Reports

Taxonomic "Descriptions"

Abstract. Original descriptions of organisms are often difficult to visualize, due to the fact that authors attempt to include the variability of the species in the description. Since the scientific name remains associated permanently with the holotype, it is suggested that the description of the holotype (which is a concrete thing) be segregated from the characterization of the species (which is conceptual).

My observations regarding the functions and objectivity of taxonomic "descriptions" result from experiences of the past 20 years in trying to visualize described organisms. I offer them in the hope that they may stimulate a discussion of methods which will result in less ambiguity in descriptions and, consequently, in greater ease of recognizing named forms.

Obviously the first questions to be answered are: What is a description? What is its purpose? *Webster's New Collegiate Dictionary* (ed. 5) defines *description* in the following terms: "Discourse, or an example of it, designed to describe a scene, person, emotion, etc." Since Webster utilizes *describe* to define *description,* it is necessary to refer to the former, for which the first part of the definition reads: "To represent by words." Webster gives as synonyms of *describe*: "represent, relate, recount, narrate, express, explain; depict, picture, delineate, characterize." The purpose of a description is to convey a concept of the object under scrutiny as clearly as possible by means of words, pictures, or diagrams.

But what are we describing? In the past, we have commonly stated that we are describing a "new species" or a "new genus." The result, in general, has been that the greater the amount of material the author had before him, the vaguer and less useful for identification his "description" became. Descriptions based upon long series become loaded with *more or less, usually, generally, about, a litte longer,* and comparable terms, with the result that a person trying to visualize the organism, or to match a specimen with the description, finds it extremely difficult to do so. Though such phrases or words are used deliberately because they are indefinite and ambiguous, they make it difficult for the reader to learn what the described specimens look like. Descriptions based upon uniques are usually more easily visualized than are those based upon series.

Are we, however, actually describing species or genera? At best we are describing only a very small segment of a variable and varying population which is represented by preserved specimens. It follows that any description or characterization of a "species" is necessarily imperfect, because no person knows the full extent of variability in any species. Furthermore, since no two specimens are exactly alike, the association of specimens must always be somewhat subjective.

Because of the impediments encountered in connection with verbal descriptions, the system of types was developed, the "holotype" being a single specimen selected by the author to represent the species permanently and to serve as a point of referral for authoritative information in case questions arise. Consequently, the closer the description comes to fitting the holotype exactly, the better the picture one can obtain of the typical specimen of the species.

Under such circumstances, would it not be best to follow the ensuing procedure in describing new species?

1) Describe the holotype exactly and in detail, giving comparative measurements in concrete terms or ratios. Selection of the holotype from the specimens available becomes the first step in "describing," if such a process is used. Since only a single specimen is involved, there can hardly be an excuse for ambiguity or vagueness in the description. Data regarding place and time of capture, collector, host, other pertinent information, and location of the holotype should be given. (A few authors do follow the procedure of describing the holotype at present.)

2) If it is available, describe the allotype and record data associated with it.

3) Attempt to characterize the species —that is, discuss the probable limits, variability, and geographical and host ranges of the species and the characters by which the species can be most easily recognized. Compare the remainder of the series—that is, the paratypes—with the holotype and explain your conception of the species.

4) Differentiate the species from others which have been described.

To a certain extent, a comparable *modus operandi* might be adopted for the higher categories, since each has its "type," but the descriptions of course become more and more inclusive.

Following such a procedure in describing new species would enable one to segregate the tangible (the holotype) from the intangible (the conception which the author has of the species) and would go far toward making the original description more useful to the person who has to refer to it. The procedure also makes justifiable the description of "species" upon the basis of uniques or small series (although this is not recommended unless a group is being revised or monographed).

The use of such a system would be one means of placing taxonomy on a more objective basis. It would certainly be of help in the future, as neotypes are designated to replace our present holotypes (which inevitably will be destroyed as the ages pass).

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Instructions for preparing reports. Begin the report with an abstract of from 45 to 55 words. The abstract should *not* repeat phrases employed in the title. It should work with the title to give the reader a summary of the results presented in the report proper.

Type manuscripts double-spaced and submit one ribbon copy and one carbon copy.

Limit the report proper to the equivalent of 1200 words. This space includes that occupied by illustrative material as well as by the references and notes.

Limit illustrative material to *one* 2-column figure (that is, a figure whose width equals two columns of text) or to *one* 2-column table or to *two* 1-column illustrations, which may consist of two figures or two tables or one of each.

For further details see "Suggestions to Contributors" [*Science* **125**, 16 (1957)].

Bomb Carbon-14 in Human Beings

Abstract. The concentration of bomb-produced radiocarbon in human beings will lag behind the rising concentration in average atmospheric CO_2. Measurements on human materials suggest a lag of about 1 year for both breath CO_2 and blood, with the suggestion of a somewhat higher value for lung tissue. These results are in reasonable agreement with predictions based on independent evidence.

In evaluating the hazard to man of bomb-produced radiocarbon, one of the factors which must be considered is the time relationship between the C^{14} concentration in the carbon of the human body and that in the carbon of atmospheric CO_2. Several investigators (*1–3*) have published data on the atmospheric