

charts which cut down data handling costs. Speaking on methods for maximizing after-tax income over the long term, Alfred N. Watson of the Curtis Publishing Company pointed out that operations research techniques can be applied to the industrial firm. Dr. Watson said that methods have been applied which increase profits by taking into account shifts in corporate income and expense factors as product output increases. F. B. Llewellyn spoke on operations research as carried on by the Bell Telephone Laboratories. He mentioned studies in the design of transcontinental telephone and television networks, and enumerated several instances in which operations research methods were employed to achieve best technical results at least cost.

Acoustical Society

Spring Meeting in New York

More than four hundred members of the Acoustical Society of America attended the forty-third meeting of the ASA at the Hotel Statler in New York City last May 8-10. A total of seventy-two contributed papers were given in eight sessions during the three-day meeting, and a special feature was a panel discussion concerned with various contemporary unsolved noise problems. A group of invited papers dealing with acoustics in the radio and television industry was also included in the technical program. The contributed papers covered most regions of current interest in acoustics, including reports of recent research in psychoacoustics, hearing, speech communication, noise control, instrumentation, ultrasonics, underwater sound, and waves and vibrations.

The panel discussion on unsolved noise problems, arranged by the Society's Committee on Noise, was under the chairmanship of Haldon A. Leedy of the Armour Research Foundation. Various aspects of the topic were summarized briefly by Gordon D. Hoople, M.D., Syracuse, N. Y.; Leo L. Beranek, Massachusetts Institute of Technology; Robert O. Fehr, General Electric Co.; Richard K. Cook, National Bureau of Standards; and Howard C. Hardy, Armour Research Foundation. There was active discussion from the floor during the panel session.

Dr. Hoople spoke on some unsolved problems relating to hearing loss in industry where it is becoming increasingly important to know how much noise will cause ear damage. In this connection, he pointed out, the problem is complicated by the fact that the same noise may impair the hearing of some individuals but not others. Such factors as the kind, intensity, and duration of noise were considered, as were problems concerning ear protection and the treatment of ear damage. One of Dr. Hoople's recommendations was that industry stress pre-employment audiograms.

Dr. Beranek talked on unsolved military noise problems. For the Navy, the major problems are concerned with suitable instrumentation and techniques for measurement of vibration characteristics of motors, generators, and engines; mechanical impedance of structures

on which such devices are mounted; and the transfer constant between the mounting points of a machine and the water outside the vessel. For the Air Force, Dr. Beranek said, the principal problem is how to reduce noise created by propellers and jet engines while in flight. Basic research aimed at understanding the mechanisms of noise reduction and later development of means for producing forward thrust with less noise can be the approach. As for the Ground Forces, the major acoustic problem is an understanding of the effect of micro-meteorological variations in the atmosphere on sound propagation. A second, though less important, problem is the development of acoustical materials which will absorb sound efficiently, will be durable, and will resist both oil and moisture.

Dr. Fehr discussed unsolved noise problems in the aircraft industry. These include noise in flight, noise reduction for ground running, and general problems such as cabin noise, high sound intensity properties, high temperature microphones for measuring high velocity air streams, and supersonic propellers. He told of specific problems involved in research and development on silencing structures for quieting engines in test cells or in reducing noise in airplanes warming up at ground level.

Dr. Cook discussed unsolved problems in architectural acoustics. The two main problems within buildings are to prevent the ingress of noise from outside and to stop its passage from one part of the building to another. The prevention of plumbing noise and the insulation of a building against the transmission of impact sounds are two problems on which progress has been impeded by a lack of suitable instrumentation and standard methods of measurement. Both laboratory investigations and studies of experimental residences should be included in a well-rounded research program, he said.

Unsolved basic physical research problems in the field of noise were discussed by Dr. Hardy. Pointing out the importance of departing from the classical approach in attacking acoustical problems, he recommended that scientists in acoustics and aerodynamics relate their two branches of mechanics since many noise problems are caused by or are related to turbulence of the medium. There is a need for devices which measure intensity or energy density and high intensity. Ways to measure transient waves, such as those from a forging hammer or gun muzzle, are in demand. Dr. Hardy listed these examples of possible basic projects: a study of the effect of outdoor and atmospheric conditions on sound propagation, a study of the propagation of noise energy through structures by flexural waves, a study of the effect of various geometries of partial enclosures (such as the open phone booth) on the suppression of noise, and a study of the properties of sound absorbing material used as space absorbers (included would be the diffraction effects of various geometries).

The session on radio and television acoustics consisted of invited papers by the following six speakers:

George Nixon of the National Broadcasting Company (an outline of a typical sound broadcasting and TV broadcasting system), Michael Kodaras of Johns-Manville Corporation (the sound and construction problem), H. M. Gurin of NBC (microphone technique), Emil T. Vincent of the American Broadcasting System (on that network's studio intercommunication facilities), and Tom Howard of Station WPIX (sound problems encountered in field TV broadcasting).

The Society's Biennial Award was presented to Osman K. Mawardi of the MIT Acoustics Laboratory during the banquet on Friday evening. The \$100 award is made in each even-numbered year.

Entertainment at the banquet was provided by the editor of the society's journal, Floyd Firestone, who sang simultaneously and at will any number of parts during his one-man performance of "Harmony for Hermits", an acoustical tour de force accomplished with the help of a novachord and a loud-speaker equipped with a curious pipe attachment which serves as an artificial larynx.

Atomic Energy in Agriculture

Fourth Oak Ridge Summer Symposium

The Oak Ridge National Laboratory and the Oak Ridge Institute of Nuclear Studies, in conjunction with the University of Tennessee-AEC agricultural research program, are planning their fourth annual summer symposium. Having as its theme "The Role of Atomic Energy in Agricultural Research", the symposium will continue from August 25 to 30 and will have a program of twenty-six papers dealing with various aspects of radioactivity in relation to agricultural research. A round table discussion on the effects of radioactive effluents will also be included, and a number of laboratory demonstrations and films relating to the symposium have been scheduled. Additional information can be obtained by writing to the University Relations Division, Oak Ridge Institute of Nuclear Studies, P. O. Box 117, Oak Ridge, Tennessee.

Venezuelan Geophysicists

Form New Society at Caracas

Forty-three exploration geophysicists met in Caracas, Venezuela, to form the "Sociedad Venezolana Geofísica" (Venezuelan Geophysical Society) on May 26, it has been announced. The group voted unanimously to form the society along the same lines and for the same purpose as the Society of Exploration Geophysicists which has its headquarters at Tulsa. Regular meetings will be held for the discussion of current exploration problems encountered in Venezuela, and consideration will be given to affiliation at a later date as a local section of the SEG. W. C. Merritt was named chairman of the constitution committee. Other members of the committee are Eduardo Rohl, A. Romero, C. F. Wachter, R. R. McIlwaine, H. Pearson, R. E. McMillen, and T. A. Kibby.

Calendar of events

July

- 8-15 Congress of the 7th Session of the International Union of Theoretical and Applied Mechanics, Istanbul, Turkey
- 11-13 American Chemical Society, Division of Physical and Inorganic Chemistry (Summer Symposium), University of Notre Dame, Notre Dame, Indiana
- 16-18 Institute of the Aeronautical Sciences (Annual Summer Meeting), Los Angeles, California
- 21-27 2nd International Congress of Biochemistry, Paris, France

August

- 4 2nd International Congress on Analytical Chemistry, Oxford, England
- 4-8 American Geographical Society (Centennial Meeting), New York City
- 8-15 17th International Geographical Union Congress, Washington, D. C.
- 11-13 Society of Automotive Engineers (National West Coast Meeting), San Francisco, California
- 11-21 Union Radio Scientifique Internationale (10th General Assembly), Sydney, Australia
- 12-16 Photographic Society of America, New Yorker Hotel, New York City
- 15 8th International Congress of Applied Mechanics, Istanbul, Turkey (through September 15)
- 19-22 American Institute of Electrical Engineers (Pacific General Meeting), Hotel Westward Ho, Phoenix, Arizona
- 25-29 4th Annual Oak Ridge Summer Symposium (Sponsored by University of Tennessee-Atomic Energy Commission Agricultural Research Program), Oak Ridge National Laboratory, Oak Ridge, Tennessee
- 25-30 Union of Pan-American Engineering Societies, New Orleans, Louisiana
- 25-2 International Union of Theoretical and Applied Mechanics (3rd General Assembly), Istanbul, Turkey

September

- 1-2 Mathematical Association of America (33rd Summer Meeting), Michigan State College, East Lansing, Michigan
- 1-5 Combustion (International Symposium), Massachusetts Institute of Technology, Cambridge, Massachusetts
- 1-6 3rd International Congress on Astronautics, Stuttgart, Germany
- 1-6 International Conference on Beta- and Gamma-Radioactivity, Amsterdam, Holland
- 2-5 American Mathematical Society (National Meeting), Michigan State College, East Lansing, Michigan
- 3-5 International Council of Scientific Unions (6th General Assembly), Amsterdam, Holland
- 3-10 British Association for the Advancement of Science (Annual Meeting), Belfast, Ireland
- 3-13 World Engineering Conference, American Society of Civil Engineers (Centennial Celebration), and other engineering societies, Chicago, Illinois
- 4-5 8th Annual National Conference on Industrial Hydraulics (Sponsored by Illinois Institute of Technology in conjunction with the Centennial of Engineering), Sherman Hotel, Chicago, Illinois
- 4-6 APS, Division of Electron Physics, Conference on Gaseous Electronics, Princeton University, Princeton, New Jersey
- 4-9 2nd International Congress on Analytical Chemistry, Oxford, England
- 4-13 International Astronomical Union (8th General Assembly), Rome, Italy
- 7 American Institute of Biological Sciences (Annual Meeting), Ithaca, New York