott.

<i>bobana</i>	<i>dandana</i>	<i>baracana</i>	<i>gomonana</i>	<i>dana</i>
<i>cocana</i>	<i>fandana</i>	<i>caracana</i>	<i>tomonana</i>	<i>fana</i>
<i>dodana</i>	<i>gandana</i>	<i>daracana</i>	<i>vomonana</i>	<i>kana</i>
<i>fofana</i>	<i>handana</i>	<i>faracana</i>	<i>womonana</i>	<i>lana</i>
<i>gogana</i>	<i>kandana</i>	<i>haracana</i>	<i>zomonana</i>	<i>mana</i>
<i>hohana</i>	<i>landana</i>	<i>maracana</i>		<i>tana</i>
<i>kokana</i>	<i>mandana</i>	<i>naracana</i>		<i>vana</i>
<i>lolana</i>	<i>nandana</i>	<i>yaracana</i>		<i>wana</i>
<i>momana</i>	<i>pandana</i>			<i>zana</i>
<i>nonana</i>	<i>randana</i>			
<i>popana</i>	<i>sandana</i>			
<i>rorana</i>	<i>tandana</i>			
<i>sosana</i>	<i>vandana</i>			
<i>totana</i>	<i>wandana</i>			
<i>vovana</i>				
<i>zozana</i>				

Because Kearfott's (1904, 1907a, b, c) names were published in widely distributed scientific journals and his species were adequately described and diagnosed, his names are as valid as anyone's. Well I like Kearfott's names. Actually, they remind me of that song from the 1960's, by Shirley Ellis. [The voice of Don Harvey shouts out from the side of the room: "The Name Game."] Yes, exactly! And if I remember correctly, the first verse went something like: Shirley, Shirley, bope-early, banana, fana, fo-pe-early, me, my, moe, merly, Shirley . . . or something like that. [Don nods in agreement.]

Well in contrast to Kearfott was Edward Meyrick, a no-nonsense, British school master that was a contemporary of Kearfott. Meyrick was quite the Latin scholar and probably the most prolific describer of microlepidoptera ever, describing over 14,000 species (Clarke 1955), all with well formed Latin binomials. You can just imagine his outrage and incredulity upon seeing the Kearfott names in a published journal. He surely must have thought that these unwashed, godless heathens in the colonies have no right naming new species if they can't do it correctly. Well, Meyrick responded to Kearfott's work with a paper called "On some impossible scientific names in Micro-Lepidoptera," published in 1912. In this paper Meyrick (1912a) described the Kearfott names as ". . . openly and obviously based on a barbarous and unmeaning gibberish." I like that. It kind of reminds me of something I've seen in reviews of my papers . . . and at least one of those anonymous reviewers is probably in this room this evening. Meyrick totally rejected Kearfott's names and proposed new "appropriate" Latin names to replace them. Unfortunately, because the Kearfott names are valid, Meyrick did nothing more than create a ton of synonyms—new names for species that already have names. For Meyrick (1912b) the concept of priority,

TABLE 4. Names on final examination.

<i>Eubetia</i> Brown, 1999—valid
<i>Eubetia bigaulae</i> Brown, 1999—valid
<i>Eubetia raz</i> Brown—rejected
<i>Eubetia boop</i> Brown, 1999—valid
<i>Phryganidia</i> Packard, 1864—valid
<i>Phryganidia steinbrenneri</i> Miller—rejected
<i>Polywana</i> Brown—rejected
<i>Polywana krakar</i> Brown—rejected
<i>Jerapowellia</i> Miller, 1995—valid
<i>Jerapowellia burnsororum</i> Miller, 1995—valid
<i>Dyaria</i> Neumoegen, 1893—valid
<i>Cephise nuspesez</i> Burns, 1996—valid
<i>Doa</i> Neumoegen & Dyar, 1894—valid

that is, recognition of the oldest name as the valid name, was nothing more than a fetish of certain taxonomists of the time. So instead of saving nomenclature from the gibberish of Kearfott, Meyrick only cluttered it with useless names of his own. Okay. So that's the deal with synonymy. Time for a quick quiz. I'm going to show you the life history of a lepidopteran; and you'd better bask in it because they're the only photographs of Leps in the entire talk. As soon as you know the family, the genus, or the species, shout it out. Here's the egg; the first instar; the fifth instar; the pupa; and here's the adult. Oh, no....wrong adult! Here's the real adult. Everybody got *Papilio thoas*? Okay, our next and last topic.

#### WHAT IS AN INAPPROPRIATE NAME? WHAT IS TAUTONOMY?

Per the *Code*, inappropriate names are those that convey false information about a species or genus; for example, something like the name *gigantea* for the smallest member of the genus. Article 18 states: "The availability of a name is not affected by inappropriateness or tautonymy." So, here you can see that the *Code* does not dismiss these names just because they are stupid. Here's a few examples that sort of portray this concept.

*Philotes sonorensis* (Felder & Felder), the Sonoran blue butterfly. You might suspect that this butterfly is from Sonora. Nope—California. Well maybe it occupies the Sonoran Zone. Nope—it ranges from the coast to the mountains. How about *Ethmia arctostaphellella* (Walsingham). You might suspect that the larva of this feeds on *Arctostaphylos*. Nope—*Eriodictyon*. *Simmondsia chinensis* (Link) C. K. Schneid. This is the scientific name of jojoba, the plant that provides that fancy oil used in gucci shampoos, which I use, of course (I thought it would be okay to use one plant name). From the name *chinensis*, you might suspect that it is from China. Nope—its native to Chile and Cal-

ifornia, not China. And *Decodes fragariana* (Busck). *Fragaria* is this genus of strawberry, so maybe this thing is a strawberry pest. Nope—its larvæ feed on oaks.

So how about tautonymy. Well, that's when the genus and species both have the same name. Its like if there was a man with the last name of William and he named his son William—he'd be William William, but I guess you could call him Bill, so that's a little different. Well here are a few tautonomous names: *Ozotuncus ozotuncus*, a tortricid moth described by the same Polish tortricid worker mentioned before. *Apus apus*, I haven't a clue what this is, but its always used as an example in the Code. *Rattus rattus* is one of those pesky European rats. And here's my favorite—*Bison bison bison* (three names; no its not a butterfly). It's not just a binomial tautonymy, it's a trinomial because there is a subspecies of bison in Europe. I really like this name because I can just image the first mammal taxonomist out there on the American prairie, creeping along on his hands and knees, peeking over a ridge and seeing this endless sea of American buffalo, and thinking to himself, BISON! BISON! BISON!

#### CONCLUSION

Well, there's just a few more sections of the *Code* that we haven't talked about, but I'll bet you now know plenty to take the test. And this is an oral examine, so you don't need a paper and pencil. Here's what I'm going to do. I'm going to present a bunch of proposed names, some of which are published and valid, and others of which have been rejected by manuscript reviewers for one reason or another. And you need to tell me which are which (See Table 4 for answers).

Here's our first question: the genus *Eubetia*. The Latin derivation is obvious, the "eu" means true or real, the "bet", Latin for wager or gamble, and the "ia" just for good measure. Anybody see a problem with this genus? Of course not, it's a fine generic name. So here are three potential species names in this genus: How about *Eubetia bigaulae*? Yes, this is a valid name. How about *Eubetia raz*? A sort of half-baked (i.e., one-cheek) or abbreviated patronym for the Polish tortricid worker Josef Razowski. No, offensive according to an anonymous reviewer . . . who happens to be in this room. How about *Eubetia boop*? Sure; although *boop* is not Latin, we can merely say that it is an arbitrary combination of letters; its short, euphonious, etc., and valid.

Now the next question: *Phryganidia*. I just love this one; it reminds me of something you might hear some taxi driver in New York shouting at you as you cross the street in front of him—"Hey, get outta da way, ya *Phryganidia*!" Anybody got a problem with *Phryganidia* as a

valid name? Reasonable? Sure, its valid. So what if an avid baseball fan in New York wants to describe a patronym for George Steinbrenner and names it *Phryganidia steinbrenneri*? Would that be okay? No, I'm afraid this one was found unacceptable by a reviewer.

How about the genus *Polywana*? This name was proposed for a new genus in the tortricid tribe Polyorthini, a group that exhibits a Gondwanan distribution. Get it, Poly(orthini) (Gond)wana? However, the new genus would be represented by the single species *Polywana krakar*. Acceptable? No, both names were found unacceptable by a co-author with no sense of humor.

How about this genus: *Jerapowellia*. Here the author of the new genus has used both the first and last name of the honoree to make sure that no other Jerry or no other Powell can think that he is the person honored by the name. Actually, the animal is a nondescript little orange moth that nobody would want their name associated with anyway. Is this an acceptable genus name? Sure. How about if you add the species name *burnsorum*? How cow, now there's a frightening combination: *Jerapowellia burnsorum*—two Berkeley graduates united for perpetuity in the name of a tortricid moth. Acceptable? Yes, but in very poor taste (depending on your taste).

How about a new genus honoring the work of Harrison Dyar . . . *Dyaria*? But what if it was intended to be pronounced "diarrhea"? Sure. Good name.

Well say you've got a new species of skipper butterfly, and all the good names in the genus already are used up. Could you name the new species "*nuspesez*"? Yes, and the culprit who perpetrated this atrocity also is in the audience this evening.

How about the genus D-O-A (*Doa*)? Sounds like every moth in my collection. [The voice of Ron Leuschner could be heard chiming in—"That's also a good name for a family."] Yes, this is a valid genus and actually the type genus for the family Doidae.

Well, I hope you've seen from this exercise that concepts like concise, euphonious, memorable, and offensive are really pretty subjective. And sometimes it

seems as though the *Code* merely provides reviewers and editors with a justification to reject names that they don't like personally. And my interpretation is that some rules of the code are like this (see Fig. 7) . . . and this is called "Straw man on a house of cards beating a dead horse with a red herring." Well, there's little doubt that our *Code* will continue to evolve over time, let's just hope it evolves faster than the species for which it is intended to provide stable nomenclature. Thank you.

#### ACKNOWLEDGMENTS

I sincerely thank my fellow lepidopterists who allowed me to poke a little fun at them. I also thank Poody Brown for years of patience and understanding; Jerry Powell for my graduate training; John Burns for hosting me as a post-doc; Howie Wier for rescuing me from poverty; Martie Clemens for the dead horse; and the USDA Systematic Entomology Laboratory for providing me with a place to indulge in that which fascinates me the most. Linda Lawrence arranged Figs. 1–6. Natalia Vandenburg and David Smith, Systematic Entomology Laboratory, National Museum of Natural History, Washington, D.C., and William Miller, University of Minnesota, St. Paul, provided comments and corrected errors in the text (but they were unable to resolve the errors in logic).

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