

## GENERAL SCIENCE

# Keeping Cool in Summer Heat

The clothes you wear, the food you eat and the exercise you take each day are some of the many factors which influence how cool you stay on the hottest days of summer.

► **UNLIKE THE PENGUINS** in Antarctica who spend the summer trying to keep warm, residents in the Northern Hemisphere spend most of their summer trying to keep cool.

If you suffer from heat frustration when the mercury hits the 90's, a little scientific knowledge of summer heat can help your body temperature and state of mind remain well within the comfort index.

It can help you decide what clothes to wear, what food to eat, how much rest and exercise is necessary, how to protect your home against heat, and above all—how to remain cool on the hottest days of summer.

Heat comes from within the body, depending on the amount of physical activity and energy required. The human body can produce between 100 and 1,000 calories of heat each hour, and it must lose approximately 75% of this in order to stay relatively cool.

## Dip in Water Refreshing

During a refreshing dip in water, one of the oldest cooling methods, or a lukewarm bath in the hot afternoon, your body will lose heat. The cooler currents of water will absorb the heat from your system as blood vessels dilate, carrying more blood near the skin surface for cooling.

An icy cold bath or drink of ice water is a shock to the heart and causes the blood to leave the surface and rush inward, raising the body temperature.

You are cooler sitting under a single shade tree than in a wooded sunlit thicket. A sheltered thicket protects you not only from the heat of the sun's rays but from ventilation as well. Only a little air can filter through the overhanging trees and shrubs, and therefore only a little heat can be absorbed by the air.

Perspiring is one way in which the body loses heat by evaporation.

Drinking a lot of liquids, especially fruit juices, helps the body perform the necessary functions of losing heat.

## Effects of Humidity

If the relative humidity is high, the air will be able to absorb only a little more moisture before reaching 100% saturation. If the relative humidity is low, a slowdown of the sweating process will cause the body temperature to rise.

Clothing during this period should be lightweight, low cut, loosely woven and stand away from the body, if possible, to allow proper ventilation. Clothes that cling to the skin cause considerable discomfort.

Colors can keep you cool psychologically

as well as physically. Blues, greens and lavenders are cooler to look at than the warmer tones of red, yellow and orange. But darker tones absorb heat, while white and the lighter pastels reflect it.

Staying cool and staying healthy is hard to do when the relative humidity hits 85% but some extra personal care during the hot months can help you feel relaxed, refreshed and mentally invigorated.

"We live in a brain or thinkers existence and not a muscle or doers one," believes Dr. Clarence A. Mills of Cincinnati, an expert on the effects of climate and weather on man.

## Brain Produces Body Heat

The brain produces most of the body's heat and it needs help in getting rid of the waste heat. In hot weather, people tend to take it easy. The annual summer droop occurs from failure to compensate through proper food, rest and exercise for the lowered level of living and heat production.

This increased difficulty of losing heat in summer slows down growth and maturity, reproduction, resistance to bacterial infection and mental capability.

Staying cool and at the same time healthy does not necessarily mean an increase in the amount of food you eat, but an increase of certain nutrients, such as amino acids and minerals. Although cells get energy from carbohydrates and fats, they need

extra proteins to complete combustion and added vitamins.

If physical activity causes you to perspire profusely and lose a lot of salt, failure to add more salt to your diet will cause heat cramps and muscle spasms, for example.

Dr. Mills recommends a normal amount of daily exercise to prevent heat letdown.

"The British and people in the tropics have long ago recognized physical exercise as necessary in reducing waste heat during the hot months," he says. It is necessary to watch the loss of salt and protein, however, or fever will develop.

The regular eight hours of rest will suffice during the summer, but short afternoon naps are advised if you find yourself becoming overly tired.

Modern artificial means of keeping a house cool include air conditioners and electric fans. But for those who have only the natural cooling features of the country—grassy lawns, giant shade trees and possibly a quiet stream—here are a few suggestions:

Since light colors reflect heat while dark colors absorb it, roof color can make a big difference in the temperature inside your home. Open attic windows or louvered ventilators will allow any breeze to sweep through your attic, cooling the ceilings below.

## Flat Roofs Hotter

Flat roofs are harder to keep cool than gabled ones, but watering a roof with a lawn sprinkler effectively reduces the temperature. As the water evaporates, it takes heat with it, drawing it out of the attic.

Light-colored curtains or shades at the windows and/or wooden overhangs and drawn shutters outside will stop heat before



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*COOL, MAN, COOL!—Mother, father and baby penguins have no trouble keeping cool these days in the icy plains of the Antarctica. You also should have no trouble, if you follow a few simple tips for sizzling hot summer days.*

it has a chance to enter the home. Insulating the walls, another heat trap in the home, or painting them white will also stop heat from entering. Western and southern walls need especial attention since they are exposed to the sun during the hottest part of the day.

### Night Air Can Be Trapped

Opening windows on opposite sides of the home will allow cross currents to remove the warm air. They should be opened as soon as the outside temperature equals the inside one. If windows are left open all night, they should be closed early in the morning to trap the cool night air inside.

Planting trees, grass and shrubbery while keeping the different exposures in mind helps to achieve a natural cooling system. Plants are nature's answer to keeping the

earth cool, and since plants "sweat" too, they provide an outer defense measure in absorbing heat.

Shade trees or plants should protect the western and southern exposures. Deciduous trees, those that shed their leaves in the fall, are preferable to evergreens that might keep sunlight out during the winter.

Vine- and rose-covered trellises and pergolas are another way of shading the home and stopping the heat. If you have a terrace, grass and moss between terrace stones instead of cement will reduce the sun's glare on hot brick or stone.

Homeowners can rarely introduce flowing streams or rippling brooks at will, but some achieve somewhat the same effect with a swimming pool. Hundreds of thousands of family swimming pools are now being built in the United States each year.

• Science News Letter, 86:10 July 4, 1964

## AGRICULTURE

# Grass-Killing Disease

**A lawn-killing disease that is difficult to control and spreads alarmingly rapidly, threatens to destroy lawns and golf greens throughout the eastern half of the United States.**

► PLANT EXPERTS have identified a fungal disease that threatens to wipe out lawns and golf greens all over the eastern half of the United States.

First observed in 1959, but only identified this year, *Fusarium* blight, an uncontrollable lawn disease, has already caused hundreds of thousands of dollars in damages to several eastern localities.

Even the Merion Kentucky bluegrass on the White House lawn was completely destroyed by the disease last year.

A Massachusetts golf green was completely wiped out in one week's time. In several Long Island communities, one week of mid-80 degree temperatures and fog provided the proper conditions for the *Fusarium* blight to destroy the sodded lawns of several hundred homeowners at a cost of \$8,000 each last year. When the fog cleared, the lawn grass was dead.

Prof. Houston B. Couch, plant pathologist at Pennsylvania State University, College of Agriculture, University Park, believes that the *Fusarium* threat poses a major problem to every golf green and sodded lawn in the eastern United States.

The disease spreads rapidly. It is transmitted by mowing equipment, shoes and the air. The spores of the *Fusarium* fungus, once started, are extremely difficult to check.

Signs of the blight appear only after it is too late to control it. "Haloes" of dead grass around green grass are the final signs of the infection on lawns.

The only thing that can be done is to completely resod the lawn, after fumigating with methyl bromide. The White House lawn was redone this way.

Some hope is provided by the commercially available fungicide, Dithane M-45, only if it is applied in time to halt the

fungus in the invisible early stages of the disease.

The disease seems to thrive best in cooler sections of the country, stated Dr. K. W. Kreitlow, plant pathologist at the Beltsville, Md., station of the U.S. Department of Agriculture.

*Fusarium roseum* is the organism causing the disease, which spreads with "alarming rapidity."

• Science News Letter, 86:11 July 4, 1964

## ZOOLOGY

# Blood, Not Hump, Lets Camels 'Store' Water

► CONTRARY to popular belief, the camel's ability to "store" water for those long desert trips is not due to the hump on its back.

A recent study by Dr. Kalman Perk of Hebrew University, Rehovoth, Israel, reveals that the camel's secret lies in the unique composition of its blood and the special nature of its body-temperature regulation mechanisms.

The hump, which is made up of fatty tissues, serves as a reserve supply of food, but does not hold the camel's water supply. This has long been known by scientists.

Nor is water stored in the camel's stomach, which is actually a series of separate compartments. The combined capacity of these compartments is little more than a gallon, while the camel can store up to 30 gallons at one filling.

Dr. Perk's studies revealed that the blood of the camel retains water far more effectively than that of other animals for two reasons:

1. Camel's blood has a high concentration of albumin of a particular type that is

effective in retaining water in the bloodstream.

2. The camel's red blood cells can absorb great quantities of water almost instantaneously, and store this water for future use.

The red blood cells of most mammals will burst if large quantities of water are introduced into the bloodstream. However, the camel's blood cells can absorb the water, expanding to even twice their normal volume without any ill effects.

In addition, camels do not perspire until their body temperature reaches 105 degrees Fahrenheit, and thus retain water stored in the body much longer. When they do perspire, they can lose up to 30% or 40% of their body weight without danger. A human, in contrast, will die if he loses much more than 10%.

• Science News Letter, 86:11 July 4, 1964

## BIOLOGY

# Lichens Found Growing On Galapagos Tortoises

► TORTOISES have lichens. This type of extremely rugged plant, able to grow almost anywhere, rides on the shell of the giant tortoises of the Galapagos Islands, made famous by the evolutionary studies of Charles Darwin.

Following in the footsteps of Darwin, John R. Hendrickson of the University of Hawaii, Honolulu, and William A. Weber of the University of Colorado, Boulder, found the tortoise-bound lichens during an International Galapagos scientific expedition this year. It is believed to be the first discovery of lichens on land animals.

Lichens are curious combinations of fungi and algae that "live together" in what is called "symbiosis." They are found almost anywhere in the world. The fungi cells in the lichen colony secrete an acid which eats away almost everything from rocks to bark.

The algae, one-celled green plants, produce the food for the lichen colony by photosynthesis.

The only area of the shell which can be inhabited by the lichen colony is the upper rear of the male's shell. The slow movement of the tortoise through the bushes and undergrowth scrapes lichens from all other areas of its shell.

The lichens, which can grow in the freezing weather of the arctic region and blazing heat of the tropics, and on everything from rocks to tortoises, cannot grow near a city because of the smoke and "smog" which markedly reduce the lichen population.

A fragment of the outer, horny layer of the shell of the giant land tortoise, *Geochelone elephantopus*, with the attached lichen species, *Physcia picta*, is preserved in the lichen herbarium of the University of Colorado Museum.

The findings were reported in Science, 144:1463, 1964.

• Science News Letter, 86:11 July 4, 1964

The virus causing measles is immune to antibiotics and is controllable only by the body's own defenses.