

Listening to the echoes from clicks. Echoes from sounds made under water will bounce off from the surface of the water and from the bottom, as well as from objects located in a horizontal plane. That echoes of this sort are actually produced by porpoise clicks can be clearly demonstrated in two ways: (1) They can be seen on the screen of a cathode-ray oscilloscope. (2) They can be heard by the human ear under the proper acoustical and temporal conditions. The actual hearing of the echoes is accomplished by reducing the playback speed of the recording tape. The original tape speed of the Ampex ultrasonic recorder is 60 in./sec. Tests have been made with playback speeds of 1/8, 1/16, 1/32, and 1/64 of the recording rate. This has the effect of lowering the intensity as well as the number of cycles per second of the sounds played. For example, a bona fide frequency of 100,000 cycles/sec, reproduced at 1/64 of its original speed, becomes 1562.5 cycles/sec. The duration of the sound is correspondingly lengthened by a factor of 64.

Under such circumstances, the echo becomes clearly audible. It can be heard by most people at 1/16 of the recording speed, is very clear at 1/32, and is often a booming reverberation at 1/64 of the original

rate. An inherent difficulty in measuring the duration of any single click is brought to light by this slow playback method, since a click cannot often be clearly separated from its own echo. One would have to be certain, in obtaining precise time measurements of this sort, that there was no echo at all—a difficult if not impossible prerequisite.

Although the facts recorded here do not establish conclusively that the bottle-nose dolphin actually uses echo-ranging, they offer good circumstantial evidence to that effect. *T. truncatus* certainly possesses what may be described as a "sonar system." The final proof that he employs it for echolocation must come by testing captive animals for the avoidance of objects in water after vision has been eliminated.

References

1. FISH, M. P. *ONR report*, Ref. No. 49-30 (1949).
2. KELLOGG, W. N., and KOHLER, R. *Science*, **116**, 250 (1952).
3. GRIFFIN, D. R. *J. Acoust. Soc. Am.*, **22**, 247 (1950).
4. ———. *Experientia*, **7**, 448 (1951).
5. FRASER, F. C. *Nature*, **160**, 759 (1947).
6. KULLENBERG, B. *Ibid.*, 648.
7. MCBRIDE, A. F. *Natural History*, **45**, 16 (1940).
8. SCHEVILL, W. E., and LAWRENCE, B. *Science*, **109**, 143 (1949).
9. ———. *ONR report*, Ref. No. 52-80 (1952).



News and Notes

Scientists in the News

James Bliss Austin, director of research and chief of U. S. Steel Company's Research Laboratory, Kearny, N. J., has been appointed chairman of the Committee on Chemical Warfare, U. S. Department of Defense, to succeed **Randolph T. Major**, vice president and scientific director of Merck & Co.

A. Ludlow Clayden has been appointed technical associate in Sun Oil Company's Chemical Research and Development Department. **John G. Moxey, Jr.**, succeeds him as manager of the Automotive Laboratory.

A. W. B. Cunningham, of the University of Edinburgh, has been appointed professor of pathology at the University of Texas Medical Branch, Galveston, where he will both teach and conduct research on arthritis and diseases of the joints.

Herbert N. Eaton retired on Jan. 31 as chief of the Hydraulics Section of the National Bureau of Standards, a position he has held since 1928. He had been with the bureau since 1919.

Gustav Egloff, petroleum scientist and director of research for Universal Oil Products Company, has been selected by five national engineering societies to receive the Washington Award for 1953, for leadership in petroleum research and in community services.

Nicholas Ercoli has been appointed head of the Department of Pharmacology and Chemotherapeutics, Research Division, Armour Laboratories, Chicago. Dr. Ercoli was formerly scientific director of the Istituto Sieroterapico Milanese Serafino Belfanti, University of Milan.

K. P. Ewing, entomologist of the U. S. Department of Agriculture, has been named head of the department's Division of Insects Affecting Cotton and other Fiber Plants. Mr. Ewing will succeed **R. W. Harned**, who will continue with the Bureau of Entomology and Plant Quarantine as staff assistant and consultant.

Herbert S. Gaskill, of the Indiana Medical School, Indianapolis, has been appointed professor and head of the Department of Psychiatry, University of Colorado, to succeed **Franklin G. Ebaugh**, who retired Jan. 1.

Blaine L. Glendening has been appointed principal chemist for the Kansas Public Health Laboratories, Topeka. He was formerly assistant chemist with the Kansas Agricultural Experiment Station.

Glenn C. Holm, member of the North Dakota Agricultural College Veterinary Department since 1949, has been named dean of agriculture and director of the Agricultural Experiment Station. Dr. Holm will succeed **H. L. Walster**, who will retire this spring.

S. D. Kirkpatrick, vice president of the McGraw-Hill Book Company, has been elected chairman of the AEC's Advisory Committee on Industrial Information. Mr. Kirkpatrick has served in the same capacity since 1949, having been appointed originally by the AEC general manager.

L. J. Klotz, chairman, Department of Plant Pathology, University of California Citrus Experiment Station, Riverside, will conduct studies in Sicily on the mal secco disease of lemons, a disease which does not occur in the lemon-producing areas of the U. S.

Jonathan D. Lankford has been appointed chief of the Region V Fuels Technology Division, Bureau of Mines, with headquarters at Minneapolis. Mr. Lankford succeeds **Alex C. Burr**, who will return to the directorship of the North Dakota Research Foundation, Bismarek, but will continue as consultant to the bureau.

Ivan N. Mensh was appointed associate professor and head of medical psychology in the Department of Neuropsychiatry, Washington University School of Medicine, St. Louis, effective Feb. 1.

Clark B. Millikan, **Hans W. Liepmann**, **Frank E. Marble**, and **Ernest E. Sechler**, of the California Institute of Technology faculty, have been reappointed to the National Advisory Committee for Aeronautics. **A. J. Stosick**, division chief of the Jet Propulsion Laboratory, owned by U. S. Army Ordnance and operated by Caltech, was appointed to the special subcommittee on rocket engines.

Norman Bartram Nelson, who has been dean of the School of Medicine, American University of Beirut, since 1951, has been named dean of the State University of Iowa College of Medicine, effective in July. Dr. Nelson served in Beirut while on leave from his post as assistant dean of the College of Medicine, University of California at Los Angeles.

William A. Sawyer, medical director of the Eastman Kodak Company since 1919, has been appointed head of the new Medical and Health Department, International Association of Machinists. The department will aid district and local lodges of the union with programs to provide prepaid health insurance for members.

Walter A. Schmidt, president and general manager of the Western Precipitation Company, Los Angeles, has been named honorary chairman of the American Chemical Society's 123rd national meeting, to be held in Los Angeles, Mar. 15-19.

Glenn T. Seaborg, director of chemical research at the Radiation Laboratory, University of California, and 1951 Nobel laureate, was selected to receive the John Scott Medal Award of the Board of City Trusts of Philadelphia. *Dr. Seaborg was honored for his discovery of five of the transuranium elements—plutonium, americium, curium, berkelium, and californium.

Education

Boston College is offering a special intensive course in Modern Industrial Spectrography, July 20-31, designed particularly for chemists and physicists from industries in the process of installing spectrographic equipment. Full information may be obtained from James J. Devlin, of the Physics Department, Chestnut Hill 67, Boston.

The **University of Chicago** will offer the facilities of the Institute for Nuclear Studies and the Institute for the Study of Metals to Ph.D. candidates during the summer session, June 22-Aug. 29. Students in chemistry, physics, or related fields may, by special permission, carry on basic research in the institutes.

Duke University Marine Laboratory will offer a course in Oceanography June 15-July 18, under the direction of Donald W. Pritchard, director of the Chesapeake Bay Institute of Johns Hopkins University. Further information may be obtained from the director of the Duke Summer School.

Finch College, a junior college until last June, has added to its curriculum four-year courses leading to the B.S. and B.A. degrees. Numerous courses have been added in both biological and physical sciences. Recent appointments include Hugh E. Potts II as head of the Department of Biological Sciences and Roger H. Charlier as head of the Department of Physical Sciences and Mathematics. Marie H. Charlier will give new courses in physical and cultural geography and geology in 1953-54.

Grants and Fellowships

The **American Academy of Arts and Sciences** will receive applications for grants-in-aid of chemical research from its Cyrus M. Warren Fund until Apr. 27. Grants in excess of \$300 are seldom made and are generally for apparatus and supplies needed for research; no funds are awarded for salaries. Application blanks will be sent upon request to the chairman of the grants committee, Edwin R. Gilliland, MIT, Cambridge 39, Mass.

The **Hamilton Memorial Foundation** has awarded a grant to the Evanston Hospital Laboratory, maintained under Northwestern University auspices. Studies on arteriosclerosis are under the direction of Arnold Wagner.

The **Louis W. and Maud Hill Family Foundation**, of St. Paul, Minn., has given \$5700 to Carleton College for research in cell biology under the direction of Thurlo B. Thomas, chairman of the Department of Zoology.

The **Lasdon Foundation** has awarded \$15,000 to Harvard Medical School and Peter Bent Brigham Hospital for support of research for the further study of the transplantation of vital organs, particularly kidneys, in human beings. George W. Thorn and Benjamin F. Miller are in charge of the work.

Eli Lilly and Company have approved three grants to Purdue University: to Henry Koffler for work on the intermediary metabolism of fungi; to C. L. Porter for investigation of antibiotics produced by certain microorganisms; and to M. G. Mellon for a study on colorimetric applications of heteropoly complexes.

The **National Paraplegia Foundation** is continuing, for the academic year 1953-54, a limited number of fellowships, at a minimum stipend of \$3000 per year, for research in spinal cord disease and trauma. Application forms (returnable by *May 1*) and full information may be obtained from L. W. Freeman, chairman, Medical Advisory Committee, 1040 W. Michigan St., Indianapolis 7, Ind.

The **National Society for Crippled Children and Adults** and **Alpha Gamma Delta** are sponsoring 20 special fellowships for a four-week training program at the School of Education, New York University-Bellevue Medical Center. Applications (returnable before *Mar. 15*) and further information may be secured from the society, 11 S. La Salle St., Chicago 3.

Radio Corporation of America has awarded scholarships to 18 university students from 14 different states. Marijane Curran, of Stamford, Vt., a student at Wellesley College majoring in science, became the first woman to receive an RCA Scholarship.

Alfred P. Sloan National Scholarships, a new series of four-year undergraduate scholarships in technology and allied fields will be administered by California Institute of Technology, Carnegie Institute of Technology, Cornell University College of Engineering, and Massachusetts Institute of Technology. For the year 1953-54 only, all students who have applied for scholarship assistance at any of the participating institutions will be automatically considered for awards. Honorariums will range from \$200 to \$2000 per year, with an average allotment of \$650 per year to each institution for each Sloan scholar.

In the Laboratories

Airborne Instruments Laboratory, Inc., has appointed Matthew T. Lebenbaum supervisor of its new Applied Electronics Section, and Peter D. Strum assistant supervising engineer.

Armour Research Foundation of Illinois Institute of Technology will reorganize and expand the State Industrial Research Institute of Burma, situated on the campus of Rangoon University. Christopher E. Barthel, Jr., assistant director of the foundation, will be resident director for the three-year program. He will leave for Burma in April.

General Motors Institute will add 83,000 square feet to its present facilities in Flint, Mich., adding approximately 40 per cent to classroom, laboratory, and general service areas. The institute will also remodel its present building, to allow greater emphasis in the curricula on the experimental approach to technological problems.

Arthur D. Little, Inc., will start construction Apr. 1 of a new Research Laboratory adjacent to its recently completed Mechanical Division building on the Concord Turnpike in West Cambridge, Mass.

Wisconsin's new million-dollar **State Laboratory of Hygiene** building, recently completed on the University of Wisconsin campus, was dedicated Feb. 28. Leonard A. Scheele, of the U. S. Public Health Service, delivered the chief address.

Meetings and Elections

A conference on **New Instruments Study Health and Disease** will be held by the Instrument Society of America, Mar. 16, 7:00 P. M., at the Midston House, New York. Kurt G. Stern, Harry Grundfest, and Raymond Jonnard will be the principal speakers; Joseph Greenspan is conference chairman.

A **Conference on Trends in Residential Air Conditioning** will be held Apr. 24-25 at Lehigh University. The Department of Mechanical Engineering is sponsoring the meeting in cooperation with the American Society of Heating and Ventilating Engineers, American Society of Refrigerating Engineers, American Society of Mechanical Engineers, Air Conditioning and Refrigeration Machinery Association, National Association of Home Builders, Building Research Board, National Mineral Wool Association, and the National Warm Air Heating and Air Conditioning Association. James V. D. Eppes is chairman of the conference committee.

An **Institute on Medical History**, organized by the New York Academy of Medicine, will be held at Arden House, Harriman, N. Y., Mar. 13-14. The first day will be devoted to addresses by Alexander T. Martin, Alan Gregg, Paul Schrecker, Owsei Temkin, George Rosen, Erwin Ackerknecht, Gilbert Highet, John F. Fulton, Iago Galdston, Frank J. McGowan, and Gregory Zilboorg. The second day's program will be one of group discussions among the approximately 60 U. S. and Canadian participants.

The **International Association for Hydraulic Research** will hold a joint meeting with the Hydraulics Division of the American Society of Civil Engineers at the University of Minnesota, Aug. 30. Subjects to be discussed include density currents; air entrainment by flowing water; waves, beach erosion, and hydro-mechanics of shore structures; and basic relationships of sediment transportation of flowing water.

An **International Conference on the Science and Applications of Photography** will be held in London, Sept. 19-25, in celebration of the centenary of the Royal Photographic Society of Great Britain. The conference will be divided into sections dealing with photographic science (including theory of latent image and development, sensitization, sensitometry, resolving power, granularity, and properties of photographic materials); cinematography and color photography; technique and applications of photography; photo-

mechanical processes; and history, literature, and training in photography. Full details may be obtained from the Hon. Secretary, RPS Centenary Conference, 16 Princes Gate, London, S. W. 7.

Miscellaneous

Six members of the **American Chemical Society** have been selected for prizes and awards in recognition of outstanding achievement: Leo Brewer, University of California and consultant to the AEC, the Leo Hendrik Baekeland Award of the North Jersey Section; Robert Jenness, University of Minnesota, the Borden Award in the Chemistry of Milk; Donald D. Van Slyke, Brookhaven National Laboratory, the Fisher Award in Analytical Chemistry; Joel H. Hildebrand, University of California, the Willard Gibbs Medal of the ACS Chicago Section; Robert B. Anderson, U. S. Bureau of Mines, Bruceton, Pa., the Ipatieff Prize; and Robert W. Schiessler, Pennsylvania State College, the Precision Scientific Company Award in Petroleum Chemistry.

The **American League Against Epilepsy** has extended the time limit for submission of dissertations on any aspect of epilepsy for the Jerry Price Memorial Prizes from Apr. 1 to *July 1*. Inquiries from students of approved U. S. and Canadian medical schools may be addressed to William G. Lennox, 300 Longwood Ave., Boston 15; Francis L. McNaughton, 3801 University St., Montreal 2; or John L. Otto, 816 Strand, Galveston.

The fourth **Archbold Expedition** to New Guinea will spend nine months in the Papua area, making the first comprehensive survey of the flora and fauna of the region. The expedition will be led by Leonard J. Brass, of the Archbold Biological Station in Lake Placid, Fla. He will be accompanied by Geoffrey M. Tate, in charge of the expeditions' New York headquarters, which are located at the American Museum of Natural History, and Hobart M. Van Deusen, of the museum's Department of Mammals. The 1953 expedition is sponsored by the museum, Richard Archbold, Arnold Arboretum, and the Office of Naval Research.

The **Association of American University Presses** will distribute descriptive catalogues to more than 175,000 scholars on books newly published by the presses in the humanities, and the social, biological, medical, and physical sciences. The catalogues are expected to be mailed periodically, beginning in March.

A *Survey of Housing Research*, made by the **Building Research Advisory Board**, National Academy of Sciences, comprising a summary of recent and current housing research and facilities for conducting such research throughout the U. S., has been issued by the Housing and Home Finance Agency. The survey is available through the GPO at \$3.00 a copy. Technical and social science aspects of housing problems are included.

Three awards were made by the **James F. Lincoln Arc Welding Foundation**, Cleveland, Ohio, in its 1952 bridge design competition, Welded Bridges for Steel Conservation. The first award went to Elwyn H. King, of Long Beach, Calif., the second to Kiser E. Dumbauld, of the Ohio State Highway Department, and the third was shared by Thomas Kavanagh, of New York University, and Leo Coff, of New York City.

The **National Science Foundation** has reported that grants and contracts for scientific research and development at nonprofit institutions made by federal agencies totaled \$297 million in the fiscal year 1951 and \$341 million in 1952, according to a preliminary analysis of information compiled with the cooperation of all agencies engaged in research and development activities. The information was obtained by broad scientific fields, and by character of work supported, including basic and applied research, development, and increase of research and development plant. The figures indicate that in 1952 there was an increase of 20 per cent over 1951 in funds expended for applied research and development, and a slight decrease for basic research.

The **Oberly Memorial Award for 1953** will be given for the best bibliography by an American citizen, in agriculture or related sciences, issued during 1951 or 1952. Seven copies of each entry, together with a letter of transmittal, should be addressed to the chairman of the committee, D. A. Brown, Agriculture Library, Mumford Hall, University of Illinois, Urbana, before *Apr. 15*.

Chemicals wanted by the **Registry of Rare Chemicals**, 35 W. 33rd St., Chicago 16, Ill., include: stannic selenide; silver thioarsenite; phenyl tellurium trichloride; selenium disulfide; lead ricinoleate; 2-thiohistidine; 2,3,4-trimethyl quinoline; 1,3-diaminocyclohexane; 3,3'-dimethyl naphthidine; 4-aminopyridine; retene; 18-hydroxystearic acid; ellagic acid; lignoceryl alcohol; 1,2,3,4-tetracarboxybutane; D-cysteine; thymidine; galactoflavin; notatin; and mucin.

The **Society of American Foresters** has awarded the Gifford Pinchot Medal to Raphael Zon, of St. Paul; the Sir William Schlich Memorial Medal was given posthumously to Ellwood Wilson, of Knowlton, Que. Henri Kieffer, chief of the Forest Protection Service of the Quebec Department of Lands and Forests, received a plaque from the **Canadian Forestry Association** for forest conservation.

Four scientists were among the men selected by the **U. S. Junior Chamber of Commerce** as America's Ten Outstanding Young Men of 1952. They were: William H. Muller, Jr., of UCLA, for cardiac surgery; Ross Melvin Hedrick, of Monsanto Chemical Company, for work in developing the soil conditioner Krilium; Frank N. Piasecki, of Lansdowne, Pa., for pioneering in the helicopter industry; and Heinz Joseph Gerber, of Gerber Scientific Company, for the invention of the Gerber Variable Scale.