

News of Science

Chicago Low-Temperature Lab

A large noncommercial laboratory for research at temperatures near absolute zero (-460°F) was opened last month at the University of Chicago's Institute for the Study of Metals. The building will be used by physicists, chemists, and metallurgists who since 1945 have been conducting their basic experiments under the west stand of Stagg Field, where the first atomic pile was built and operated in 1942. Earl A. Long, professor of chemistry who has been at the university since 1956 and who was assistant director of Los Alamos Scientific Laboratory during World War II, is director of the Institute for the Study of Metals and of the new laboratory.

The low-temperature laboratory contains equipment that can produce 50 quarts per hour of liquid hydrogen at -423°F , and 8 quarts per hour of liquid helium at -453°F . Additional equipment to permit an output of 20 quarts of liquid helium per hour is planned.

The liquefied gases will be used in the new building's seven experiment rooms. Here, in addition to structural observations, studies will be made of such extreme cold phenomena as superconductivity of supercooled lead and the nature of the liquefied gases themselves—for example, their defiance of gravity and their frictionless flow.

Carnegie Supports Educational Psychology at Northwestern

A 3-year program of teaching, research, and training in educational psychology will be supported at Northwestern University by a grant of \$156,000 from the Carnegie Corporation of New York. The Northwestern appropriation is included among new grants totaling almost half a million dollars that have just been announced by Carnegie.

Under the Northwestern program, faculty members of both the school of education and the department of psychology will join together to develop new undergraduate and graduate courses in educational psychology. These courses will include more knowledge of basic research on human behavior than is provided in

the usual teacher-training curriculum. The Northwestern group will also outline a program of basic research needed in the field. A portion of the Carnegie funds will be used for the training of graduate students.

Other new Carnegie grants include one of \$55,000 to the National Education Association for a conference on gifted students; another of \$36,000 to Illinois Institute of Technology for the development of a new approach to mathematics teaching; and one of \$66,000 to the University of Maryland for developing an experimental program of mathematics for the junior high school.

Standard Musical Pitch

One of the lesser known services of the National Bureau of Standards is the broadcasting of a musical tone of standard pitch—middle A at 440 cycles per second—over its shortwave stations WWV (Beltsville, Md.) and WWVH (Maui, Hawaii). These broadcasts make standard pitch available day and night throughout the United States and over much of the world. Since a short-wave receiver is all that is needed, easy access to standard pitch is thus provided for piano tuners and amateur and professional musicians as well as for makers of musical instruments.

A 600-cycle-per-second tone is also broadcast. This, together with the 440-cycle-per-second tone, is used by scientists, electronics engineers, and manufacturers in the measurement of short intervals of time and for calibrating instruments and devices that operate in the audio and ultrasonic frequency ranges. Both the 440- and the 600-cycle-per-second tones are obtained from an electronic, crystal-controlled oscillator and are accurate, as transmitted, to better than 1 part in 100 million.

In this country, A = 440 cycles per second has been accepted as standard pitch since 1925. Initially, this value was agreed upon by the Music Industries Chamber of Commerce as a useful compromise among the various pitches chosen arbitrarily by different musical groups. In 1936 the same pitch standard was adopted by the American Standards

Association, giving it the status of an industrial standard. Three years later the International Federation of the National Standardizing Associations sponsored a conference in London. France, Germany, Great Britain, Holland, and Italy sent delegates, and the United States and Switzerland sent official messages. Six of the seven countries independently proposed A = 440 as the standard, and the conference adopted it unanimously. The same standard was again endorsed by the International Organization for Standardization in 1953 and was accepted as an ISO Recommendation in 1955.

The National Bureau of Standards maintains the A = 440 standard as the one on which general agreement has been reached. The musical merits of any particular standard are, of course, outside its province.

Previous standards of pitch were defined in terms of the frequency of a particular tuning fork or bar, or the length of a specified vibrating air column (organ pipe). Since the sound frequencies generated by these devices vary with the surrounding temperature, it is necessary to specify the temperature at which comparisons with these standards should be made.

In 1859 the "Diapason Normal" was defined in terms of a standard tuning fork deposited by the French Government at the Paris Conservatory of Music. The vibration frequency of this fork was stated to be 435 cycles per second when measured at the then standard laboratory temperature of 15°C . When R. Koenig (1880) made a careful determination of the frequency, it proved to be 435.45 cycles per second at 15°C and to have a thermal coefficient of -0.0486 cycle per second, per degree centigrade. Thus the fork would really have the defined standard frequency at slightly over 24°C .

From a technical point of view, the present standard of musical pitch, as maintained by NBS, has the advantage that it is free from the vagaries of the material objects (tuning forks, organ pipes) that embodied past standards. A tone is produced that for all practical purposes is independent of the temperature of the surroundings.

U.N. Urges Live Poliovirus Testing

A 12-nation group of experts of the World Health Organization has urged large-scale trials of a new polio vaccine prepared from live virus. The live-virus vaccine is taken by mouth instead of being injected. It is prepared from strains of virus that have been attenuated so that they are no longer able to cause the disease but stimulate protection against it.

If the trials prove successful, accord-

ing to the special WHO committee, the live-virus vaccine will provide reliable and enduring immunity against paralytic poliomyelitis. It would also eliminate or substantially reduce virulent strains. The committee believes that the present Salk killed-virus vaccine is not able to achieve this kind of result. Committee members emphasized that the new vaccine should be considered an adjunct to the Salk vaccine, although it might eventually replace it.

There is an unlikely but possible hazard in the use of the live-virus vaccine, since it has not been conclusively determined whether viruses excreted by immunized persons could prove dangerous to others. Viruses excreted by human beings were injected into the spinal fluid of chimpanzees without harm.

AEC Nuclear Technology Fellowships

Applications are again being accepted for Atomic Energy Commission special fellowships in nuclear technology. These awards are available to students starting their work at the beginning of the second semester or quarter, or third quarter, of the 1957-58 year. The fellowship program is administered for the AEC by Oak Ridge Institute of Nuclear Studies.

Completed applications should be submitted *not later than 15 Oct.* Forms may be obtained from the Fellowship Office, Oak Ridge Institute of Nuclear Studies, P.O. Box 117, Oak Ridge, Tenn.

These fellowships, which carry stipends of \$1800 plus tuition and dependency allowances, are open to students with a bachelor's degree in engineering, chemistry, mathematics, or physics, who have completed a course in ordinary differential equations. Fellows must be United States citizens. Before fellowship appointments become effective, the applicant must be accepted as a candidate for a graduate degree by an institution participating in the program. A list of these institutions is included with the application form, and applicants may make their choice from among them.

Proposed Legislation

Of the many bills introduced in Congress, some have a special relevance to science and education. A list of such bills introduced recently follows:

S 2447. Authorize and direct Secretary of Interior to undertake continuing studies of effects of insecticides, herbicides, and fungicides upon fish and wildlife for purpose of preventing losses of those natural resources following spraying and to provide basic data on various chemical controls so that forests, croplands,

and marshes can be sprayed with minimum losses of fish and wildlife. Magnuson (D Wash.) Senate Interstate and Foreign Commerce.

HR 8461. Amend Atomic Energy Act of 1954 to provide for appointment of representatives of U.S. in organs of International Atomic Energy Agency; make provisions re participation of U.S. in that agency. Cole (R N.Y.) Joint Atomic Energy.

S 2490. Provide for control of noxious weeds on land under control or jurisdiction of Federal Government. Humphrey (D Minn.) Senate Agriculture and Forestry.

HR 8571. Provide federal insurance for loans made to science and engineering students. Lane (D Mass.) House Education and Labor.

HR 8629. Protect public health by amending the Federal Food, Drug, and Cosmetic Act to prohibit the use in food of additives which have not been adequately tested to establish their safety. Wolverton (R N.J.) House Interstate and Foreign Commerce.

H J Res 399. Amend act of Congress approved 7 Aug. 1935 (PL 253), concerning United States contributions to the International Council of Scientific Unions and certain associated unions. O'Hara (D Ill.) House Foreign Affairs.

S 2501. Authorize 88 positions for specially qualified scientific and professional personnel in the Department of Commerce at rates of compensation not to exceed the maximum rate payable under PL 313, 80th Congress, as amended, and PL 854, 84th Congress. Johnston (D S.C.) Senate Post Office and Civil Service.

News Briefs

Columbia University has received a large collection of documents by and about the late Otto Rank, psychotherapist and student and associate of the late Sigmund Freud. Also included among the gifts were three of Freud's original manuscripts.

The French research reactor at Saclay has begun to operate on nuclear energy, utilizing heavy water made available to France by the U.S. Atomic Energy Commission.

The Philadelphia College of Osteopathy has announced plans to erect an osteopathic center on a 16-acre tract in Philadelphia at a cost of \$10 million. Among the buildings will be two hospitals, with a total of 600 beds.

National Science Foundation publications are available to all scientists who have need for them. Lists of publications

may be obtained from the foundation. Requests should be addressed to the Publications Office, National Science Foundation, Washington 25, D.C.

The corporate name of North American Instruments, Inc., has been changed to Northam Electronics, Inc. The company is a subsidiary of Norris-Thermador Corporation, with headquarters in Los Angeles, Calif.

A centennial program in memory of Elisha Mitchell, chemist, geologist, and mathematician, was held on the summit of the mountain near Asheville, N.C., that bears his name. It was the second of three programs planned by the University of North Carolina in observance of the centennial of Dr. Mitchell's death. The third will take place this fall at Chapel Hill.

The blue whale, the biggest animal ever known to exist, is in danger of becoming extinct owing to overhunting. Under international treaty, each year's take is limited, but it is feared that, unless the killings are further reduced, the species may not survive.

Aerojet-General Corporation, Azusa, Calif., has announced the establishment of a new Astronautics Research Laboratory for investigation in propulsion, astrophysical chemistry, and materials.

A lifelike cast of *Latimeria*, the living coelacanth and survivor of a 300-million-year-old species, is being exhibited at the American Museum of Natural History, New York. It was purchased from the Natural History Museum in Paris.

BJ Electronics, a facility of Borg-Warner Corporation, has begun operation of a new electronic performance and environmental testing laboratory at Santa Ana, Calif.

Total iron-ore resources of the United States are about 75 billion long tons of crude ore, according to a recent estimate by the U.S. Geological Survey. Since the last summary of iron-ore resources was published in 1955, the estimated total of major deposits has been increased by more than 25 billion long tons, partly as the result of further exploration and more complete information but principally by the inclusion of additional low-grade material in the Lake Superior region.

Career Choice of Merit Scholars

The 1957 Merit Scholarship Program conducted a survey of the career choices and proposed fields of specialization in