Digest of Conference on

SOCIAL IMPLICATIONS OF THE SCIENCES IN GENERAL EDUCATION

Discussion leaders:

Professor Paul B. Sears, Oberlin College; President Carter Davidson, Knox College.

Digest prepared by J. Lloyd Trump, graduate student, University of Chicago.

Dr. Davidson opened the discussion by describing in detail an interesting course being developed at Knox College at the freshman level, the purpose of which is to give a regional approach to the study of problems drawn from the areas of both the social and natural sciences. The course developed out of a dissatisfaction with the operation of the general survey course, which is now being given in many colleges and universities at this level and which also had been given at Knox. Three criticisms were directed against these survey courses: first, that the typical survey course in social science, or physical science, for example, covers too large a field for the students to understand satisfactorily; second, that teachers come in for a time to deliver a few lectures and then disappear from contacts with the students in the course; and third, the courses are frequently not tied up with the experiences of the students (for example, much of the Humanities survey is taken up with the ancient and medieval periods, and the lack of time may result in the modern period being treated lightly or eliminated entirely, even though it is the modern period that is closest to the experiences of the students). The effort at Knox, therefore, was to develop a course that would meet insofar as possible these criticisms of the typical survey courses.

Taking each of the foregoing criticisms, Dr. Davidson demonstrated how the Knox course was developed. With respect to the field of the survey course being too general, the decision was made to limit the study to materials related to the region of the middle west, the one in which the college is located. Referring to the book, American Regionalism, by Odum and Moore, published in 1939. Dr. Davidson pointed out that the purpose in limiting the study of problems to a region was comparable to the scientist's studying a small section of matter with a microscope; the purpose of studying a small portion of the whole is to permit a more effective study by limiting the area being observed. Thus the purpose of studying a region is to limit the study to a point more easily understood by students. The second criticism of the typical survey course was met by having every faculty member who lectures in the course attend every other lecture in the course. Moreover, each lecturer is assigned to one discussion group and remains with this same group throughout the year, thus coming to know the students very well. The third criticism was approached through a conscious tie-up, whenever possible, between the materials of the course and what the students have seen and done. At the end of the first semester, for example, students turned in a term paper on some aspect of culture as observed in his own community. These papers are to be expanded during the second semester. Several examples of the papers were mentioned.

The course is being given this year for the first time. The order of the divisions of the course was given by Dr. Davidson. First, the geological and geographic features of the midwest are studied. This leads naturally to a study of the biology of the region. The third part of the course deals with the history of this region with much emphasis upon anthropology; the work of the mound-builders is studied in some detail, for example. Fourth, sociological aspects of the middle west are considered, involving rural-urban relationships, problems of race, relations of institutions, and so on, as observed in the region. The first semester is closed with a study of the economic problems of the region.

The sixth part of the course deals with the political structure of the region. This is followed by a study of the educational institutions of the middle west. State universities, for example, have enjoyed unusual development in this region. The eighth part of the course is made up of a study of the religious life of the region. In the final division of the course, the art, music, and literature of the region are studied. Syllabi, for each of the semesters of the course, entitled, "The Middle West: An Approach to Learning and Living Through Examination of the Student's Own Environment," were distributed for observation by the group.*

"This course," said Dr. Davidson, "gives the student a taste of the subject fields, but more than that, a study of his own region." He went on to point out that the instructors in the different fields found new approaches to the study of their respective subjects as they planned the study on a regional basis. The assigned readings are of a different type from those frequently assigned. Selections which are not only scientific but also literary have been chosen. Thus, Sears, Deserts on the March and Lincoln Steffens, Autobiography are typical examples of required readings. A bus trip over the region is planned for the spring as a means of seeing the different forces at work. The costs of this will be borne by the students, although Dr. Davidson felt this logically should be paid by the college, that this might be a possibility in the future.

Dr. Sears, in emphasizing the significance of this approach, placed on the blackboard a diagram of the divisions of knowledge in medieval days, out of which have developed the different subject areas as they are known today. He pointed out that a liberal education involves a knowledge of all these areas and that a tendency to break down the divisions between the areas was being furthered by this course at Knox. It is possible in a region to see all these areas of knowledge in operation together and subject divisions are not apparent. "Science," said Dr. Sears, "is not developed in an ivory tower, but is drawn from the everyday activities of men. The great trends in science are of social origin." This seems to point to the possible study of knowledge in a regional setting.

At this point in the discussion, several pertinent questions were raised by the group. These will be presented along with the answers given in order to give additional details with respect to the course at Knox and also to reveal some general problems in implementing the sciences in the direction of social understandings.

How may there be a tie-up with other regions in order to prevent a narrowing of the student's vision? Dr. Davidson pointed out that there was a constant tie-up between the middle west and other regions. It would be impossible to understand either the mid-west or the other regions if comparisons and contrasts were not made. The major emphasis, of course, is placed upon the midwest since this is the region best known to the students and the one in which the school is located.

What is done with respect to students from other regions who are attending the school? Referring to the term paper or special study, Dr. Davidson indicated that students from other regions are urged to take some problem and study this in their home region and then make comparisons with the mid-west.

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* Copies of the two volumes of the syllabus, published in mimeographed form in September, 1939 and February, 1940, may be obtained for one dollar (for both volumes) by writing President Carter Davidson, Knox College, Galesburg, Illinois.

Do students come to think too much in terms of one region? Won't a short two-day bus trip fix some wrong impressions in their minds since obviously they can see only a small part of even the mid-west? This was recognized as an important problem. Time and, mainly, finances would prevent a more extensive study, desirable as this would be. Dr. Sears pointed out that students must be taught to realize that regional boundaries were not static, that the region was a unit selected for purposes of study. Students should realize that the federal government was using regions as a basis for programs of national planning. They must see that the region is a part of the entire national picture.

Is this the only course taken by freshmen at Knox? No, at the present time, there are separate required courses in English, Hygiene, and How to Study. In addition, students may take one of the required science courses, such as physics or chemistry. It is interesting to note that these sciences have not been incorporated in the regional course. Recently, the instructor in astronomy raised the question, "Isn't there any sky in the middle west?" indicating a feeling that this science should be included in the course. It was seemingly difficult when the course was being organized for the instructors in these science fields to see the possibilities of the regional approach, although these are now being seen. Dr. Sears emphasized the point of view that these might well be included in the course. The group seemed to feel that possibly all areas of knowledge might be included in the course and that this might be the one course taken by all freshmen and that the course might be counted as a major course in every department.

Why is scientific terminology avoided to such a large degree in the course? As an example, it was shown that an effort is made to explain who Linneus was and his great contribution in the classification system he developed, but that no attempt was made to teach all the Latin names he applied, using only a few that applied to living things in the midwest as examples. Dr. Sears pointed out that for the purposes of general education it was probably better to drop some of the technical terminology, that confusion existed in some of it anyway, and that knowing about it was enough in most cases. Social implications, said Dr. Davidson, are emphasized rather than scientific terminology.

What about superficiality in these courses from the scientific viewpoint? This question and its implications provoked a lengthy discussion. The point of view was expressed that superficiality might result from the instructor rather than the course. Professors must get away from the idea that they must tell students all they know. The preparation of a one hour lecture in a given field involves the careful selection of material that is most worthwhile; this may be done in a manner that is not superficial if care is used in the selection. The fact should be kept constantly in mind that this is general education at the undergraduate level and that the purpose should not be to teach all the facts of the different sciences.

At this point, the discussion turned to the question of graduate school requirements. There seemed to be a general feeling that the requirements of medical and engineering schools, for example, were a handicap to the efforts of science instructors trying to emphasize the social implications in their courses. It was shown that students similarly demand that instructors in undergraduate courses give them the facts they will need in graduate study. Requirements of learned societies were also criticized. There seemed to be general agreement that new standards of the American Chemical Society are particularly objectionable. Sooner or later, if real progress is to be made in realizing social implications of the sciences, graduate schools, students, and learned societies must change their attitudes with respect to the factual knowledge expected from students who have completed general education at the undergraduate level.

What are the effects of the new courses upon the instructors? Several trends have been observed. Instructors are thinking of themselves more, for example, as ecologists, rather than botanists or zoologists. There is a real challenge to locate new materials and to think through new ways of organizing these.

How is scientific method taught in the course at Knox? Lecturers point out frequently how the knowledge being studied has been discovered. Scientific method is also taught by means of exhibits which are frequently changed.

The relationships between the elementary school, high school, and college work in science were discussed at some length. A suggestion was made that the teaching of science in the elementary school might be much more effective if teachers were better qualified and had more adequate materials, that improvement here would result in more effective instruction in high school and college. Dr. Sears proposed that a study should be made of outstanding science teaching at the elementary level, that a skilled reporter should visit and report practices in elementary school laboratories. This suggestion met with general approval of the group. The discussion relative to the high school revolved largely about the possibility of teaching the survey courses at the high school level, thus permitting a survey or integrating course to be taught at the end of the college period rather than at the beginning as is generally true. Mention was made of the survey courses at the eleventh and twelfth grade level in the Four-Year College of the University of Chicago. In general, it was brought out in the discussion, education in the elementary school, the high school, and the college must be regarded as a continuous process, that each level must assume responsibility for continuing the teaching of fundamental operations in language, mathematics, and so on.

The need for public laboratories as well as public libraries was emphasized by one individual as another aspect of social implications of the sciences. Dr. Sears reported favorably upon the experiences in England and Russia with the idea of public laboratories.

The general discussion may be summed up in several statements somewhat as follows: (1) the regional approach to the study of science gives opportunities for discovering the social implications in this field; (2) vigorous protests should be made against all groups tending to enforce specific subject-matter requirements which delimit the teaching of science courses in terms of materials or methods; (3) a study should be made of outstanding practices in the teaching of science at the elementary school level; and (4) education is a continuous process and the contributions of any level in the educational system must be viewed in terms of the other levels.