

NUCLEAR ENGINEERING CONGRESS

by CHARLES A. STICKELS, *Chem. and Met.* '56

Last summer, shortly after the spring semester ended, the Michigan campus was host to the First International Nuclear Engineering Congress. Co-sponsored by the American Institute of Chemical Engineers and the University, this conference marked a milestone—this was the first organized, well-advertised attempt to take what has been learned about nuclear technology out of the wraps of secrecy and into the forum. It was a promising start toward the free interchange of ideas and discoveries which will be necessary before widespread industrial application of nuclear energy is possible.

Several years ago the A.I.Ch.E. established a Nuclear Energy Committee and last December this group was organized into the Nuclear Engineering Division of A.I.Ch.E. Under the chairmanship of Professor Donald L. Katz, head of Michigan's Chemical Engineering Department, this group now has over 800 members, the majority not chemical engineers. It was this group and the Congress on Nuclear Engineering who, with the support of the University (and the particular labors of the Chemical Engineering Department), planned and brought the conference off successfully.

The Congress was attended by more than 1000 persons, some 117 from foreign countries. Over 100 papers were presented on topics ranging from "Thorium Metallurgy" and "The Role of Exponential Experiments in Reactor Design" to "The Impact of Nuclear Energy on Religious Thought." The various technical sessions considered such problems as Research and Educational Reactors, Materials of Reactor Construction, Heat Transfer and Fluid Flow in Reactors, Reactor Fuel Refining and Preparation, Reactor Statics and Kinetics, The Application of Materials in Reactor Systems, Separations Technology, Applications and Uses of Radioactive Products, The Social Impact of Nuclear Energy, and Nuclear Power Reactors.

Following, from a summary which appeared in the A.I.Ch.E. journal "Chemical Engineering Progress," are some of the interesting ideas aired at the Congress.

One of the pet peeves of would-be nuclear engineers is the tight security restrictions on information concerning reactors and reactor technology. Perhaps



Credit: University News 8

A scientist from Battelle Memorial Institute is explaining features of a shaft seal device which prevents leakage of radioactive substances to a distinguished group of visiting firemen.

the most vehement remarks on the subject came from newspaper publisher Paul Block, Jr. who said, "the Japanese fishermen know far more about an H-bomb explosion than do I . . ." He went on to say that the trend of judging most discoveries as having military potential, a mistake that has been made before in history by overmilitary conscious governments, was certain to impede the very result we need: practical, operating plants. Other speakers also denounced the present policy of the A.E.C., L. V. Berkner, President of the Associated Universities, Inc. said, "The absence of such (scientific weapons—such as radar—in the early stages of the last war) is directly attributable to the technological delays resulting from secrecy. Had airborne radar been developed and advertised openly, the consequent great progress in these developments might have so weakened the German confidence in their submarine supremacy, or in their capabilities for strategic air attack, that the war might

have been prevented altogether . . .

Further words on the subject came from C. E. Larson, Director of the Ridge National Laboratory, who credited discoveries in the nonnuclear field making such nuclear success as we had possible. He praised President Eisenhower's attitude toward security restrictions and said, "It is to be fervently hoped that this meeting will serve to ignite a chain reaction of cooperation among scientists of the world and may serve as a rallying point for the extension of (President Eisenhower's) spirit to all areas of human endeavor which will result in progress toward that goal of mutual understanding and cooperation which is the prelude to a peaceful world."

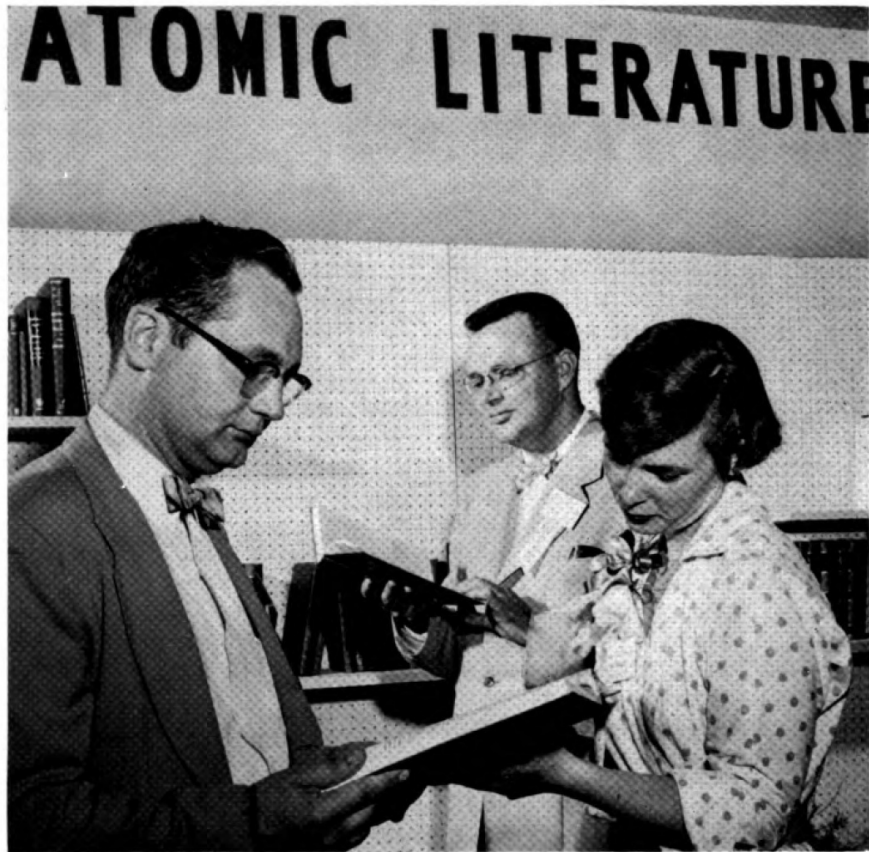
Gordon Dean, former chairman of the A.E.C., predicted that the Atomic Energy Act of 1946 would be liberalized. "It was," he said, "written at a time when we thought we had a monopoly . . . we should have known better; but at the time the men who wrote these provisions

to do with sharing information (or allies) into the law felt that measures would delay the time when a potential aggressor would get the . . . Perhaps they did albeit it . . .

endorsed the Administration's efforts towards revision of the law and for a program that would (1) control atomic weapons at a pace than Russia's (2) de-classification in the nonweapons area, and (3) make possible a bold interchange of information and materials pertaining to peaceful uses of atomic energy.

A.E.C.'s viewpoint in security matters outlined by Morse Salisbury, director of A.E.C. information services. As one judge, he asked, when is information is or is not in the secret category? Salisbury pointed out we were sure that "there would be no war for 30 years, virtually all could be abandoned." But on the other hand, "If it were to be next year there would be virtually complete secrecy. A solution to this dilemma would be possible if it were known exactly when the U. S. might have to defend itself against another war."

The remainder of the A.E.C.'s position was outlined by the director of classification for the A.E.C., Mr. J. G. Becker. Concluding his remarks he said, "I recognize that limiting atomic energy to peaceful uses of atomic energy is a mature future action. There will need to be considerable public discussion and some Congressional action before the Commission could undertake such a



Credit: University News Service
Browsing through a display of atomic literature are R. R. White and C. M. Sliepcevich of the Chemical Engineering Department. Jane Boswell, librarian in East Engineering, aids in locating the technical information.

program. However, I should like to predict that, just as it is inevitable that competitive nuclear power will be developed, so it is inevitable that peacetime non-weapons technical information will in

time be essentially completely unclassified."

An attitude somewhat in conflict with this sentiment was expressed, however, by Salisbury in reply to a question from the floor concerning the Administration's philosophy on publicity about peacetime nuclear-power applications. His answer was that nuclear-power reactors are rapidly coming to be regarded as an "element of strategy of the cold war . . . That is to say, the nation which leads the way into practical demonstrations of nuclear power has gained for itself in the spectrum of world opinion considerable advantage. It enjoys a much more favorable climate of opinion among the nations that are on the teeter totter than the nations which have fallen behind in the race."

Much of the above discussion took place at three meetings organized in conjunction with the Journalism Department's Mass Communications Conference on Nuclear Energy Developments which was being held at the same time. The journalists and the nuclear engineers wrangled at two evening panel discussions which

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Credit: University News Service
Manipulators are used for handling radioactive substances at a safe distance. The operator is viewing her work by 3-D television; there are no mechanical links, just a single coaxial cable, between the operator and the operation.

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gave each side an opportunity to bring out the shortcomings of the other. The apparent outcome of the debate was that scientists should step down from their ivory towers occasionally and relate their work to the world about them, while journalists should observe more accurate reporting methods and indulge in less pseudo-scientific speculation.

Besides the above discussions and the presentation of recently unclassified technical papers, the Congress considered two other broad topics: The Education of Nuclear Engineers and the Social Impact of Nuclear Energy.

A panel of educational leaders headed by Manson Benedict of M.I.T. considered the first of these topics. They reported that present training in nuclear engineering departments rather than as a separate curriculum. Several industrial speakers endorsed this approach, and most everyone seemed to agree that this was most desirable at the present time.

The Social Impact of Nuclear Energy was treated by eight speakers who considered nuclear developments from the standpoint of health, safety, the individ-

ual, education, military tactics, scientific research, the law, and its influence on religious thought. One of the most stirring speeches of the conference was given by Dr. Elton Trueblood, chief of religious information, U.S. Information Agency. In discussing the effect of nuclear energy on religious thought, Dr. Trueblood recalled meeting with a group of scientists shortly after the first atomic bomb explosion. Never, he said, had he been among men who evoked such wonder as to what the world would be like in the future. He claimed that four insights are needed today: Antidotes to (1) absolute despair, (2) easy optimism, (3) insensitivity to the use of nuclear weapons and, (4) recognition that the ultimate solution of our problems will be spiritual.

In conjunction with the Congress an *Atoms for Peace* exposition was held in the Rackham Building. Over forty companies set up displays and exhibits and had representatives on hand to demonstrate and explain them. Among the most popular exhibits were the manipulators used by scientists to work with radioactive materials from a safe distance. Visi-

tors to the exhibit were able to bottles, pour liquids, wind their v etc. with these amazing gadgets. Interest to visiting engineers were the centrifugal pumps used for circulating radioactive liquids and the draw various sorts of reactors exhibited by many companies. The illustrations accompanying this article show a few of the exhibits.

There was much talk and speculation during the three-day conference as to the future of Nuclear Engineering and the Nuclear Engineering Division of A.I.Ch.E. Many of those present thought the Division ought to reorganize as a society for Nuclear Engineering independent of A.I.Ch.E. The majority of those attending, however, were in favor of maintaining the status quo and trying to see how the field of Nuclear Engineering develops. Few persons thought it can be assimilated into one of the present fields (chemical engineering being the most likely one); the question will it remain simply a component field (as it must to a certain extent regardless), or will it separate into a distinct engineering field?

In either case, this much seems clear: the progress of professional development in Nuclear Engineering will in some measure be determined by the government's security policy. Tight security restrictions could delay development for many years.

The first Nuclear Engineering Congress, then, was more than just a technical meeting; it was a step toward a more liberal distribution of nuclear information (and thus, the professional development of Nuclear Engineering above this, it was a most encouraging omen for the future of science in the Nuclear Age.

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ACTIVITIES FOR S

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- Pi Tau Sigma—Lewis Burnham Quarterdeck—Bill Gray, 448 W
- Sigma Rho Tau—W. Phillip A Soph. Eng. Council—Nancy Fa NO 3-1561
- Tau Beta Pi—Roger Maugh, NO 8-8445
- Technic—Chuck Stickels NO 2-
- Vulcans—Roger Maugh, NO 8