Introduction

Evergreen State College is the first college to be started in this century by the State of Washington. In September 1971 Evergreen opened its doors to 1000 students, the first to be enrolled. For the next three years this enrollment will increase at the rate of 1000/year. By late summer of 1972 the first natural science building will be ready for operation. With this new facility by the fall of 1972 we hope to begin a unique approach to the teaching of science. It is an approach which has been arrived at after a year of planning. It is an approach which the College can continue with its own resources but assistance is vitally needed in the development. Without this assistance a bright chance will have been lost to cast an entire undergraduate science program in a new framework. It is a framework which we feel is more viable than those that we as teachers have been involved previously.

This proposal is divided into two major parts: first a description of the overall design of the Evergreen Science Program and, second, a detailed outline of the programs to be undertaken and the assistance for the development of these programs being requested from the National Science Foundation.

Follow this are sections describing

a. the potential impact of this program on science education
b. the personnel to be involved in the project
c. Evergreen State College

The Design

First some Problems

The traditional teaching of natural science is carried out in a rather unnatural manner. Any teacher who has taken part in this unnatural process would probably admit that the organization and emphasis of our teaching is a handicap. The traditional departmental structure of the sciences has caused ~~some~~ unnatural separations of some topics even to the extent of creating a lack of communication between two scientists working on or teaching about the same topic. It is the teaching of the "interdisciplinary" topics that particularly suffer here. For example, it is sometimes difficult to recognize a biologist's and a chemist's treatment of photosynthesis as actually dealing with the same topic. The redundancy and inefficiency caused by departmentalized teaching is even more obvious. Consider a physicist's and a chemist's introduction to quantum mechanics. The recognition of the problems associated with departmentalized science -- either for teaching or research is by no means new. Many schools and faculty have tried to do something about it. An unhappy fact about these attempts is the realization that a departmental structure in an existing institution is very difficult to break. Even though it may have its shortcomings it is the path of least resistance made comfortable by the traditional professional training that we have all received. For an institution that is just beginning the task is easier though still difficult. A few institutions have started recently and deliberately

attempted to eliminate departmental structure but many have now started to regroup around traditional departmental lines.

We feel that part of the problem is continuation of the normal course structure, i.e., if chemistry courses are given there is a compelling reason for a chemistry department to materialize. So that no matter how well intentioned a faculty may be departmental offerings will produce departments.

A Solution

At Evergreen we feel that the structure of our science offerings will cope with this dilemma. ~~First of all~~ There will be no departments. But more important are the ~~two~~ modes of instruction we shall employ.

The Topical Course

First we propose to offer topical courses of an ~~inter~~multi disciplinary nature instead of straight chemistry or physics or biology courses. These programs are not contrived integrations. We have not attempted to construct parallels which have more aesthetic than scientific merit. Instead we have simply chosen to deal with topics which require a multi-disciplinary approach in order to understand them. After all it was the dilemma of the specialist when faced with such complicated systems that has pointed to the need for diversity in training. The problem is, of course, that our training has not been in the manner we would teach. Nor can we change ourselves overnight. But by combining forces we can identify for the student the many facets of a central problem and at the same time broaden our own expertise and outlook. For example, a chemist, a biologist and a physicist could associate and design a short course in photosynthesis with

each one contributing his discipline as it bears upon the topic. We feel that these courses will not only provide a realistic view of these topics for the student since any analysis of a system requires more than one discipline to understand it, but they will also provide a fruitful interaction between the faculty involved.

In this mode ~~then~~ we have planned for a series of short programs whose overriding justification is that they involve at least two disciplines. Listed below in Table I is a representative sample of what we propose in this mode. Each course would last about six weeks during which time students and faculty involved would be totally committed to that program.

It is important to recognize that these short, topical courses will not be survey courses. Students coming out of these programs will have an intensive preparation equivalent to an upperclass student in the traditional curriculum. He will be aware of recent work in the area and also will be in position to critically evaluate it.

Where appropriate, laboratory work will be included in these programs. The laboratory work will be directly related to the topic. It will be introduced in the form of an independent project to develop the critical judgments necessary for dealing with real systems.

Finally, disciplines will be represented in each program which are not identified in Table I. These are the historical-humanistic aspects of the topic under study. Again these will be discussed at natural points of departure during the topic.