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## Teaching the Scientific Method in General Zoology at the College Level

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## TEACHING THE SCIENTIFIC METHOD IN GENERAL ZOOLOGY AT THE COLLEGE LEVEL

KARL A. STILES

Science teachers generally consider teaching the scientific method as one of their chief objectives in a general course. But too often after setting up this objective they leave it. The most widely used textbook of zoology in the midwest is Hegner's General Zoology and yet there is not one word in this popular text on the scientific method. Two of the newest texts of zoology are Textbook of Zoology by Potter, and Animals without Backbones by Buchsbaum. These books have received much favorable comment yet Buchsbaum's does not contain one word about the scientific method and Potter's devotes about one and one-half pages to it. The high school texts of biology have made at least an effort to give the student some appreciation of the scientific method, and I feel that the high schools are again leading the way.

What is wrong? Do we not consider the scientific method important or do we think it will teach itself? A number of science teachers have told me that they considered a knowledge of the scientific method as an inevitable by-product of science teaching, therefore, they do not need to concern themselves about it. But testing, which we have been doing at Coe College, indicates that the student does not grasp an understanding of the method of science by merely being exposed to the subject. Even students who had had the best of instruction along this line in high school seem to have little understanding of the method when they start college work. I am convinced that if we wish science students to possess the ability to use the scientific method as well as have an appreciation of it, we must teach it to them.

Our general zoology course is a year's course. Early in the first semester the scientific method is explained to the students, and an effort is made to show them its practical value in every-day life in addition to its application to science problems. Advantage is taken of every opportunity presented in the classroom to apply the scientific method, and the students are constantly made conscious of this. A regular feature is the testing of an understanding of the method, giving problems which the students are instructed **to solve by this method.** Students are also asked to prepare prob-

lems for solution by this method. Often at the beginning of the class period a newspaper clipping is discussed in the light of scientific method and students are urged to contribute materials for these discussions. Sometimes they are assigned the task of locating in the scientific literature papers which illustrate especially the application of the scientific method. A term paper is assigned on scientific method in which the student attempts to bring together all the information he can find from library research on this common sense approach to questions.

An original study of some human trait constitutes a second term paper. This gives the student a practical problem to solve by the scientific method. Another assignment the second semester is for the students to make a record of all the illustrations of the scientific method which come within their experience. These may be examples of either its application or lack of application to a situation. I suggest that they may pick up some of the latter brand, even in the classroom. These records are turned in near the end of the semester. This assignment serves two purposes, it keeps the students thinking about the scientific method, and the examples they turn in give some idea as to whether they have a real understanding of it. Anyone of these things is not so significant in itself, but taken all together they make the student feel that we are serious about our number one objective in zoology; and while we do not feel very well satisfied with the results, we do feel we are accomplishing something. We are constantly looking forward to improvements in teaching scientific thinking and ask for your suggestions.

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