

AERONAUTICS

Airplane-Design Graphs Warn of Thermal Barrier

► ADVANCE WARNING of how the formidable thermal barrier will attack tomorrow's supersonic planes now can be obtained quickly from new graphs created by New York University research engineers under an Air Force contract.

The graphs permit aircraft designers to predict almost at a glance how hot the plane's "skin" will become as it rams through the air at speeds up to five times the speed of sound. At this speed, planes generate scorching heat due to air friction.

Called the thermal barrier, this frictional heat has become one of the aircraft designer's major problems. It is as imposing today as the sonic barrier was a decade ago. The heat affects not only the mechanical performance of the plane or missile, but also its fuel, interior equipment and human or automatic pilot.

Under the direction of William D. Murray and Lawrence Slotc, the New York University research team confirmed that to cool the total surface of an airplane flying five times the speed of sound requires as much refrigerating equipment as would be needed to air-condition a large building in the tropics.

By studying and analyzing a flat plate under known conditions, the research team was able to produce graphs which, with minor modifications, can be applied to aircraft surfaces. The graphs permit engineers to determine quickly the temperatures that will be encountered by planes flying as high as 100,000 feet and at speeds of five times that of sound.

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GENERAL SCIENCE

Scientists, Students Urged to Learn Russian

► AMERICAN SCIENTISTS should possess a reading knowledge of Russian and this language should be a required subject in studies leading to a Ph.D. degree in scientific fields.

This was advocated by Dr. Irving S. Bengelsdorf of the University of California at Los Angeles, who has made a special study of scientific Russian.

The increasing eminence and future development of Soviet science make it imperative that well-informed American scientists keep abreast of scientific developments in the U.S.S.R., he said.

Although abstracts of Soviet journal articles have become available in recent years through a State Department exchange program, it is often more desirable for the scientist to read the original article.

Dr. Bengelsdorf found it necessary to learn the difficult language to thoroughly explore his current field of investigation—organophosphorus compounds. Most of the literature on the subject was in Russian, as

Soviet scientists had performed the majority of work in this field.

"It is evident that the Russians are creating a vast pool of trained scientists, which may soon be larger than the number of trained scientific personnel in this country," he declared.

"Scientists in Russia belong to the upper stratum of the 'classless' Soviet society. The prestige and relative economic and social advantages of a scientific career is a great factor of attraction to young Soviet intellectuals."

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BIOCHEMISTRY

Pituitary Plays Part In Fat Utilization

► THE OVERWEIGHTS and underweights in the population may, at least some of them, be able to blame their condition on their pituitary gland, famous as producer of anti-arthritis ACTH.

Studies suggesting this were reported by Drs. E. B. Astwood, M. S. Raben, I. N. Rosenberg and V. W. Westermeyer of Tufts College Medical School at the meeting of the National Academy of Sciences in Cambridge, Mass.

The pituitary, these scientists think, may play an essential part in regulating normal utilization of fat during fasting. This suggests that it may be concerned in states of over- and under-nutrition.

The scientists from Tufts tested, on mice, a purified pituitary extract with adrenal stimulating properties called corticotropin. Tiny doses, they found, caused rapid mobilization of depot fat to the liver and a rise in the rate of body chemical processes when the mouse was fasting. In fed animals, the extract caused a lowering of the rate of metabolic, or chemical, processes. Larger doses protected both fed and fasted mice against convulsions and low blood sugar when insulin was given, but when given without insulin, the extract in the larger doses had the contrary effect of lowering the blood sugar.

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TECHNOLOGY

New Lightweight Hose Speeds Ship Refueling

► THE U.S. Navy has installed a seven-inch hose on its seagoing tankers to speed up refueling operations at sea.

The new hose weighs no more than the six-inch hose it replaces when both hoses are filled with oil. The weight saving was achieved by the elimination of heavy metal nipples, and through the use of a B. F. Goodrich special hose.

Because of its weight, the six-inch hose was the largest that could be handled easily at sea. The new hose is reinforced with high tension steel wires at points where it is suspended across water by ships' hoists.

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METEOROLOGY

Forecast Above Normal Temperatures

► ABOVE NORMAL temperatures for the eastern half of the nation, with the exception of the Gulf states, were predicted for the period until mid-December by long-range forecasters at the U. S. Weather Bureau.

However, Jerome Namias, chief of the Bureau's extended forecast section, pointed out that such a forecast does not mean that there will be no cold weather east of the Mississippi before that time. There seems to be, rather, a continuing, near-weekly alternation between cold weather and warm weather, and the warm weather spells on the whole will predominate in the eastern half of the country until mid-December.

West of the Continental Divide and in west Texas, the long-range forecasters predict that temperatures will average below normal until mid-December. In the regions not specified, near normal thermometer readings are expected.

The precipitation, which can be either snow or rain for much of the country at this time of year, is expected to be "in excess of normal" over most of the nation, except in the South Atlantic and northern plateau states, where subnormal amounts are in prospect.

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VETERINARY MEDICINE

Vaccine to Be Tested On Thailand Cattle

► THE VACCINATION of 70,000 cattle in Thailand before next June will test a new vaccine for hemorrhagic septicemia, a serious and often fatal animal disease in many parts of the world.

The vaccine was developed by Dr. R. V. S. Bain of the University of Sydney, Australia, who did a part of the research for the vaccine in this country on a Fulbright scholarship.

Hemorrhagic septicemia annually flares up in Thailand at the start of the monsoon season in July. The cattle will be vaccinated to test the vaccine under field conditions. The mass vaccinations will be done through the Food and Agriculture Organization of the United Nations.

Most American veterinary scientists believe that cattle shipping fever in this country is a different form of hemorrhagic septicemia and the vaccine will probably not be useful here. The disease is of minor importance here.

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CE FIELDS

TECHNOLOGY

"Electronic Machinist" Works Like Phonograph

► MAKING A specialized airplane part some day will be as easy as putting a record on the phonograph.

An electronic machine control being built in Schenectady, N. Y., will do the trick, taking its instructions from a magnetic tape instead of a phonograph disk. The control will tell the machine what to do and, without human attention, the machine will turn out the part.

The tape of instructions will be made when a human operator first makes a part he wants "recorded." As the machinist works his tool to produce the part, the motions are translated into electrical impulses and deposited on the recording tape for future playback to produce the part.

Currently under development by General Electric engineers, the first commercial model of the "electronic machinist" is scheduled for shipment in early 1954. It will serve as the nerve center for a milling machine and is expected to double production speed of self-reinforced "skin" structures for jet planes.

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SURGERY

Blood Shunting Saves War Jaundice Victims

► FOR THOSE of the 60,000 to 80,000 World War II veterans whose livers may now be showing damage from jaundice suffered during the war, a blood-shunting operation may prove life-saving, Dr. Robert Coffey of Georgetown University Medical School, Washington, told members of the Association of Military Surgeons of the United States meeting in Washington.

Some of these veterans got jaundice from the liver infection called epidemic hepatitis. Others got it from the early yellow fever vaccine shots. More and more of them, Dr. Coffey said, are now getting into the chronic state in which the disease-scars of the liver cause obstruction of the portal vein which drains the liver. As a result, too much pressure builds up in this vein system and massive bleeding from enlarged veins in the esophagus occurs.

Half of those who bleed from these esophageal varices will die within a year from further bleeding, Dr. Coffey said.

The blood-shunting operation he described stops this. The operation shunts blood from the portal vein to the vena cava, which is the main vein of the body. This lowers the pressure in the liver vein system by 300 to 400 millimeters of water and thus averts

the danger of further bleeding. With the patient saved from this immediate danger, medical men can treat the liver to improve its condition.

Besides the liver damage, some of these jaundice patients also develop an enlarged spleen. In such cases surgeons can remove the spleen and connect the splenic vein to the kidney vein which again detours the blood to the general vein system of the body.

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GENETICS

Breeding Short-Cut For Plants Successful

► NEW PLANTS will be produced years earlier than previously possible by use of a powerful drug that fixes a desired characteristic for heredity, Dr. J. G. Ross and C. J. Franzke of the South Dakota Agricultural Experiment Station reported at the American Society of Agronomy meeting in Dallas, Tex.

Colchicine has stabilized the characteristics of a new strain of sorghum seedlings in a single year so that the characteristics are transmitted to succeeding generations. Treatment of sorghum seedlings with colchicine produced a wide variability in the plants, the agronomists said. The treatment then fixed a chosen characteristic for transmission to later generations.

In the past, plant breeders have often spent many years developing a plant strain with certain desired characteristics. Frequently the seed of such plants is sterile or the characteristics are not transmitted to succeeding generations.

An examination of four generations of the sorghum seedlings in their experiments showed that, under controlled conditions, the desired changes in the plant were immediately and permanently established in the new varieties, they said.

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PSYCHOLOGY

Different Tests Give Different I.Q. Scores

► IF YOUR child gets a higher IQ rating on a school intelligence test than he did some time ago, it does not necessarily mean that he is getting brighter.

When the same examiner uses different tests to measure the mental ability of the same child, the results differ even when the tests are given within three months. This was reported in *Science* (Nov. 13) by Dr. Ralph Mason Dreger of Florida State University.

The scores of one six-year-old child tested under Dr. Dreger's direction varied from 89 to 111, those of an eight-year-old from 101 to 153. An IQ of 100 is normal.

In spite of these differences in the scores of individuals on different tests, the average for the group was found to be just about the same.

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MARINE BIOLOGY

Arctic Shrimp Have Big Beds But Small Sizes

► THE WORLD'S largest individual shrimp beds have been found off the coast of Greenland, but the chances are you will not get any Arctic shrimp as appetizers.

Shrimp taken in northern waters tend to be half the size of the familiar Gulf of Mexico shrimp. Running nearly 100 shrimp to the pound, the market for them in the past has been small.

Dr. Paul Marinus of Denmark has reported the discovery of the beds to the Northwest Atlantic Fisheries Commission. It is possible that the Danes may try to develop the fishery.

Frozen peeled shrimp from Iceland were once imported into this country but the experiment was not successful. American housewives are too fond of the jumbo shrimp from the Gulf of Mexico, which usually runs around 40 shrimp per pound but may go as low as 25 to 30.

The Greenland shrimp beds are all in the Disko Bay region about halfway up the western coast of the huge island. Each bed is 10 miles long and five miles wide.

Similar northern shrimp are caught off the coast of Maine and Alaska. They are usually marketed after boiling and shelling as peeled shrimp.

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PSYCHOLOGY

Bronze Plate Rated Human Qualities in 1826

► "RATING SCALES" are not a new thing after all. This device for showing the judgment of a supervisor or teacher with regard to personality traits of an employee, applicant or student has in recent years come into wide use.

Now it has been found that such a scale was invented more than 100 years ago by Robert Owen, leader of the New Harmony social experiment and leader in improved educational methods. Discovery of what is now believed to be the original rating scale in the New Harmony museum is reported by Prof. Douglas G. Ellson, psychologist of Indiana University, and his wife to the *Psychological Bulletin*.

Owen's scale was not printed on paper as are the modern counterparts. It is a bronze plate, seven by 12 inches. The list of personality traits includes courage, strength, imagination, memory, affection, judgment, self-attachment, reflection, perception and excitability. Opposite each trait is a sliding strip which, before the scale was damaged by fire, could be set anywhere on a scale of 100 points. The Duke of Saxe-Weimar reported seeing Owen's scale on a visit to New Harmony in 1826.

Previously, invention of the rating scale has been credited to the anthropologist, Sir Francis Galton of England, in 1884.

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