Haeckel's Forgeries

The Editor,

The recent article "Haeckel's Embryos and Evolution" (Wells, *ABT*, May 1999) is a timely reminder that significant parts of Haeckel's diagrams of embryos were forged, as Haeckel himself publicly admitted in a letter to the *Berliner Volkszeitung* on 29th December 1908 (Assmuth & Hall 1918). In fact nowadays, for young biology students, it is more relevant to introduce Haeckel and his "biogenetic law" as one of the worst examples of scientific fraud, the consequences of which can still be detected, particularly in the fields of human embryology and molecular biology (Freeman 1987). Indeed, it is remarkable how major contemporary textbooks continue to reproduce Haeckel's forgeries and thereby perpetuate the myth of the "biogenetic law" (e.g., Alberts *et al*. 1994, p. 33, p. 1049).

Even the subsequent letter to your journal (Sonleitner, *ABT*, September 1999), criticizing the May article, persists with the erroneous terminology of "branchial" (i.e., gill) arches for a mammalian embryo. Here I am not merely nit-picking over terminology: when our language is based on fraudulent concepts, then our thinking is clouded and a discipline cannot progress. For example, extensive studies of early human embryos (Blechschmidt 1978) have shown that the folds on the ventral side of the embryo's head-neck region have nothing whatsoever to do with gills; the same applies to the chick and pig embryo. They are simple biomechanical flexion folds, caused by the embryo's head growing around the heart to which the neural tube is anchored biophysically via tension-bearing blood vessels. Such folds occur throughout life on the flexion side of all bends in the body, no matter whether the body belongs to an embryo or an adult. To retain the generic term "branchial" for the head folds of all embryos is to conceal the special nature of the folding in any one animal.

Today, all we need to know of Haeckel's "law" is that it is false and that it cannot be rescued by subtle rewording, or by claims that it is only partially true. Once this mental straightjacket is cast aside, along with its inaccurate concepts and terminology, it is possible to open our students' minds to the unique ontogeny of each species, and to recast evolution in a totally different and exciting framework.

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