

PUBLIC HEALTH

Experts See No Harm In Auto Air-Conditioning

HEALTH authorities do not see any hazard in a makeshift air-conditioning practice now in vogue in the torrid Midwest. The custom there is for motorists to refrigerate their cars by putting a block of "dry ice" on the floor and shutting all the windows. As the "ice melts," or evaporates, the air inside the car is cooled. A store in Des Moines, Iowa, specializes in "dry ice" for automobiles.

"Dry ice" is solidified carbon dioxide, so when the "ice melts," this gas passes into the air. This gas is normally present in the air in very small amounts. If the amount in the air reaches one per cent, animals and men begin to breathe a little faster and deeper. With two per cent carbon dioxide in the air, this effect is considerably increased, the breathing being much faster and deeper. At fifteen per cent, this effect is reversed, and the breathing is slowed. Breathing air with this much or more carbon dioxide for a few hours would make a person feel sick and would be dangerous.

However, long before this concentration is reached, Dr. R. R. Sayers of the U. S. Public Health Service explained, the motorist who refrigerates his car with dry ice will find himself breathing so uncomfortably fast that he will open his windows, allowing the gas to escape and thus averting any danger to himself or other occupants of the car.

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CLIMATOLOGY

18th Century Droughts Traced in Tree Rings

DROUGHTS that troubled farmers half a century before the Revolutionary War have left their records clearly written in the rings of New England trees, Prof. Charles J. Lyon of Dartmouth College has found (*Ecology*, July).

A tree ring represents the amount of wood grown in a given season. In a good year it is thick, in a droughty or otherwise bad year it is thin. Long-past alternations of good and bad years have been read successfully in other parts of the United States, particularly the Southwest, but hitherto the records from New England have been confused and contradictory. By studying a larger number of tree stumps, in several different loca-

tions in New Hampshire and Vermont, Prof. Lyon has at last been able to "make sense" out of early New England weather.

"Many years since 1600 are found to have been outstanding for the good moisture conditions available for plant growth," he states. "During the same three and a third centuries, about twice as many years are marked by actual physiological drought which retarded plant growth throughout the entire area. Cyclic effects are not evident."

In comparing his ring measurements with old weather data, Prof. Lyon found official rainfall records less valuable than early crop reports. Typical notes from years of narrow tree rings are:

1727: "Hay scarce on account of drought."

1736: "Corn scarce."

1741: "Hot and dry all summer."

1749: "Dry until July 25th."

1762: "Forest fires; public prayers and fast on account of the 'grievous drought.'"

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PHYSIOLOGY

Milk, Water, and Salt Hot Weather Health Aids

MILK, water, and salt are hot weather health aids, it appears from studies reported by Dr. Cecil K. Drinker, dean of the Harvard School of Public Health. Dr. Drinker discussed the effects on the body of high temperatures and humidities at the symposium on environment and its effect on man, being held as part of the Harvard Tercentenary celebration.

A man doing hard work in high temperatures must have plenty of food and water and he should take half an ounce of salt a day to replace the amount that will be lost from the body in perspiration, Dr. Drinker said. He can see no reason for limiting unduly the amount of protein food such as meat, eggs, and cheese.

High humidities and direct sunlight may intensify the heat effect and make you uncomfortable, but Dr. Drinker does not believe they are of great consequence so far as health is concerned. For the white man, life in the tropics depends on a severe discipline which is hard to maintain in the tropical climate. Dr. Drinker advises for white residents in the tropics a moderate amount of simple food, plenty of water, an adequate amount of salt, daily exercise, no alcohol or excesses of any kind, and plenty of sleep.

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IN SCIENCE

BIOLOGY

Bats Migrate Like Birds, Have Homing Instinct

BATS migrate like birds, though not to such great distances. Like birds, they know the way home again. Female bats have a second "home"—a nursery cave, where their young are born, and where males very rarely intrude.

These are among the results of an intensive study of bat ways conducted by Dr. Martin Eisentraut of the University of Berlin. (*Forschungen und Fortschritte*, July 10-20).

Dr. Eisentraut attached identifying bands to over 6,000 bats, after the manner of banding birds. He did this while the bats were in their winter quarters in two places in central Germany. Captured and reported subsequently, the bats showed migration tendencies principally toward the north and east, but their range was not great. In no case did it exceed 300 miles, and many of the little animals did not fly more than four or five miles from the winter cave.

In winter quarters, male and female bats share the same caves, hanging in great clusters from the ceiling and wall projections. But the nursery cave is distinctly a "no man's land"; male intrusions are probably mostly accidental.

Bats' ability to find their way back to the home cave after their summer wanderings indicates a strong locality sense, comments Dr. Eisentraut. This is doubly developed in the females, which must keep track of the location of the nursery cave as well as the over-wintering cave.

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ENGINEERING

Molasses Used for Roads To Make Dustless Surface

MOLASSES is being mixed with surface soil on the roads of Mysore Province in India to produce a cheap highway that is dustless, wear-resisting and impervious to all but the heaviest rains, states a report to the U. S. Department of Commerce.

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FIELDS

DENDROLOGY

Street Lights Cause Delay Of Autumn Loss of Leaves

IF YOU have a street light and a shade tree close together, in front of your house, watch the leaves on the branches nearest the lamp, when the tree begins to lose its foliage this fall. The chances are that the branches getting the most light will keep their leaves longest.

Observations on the behavior of night-lighted street trees have been made by Dr. Edwin B. Matzke of Columbia University. He reports (*American Journal of Botany*, June) the retention of leaves by the most strongly illuminated branches, considerably past the date of leaf-fall from the rest of the tree. His studies were made on Carolina poplar, two species of sycamore, and the crack willow—all trees able to survive the somewhat unfavorable conditions of New York City streets.

The poplar eventually lost all of its leaves in the normal way, but the leaves of the two sycamore species clung fast to the tree until frozen to death.

A relatively weak light, as much as 45 feet from the tip of the nearest branch, was able to cause retention of numerous leaves. Light intensity as low as one foot-candle or less may be effective, Dr. Matzke states.

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VITAL STATISTICS

Accidents Exceed Disease In Child Fatalities

MORE than twice as many children under 15 years are killed by accidents as by three common communicable diseases, measles, scarlet fever and diphtheria. This fact emerges in a study of fatal childhood accidents which has been undertaken by the U. S. Public Health Service. First section of the study, relating to automobile accidents, has just been reported by William M. Gafafer, senior statistician of the federal health service.

For children under one year of age mechanical suffocation leads the list of fatal accidents. At one and two years burns caused most fatal accidents. Auto-

mobile accidents and burns lead at three years. At four years and from then up to fifteen years, automobile accidents rank first as cause of accidental deaths. The study was limited to year 1930, most recent year for which accurate population enumerations exist.

Dr. Gafafer divided the country into four geographic regions, Northeastern, North Central, Southeastern and Western, and reviewed the fatality figures region by region.

The Northeastern region had most childhood automobile deaths per hundred thousand children. Next greatest number was found in the Western region. Then followed the North Central and finally the Southeastern with fewest deaths per hundred thousand children. This order was changed when the regions were rated according to deaths per hundred thousand registered automobiles or per 50 million gallons of gasoline consumed. Using these measures of mortality, the Northeastern region still led with most deaths, followed by the Southeastern, the North Central and finally the Western regions. The reason for the change in order, Dr. Gafafer explains, is that the Western region has more automobiles in relation to the number of children, and there is no subsequent change when gasoline consumption is considered because the number of gallons consumed per automobile varies but little in the different regions.

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PSYCHIATRY

Mental Disease Strikes All Nationalities Alike

FOREIGN-BORN persons in New York State are no more subject to mental disease than are native Americans, if allowance is made for difference in age and environment, reports Dr. Benjamin Malzberg, of the New York State Department of Mental Hygiene (*American Journal of Psychiatry*, July).

Although the average annual rates of first admissions to mental hospitals seem to indicate that the cases of mental disease among foreign-born are twice as numerous as among native Americans, these figures are misleading, Dr. Malzberg declares. The foreign-born are older, on the average, than the natives and consequently have had more chance to develop mental disease. They are also more concentrated in cities, where mental disease, or at least hospitalization for it, is more common.

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METALLURGY

Steel Failure Caused By Crystallites in Metal

SAFETY in skyscrapers, or bridges, and on the highways, depends upon how correctly engineers can estimate the strength of steel.

One way of learning something about this vital matter is to place a steel bar in a special machine which pulls it apart and records the strength of pull necessary to do this. Then the engineers see to it that a bar of this kind will only have to stand a small fraction of this rupturing strain.

But sometimes after long use, a steel part may fail even though the forces involved have been well under the supposed breaking point. "Fatigue failure," it is called.

Why is it that steel (and other materials, too) possesses this very human characteristic of getting tired? Two English physicists, Dr. H. J. Gough and W. A. Wood, are among those who have given an answer.

To find out what was going on inside of pieces of steel they shot penetrating X-rays through them. Reflected onto a photographic plate, the rays formed a pattern which showed that the solid bar was really a structure of minute grains—hundreds of them to the inch.

Then they subjected the steel to all sorts of maltreatment and watched the X-ray patterns closely. Long before a piece broke, a breakdown of its internal structure could be seen developing.

In a fresh piece of steel the grains are arranged in a way which gives great strength to the mass as a whole. But violent strains continued long enough may produce changes. The grains seem to go to pieces at the boundaries, breaking up into much smaller grains—so small that tens of thousands would only line up to an inch.

These tiny "crystallites" (as they are called) are not regularly arranged as are the initial grains. The steel loses its virgin strength.

Fortunately, however, scientists Gough and Wood found that there is a safe maximum strain under which no amount of abuse seems to cause this crystalline disintegration.

It is incorrect to speak of "crystallizing" as a cause of steel failure. Steel always has a crystalline structure. But when fatigue occurs, larger crystals break down into much smaller ones, according to these investigators.

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