TECHNOLOGY

Subsonic Wind Tunnels Aid in Research

➤ AIR TRAVELING slower than the speed of sound is being critically examined in an unusual wind tunnel built in Linden, N. J., by scientists of the Esso Research and Engineering Co.

Less generally heard about than supersonic wind tunnels that are used in aircraft testing, subsonic wind tunnels are important in determining facts about air pollution and air conditioning, and for checking aerodynamic shapes used in industry.

A special design gives one of the widest ranges of air flow from a subsonic tunnel in existence. An import from the world of music—a Sousaphone bell—gives unusually uniform air flow along the tunnel's throat.

The precise determination and measurement of air patterns has become an important factor in industry, particularly in the petroleum field, according to Richard Brief, who is in charge of the wind tunnel studies.

The new wind tunnel is able to produce and examine air flows ranging from "still air," which actually moves at about 20 feet a minute, to air traveling at 5,000 feet per minute, or at the approximate speed of a small hurricane.

• Science News Letter, 78:120 August 20, 1960

AERONAUTICS

Orbiting Jet Seen As "Ultimate Airplane"

➤ THE "ULTIMATE AIRPLANE," which will fly at 17,000 miles an hour or 25 times the speed of sound, was described by Alexander Kartveli, a Russian-born aircraft engineer responsible for the development of 14 aircraft types.

Mr. Kartveli, now vice president of research and development for Republic Aviation Corporation, told the Institute of Aeronautical Sciences national meeting in San Diego, Calif., that the craft would be the last major type before aircraft makers turn most of their attention from aviation to astronautics.

It will be 170 feet long, 33 feet high and have a wingspan of nearly 99 feet. Its front will be a massive series of air ducts to draw huge quantities of air into four hydrogen-burning engines in combination with four ramjets.

It will be capable of taking off from the ground with a substantial military load, accelerating to orbital speed, orbiting around the earth and landing on earth when desired.

Mr. Kartveli said design consultants for Republic have already done basic exploratory work on the combustion scheme to power such a craft.

He also presented designs for three generations of planes he believes will come before the "ultimate":

1. A fighter-bomber, capable of vertical take-off, that could fly at 1,500 miles an hour. It could pinpoint bombs on a target from 75,000 feet.

2. A nuclear-ramjet strategic bomber, to be produced between 1970 and 1975, that would fly at 2,800 miles an hour and cruise at 85,000 feet. Its two-man crew would be in a shielded compartment. This bomber would eliminate U. S. reliance on allied bases.

3. A 4,960-miles-an-hour bomber, shaped like a great triangle, capable of flight at 120,000 feet. With two ramjet and two turbojet engines, it would have a range of 5,000 miles.

• Science News Letter, 78:120 August 20, 1960

AERONAUTICS

New Jet Lift Fan Shown, Plane Type Predicted

See Front Cover

➤ A LARGE COMMERCIAL TRANSPORT that can take off and land vertically is foreseen by engineers who announced a new "lift fan" propulsion system.

The plane, which would need no runway, could pick up passengers in the center of a city for short trips to nearby cities. The engineers say the plane could be developed by 1970.

It would use a turbojet engine. The engine's thrust would be diverted to the "lift fan," whose rotor is shown on the cover of this week's SCIENCE NEWS LETTER, for take-off and landing. The exhaust gases would turn the fan, which would in turn produce vertical thrust.

The system was shown by General Electric's Flight Propulsion Laboratory Department at the annual meeting of the Association of the United States Army in Washington, D. C.

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PSYCHOLOGY

Blonde "Eye-Openers" Dilate Men's Pupils

➤ THOSE CURVY BLONDES referred to as "eye-openers" really are.

Two University of Chicago scientists report a study of six men and women in which the subjects were shown pictures of a partially nude man and a partially nude woman, among others.

The men's pupils, which act like the lens opening on a camera and primarily expand in response to available light, also expanded greatly for the near-nude female, much less for the near-nude male.

The women opened their eyes for the man, reduced their aperture for the female. The women, none of whom had children, opened their eyes widest, however, for a picture of a woman and child.

Dr. Eckhard H. Hess and James M. Polt report in the American Association for the Advancement of Science's journal Science, 132:349, 1960, that their study was limited to six subjects.

To the lines of Guillaume de Salluste, "These lovely lamps, these windows of the soul," the scientists add that there was increasing evidence that the pupils do register directly certain activities of the nervous system.

• Science News Letter, 78:120 August 20, 1960

IN SCIEN

ASTRONAUTICS

Small, Shielded Section Needed in Space Ship

➤ SPACE TRAVELERS may have to squeeze into a tiny, heavily shielded compartment in their space vehicle while going through the earth's radiation belts and through storms of solar protons in space.

Such a protective addition to the operating area of a manned space ship was predicted by J. W. Keller and N. M. Schaeffer, both of the Convair Division of General Dynamics in Fort Worth, Texas. They reported a shielding study to the Pacific General meeting of the American Institute of Electrical Engineers in San Diego, Calif.

The use of a small shielded compartment would eliminate the necessity of heavy shielding for the larger area in which astronauts will be able to live and work once they are past the radiation belts, provided solar protons are not present in large numbers, as they are about ten times a year.

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ANIMAL HUSBANDRY

Male Chicks Help Lick Hens' Insect Problems

➤ YOUNG MALE CHICKS are used to eliminate flies around laying hens in a new fly-control system developed by a technician, John Rodriguez, at the University of California, Riverside.

Previous methods have involved the use of poison sprays or mists. However, Mr. Rodriguez' method is to place young male chicks (cockerels) under the cages of the hens.

The cockerels eat almost all fly larvae and pupae, thereby eliminating thousands of potential flies.

The method, in addition to being safer than chemical methods, is less expensive, because hatcheries will provide the males free, as they are unproductive. The rancher raises the chicks in a brooder, inoculates them against disease and releases them under the cages of his hens, where they eat the larvae.

There are three main disadvantages to the older chemical prevention:

1. Chemicals that at one time were effective are becoming less so, due to the building up of an immunity by the flies.

2. Chemical control involves the danger of a toxic residue on birds and eggs.

3. Chemicals are expensive. Also, there is additional cost for application.

On one of the farms that tried Mr. Rodriguez' system on an experimental basis, 750 cockerels were used to control flies among 35,000 laying hens. If the insect problem is severe, however, one chick might be needed for each 10 or 20 hens.

• Science News Letter, 78:120 August 20, 1960

SCIENCE FIELDS

PUBLIC HEALTH

Farm Chemicals Prove Hazard in California

➤ FARM CHEMICALS have harmed hundreds of persons in California, state health officials report.

As the use of insecticides, chemical fertilizers and soil additives has increased, so has the number of reports of occupational disease attributed to these agents, California state officials say in the Archives of Environmental Health, 1:18, 1960, published by the American Medical Association.

Goldy D. Kleinman, Dr. Irma West and Marguerite S. Augustine, all of California's State Department of Public Health, say there were 749 reports of disease attributed to the chemicals in 1957. Nearly a third of these were attributed to organic phosphate pesticides.

These "are among the most hazardous materials used as pesticides," the officials say. "Organic phosphate chemicals may enter the body directly through the skin, as well as by inhalation and swallowing.

"Since many persons find the concept of poisoning through the skin hard to understand, workers often fail to wear protective clothing when applying such chemicals and to wash themselves thoroughly afterward."

Other pesticides contain nicotine, fluorides and arsenic compounds, any of which can be hazardous. California is estimated to use one-fifth of the total quantity of pesticides in the United States. One death attributed to agricultural poisoning was recorded in 1957.

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PUBLIC HEALTH

Russia Plans to Wipe Out Malaria There in 1960

➤ SOVIET HEALTH OFFICIALS seek to completely eradicate malaria in Russia this year and to reduce diphtheria, rabies, hookworm disease and Taeniarhynchus (a beef tapeworm) infestation to the point of sporadic occurrence by 1965, according to a translation by the Central Intelligence Agency. The report is distributed by the U. S. Department of Commerce, Office of Technical Services.

At the present time, malaria as well as tularemia have almost been wiped out, according to L. A. Sakvarelidze, deputy chief of the State Sanitation Inspection of the Ministry of Health in the USSR, whose report appeared originally in Meditsinskaya Sestra. Cholera, plague, black smallpox and parasitogenic typhus infections have been completely eradicated, he reports.

In January, a conference called by the Ministry of Health and other medical groups evaluated health services at regional and local levels and found them to be considerably improved, but the medical men are still concerned over communicable diseases and the use of vaccines to curb them.

To ease the burden on doctors, the Ministry plans to train subprofessional personnel, such as midwives, in immunization and epidemiology.

By 1965, health agencies should have made a sizable reduction in the incidence of polio, typhoid fever, whooping cough, tetanus, brucellosis and other infections.

• Science News Letter, 78:121 August 20, 1960

TECHNOLOGY

Tiny Drum Could Carry Information in Satellites

➤ ENGINEERS can put 100,000 bits of information on a stainless steel memory drum only three inches long and three inches in diameter. It weighs only six ounces.

Its lightness and smallness make it excellent for use in airborne or satellite computers, the developers at International Business Machines Corporation's federal systems division laboratory in Owego, N. Y., reported.

The drum, a thin steel shell, spins at 6,000 revolutions a minute within a lightweight frame. Magnetic pickup and recording heads are imbedded on the frame. These record or play back information while riding on a cushion of air 100-millionths of an inch away from the drum.

The drum and its assembly weigh eight pounds. Conventional drum assemblies weigh about 235 pounds.

• Science News Letter, 78:121 August 20, 1960

MEDICINE

Cholesterol Symptom Reduced by Exercise

➤ AFTER A FATTY MEAL, the blood plasma may show delayed clearing of cloudiness, which is thought by some researchers to indicate a high cholesterol level that may cause coronary heart disease. But tests have shown that healthy persons can speed the clearing of their blood by a little exercise.

The tests were made on 22 healthy medical students. "In a statistically significant number of cases," when they walked or cycled after a standard meal containing 60 to 75 grams of fat, the plasma cloudiness was less than when they rested.

The investigators, Harold Cohen, senior registrar at Royal Hospital, in Sheffield, and Cissie Goldberg, a statistician, report their work in the British Medical Journal, Aug. 13, 1960.

For breakfast the students, after an overnight fast, were given a standard meal such as cornflakes, medium fat fried bacon, butter, a fried egg, two ounces of cream and three ounces of milk. No restriction was placed on the amount of bread, coffee or tea or marmalade that could be taken.

The researchers tentatively concluded that exercise might well be beneficial to persons inclined to atherosclerosis.

• Science News Letter, 78:121 August 20, 1960

PUBLIC HEALTH

No Paralytic Polio In Denmark in 1960

➤ DENMARK has had no cases of paralytic polio so far in 1960. Yet no one knows how long the polio virus vaccine protection will last, Dr. Herdis von Magnus of the Entero-virus Division of Statens Seruminstitut, who was responsible for all the polio vaccine made and used in Denmark, said.

About 2,500,000 persons of the 4,500,000 population of Denmark have been vaccinated with a Salk-type inactivated, or killed, polio vaccine.

Dr. von Magnus said there are a number of difficulties in predicting the duration of the immunity from the vaccine:

1. The polio vaccines have differed greatly in antigenicity from batch to batch and from year to year.
2. The immunization schedules used have varied from time to time and from one country to another.
3. The antibody response and the duration of immunity vary considerably in different persons, even when the same vaccine is used.
4. The bulk of data on the decline in immunity level comes from studies in school children whose immune response differs from that of adults.

For these reasons, she said, many more studies must be made before the duration of immunity from polio vaccine can be predicted.

She added that little is actually known about the duration of immunity in humans after the use of any virus vaccine, live or inactivated. Live virus vaccines like smallpox and yellow fever vaccine have been seen as ideal vaccines producing life-long protection. Yet, even now, exact knowledge of these vaccines is lacking.

Dr. von Magnus said the vaccination program in Denmark began in 1955. Today 90% of the population under the age of 40 has been vaccinated against polio. Most persons have been vaccinated three times, free of charge.

Last year, in 1959, a fourth vaccination was offered free to those of the population under 18 years of age. Eighty percent of those under 18 got this fourth vaccination.

• Science News Letter, 78:121 August 20, 1960

DENTISTRY

Six-Ounce Unit Checks Heart During Dentistry

➤ A HEART MONITOR attached to the arms of dental patients under anesthesia will warn dentists of cardiac changes.

The small instrument was invented for use in hospital operating rooms by Dr. William F. Veling, a Detroit surgeon. It is suggested for dental use by the medical equipment department of Chemetron Corporation's National Cylinder Gas Division.

The six-ounce monitor translates heart activity into audible "beeps." A change in the beeps coming from the instrument would warn dentists and their assistants of heart disturbances, including cardiac arrests.

• Science News Letter, 78:121 August 20, 1960