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Paedomorphosis

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Source: *Journal of Herpetology*, Vol. 14, No. 1 (Mar. 31, 1980), pp. 80-81

Published by: [Society for the Study of Amphibians and Reptiles](#)

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sense.” The term *paedomorphosis* completely solves the potential problem when this term is used to refer to the retention of juvenile characters in the adult without reference to the specific type and/or process involved. The importance of these evolutionary processes documented in the literature demands that their terminology be consistent and unambiguous. Gould’s (1977) update of de Beer’s terminology meets these needs admirably.

ACKNOWLEDGMENTS

I thank Robert Anstey (Michigan State University) for critically reading this paper and offering valuable suggestions concerning its content.

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Accepted 21 June 1979

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1980 **JOURNAL OF HERPETOLOGY** 14(1):79–80

PAEDOMORPHOSIS

In a note recently published in this journal, Pierce and Smith (1979) argue that the widely used term “paedomorphosis” be abandoned by herpetologists, mainly on the erroneous grounds (see below) that it has not been accepted. Other reasons cited for abandoning the term include its relatively late introduction (Garstang, 1922; over 50 years ago!) and its “confusing orthographic similarity to paedogenesis.”

I believe that the recommendations of Pierce and Smith are ill-conceived, and represent a step backward in the often confused history of descriptions of ontogenetic-phylogenetic correlations. Paedomorphosis is a general and inclusive term that refers to an entire class of heterochronous phenomena involving retention of juvenile characters (deBeer, 1930; Gould, 1977). Neoteny and progenesis (Gould, 1977, makes a convincing case for use of the latter term instead of paedogenesis) are among several morphological modes of evolution included within the general concept of paedomorphosis.

By focusing narrowly on urodeles, and ignoring the more general implications of the phenomena discussed, Pierce and Smith perform a disservice. They recommend “*neoteny (sensu lato)*” as a substitute for paedomorphosis, and “*neoteny (Sensu stricto)*” for certain kinds of larval reproduction. Such provincial redefinition can only lead to confusion and to isolation from the mainstream of work on evolutionary developmental biology, a burgeoning area of modern research.

In fact, the term paedomorphosis has seen frequent use in the herpetological literature, and its use seems to be steadily increasing (some examples: Bolt, 1977; Edwards, 1976; Estes, 1975; Estes and Reig, 1973; Goin, Goin, and Zug, 1978; Lombard, 1977; Lynch, 1973; Marlow, Brode, and Wake, 1979; Wake, 1966; Wake and Brame, 1969). These workers all use the term

paedomorphosis in the broad, generally understood sense of Garstang (1922). Pierce and Smith are mistaken in stating that the term is not accepted by herpetologists.

Gould (1977) has teased apart the nomenclature in this field in an admirably clear way. While I believe that some additional clarification is necessary (see Alberch, Gould, Oster, and Wake, 1979), the sterile terminological debate presented by Pierce and Smith contributes only negatively, and I recommend that their suggestion be ignored.

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Accepted 7 Sept 1979

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1980 JOURNAL OF HERPETOLOGY 14(1):80-81

ON THE USE OF THE TERM PAEDOMORPHOSIS

Debate over terminology may often appear to be a trivial exercise, but a common terminology serves as the basis for communication between scientists. When there exists no consensus or uniformity in the use of important terms, it becomes impossible to convey ideas and findings clearly, and scientific progress may be seriously impeded. An acute lack of such consensus occurs in the use of several terms describing larval reproduction (e.g., *paedogenesis*, *paedomorphosis*, *neoteny*, and *progenesis*). In a recent note (Pierce and Smith, 1979) we attempted to illuminate this problem, review the history of relevant terminology, and offer suggestions to herpetologists for dealing with the subject. In the preceding notes Wake (1979) and Sullivan (1979) put forward several criticisms of our effort, some of which are misleading and/or inaccurate.

One criticism concerns our observation that *paedomorphosis* was a relatively late introduction to the literature. Wake suggests that this is incorrect because *paedomorphosis* was introduced over