

TECHNOLOGY

Air Conditioning and You

Air conditioning plays a vital role in your life even if you have never seen a window machine jutting from an office building. It is also said to keep hens laying on the job.

By ALLEN LONG

► AIR CONDITIONING plays a big role in your life even if you've never lived in a climate-controlled apartment, worked in an air-cooled office or slipped into a refrigerated theater.

Because of man's machines for controlling indoor weather, your butcher's scales are more accurate, your chocolate-coated candies are more appealing and your television set works better.

And air conditioning takes on even more vital aspects when viewed through military eyes. It may save your life during an atomic attack upon this country.

The National Bureau of Standards is running tests at several experimental sites in the Blue Ridge mountains to find out what can be expected of air conditioning in underground facilities. The work is being done in tight-lipped secrecy under sponsorship of the Office of the Chief of Engineers, a part of the Army's Corps of Engineers. It is believed that experimental results will be published in two or three years.

Perhaps huge underground rooms may be a defense against the H-bomb. If so, air conditioning might help to keep alive all the people who would be squeezing in for protection.

Valuable in Submarines

Military-wise, air conditioning already runs the gamut from submarines to supersonic planes. In both cases, the performance of men dictates its necessity. Navy chief J. M. Wright, a submariner of 14 years' experience, says air conditioning "is the life's blood of submarines."

The performance of the sub as a fighting machine depends upon the comfort of its crew. The big air conditioning plants carried on subs add oxygen to the air as well as cool and dehumidify it. Chief Wright said air conditioning plants aboard the subs permitted long patrols during World War II. The treated air also stalled off the fatigue that crept over the crews of older submarines lacking the equipment.

In supersonic airplanes, air conditioning is critically important. Temperatures generated inside the plane due to air friction could roast the pilot and melt the wings.

Cockpit cooling systems are going into more and more of America's modern planes. Some of these airplane air conditioners have amazing capacities. The unit in the Navy's F4D Skyray jet fighter is powerful enough to turn out 176,000 ice cubes a day.

One air conditioning device is about the size of a pilot's hand. It weighs five pounds and has a cooling capacity equal to 45 home refrigerators. The cooling equipment in the Air Force's B-47 jet bomber is large enough to handle five five-room houses.

Air conditioning also plays a major role in science—a role so important that it reaches all the way from the National Bureau of Standards in Washington down to the scales on your butcher's counter.

Accurate weights are vital to industry. Customers must not be overcharged, and industry must not lose money by undercharging. To help prevent this, accurate weight standards are stored at the National Bureau of Standards. They are used to keep America's pound equal to a pound.

Standards Carefully Kept

The weights used to make your butcher's scales accurate are checked against your state's standard weights. The state's weights in turn are checked at the National Bureau of Standards.

This checking is done under carefully controlled conditions in the basement of the Bureau's South Building. Both standard weights and weights to be checked are placed in an air conditioned room from 24 to 48 hours in advance. At the end of that time, they reach a "thermal equilibrium" that assures proper comparison.

The checking operation is so accurate that the man running the test must stand 10 feet away from the weights with which he is working. He must handle them with a mechanical hand attached to the traditional 10-foot pole. This keeps his body heat from interfering with the check tests.

Industrial measuring devices fall in the same category. Gauges and yardsticks are checked in air conditioned rooms to insure accuracy. It has been said that without such precise means of keeping things standard, America's whole system of mass production would be impossible.

Interchangeable parts would become the bane of industry rather than its blessing.

A part made by Company A to fit a machine made by Company B probably would not fit at all. It would be too tight on this machine, too loose on that one. Production costs would skyrocket and automobiles would become the rich man's luxury.

Tolerances in machining the parts often are measured in terms of a few thousandths of an inch. Such tolerances permit no error.

As it helps the skilled workman maintain the proper machine tolerance, air condition-

ing also helps other men maintain bodily tolerance to bad working conditions.

Gold mines in South Africa, bored a mile or more deep, would be unworkable without air conditioning. After a depth of 1,000 feet has been reached, the shaft temperature rises about one degree Fahrenheit for each additional 100 feet of depth.

Air conditioned mines are not peculiar to South Africa. Deep copper mines near Butte, Mont., are equipped with the machines.

The U. S. Bureau of Mines found in a study of the Beech Bottom Coal mine near Wheeling, W. Va., that air conditioning helped prevent roof falls. Other experiments have verified this.

Use of air conditioning in this case depended upon the nature of the rock in the mine roof. Recent revolutionary methods of bolting the roof or coating it with an asphalt paint outmoded the air conditioning system before it was picked up widely.

Although air conditioning has existed in some form or another ever since the ancients hung wet towels over their windows, Willis H. Carrier, founder of the Carrier Corporation, is widely credited with developing the first air conditioning system as now known.



HIGH-TEMPERATURE SUIT—
This man is wearing an aluminum-coated suit that reflects 90% of the heat encountered between two tunnels of a huge gas furnace at the Belleville, N. J., plant of Walter Kidde and Company. The air-cooled garb permits him to work 45 minutes in temperatures of 400° Fahrenheit.

He worked out a humidity and air-cooling control machine in 1902. He tried it out in the Sackett-Wilhelms Lithographing and Printing Company in Brooklyn.

From this inauspicious birth, the industry has grown into a multi-billion dollar business that encompasses everything from candy making to television set manufacture. Goodies get their smooth coatings when dipped in chocolate under carefully controlled temperatures. Television sets work better because some of their innards are assembled under ideal humidity conditions.

Air conditioning plants also are making life a little easier for some television stars who must combat the heat of strong lights as well as the tantrums of temperamental directors and producers.

Prisoners in Reno's jail can loll about in comfort while others in the area swelter under the hot summer sun.

Then there is the man on the West Coast who installed air conditioning in his chicken house. He claims it keeps his birds laying on the job.

Science News Letter, June 12, 1954

ENTOMOLOGY

Pine Borers Scavenge But Bark Beetles Kill

► NOW IS the time for home owners to start warring on bark beetles, insect killers of pine trees, Dr. Roger F. Anderson of Duke University School of Forestry, Durham, N. C., has advised.

The bark beetle kills, but pine borers, contrary to popular notion, are mere scavengers, incapable of harming healthy trees, Dr. Anderson pointed out. Bark beetles reach the peak of their destructiveness in summer. The problem becomes more acute when there are summer and fall droughts.

"There is usually no cure after bark beetles begin their onslaught," Dr. Anderson said. "Prevention is the answer to this problem."

Preventive measures include keeping the trees growing vigorously by giving each sufficient space, allowing no soil disturbance, and keeping them well watered during dry spells.

Another preventive method is to spray the tree trunks with a solution of the gamma isomer of benzene hexachloride, one-half pound per 25 gallons of water. This chemical is sold under many trade names. Oil solutions of the chemical should not be used, because the oils will burn any foliage they might contact.

The beetles, scarcely a quarter-inch long, are dark and cylindrical in shape. They produce small, curled white grubs.

During dry periods, the trees are weakened and especially vulnerable to attack by the beetles. Both bark beetles and their grubs live and feed in the soft white tissues between the outer bark and wood of the pine.

Science News Letter, June 12, 1954

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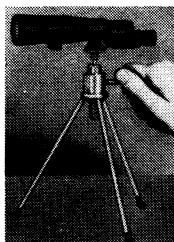
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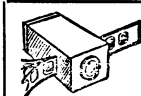
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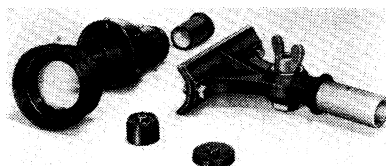
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