

Science Teaching in Workers' Education Programs

I. Aims.

A. Eventual objectives.

1. The elimination of natural superstition.

Social progress is continuously being blocked by superstitions - for example birth control, false notions of hereditary problems and racial problems, lack of information concerning human hygiene. Considerations of the dynamic and ever-changing nature of the universe may help in the acceptance of motion and change in human society.

2. The understanding of the natural environment.

Reasons for agricultural research, problems of soil conservation, conservation of natural resources, preventative medicine, etc.

3. The provision of leisure time activities.

Nature study, home laboratories, readings in scientific books (this latter point needs some amplification - the namby-pamby style of current popular science writings results from the cultural level of the reading public - as the understanding of the reading public rises scientific information can be spread in a style that will become increasingly more interesting and authentic and less dramatic).

4. The elimination of the "latter day" superstitions.

A greater understanding of laboratory science will tend to dispel the aura of magic that surrounds scientific research today. It will prevent the utilization of this magical concept as a tool for domination of workers by the vested interests which make use of scientific research. It will help develop a critical attitude toward advertising trickery. Many other examples could be mentioned here.

5. The increased utilization of the "scientific method" in the solution of human problems.

B. Immediated objectives.

1. Presentation of interesting material from the vast fund of facts accumulated by scientific investigation.

This can provide for a definite recreation, for much of scientific information is very stimulating. Such attractive presentations can help to "dress up" a planned curriculum involving many projects which are not concerned with scientific information. It would sort of spice the meat and help keep people connected with the program as a whole.

2. Dispersal of information of immediate importance in everyday life.

Knowledge of human hygiene, sources of information available such as governmental agencies, etc.

3. Presentation of some of the established theories of science and their development.

This point perhaps ought to be included under recreation. It can be carried out where there is a body of workers that meets regularly to listen to lectures on all sorts of topics and has learned to enjoy such meetings. These topics would be presented in lecture form accompanied by good demonstrations and would serve as a possible stimulant for the desire to learn more detailed facts.

4. Utilization of scientific instruments.

Microscope, telescope, etc.

5. Accomplishment of simple experimentation.

Chemical tests, biological tests, etc.

II. Procedure.

A. Eventual objectives.

Procedures here will develop out of an expanding and advancing curriculum. There is little need at this time to discuss these eventualities since the immediate objectives must be worked on first. However, it is valuable to keep in mind that procedures must be flexible and advance with the group being worked with.

B. Immediate objectives.

1. Extensive use of visual aids.

Moving pictures, lantern slides, charts, graphically written books and pamphlets.

2. The use of direct demonstration.

Living material., electrical equipment, microscopes, chemical experiments, etc.

3. Stimulation of readings in available publications.

This requires careful survey of the available material. Such surveys should be carried out by competent and trained people in order to avoid dispensing inaccurate and possibly dangerous material. There must be supervision of reading of the worker-students in order to train accuracy in the conversion of printed words into mental images.

4. Nature study trips and lectures in natural history.

5. Trips to local laboratories, museums, etc.

6. Talks by members of the student groups on applications of laboratory knowledge to their individual industries.

This requires personal supervision on the part of teachers and amplification of these topics by trained authorities.

7. Historical reference.

There is ample opportunity in presenting scientific information to illustrate the impact of ideas and facts on society, and vice versa. For instance, the knowledge of the bacterial causes of human diseases, movement of the earth, etc. These references can point out the array of cultural hindrances to advances in knowledge and changes in social habits. Historical development should not be used as a separate study but should form a part of the material being presented.

8. Utilization of trained people in the vicinity of the teaching program.

There are always people available in neighboring universities who can be persuaded to aid in course work. These individuals can help in procuring other trained individuals from the same universities. Such people should be requested to avoid the academic in their talks and to use demonstrations as much as possible.

9. All of the above procedures can be carried out through union facilities. Each of the suggested points can be part of a functional program.

Health committee program, chemistry for rayon workers, physics for electrical workers, etc. From beginnings in such studies as are of immediate concern to workers it should be possible to lead into a variety of types of science instruction. Such a procedure is relatively simple in science instruction since the various fields of science are so closely interwoven.

III. Additional remarks.

1. The sensational and magical side of scientific information has no place in workers' education. In fact there is no such side to science. It is something impressed upon scientific information and achievement by our existing agencies for the dissemination of knowledge. It need only be mentioned that at the present time many people take vitamin pills instead of wearing amulets, endowed with magical power, and all this in the name of science as learned from the advertising agency.

2. A program of science study is expensive. Merely talking about science is not sufficient. It is the very essence of science that facts be demonstrated. Little value accrues from a course in science that is not prepared to spend some money on what may be called laboratory equipment. This is unfortunate but it must be done sooner or later. Furthermore, workers who have had visions of laboratories in the newspapers and movies are not going to believe that they are having real science unless they have some sort of real laboratory to go along with their studying. Also a chance to do experiments will help dispell the abstract qualities that surround the ability to do research.

3. Material must be presented in as simple a manner as possible. However, simplification to the extent of falsification of the facts is very undesirable. Where a problem admits of no simplification, it must be met squarely even though it may take a disproportionated amount of the available time.

4. Scientifically trained men cannot be expected to have all the answers. This is obvious since science has never really been a panacea. Nor can a scientist be expected to advance an opinion which may be favorable to the welfare of his listeners if this opinion has no justification in available fact.

5. It is very doubtful that the nature of scientific procedure, "scientific method", can be clearly presented to a workers' group at the present time. The concept of this procedure grows out of laboratory experience and is a development of years. The aim at present can hardly be more than to point out the factual background to scientific theory. Furthermore, there is no reason that considerations of fact and opinion must necessarily be limited to a science course.