science in education, and the feasibility of an atomic test inspection system.

Will Stay on Committee

Killian will continue to be a member of the advisory committee. In this position he will be able to continue working with Kistiakowsky. The new special assistant, who, unlike Killian, is a noted research scientist, has been a member of the committee since 1957. He has served as one of the Administration's chief advisers on the ballistic missile program and has had rather extensive personal contact with the President in this position. He was also a member of the U.S. delegation at the technical talks on surprise attack held in Geneva in 1958.

The new adviser is said to have an out-going personality and a well-developed sense of humor. Anecdotes about him mention that he frequently uses his skill with explosives to solve house-owner problems—for example, to clear land of stumps or to clean a neighbor's cement mixer.

Science Display at Soviet Exhibition

On 30 June the Soviet Exhibition will open at the Coliseum in New York. The large exhibition, which will run until 10 August will have a science section covering approximately 13,000 square feet, which will contain exhibits dealing mainly with the activities of the U.S.S.R. Academy of Sciences. F. R. Kozlov, a First Deputy Premier of the Soviet Union, will open the show, which is part of a cultural exchange between the United States and Russia.

Three large displays in the physics and mathematics section will provide information about important research work—for instance, the work of P. N. Cherenkov, a Nobel Prize winner. An operating unit will demonstrate the glow that he discovered. There will be instruments demonstrating other applications of research in physics, including a machine tool for supersonic treatment of hard and fragile materials. There will also be a display of the uses of transistors, notably a transistorized refrigerator model.

There will be a varied display on Soviet geological and geographic research. The extent of the Soviet Union's mineral riches and the ways in which these minerals are being uncovered will be illustrated in geological and tectonic maps and in collections of ores and minerals. The geographic section will have displays on the exploration of the earth's ice cover and the world oceans. There will be a model of the *Vityaz,* the famous "science ship" which has sailed thousands of miles across the oceans of the world. The exhibits include cross sections of deepwater depressions plumbed by Soviet oceanographers, models of the huge underwater ridges they discovered, and models and drawings showing the strange sea animals caught by Soviet scientists. In addition, the geophysics section will show models of the standard-type seismic stations that were used for research under the International Geophysical Year program.

A special section will illustrate Soviet achievements in organic and inorganic chemistry and will demonstrate discoveries by Soviet scientists in the field of chain reactions and operating instruments used in observing the most delicate and complex chemical processes. The instruments include a mass spectrometer (an instrument for photographing fast-flowing processes at a speed of from 7 million to 33 million frames per second) and an electronic paramagnetic resonance unit. The exhibits devoted to theoretical and practical research in organic chemistry will demonstrate techniques for producing new chemical compounds and plastics, and artificial fibers made from these compounds.

The exhibitors have attempted to make the meaning of scientific research comprehensible to the layman. With this end in view, they have provided a large variety of charts, drawings, sketches, photographs, and color slides, to be shown on special screens. In addition there will be 12 science-fiction films. Also on display will be more than 100 instruments and devices developed by Soviet scientists, and many models.

A special section will be devoted to the work of the History Division of the U.S.S.R. Academy of Sciences. It will deal with historical and archeological subjects. This is the first time that Soviet historical research will have been represented at an international exhibition. A special display, in the form of a huge cylinder about 10 meters in diameter, will be set up, with models, drawings, maps, and so on covering its exterior. Upon entering this structure, visitors will find a well-lit and well-furnished library where they will be able to examine books by Soviet historians and Soviet historical magazines.

Report on Education in Age of Science

A report, titled "Education for the Age of Science," was issued 23 May by the President's Science Advisory Committee. It was written by a 9-man panel on science and engineering education. An accompanying statement by President Eisenhower, the panel's four sets of recommendations, and the panel membership follow.

President's Statement

This report makes clear that the strengthening of science and engineering education requires the strengthening of all education. As an excellent statement of educational goals and needs, I hope it will be widely read and that it will stimulate a wider understanding of the importance of excellence in our educational system.

One subject discussed in the report warrants special emphasis—the importance of raising the standing of our teachers in their communities. Higher salaries are a first requirement, but we need also to recognize the great importance of what teachers do and to accord them the encouragement, understanding, and recognition which will help to make the teaching profession attractive to increasing numbers of first-rate people.

Curriculum and Course Content

Curriculum. We urge the scientists and scholars of the country to establish more intimate contact with experienced teachers at all levels, so the curricula and the teaching and learning aids in schools, colleges and universities may take account of the new facts and the new points of view that scientific progress has revealed.

We further recommend that a research program be established by an appropriate foundation or agency in which scientists, scholars and teachers cooperate to design more adequate curricula planned to give to all educated citizens an adequate introduction to those areas of science and technology essential to an understanding of the problems of a modern society.

Course Content. We recommend that present efforts be aggressively pursued and substantially expanded in bringing together leading scientists, scholars and teachers in these various subject-matter fields to seek:

1) To bring the course content in each subject at each level into line with the most modern scholarly research in its field, consonant with the level of instruction.

2) To outline, write, publish, and revise the necessary textbooks and auxiliary reading materials to achieve the above objectives. We believe, in particular, that far more imagination and innovation is appropriate in the preparation, printing, illustrating and publication of textbooks—on the one hand, to produce much less expensive books in the basic fields so that a much larger number of students will be able to build their own libraries; and, on the other hand, to insure that all the resources of the modern publication art are brought to bear in the preparation of textbooks which are challenging, stimulating, and exciting.

3) To develop and supply adequate teaching and learning aids of all appro-

priate kinds, including motion pictures, television, tape recordings, slides, and other audio-visual materials designed to aid the student in understanding the subject more thoroughly, and especially to relieve the teacher of unnecessary burdens of preparation and instruction, and to enable the outstanding teacher to reach a much larger number of students.

4) To develop and supply laboratory equipment and materials for science courses together with the necessary manuals and reading materials to make the laboratory and field work a far more meaningful, useful and exciting aid to student and teacher.

The programs now being sponsored by the Carnegie Corporation, the Ford Foundation, the Alfred P. Sloan Foundation, and the National Science Foundation provide excellent preliminary efforts. They need very rapid and substantial expansion to cover other fields and other educational levels. The National Defense Education Act of 1958 recognized this need.

Quality and Effectiveness of Teachers

We recommend that:

1) Scientists and engineers in universities and industries seek to establish organized programs of collaboration with high school and college teachers in order to reduce the gap in communication and understanding between these groups, rendering assistance and providing teaching material to teachers and their students, and bringing high school and college students and teachers into more direct contact with scientific and scholarly work in universities and industry.

2) Efforts be continued and accelerated toward improving the economic and social status of teachers at all levels, and enabling them to devote more of their working time to teaching tasks rather than administrative chores, and allowing them more time for preparation and study in their chosen fields.

3) Private and government agencies evolve state and national programs for providing substantial rewards, prizes, and other recognition to outstanding teachers in both elementary and secondary schools.

4) A research program be sponsored by an appropriate foundation or agency and organized on a national scale to bring together a key group of scientists and scholars to collaborate with teachers and educators on the problem of designing more adequate curricula for the education of high school and college teachers, especially in the sciences and mathematics, with the aims of reducing the alleged conflict between subject matter and methodology, making teacher training programs more attractive to the best students, and bringing about a better understanding between scholars, scientists, teachers, educators and the public in regard to the philosophy, goals, and methods of the educational system.

5) With the assistance and encouragement of our universities, the nation's best scholars join the nation's great teachers in the task of determining how the great teacher may be brought before an even larger number of students.

Recognition and Encouragement of Students

[We recommend] that we accept as a national goal lifting student performance to higher levels of excellence by greater motivation and by the provision of rewards for intellectual achievement and more adequate and extensive opportunities and challenges to the highly gifted student. To these ends we specifically recommend that:

1) A nation-wide effort be made to pay more attention to the academically talented students (that is, those in the upper 15 to 20 percent of their age group in intellectual ability) and to the unusually gifted students (that is, those in the upper 3 percent of the age group). Such an effort should involve citizens, schoolboards, parents, teachers, together with state and national agencies, public and private. Talented students should be recognized at an early age and given guidance and counsel in planning their educational programs and in preparing for and choosing college and university work.

2) These gifted students be given necessary help in financing their educational programs in high school as well as in college and in graduate school.

3) Such students be rewarded and encouraged for their achievement in order that they may take pride in intellectual excellence, even at an early age.

4) Programs of prizes and scholarships be extended into the high school level so that students even in remote and rural communities are enabled to attend high schools which will provide opportunities commensurate with their abilities.

5) Public and private agencies combine to offer on a national basis a much larger number of prizes than now exist to high school students for unusual intellectual achievement in important subject-matter fields.

Development of Intellectual Leadership

We specifically recommend that:

1) The curricular revision program now being developed for high school science courses be extended to undergraduate college courses in science and mathematics.

2) Aid be rendered to liberal arts colleges in examining their curricular to assure that they are adequately providing for scientific education of the nonscientist as well as of the future scientist or engineer.

3) We accept as a national goal improving the number and quality of our schools of science and engineering.

4) University graduate schools in science and engineering be enlarged in number and improved in quality, and especially that far greater emphasis be placed upon graduate work in engineering.

5) The engineering colleges of the country collaborate to improve and modernize their offerings in all engineering fields to insure that able students are attracted to these fields and that they are given adequate training to meet the engineering and technological problems of tomorrow.

6) Government agencies concerned with research in science and engineering re-examine the terms of their research support to educational institutions with a view to avoiding placing a financial burden or penalty on such institutions by reason of inadequate coverage in research contracts or grants of costs properly chargeable as overhead and for management allowances. Without serving as a subsidy in any way, proper handling of these fiscal matters can make certain that the research support will not affect adversely the opportunity to use the research effectively for the education of students, for the attraction and retention of able faculty members, and for the release of teachers and students from burdensome administrative and fiscal restrictions.

Membership of Panel

John E. Burchard, dean, School of Humanities and Social Studies, Massachusetts Institute of Technology.

Henry Chauncey, president, Educational Testing Service.

Caryl P. Haskins, president, Carnegie Institution of Washington.

Frederick C. Lindvall, chairman, Division of Engineering, California Institute of Technology.

James A. Perkins, vice president, Carnegie Corporation.

Alan T. Waterman, director, National Science Foundation.

Dael Wolfle, executive officer, American Association for the Advancement of Science.

Jerrold R. Zacharias, professor of physics, Massachusetts Institute of Technology.

Lee A. DuBridge, president, California Institute of Technology (chairman).

Consultants to Panel

Harold B. Gores, president, Educational Facilities Laboratories, Inc.

S. C. Hollister, dean, College of Engineering, Cornell University.

Frederick L. Hovde, president, Purdue University.

Stephen White, director, Film Division, Educational Services Incorporated.