News of Science

Cigarettes and Cancer

A new study by scientists at the National Cancer Institute shows that the entire cigarette-smoking population of the United States appears to be subject to the same high risk of lung cancer which was found in earlier studies of selected groups of smokers and nonsmokers. This conclusion is reached by William Haenszel, head of the biometry section, and Michael B. Shimkin, chief of the biometry and epidemiology branch, National Cancer Institute. Their report, *Smoking Patterns and Epidemiology of Lung Cancer in the United States: Are They Compatible?* appeared in the June issue of the *Journal of the National Cancer Institute.*

This study represents the first attempt to test the consistency of data derived from a number of studies relating to the risk of smokers developing lung cancer, smoking habits of Americans, and the general distribution of lung cancer in the population. In general, consistency was noted.

The male-to-female ratio of lung cancer deaths, now 5 to 1, represents the highest sex ratio known for any major disease. The adjustment for smoking history brought the sex ratio for lung cancer into line with those observed for other causes of death. The authors further indicated that if smoking is, in fact, a cause of lung cancer, the following two trends should prevail: the rate of deaths from lung cancer for females will rise by 1965, in accordance with the trend to smoking at earlier ages among women; and the increasing rate of deaths from lung cancer for males will slow down by 1965.

Adjustment for different smoking patterns in rural and urban populations accounted for only a part of the urban-rural differences in lung cancer mortality. In the opinion of the authors, this urban-rural discrepancy represents a real finding and is a manifestation of multiple environmental factors in lung cancer.

Data from the Census Bureau survey, taken in February 1955, show a definite trend toward cigarette smoking at earlier ages among males. About 61 percent of men aged 25–34 had smoked cigarettes regularly by age 21, while only 41 percent of the 55–64 age group had taken up regular smoking at that age.

The survey data also show that only a few women were smoking cigarettes regularly before 1930. In the 25–34 age group, 29 percent were regular smokers by 21, while only 2 percent of the 55–64 age group reported to have smoked regularly at that age. All sources of data used in the study agree that lung cancer incidence and deaths are higher in urban than in rural areas, particularly for males.

British and American Engineering Research

Government support of engineering research in American universities is about 100 times that given by Great Britain to British universities. When Donald F. Galloway, research director of the Production Engineering Research Association of Great Britain, delivered the Calvin W. Rice lecture at the recent semiannual meeting of the American Society of Mechanical Engineers, he said: "The total expenditure by the British government and industry on engineering research in the universities probably does not exceed $700,000 per annum, compared with over $70 million by the United States government." He added that the estimated total expenditure for research and development in the United States last year was about $5 billion, compared with about $700 million in Great Britain, and that research work employs about 500,000 persons in the United States and about 60,000 in Great Britain.

NSF Expands Soviet Translation Program

The National Science Foundation has announced expansion of its program for the translation into English of Soviet research literature. A grant of $76,500 for this purpose has been awarded to the American Institute of Physics. The expanded program will include the *Zhurnal Teknicheskoi Fiziki* (*Journal of Technical Physics*), *Akusticheskii Zhurnal* (*Acoustics Journal*), and physics articles from the *Doklady Akademii Nauk SSSR* (*Proceedings of the USSR Academy of Sciences*). First issues of the translated journals will appear this summer.

Subscription prices for the new journals are as follows: *Journal of Technical Physics,* approximately 4000 pages per year, $90; *Acoustics Journal,* approximately 500 pages per year, $20; *Proceedings of the USSR Academy of Sciences* (physics articles only), approximately 900 pages per year, $25.

The foundation and the American Institute of Physics have already successfully collaborated in the publication of *Soviet Physics—JETP,* a bimonthly translation of *Zhurnal Eksperimentalnoi i Teoreticheskoi Fiziki* (*Journal of Experimental and Theoretical Physics*), six issues of which have now appeared.

In addition to the program in physics, NSF is supporting translations of Soviet papers in mathematics and biology; and plans for 1957 include the earth sciences and the engineering sciences. The American Mathematical Society publishes about 1000 pages annually of Soviet work under the title, *American Mathematical Society Translations.*

The foundation has just awarded a small grant to *Biological Abstracts* for the translation and publication of abstracts from the Soviet journal, *Referativnyi Zhurnal: Biologiia* will be translated by Consultants Bureau, Inc., of New York and reprinted in *Biological Abstracts.* The abstracts will be drawn from 31 primary journals covering a wide range in the field of biology.

Free Neutrino Found

Evidence for the existence of the free neutrino has been collected by Frederick Reines and Clyde Cowan, Jr., of the Los Alamos Scientific Laboratory, which is operated for the U.S. Atomic Energy Commission by the University of California. The existence of the free neutrino, a particle without charge and with vanishingly small mass, was postulated more than 20 years ago by Nobel laureates Enrico Fermi and Wolfgang Pauli in order to account for the disappearance of energy from the radioactive process known as beta decay.

In a statement of congratulations for the discovery, Willard F. Libby, commissioner and acting chairman of the AEC, said: "Detection of the neutrino by scientists at Los Alamos Scientific Laboratory and the Savannah River Plant of the U.S. Atomic Energy Commission is of great importance to nuclear research. The Commission congratulates the scientific team . . . on its magnificent accomplishment. . . .

"One of the greatest mysteries facing scientists today is the nature of the 'glue'

which holds atomic nuclei together. Discovery of the neutrino should help scientists to gain understanding of this force, which is one of the fundamental properties of matter."

The first scientific publication about the discovery will be a paper by Reines and Cowan which will appear in an early issue of *Science*.

Survey of Engineering Professors

The engineering colleges of the United States have experienced a net loss of 3 percent of their professors to industry within a 2-year period, and this at a time when the engineering colleges need 1300 more teachers to carry the 1956–57 load. This situation was reported to the American Society for Engineering Education by an industry committee headed by A. R. Hellwarth, assistant to the director of employment, Detroit Edison Company.

The committee, acting under the ASEE Relations with Industry Division, reported a net 2-year loss of three professors in each hundred from campuses to industrial employers, with higher salaries being the major lure. During the 2-year period more than 750 left engineering faculties for industry, but 500 left industry for teaching positions.

The survey was based on figures submitted by 62 percent of the 150 colleges and universities accredited by the Engineers' Council for Professional Development. These institutions recorded a gain in teaching strength from 8000 to 8400 during the period, in spite of losses to industrial employers. The present shortage of 1300 would require the engagement of 15 additional professors or instructors for every 100 now teaching.

Mammary Tumor Agent in Mice

In a 10-year study of the occurrence of mammary tumors in more than 4000 female mice of various specific genotypes, scientists at the National Cancer Institute have been able to change the susceptibility of certain strains to breast tumors by genetically controlling the transmission of the mammary tumor agent. This agent, or virus, is also known as the "milk factor," because some 20 years ago a series of experiments at the Jackson Memorial Laboratory, Bar Harbor, Me., disclosed a maternal influence in mouse breast cancer.

When the young of a high-cancer strain mouse were foster-nursed by a female of a low-cancer strain, the young failed to develop cancer at the appropriate age as would have been expected. The experiment was then reversed, and many mice later developed breast cancer. These studies indicated that some factor in the milk was inciting the cancer, and that this "factor" or "agent" seemed to have many characteristics of a virus.

In the search for the specific gene or genes responsible for the transmission of this "milk factor," three strains of mice were used: one that possessed the tumor agent and was genetically susceptible to it; one that did not have the agent but was genetically susceptible to it; and one that neither had the agent nor was susceptible to it. By a system of matings involving cross-breeding, genetic material of the resistant strain was introduced into a susceptible strain and progressively increased in succeeding generations.

The authors, Walter E. Heston, Margaret K. Deringer, and Thelma B. Dunn of the Laboratory of Biology, National Cancer Institute, believe that evidence is at hand indicating that the agent does not remain inactive over a number of generations only to suddenly reappear; the agent did not appear intrinsically or *de novo*; and not all mammary tumors of the mouse are associated with the agent and not all mice with the agent develop tumors. The presence of the agent merely increases the probability that a tumor will occur and its absence decreases this possibility.

News Briefs

■ Heart disease, which causes more deaths in the United States than any other disease, does not rank among the top three most serious illnesses in any Asian country. In Asia, the top killers are epidemic diseases and others such as tuberculosis, beri-beri, cancer, malaria, yaws, and pneumonia.

In Japan, heart disease was the fifth most frequent cause of death in 1954 with a rate of 59.8 per 100,000, the highest rate in Asia. In the United States in 1950, 745,074 persons died of heart disease—a rate of 494.4 per 100,000 population. In 1953, this jumped to 794,120 deaths—a rate of 501.4 per 100,000.

■ The United Nations Educational, Scientific and Cultural Organization has announced that an experimental solar still to remove minerals from water has been erected at Mildura in Australia. The device consists of a glass structure set over a shallow trough of black plastic. Water to be treated is siphoned into the trough and evaporated by the sun shining through the glass canopy. The vapor condenses and drains into storage tanks. It may be possible to use the still to provide an inexpensive method of purifying water from artificial wells for agricultural and household uses in areas that receive little rainfall.

■ The first house in Britain to be heated by solar energy will be ready for occupancy in September. The special heating equipment, details of which are secret, is being installed. Leslie Gardner of the Western Detail Manufacturing Company Ltd., Bristol, is the inventor of the system and designer of the house. He will be visiting the United States this summer, probably in mid-August, when he will go to Detroit and Chicago in the hope of interesting American industrialists in his idea.

■ The nation's new $750,000 magnetic observatory and laboratory opened recently at Fredericksburg, Va. It replaces the old magnetic observatory at Cheltenhem, Md.

■ Both the United States and the Soviet Union have officially endorsed Vienna as the site of headquarters for the proposed International Atomic Energy Agency.

■ Pakistan has started the construction of a national science institute at Lahore, the United Nations Educational, Scientific and Cultural Organization reports. Recently representatives from Australia, India, Britain, the Soviet Union, and the United States attended a ceremony for the laying of the cornerstone.

The institute, the Ismail Science House, is to be completed in a year. It will have a library of 250,000 works, Pakistan's first comprehensive scientific library. It also will have a bibliographic and documentation center, a modern auditorium, a research center, a press and publication department, offices for scientific societies, club rooms, and a cafeteria.

■ The Woods Hole Oceanographic Institution has spent $200,000 converting the former Coast Guard cutter *Crawford* for hurricane research. The vessel left on 1 July for a 6-week cruise.

The *Crawford*, which is 125 feet long and 23 feet wide, has been air-conditioned and is capable of carrying food for 1 month for a crew of 14 and an 8-man scientific staff. The ship has two laboratory areas, and her scientific equipment includes a deep-sea winch with 25,000 feet of 5/32-inch wire, radar, two Long Range Navigation sets (Loran), a Raytheon shallow water echo-sounder, an Edo deep water echo-sounder, a special precision echo-sounder recorder developed at Woods Hole, two small winches for temperature measurements down to a depth of about 1000 feet, a continuously operated motion picture camera that will photograph the sea surface by exposing one frame every second, sea temperature measurement devices,