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INOCULATION AGAINST SPRING FEVER IN THE ELEMENTARY COURSE IN ZOOLOGY

FÆ M. SHAWHAN

Webster's dictionary defines inoculation as "the act or process of improving." Also, I find that "inoculation may be *protective*, when the substance injected aims to secure immunity; or *curative*, when an anti-toxin is injected as a remedy."

We can all agree that the aims of an elementary Zoology course are many and varied. It is our claim at Drake that one of the most important and useful aims is to help our students to better understand their own biological organization. A very large percentage of students taking a general course in any elementary science are taking it for the science credit required for graduation, and will never take another course in that department. Zoology is no exception. It is our contention that if these students are to know much about the structure and function of the parts of the human body, they must peer inside something constructed more like the human body, than a frog or a pigeon.

The Zoology course as given at Drake is a ten-hour course — five hours each semester. In the laboratory work of our first semester we study the invertebrates from the Protozoa through the Arthropods. In the second semester, approximately the first seven weeks are devoted to detailed work on frog dissection, and three weeks are spent on histological study of tissues and organs. Seven weeks on dissection of the cat and one week for general review completes the work for the year. It is this last point, mammalian dissection, in the second semester of the first year course, which I believe is uncommon, and that I wish to briefly discuss.

The advantages derived by the general student in observing the internal structure of a mammal are perhaps obvious, a few are here mentioned.

(1) The cat gives a much better basis for a comparison with human anatomy. Compare for a moment the structure of the parts of the respiratory system of the frog and a human, and then of a cat and a human. Remember that most beginning students have never seen a wind-pipe or a bronchial tube, and the lung of a frog does not look much like their own lung. The urinogenital system of

the cat is a much better basis for human comparison than that of an Amphibian or bird, which only remotely resembles the human organization. There are decided advantages derived from even a brief survey of the more highly organized nervous system of the cat over the commonly used frog or pigeon.

(2) The glands of internal secretion can be readily found, and after being seen can be better understood.

(3) Most specimens used in elementary courses are not at all satisfactory for muscle dissection. This objection is met by using the cat.

(4) The size of the specimen is an advantage. Students definitely feel that at last they have something that is big enough in which to see something.

There are two principal objections which I expect to have presented in opposition to the central idea expressed in this paper. One of these is the objection that such an arrangement interferes with the regular cat course given in most schools as a part of their study in Vertebrate Anatomy; that there will be repetition. We have a laboratory course at Drake devoted entirely to the cat. Three semester-hours credit is given. Our experience has been that instead of the arrangement being a disadvantage, it has been a decided advantage. It gives additional time in the advanced course to include many of the things you have been wishing you could find time to include, thereby strengthening the course. I need only mention more detailed muscle study; more detail of structure of organs, especially of the nervous system; eye and ear detail, to explain what I mean.

The other objection to which I refer is the item of cost. I assume that in courses where the frog is used as the last specimen studied in the elementary course that it is the Giant Bullfrog (*Rana catesbeiana*) which is studied. These are listed in medium size, singly injected, at from \$76.00 to \$115.00 per hundred, or approximately \$1.00 each. Embalmed cats, singly injected, cost us a little less than \$2.00 each, or about twice as much as the Bullfrogs. For our work on the frog in the first part of the semester we use the grassfrog (*Rana pipiens*) which is not expensive. We take care of most of this excess cost at Drake by permitting two students to work on the same cat, thereby making the cost about the same as if each student dissected a Bullfrog. We recognize that there are objections to this method of study. However, with a specimen this large we have found the method satisfactory. There

are many ways of grouping students for this method of study. With proper supervision, we have found that the above plan will work to advantage.

It is difficult to explain the psychology back of the increased interest aroused. According to the students' own admission they work harder the first part of the semester in order to get to the cat for dissection. We have never had an unfavorable comment from students, and we have heard many statements in favor of the plan. The increased number of students voluntarily working extra hours after beginning the cat dissection is an interesting fact. Coming at a time when Spring Fever usually claims many victims, we think this is significant. It provides an opportunity for individual project work in the first year, and gives an important preview into more advanced work. It seems to develop a feeling of pride and of success in having been permitted to work on something larger than what they consider a "mere frog." However, our most important reason is that it gives a better basis for comparison and understanding of human anatomy, and as most general students never take another course in Zoology, this is important.

No inoculation is 100 per cent preventive or curative and in spite of the cat inoculation we still fail to pass some elementary students in Zoology at Drake.

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