

dumps and taking political action to clean them up. In addition, many have been looking into the state and federal laws about pollution and have been involved in contacting legislators and informing them of these "old" laws and requesting action on their behalf. Some students have been taking surveys from people about their feelings on family size and population control. As one can readily see, the class is actively involved in the entire environmental "scene." They are not only learning about ecologic principles as they affect man but they are living and working with this "new" ecology and are emotionally involved in the course.

The greatest aspect of the entire course is the breaking down of the academic barriers and having students from all fields of study work together in an endeavor to learn and find out more about their environment, and how each can contribute. This so-called interdisciplinary approach is working, and it can work if we use a model in which students can participate and give their insights into the problems and are willing to scratch heads together in order to develop a program that might work. We no longer can divorce ourselves from the other disciplines, but we must work, each of us, to bring together these vast fields of knowledge in order that mankind and the environment can benefit.

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A Study of the Needs of High School Biology Teachers

The knowledge explosion and the impact of the new curricula developed for high school biology instruction by national study groups, such as BSCS, have caused a scientific subject-matter content and competency lag for present-day high school teachers of biology.

In an effort to assist in updating the content background of biology teachers in the high schools, the departments of education and biology of Wagner College, with the aid of a faculty research grant, conducted a questionnaire survey of New York City biology teachers. The purpose of this teacher survey was to ascertain deficiency areas in biology background; to discover major interest areas within the biologic sciences; and to create a program for secondary school biology teachers to alleviate deficiencies and to update and expand the major interest areas.

The survey was accomplished by use of a questionnaire consisting of 245 content items organized into seven units. The content items closely paralleled the material covered in the New York State biology syllabus. The teachers were asked to judge each item on a three-scale rating: "high," "medium," "low." "High" indicated a desire for more in-depth

information; "medium," for more general information; and "low," if no further information was sought.

The science department chairman of every New York City high school was contacted to determine the number of questionnaires that should be sent to each school. A total of 85 high schools participated, including local Staten Island private and parochial schools. 56 high schools responded—over 300 individual replies, for a return of 66%.

The results indicated that there were 95 items that had a cumulative "high" rating of 100 or more. ("100" out of approximately 300 possible "more in-depth information" ratings was an arbitrarily chosen number selected for inclusion of this item in the proposed program.) The areas of primary concern for the teachers as reflected by the questionnaire were within the realms of ecology, genetics, and evolution. In addition, recent information on certain aspects of human physiology and of cellular processes in both plants and animals was requested.

The survey reflects a concern shared by a large segment of our society for the great environmental crises that have recently come to light. Ecology, evolution, genetics, and certain aspects of physiology were rated "high," since they are intimately related to many of the problems created by our modern technology.

A program was devised to meet the needs as ascertained by the questionnaire. This proposal emphasizes selected aspects of biology content with an orientation towards current ecologic problems. For example, this program includes a study of the world population explosion, with an orientation based on reproductive physiology; and an analysis of the effects of air and water pollution on ecosystems, on organisms, and on cells, with respect to such processes as respiration and photosynthesis.

The program will provide a means for sustaining and intensifying interest from both an academic and a practical point of view. With this exposure, high school biology teachers should be better prepared to cope with the demands of today's biology courses and to keep abreast of the current knowledge explosion.

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Guarding Your Thermometers

As part of an effort to develop a program in environmental education, an outdoor biology program for children in grades 4 to 6 was initiated at the University of California Botanical Garden, at Berkeley, during the past summer. A lesson on determination of thermal gradients was developed as part of that program. The purpose of this particular lesson was to show quantitatively the temperature dif-