

applies to measurements when they are included in species descriptions; and when they are tabulated for the species in a genus, they are often presented in a way that makes comparison very difficult (for example, mixing measurements for males and females in succeeding rows, and having a row for the same measurement character rather than a column).

The paragraphic description has practical problems as well. Unless one is dealing with a template description, some characters may be inadvertently left out, and others may not be comparative. In the extraordinarily complete descriptions of *Ceuthophilus* by Hubbell in his monumental 1936 monograph, there are a number of infuriating cases like this, which often interferes with even simple identifications.

Some of these problems would seem to be solved with illustrations. But although it is commonly thought that a picture is worth a thousand words, in taxonomy, figures as usually presented pose three problems. First, if the same structures for different species are presented on different pages, they are very hard to compare. Second, the non-specialist eye may be caught by trivial differences (see next) that in fact may not be important when compared in a series. And third, if only one specimen is illustrated, almost surely there will be variation in the series making differences seen in the figures difficult to evaluate. Some of these problems appear in my own papers; although we tabulated the drawings, there are no indications of critical features, and in one case in the *Barytettix* paper, we presented structures just to show the reader what they looked like in general but failed to indicate that the differences were the preservational artifacts!

Thus, the usual method of presentation of taxonomic descriptions makes it difficult to compare characters, the very lifeblood of the scientific method in taxonomy. One almost gets the impression that this kind of description is designed to PREVENT checking on the conclusions of the describer, and enhancing the authority of that taxonomist. It lends credence to the inaccurate idea that the specialist has great intuition and knows what the "good characters" are. Of course, this is to a large extent true of specialists, but only because they have compared characters in their minds from the experience they have had with examining numerous specimens of many species. But if that which is in the mind is not explained and justified in print, then one is not dealing with science.

Paragraphic presentation has a serious deleterious effect on modern analysis. There are now computer programs that can handle large numbers of characters and enable one to thoroughly and easily investigate classifications, to test hypotheses of relationships, and to study various biological problems such as character evolution (including convergence). But with paragraphic descriptions and unannotated figures, others who wish to employ such electronic methods are themselves forced to laboriously tabulate all the published characters, a task that could have been readily done by the original describer. In making such a tabulation the non-specialist runs the risk of misinterpretation of differences in wording and slight differences in description and illustrations from species to species. And even the describer may not quite remember how a particular structure in species number 29 was described in species number 11 a few weeks previously.

Tabulation of characters at the time of description would solve all these problems and bring taxonomy into compliance with the scientific method. How little additional effort (if any) would be required of the original describer or reviser. The only drawback is that a table does not provide infinite space for detailed description of difficult characters. Yet this too can be easily solved with footnotes or tiny pictures in the body of the table. And illustrations would indeed be worth many words, if the reader were guided by brief instructions concerning what to look for, or by the use of arrows, similar to the technique in the famous Peterson field guides.