

AGRICULTURE

Exhaled Carbon Dioxide Helps Mosquito Zero In

► THERE IS ONE sure way to be less attractive to biting mosquitoes—stop breathing. Carbon dioxide, the chief gas exhaled in breathing, is a virtual homing beacon to mosquitoes, the U. S. Department of Agriculture has discovered.

In experiments aimed at finding a better insect repellent, entomologists C. N. Smith, I. H. Gilbert and H. K. Gouck of USDA's insect laboratory in Orlando, Fla., dressed a man in a lightweight diving suit and put him in a small room with three man-sized dummies and 300 *Aedes aegypti* mosquitoes, the kind that carries yellow fever.

The mosquitoes showed no preference for the man, whose breath was piped out of the room, until small amounts of carbon dioxide were released from a tank above his head.

Draping a cloth suit also made him more attractive to the mosquitoes as did uncovering his hands, regardless of carbon dioxide.

Exposing the face did not draw *A. aegypti*, but it did lure *A. taeniorhynchus*, a voracious biter found near salt marshes.

Such differences in preference also occur among flies, where different species prefer to bite cattle of different colors. Horse flies prefer red cattle to white ones, stable flies are most attracted to black cattle, a study showed.

Knowledge of this type, the entomologists report in Agricultural Research, May, 1961, could result in a repellent that does not actually repel, but rather masks the attractive factor.

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MEDICINE

Skin Diphtheria Spread By Returning Troops

► TROOPS RETURNING from foreign lands could cause an increase in skin diphtheria, now rarely found in the United States, physicians are warned in the Journal of the American Medical Association, 176:273, 1961. Skin diphtheria, which takes the form of ulcerated sores, can be cured by penicillin, but requires tests to differentiate it from similar-appearing skin diseases, Dr. Tobias R. Funt, Fort Lauderdale, Fla., reports.

Physicians also will be reading in the official journal:

Radioactive iodine has produced some striking improvement in 356 persons with overactive thyroid glands and some forms of heart disease.—Drs. Clement Delit, Solomon Silver, Stephen B. Yohalem and Robert L. Segal, Mount Sinai Hospital, New York (p. 262).

Blood pressure has been lowered in a group of patients with hypertension by the use of Marplan, or isocarboxazid, which has been found to be more potent than iproniazide, a similar drug. Both are called monoamine oxidase inhibitors (MAO) and are capable of blocking the activity of enzymes that alter blood pressure.—Drs. Marvin Moser, Bernard Brodoff, Hirsch

Bakan and Aaron Miller of Montefiore Hospital, New York (p. 276).

Acute barbiturate poisoning, which continues to increase at an alarming rate (1,111 cases reported to the New York City Poison Control Center during 1958 alone), is usually better treated by supportive care than by stimulants such as caffeine, amphetamine and picrotoxin. Intake of alcohol with the barbiturate contributes to the depth of the coma but not to its duration, and no deaths occurred in patients who had taken both.—Drs. Joseph K. Dobos, Denver, Colo., and Drs. John Phillips and Gabriel A. Covo, Roosevelt Hospital, New York (p. 268).

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SURGERY

Special Anesthetic For Use in Antarctic

► HALOTHANE, a new anesthetic that can be administered with special apparatus under Antarctic conditions by a lay assistant, has been recommended for use by a British physician.

Dr. J. F. Nunn of the Royal College of Surgeons of England reported in the British Medical Journal, April 22, 1961, that convenient portable apparatus has been constructed for the safe use of halothane with oxygen. This apparatus requires no protection from extremes of temperature other than prevention of condensation within the vaporizer. Dr. Nunn said that an "intelligent layman" might be instructed to administer the anesthetic with the direction of the operating surgeon.

In the Antarctic, the most common operations are for appendicitis, strangulated hernia or perforated peptic ulcer. They must be performed in a hut, caboose or possibly a tent with open heating, where the temperature can be raised to at least 64 degrees Fahrenheit, Dr. Nunn said.

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GEOPHYSICS

Surface Electric Currents Come From Earth's Core

► ELECTRIC CURRENTS flowing at the surface of the earth probably come from the earth's core, two British scientists reported.

These currents were started by the same mechanism that created the earth's magnetic field, Dr. P. H. Roberts and Dr. F. J. Lowes of King's College, Newcastle-upon-Tyne, England, stated. Electric currents sent out into the mantle surrounding the core generate another current that can be measured at the earth's surface.

By conducting a survey of the electric current system at the earth's surface, much could be learned about the little known movements of the magnetic field deep in the earth's interior, they report in the Journal of Geophysical Research, 66:1243, 1961.

Earth currents have actually been measured for many years by geophysicists, but these currents originated primarily from sources near the earth's surface.

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IN SCIENCE

METEOROLOGY

100 Lightning Flashes Strike Each Second

► ABOUT 100 lightning flashes strike the earth each second throughout the world.

This average is based on the number of storms that strike different parts of the globe throughout the year, Dr. Robert C. Davis of the National Bureau of Standards reported at a joint meeting of the Institute of Radio Engineers and the U. S. National Committee of the International Scientific Radio Union in Washington, D. C.

Weather maps of the World Meteorological Organization indicating the storm activity in Europe, United States and other parts of the world and the amount of electric charge generated by thunder clouds were both used to arrive at the 100 per second figure.

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MEDICINE

Fever Caused By Body Hormones

► TEN HORMONAL by-products normally occurring in the human body can cause intense fever not due to bacteria, a group of University of Chicago scientists reported to the American Society for Clinical Investigation in Atlantic City, N. J.

Dr. Atallah Kappas, head of the research group, outlined in his paper a whole new class of substances to which attention is being called in explaining such fevers. Assisting Dr. Kappas were Dr. Robert H. Palmer and Dr. Paul Glickman.

The first clue in this field of fever research was uncovered by Dr. Kappas when he found that one by-product of the body's hormone metabolism, etiocholanolone, has a new biological action in fever production. This was a breakthrough in understanding fever.

Since then, the University of Chicago group has found nine other hormonal compounds that can have similar effects unless they are normally disposed of in the body. The investigators believe that the liver usually serves as a monitor in preventing the hormonal by-products from producing body fever from day to day.

In clinical experiments, the scientists have produced intense fevers by injecting the following hormonal by-products in addition to etiocholanolone—all occurring in the human body:

From the ovary, pregnanalone, pregnandiol, pregnanedione; from the testis, etiocholanedione; from the adrenals, 11 hydroxy etiocholanolone, 11-keto pregnanalone, as well as the bile substances, lithocholic acid, ursodesoxycholic acid, and hyodesoxycholic acid.

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CE FIELDS

POLITICAL SCIENCE

Space Office Created By State Department

► THE DEPARTMENT OF STATE has officially recognized outer space. It has established a special office to handle all international problems dealing with the space frontier, including man in space and returning from space.

The man in charge is Dr. Philip Farley, 44-year-old career officer, who has been designated to advise the Secretary of State and assist in formulating policy and action on the exploration, use and control of outer space. He also is responsible in the same areas for the peaceful uses of atomic energy and has the title of special assistant for atomic energy and outer space.

To prepare for the U. S. orbit of a man into space, Dr. Farley's office has negotiated agreements with a number of countries to assist in tracking and gathering radio data for the manned launch, still scheduled for some time this year.

Dr. Farley's office also is responsible for coordinating all Government activities, both civilian and military, concerned with international cooperation in the fields of atomic development and space.

While the office is newly established, space has had a place in the State Department for more than two years. However, recognition of the importance of this new dimension was marked by its establishment.

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DENTISTRY

Signing Petitions Urged To Prevent Tooth Decay

► SIGNING petitions for water fluoridation in the offices of dentists, physicians and pharmacists was advised as a substitute for referendums that would allow the addition of a minute amount of harmless fluoride in public drinking water to prevent decay.

The emotional atmosphere surrounding referendums on the subject "leads to unintentional as well as deliberate distortion of the facts," Dr. Stanley J. Buckman, biochemist of Memphis, Tenn., told the National Dental Health Conference in Chicago.

Dr. Donald R. McNeil, State Historical Society of Wisconsin, Madison, said that "politics rather than science" has taken over the fluoridation issue, and he urged a declaration of war against those who would deny the benefits of fluoridation to our children. He charged that "fluoridation has been wrested from the hands of the scientists and deposited squarely in the middle of the political arena."

The U. S. Public Health Service has estimated that the community lag in adopting fluoridation is depriving 40,000,000 children of protection from tooth decay and

is costing the United States \$452,000,000 a year in needless dental bills.

The American Dental Association has found that some 2,000 communities in the U. S. with a population of more than 38,000,000 persons have added fluoride compounds to their water.

Fluoride occurs naturally in some 1,900 communities with 7,000,000 inhabitants.

The American Medical Association as well as the ADA, the American School Health Association, the American Public Health Association, the National Institute of Municipal Law Officers, the Department of the Army and other organizations and agencies have approved fluoridation as a safe preventive of dental decay.

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GENERAL SCIENCE

Science Adviser Makes Recommendations

► THE SCIENCE ADVISER to the President is responsible for policy recommendations as well as scientific judgments, Dr. George B. Kistiakowsky, Science Adviser to former President Eisenhower, said at the annual meeting of the American Philosophical Society in Philadelphia.

During his tenure in the White House, Dr. Kistiakowsky was called upon for advice on national problems such as a Federal policy on food additives and issues related to nuclear testing and arms limitation, with their broad international implications.

Advice was given by Dr. Kistiakowsky on these matters after the technical and scientific background had been evaluated by the President's Science Advisory Committee.

For example, in considering the problems involved in a nuclear test ban agreement, the Science Committee would discuss and analyze the technical feasibility of a proposal, the possibilities of monitoring, whether the ban would affect the development of atomic weapons, and what sort of an organization would have to be established. On the basis of conclusions reached by the Committee, the Science Adviser would make his recommendations.

Before the establishment of the office of Science Adviser and the functioning of the Committee within the White House, policy makers in the Government had to rely largely on the advice of professional technically competent Government employees within their staffs. When problems affected more than one agency, the policy makers often were confronted with opposing advice from staffs of agencies involved.

It was this situation, Dr. Kistiakowsky said, that led the then President Eisenhower to create the post of Special Assistant for Science and Technology and to bring the Science Advisory Committee into the White House.

His aim was to obtain advice from technically competent persons not committed to any particular executive agency, thus bypassing the multi-layered staff of Government agencies, if necessary.

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ASTRONOMY

Model Star Burns at 630 Million Degrees

► A MODEL STAR, not the Hollywood type but the kind that becomes a red giant star in the center of galaxies, has been proved to burn at 630 million degrees Fahrenheit in the center.

The red giant stars have long been suspected of having a core of runaway heat processes inside them and this has now been confirmed in step-by-step computer calculations of helium burning in giant stars by Drs. R. Harm and M. Schwarzschild at Princeton University Observatory.

The scientists followed the development of the model star through its evolution when thermonuclear burning of helium begins. They found that 40% of the star was a core of helium with atoms stripped of their outer electrons and packed together to a million grams per cubic centimeter. A shell of burning hydrogen enclosed this helium core.

The helium burning sets in when temperature in the core reaches approximately 150 million degrees Fahrenheit. The helium burning becomes more and more rapid until the temperature reaches about 630 million degrees. At that time the core is releasing as much energy as is produced by ten million million suns, but none of it escapes from the star.

At such temperatures the star finally expands and the runaway climb in temperature stops. As the star expands it cools down and becomes a red giant. This process in the star is called a helium flash that lasts about 3,000 years, it is reported in the current issue of *Sky and Telescope*, 21:275, 1961.

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ASTRONOMY

Micrometeorite Showers Break Off Larger Meteor

► MICROMETEORITE showers raining down from the heavens are due to a large meteor breaking up when it enters the earth's atmosphere.

The disintegrating meteor causes the intense sparks and bright flare occasionally seen in the sky by eyewitnesses, Soviet Academician Dr. E. L. Krinov reports in the *American Journal of Science*, 259:391, 1961.

Fused crusts on tiny pieces of meteorites show that the meteors melted temporarily when they broke off from the larger meteor and later cooled, Dr. Krinov stated. Air currents in the atmosphere then spread the pieces over a large area where they eventually settled to the earth and became mixed with the soil.

All meteor showers will contain these tiny dust-like micrometeorites in addition to the larger fragments, Dr. Krinov said. The micrometeorites have all the main features of the larger meteorites.

Most scientists believe meteor showers occur when the earth's orbit passes through a concentration of tiny particles concentrated in space, possibly left by a comet.

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