

AIP Corporate Associates Study Physics and Society

How physicists appear to their colleagues, what their job attitudes are, how the public looks at physics and latest physics advances are some of the topics treated at the meeting.

by Edward Creutz

RECOGNIZING the increasing importance of the relation between physics and society in general, the American Institute of Physics Corporate Associates chose this topic as its theme for its tenth annual meeting, held in New York City from 1-2 Oct. More than 150 physicists from industry and academic institutions heard lectures and exchanged ideas on the image of physics in society, on the tensions between basic research and social goals, new trends in education and the role of AIP in serving the physics community. Also at the meeting AIP awarded its Karl Taylor Compton gold medal to Alan T. Waterman and talks were given on new developments in particle physics, neutron probing, electroluminescence and plasma dynamics.

Image of physics

A panel which I moderated on Sunday night discussed "The Image of Physics." Floyd C. Mann, director of the Center for Research on Utilization of Scientific Knowledge, University of Michigan, reported on data he had gathered from physicists in a government laboratory, both in supervisory and non-supervisory posts, to get some feeling for their job attitudes. Not surprisingly, the "needs" felt by both groups are rather similar. Two needs with high rating were freedom to carry out ideas and opportunity to work with colleagues of high technical competence.

Some minor needs were a chance to advance in administrative authority and opportunity to associate with top executives. The degree to which

physicists feel their needs are being met in their posts varied with the supervisory and nonsupervisory groups. The need furthest from being met is the opportunity to work with colleagues of high competence; one being met to a high degree is employment stability. The extent to which individuals feel willing to deviate from stated policy when it is desirable to do so is higher among supervisors than others.

John R. Pierce, executive director, research-communication sciences division, Bell Telephone Laboratories, talked on "Physicists As I Have Known Them." His impressions are that physicists are hard workers with a reasonable interest in the arts and public affairs. On the other hand, Pierce believes there are understandable reasons why physicists are not more sought after in society. Some of their undesirable characteristics are arrogance and naïveté. He feels they lead a rather protected life and don't adequately appreciate very complex problems nor "those in which cost is a governing matter rather than a secondary consideration."

John A. Wheeler of Princeton spoke on "Physics—Spoiled Brat or Hard Working Agent of the Larger Community." Wheeler compared physics and physicists to the monasteries and monks of the middle ages, high-minded people who felt all good men should favor and protect them. He pointed out that although we have excellent tools, including the best textbooks ever written and good science writers, the real tradition of physics is not generally understood. The public does not ap-



ALL PHOTOS BY MITCHELL VALENTINE AND MARJORIE LAKIN

preciate the family spirit exemplified by Planck, Bohr and Einstein. Quite the opposite, the picture often is of the physicist as a lone worker, not really interested in extensive cross-checking of new ideas.

Robert Merton, professor of sociology at Columbia University and commentator on the panel, pointed out that the discussion concerned a subject about which very little is known. No really serious and complete study of the attitude of society towards physics or physicists has been made. We should therefore tread cautiously in drawing conclusions, except possibly to realize the situation is one that demands the attention of physicists lest

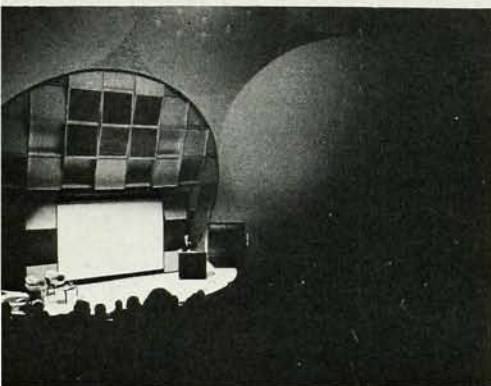
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their apparently diminishing role in society become even lessened.

Physics and society

On Monday morning Harvey Brooks, dean of the division of engineering and applied physics at Harvard, talked on "Applied Science and Freedom of Research." He discussed the necessary compromise that scientific research must strike between freedom of inquiry, which makes it possible and the results it obtains, which make it a recognized part of social progress. He called this situation and the compromises it requires a "creative tension . . . which must be resolved separately in every situation where science is employed in the service of social ends." As for the tension between industry and universities, he feels its origins came from the basic simplicity of sci-



ence and the complexity of technology. Brooks concludes that it is "exactly within this conflict that the greatest potential creativity lies" and that one should not try to resolve this unresolvable argument but let the ensuing discussion direct the attention of scientists to new, fruitful areas and that of technologists to "new insight into the potential applicability of the current abstractions."

Gerald Holton, professor of physics at Harvard, spoke on "New Trends in Physics Education." He noted that we have made great efforts in improving physics in the university but have not made similar efforts in the high schools. A major aspect of the problem is that, in a typical high school, physics is not a full-time job but consists of one section. Moreover, fewer than ten colleges in the US graduate more than five prepared physics teachers per year.

Holton argued for teaching science in a humanistic way to bring back a greater fraction of students into the classroom. He feels physics courses should be made more flexible to appeal to students with different modes of understanding.

H. William Koch, director of AIP, described the critical situations the institute faced at its founding in 1931—increasing journal publication, splintering of the physics community, weak public image of physics. He noted that those crises sounded very much like the trends of challenges today. AIP activities in publishing, information retrieval, education and its newly founded committee on physics and society were described. In ending, Koch portrayed the role of AIP "as the somewhat silent component of the American physics community that takes care of the administrative and organizational details and that permits the physicists . . . to concentrate on ever improving the quality of our science."

Highlight of the morning meeting was the presentation of the Compton award for statesmanship in science to Alan T. Waterman. Frederick Seitz, president of the National Academy of Sciences, reviewed Waterman's role in helping physics attain a respected place in society.

Monday afternoon the program consisted of talks on recent developments in physics. Victor Weisskopf of MIT discussed high-energy physics and particularly made the point that areas of physics that originally seemed quite abstract have gradually had a great influence on society since they dealt with natural phenomena that intersect the domain of civilization. Clifford Shull of MIT spoke on probing with neutrons and described the many kinds of crystalline structure and interactions within solids that can best be studied with neutrons. David Thomas, department head at Bell Labs, spoke on progress in electroluminescence, showing how efficiency of electroluminescent devices is gradually being increased as are their practical applications. Arthur Kantrowitz, director of Avco Everett Research Laboratory, closed the meeting with a talk on plasma dynamics applications, particularly with regard to magnetohydrodynamics. □





IMAGE OF PHYSICS is discussed by panelists (l. to r.) John A. Wheeler, John R. Pierce, Robert Merton, Edward Creutz and Floyd C. Mann. Physicists lead a protected life and can be compared to the monks of the middle ages were some of the panelists' themes. Very little is known, however, about the attitude of society to physics and physicists.

RESEARCH FREEDOM, education and the role of AIP are respectively treated by Harvey Brooks (left), Gerald Holton (below left) and H. William Koch.



HORIZONS IN PHYSICS. Victor Weisskopf (above left) speaks on high-energy physics, Clifford Shull (above center) on neutron probes, David Thomas (above right) on electroluminescence and Arthur Kantrowitz on plasma dynamics.



ALAN T. Waterman (above) receives K. T. Compton gold medal from AIP governing board chairman Ralph A. Sawyer (right). Frederick Seitz (left) describes Waterman's science statesmanship.

