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News of Science

Schweitzer and Libby on Nuclear Tests

Albert Schweitzer has appealed to the world to end nuclear tests. A letter issued by Schweitzer through the Norwegian Nobel Committee was broadcast to approximately 50 countries, though not to the United States. The letter was read in Norwegian by Unnar Jahn, chairman of the Norwegian Nobel Committee, who in 1952 presented the Nobel peace prize to Schweitzer. The impact of the appeal was heightened for Norwegian listeners because the broadcast followed by 15 minutes a report of a recent radioactive rain over Norway caused by Soviet nuclear explosions. Schweitzer's message included the following statements: "From official and unofficial sources we have been assured, time and time again, that the increase in radioactivity of the air does not exceed the amount which the human body can tolerate without any harmful effects. This is just evading the problem.

"Even if not directly affected by the radioactive material in the air, we are indirectly affected through that which has fallen down, is falling down, and will fall down. . . .

"We are forced to regard every increase in the existing danger through further creation of radioactive elements by atom bomb explosions as a catastrophe for the human race, a catastrophe that must be prevented under every circumstance. . . .

"When public opinion has been created in the countries concerned . . ., then the statesmen may reach an agreement to stop the experiments.

"A public opinion of this kind stands in no need of plebiscites or of forming of committees to express itself. It works through just being there.

"The end of further experiments with atom bombs would be like the early sun rays of hope which suffering humanity is longing for."

Willard F. Libby, member of the U.S. Atomic Energy Commission, has responded to Schweitzer in an eight-page letter to him. After expressing respect for Schweitzer and for the motives behind his appeal, Libby questioned whether Schweitzer "had access to the most recent information" on fallout.

Libby then went on to say that in general the risk from radiation resulting from nuclear tests "is extremely small compared with other risks which persons everywhere take as a normal part of their lives." He urged Schweitzer to weigh this risk against what he believed would be the "far greater risk, to freedom-loving people everywhere in the world, of not maintaining our defenses against the totalitarian forces."

Libby's main thesis was that radiation produced by fallout was far less than the natural radiation to which everyone is exposed. He asserted that a person could get a heavier dose of radiation by moving from the beach to a hilltop or from a wooden house to a brick house than he gets from test fallout.

G.E. Fellowships at Stanford for High-School Mathematics Teachers

Stanford University will award 50 fellowships this year to high-school mathematics teachers from 14 western states for participation in a special 6-week summer program conducted by the department of mathematics of the university. The fellowships are supported by a grant from the General Electric Educational and Charitable Fund and pay all expenses, including tuition, room and board, and travel.

Two other similar fellowship programs for high-school teachers, the Shell Merit Fellowship Program and the National Science Foundation Institute for Teachers of Science and Mathematics, are in operation at Stanford, but the General Electric Program is the first which is limited to teachers of mathematics. This limitation has provided an opportunity and a challenge to plan a concentrated and integrated program of training in mathematics which will supplement professional training in the teaching of high-school mathematics.

The aim of such a program, of course, is to increase the mathematical knowledge of the teachers who participate. What mathematics should a high-school teacher know? Most important certainly is the mathematics he teaches. This knowledge is acquired principally through professional training and experience, and the intention of the General Electric Program is to select as fellows teachers who are already competent in this respect. Additional mathematical knowledge will be useful to the teacher if it enables him to place his subjects in a broader context and enhances his ability to stimulate interest. Training of this kind is the specific objective of the program.

With these goals in view two courses have been planned for the program. The first, "Elementary Mathematics from a Higher Point of View," will present subjects which border on high-school mathematics and are at about the same level. Among the topics to be discussed are number theory, whose simplicity and elegance have immediate appeal, and non-Euclidean geometry, whose novelty and connection with modern physics excite interest. Knowledge of such subjects should help the teacher to enrich his classes and direct the curiosity of his better students.

The second course, "Aspects of the Calculus," will present the essential concepts of the calculus, emphasizing ideas rather than technique, and discuss the relationship of these ideas to high-school

subjects. An understanding of the mathematical training which follows high-school instruction should suggest topics for emphasis to the teacher and lend greater authority to his teaching.

Thus the teachers knowledge of high-school mathematics will be extended to contiguous subjects in two dimensions, one might say horizontally and vertically. But there is a third dimension. Knowledge of mathematics is not mere possession of information, more or less systematized. The experience of mathematics as an activity, rather than as a collection of results, is essential to the understanding of mathematics. The characteristic activity of mathematics is problem-solving. Yet very few teachers have had *genuine* experience in problem-solving. It is in this connection that Stanford hopes to make a novel contribution to teacher training in mathematics.

Included in the General Electric Program will be a "Seminar on Problem-Solving," conducted by George Polya. Polya has written extensively on the philosophy and methodology of problem-solving, and his many ideas cannot be discussed here, even briefly. The following outline for the conduct of the seminar which he has written will be of interest, however.

"A plan for such a seminar should not be too rigid. It should have plenty of flexibility to take care of the many relevant points that cannot be assessed in advance: interest, knowledge, personality of the participants. Yet a broad outline can be proposed.

"Problems should be selected from fields with which the participants are already acquainted. The instructor starts with a problem which, for some reason or other, is impressive and uses its solution as a *pattern* for solving several similar problems. The participants, unobtrusively helped by the instructor, should have as great a share as possible in solving these problems in class discussion, and should, as far as feasible, disentangle the 'pattern' themselves.

"After several days' work, the class passes to another initial problem, then to subsequent similar problems, and abstracts another pattern. After two or three such experiences the question of 'very general' patterns is raised. Then the class is prepared for the discussion of such general aspects of problem-solving as generalization, specialization and analogy, the role of guesses, of induction, of plausible reasoning.

"When such questions have been fairly clearly resolved, the final question arises: How should the participants direct the solution of problems in their own classes and reveal the essential methodical ideas? At this stage one of the participants may assume the role of instructor, with the other participants continuing the discussion after his presentation. Then another participant takes the place of the instructor, and so on."

The two courses and the seminar, with occasional lectures on special topics, constitute the academic portion of the program. Coordinate with this will be a program of field trips to university laboratories and General Electric facilities in the vicinity of the university. During these visits, scientific, engineering, and management personnel will present lectures on mathematical aspects of their activities. The information thus acquired about the role of mathematics in contemporary society and, in particular, in the future vocations of his students should provide the teacher with an important means for motivating the study of mathematics.

The principal criterion for the success of the program will be a simple one. If the enthusiasm of the participants is stimulated, then we may expect that it will eventually be transmitted to their students, and the main objective of the program will have been achieved.

PAUL W. BERG

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AAAS Theobald Smith Award

The Theobald Smith award of $1000 and a bronze medal, which has been given yearly since 1937 (except for a lapse during the war years) by Eli Lilly and Company of Indianapolis, Ind., under the auspices of the AAAS, will be presented at the association's 124th meeting in Indianapolis, 26–31 Dec. Nominations are now being requested for the award. They may be made by fellows of the AAAS and should be sent to the secretary of the Section on Medical Sciences, Dr. Allan D. Bass, Department of Pharmacology, Vanderbilt University School of Medicine, Nashville 5, Tenn.

The prize is given for "demonstrated research in the field of the medical sciences, taking into consideration independence of thought and originality." Any investigator is eligible who was less than 35 years of age on 1 Jan. 1957 and who is a citizen of the United States. The research is not to be judged in comparison with the work of more mature and experienced investigators.

Nominations must be received *before 1 Sept.* The secretary requests that six copies of all data be submitted. The nomination should include a curriculum vitae, a statement summarizing the nominee's scientific contributions with an evaluation of their significance, and reprints of his or her more important publications. The vice president of Section N–Medical Sciences and four fellows will form the committee of award.

AEC Courses for Faculty

The U.S. Atomic Energy Commission has announced that it will sponsor summer institutes in nuclear energy technology for university faculty at five commission facilities in 1957. Approximately 150 faculty members will attend the sessions at Brookhaven, Argonne, and Oak Ridge National Laboratories, the Ames Laboratory, and the Hanford Plant. Each institute will be conducted by the staffs of commission contractors for a period of 2 months.

Basic courses in nuclear energy technology will be offered at Brookhaven. The curricula will include reactor physics, chemistry and chemical engineering, reactor materials and metallurgy, and reactor instrumentation and controls.

The courses offered at the other four installations will be of a more advanced and specialized nature. Each will require technical education comparable to that gained from participation in the institutes held last summer at the Brookhaven and Argonne laboratories, or the equivalent in work experience.

The AEC will provide cost-of-living stipends up to $750 per faculty member (matching amount to be provided by each participant's academic institution) and will defray travel expenses. These funds will be administered by the American Society for Engineering Education. No tuition will be charged.

The ASEE will also cooperate with the commission in the selection of faculty to attend the institutes. Inquiries concerning enrollment may be addressed to: W. Leighton Collins, Executive Secretary, American Society for Engineering Education, University of Illinois, Urbana, Ill.

U.N. Radiation Committee

The United Nations Scientific Committee on the Effects of Atomic Radiation completed its third session in Geneva, Switzerland, on 18 Apr. A statement issued at the conclusion of the session follows:

"The General Assembly's Special Committee for the study of the effects of nuclear radiation on man and his environment completed its third session today. The meetings were held in private and much of the work was done in specialized subcommittees. Presiding was Prof. Zenon Bacq of Belgium, and Dr. E. A. Watkinson of Canada was vice-chairman.

"The two principal subjects discussed were the question of the genetic effects of radiation, and the committee's report to the General Assembly, which is to be submitted in July 1958. Also studied were measurements of radiation levels,