

PHYSIOLOGY

Ice Bag on Forehead Lowers Brain Temperature

HHEADACHE victims who find an ice-bag on the forehead soothing really are cooling off that part of the brain right through the skull. So Dr. William Bierman, and Dr. Mae Friedlander, of Mount Sinai Hospital, New York, were enabled to report to the Cleveland meeting of the American Congress of Physical Therapy, as the result of an unusual opportunity to measure brain temperature of a human being.

While ice bags lay on the forehead of a patient from whom a brain tumor had been removed. Dr. Bierman inserted a thermocouple into the frontal part of the brain. Two inches below the forehead surface, the brain was cooled a degree and a half Fahrenheit.

Cold has received less attention than heat, as an ameliorating influence in disease, the investigators stated, but they predicted greater use for cold. Their experiments with human beings indicate that cold applied to skin surface penetrates deeply.

Ice bags on the calf of a patient's leg lowered temperature deep within the leg muscles as much as 26.4 degrees Fahrenheit, they discovered. Testing the general supposition that drafts of cold air have no particular effect upon structures lying beneath the skin surface, they blew cold air on the leg calf and found that within the muscles the temperature dropped as much as 11 degrees.

Cold applied to the abdomen seems to influence organs within, they reported from other tests, though the cooling was not very great.

Science News Letter, September 7, 1940

PHYSICS

New Plane Detector Works Like Electron Telescope

THE REPORTED British sensitive detector for enemy airplanes, which makes use of invisible rays from the plane's engine, probably employs the infra-red radiation given off from any hot object and makes it visible by a method similar to that employed in the electron microscope recently developed to permit ultra high magnification. A similar American device is said to have been tried at the maneuvers of the First Army, but no details have yet been made public.

At the December, 1935, meeting in St. Louis of the American Association for

the Advancement of Science, Dr. Vladimir K. Zworykin, Russian-born television expert of the Radio Corporation of America, showed an infra-red telescope that caused excited comment among the scientists. It was described in detail in a Science Service dispatch at the time (*SNL*, Jan. 11, 1936, page 20). Possible military uses were then predicted.

Infra-red rays are given off at night as well as during the day. They pass freely through haze and smoke, but any fog, except a very thin one, stops them. However, such a fog would hamper the movements of the airplane anyhow. Funnels of warships, like airplane engines, also emit infra-red rays, as do clouds of hot gases from engine exhausts. An observer not provided with such a telescope would be unaware of the rays going past him.

The electron microscope, demonstrated by Dr. Zworykin last April to members of the American Philosophical Society, employs an electron lens with principles similar to the infra-red telescope. Magnification of ordinary microscopes is limited because they will show no details smaller than the waves of light with which they are viewed. But the electrons are still smaller, and by focussing these, extreme magnifications, up to 20,000 times or more, have been secured.

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BACTERIOLOGY

Bacteria in Ocean May Use More Oxygen Than Fish

OXYGEN in the ocean is probably used up more rapidly by bacteria and other microorganisms than it is by all the fish, and other visible animals ranging from tiny shrimp to giant octopuses, suggests Dr. Claude E. ZoBell of the Scripps Institution of Oceanography.

Bacteria swarm in the depths in simply incredible numbers, Dr. ZoBell states. A quart of ocean water may contain anywhere from 100,000 to 10,000,000 bacteria, consuming oxygen at the rate of .001 cubic centimeter to more than one cubic centimeter per quart per year. This looks rather insignificant—but there are quite a number of quarts of water in the ocean, and the total becomes staggering.

Oxygen consumption becomes a particularly acute problem at great depths, for the only way this life-gas can get down there is to diffuse slowly from the surface—with bacteria and other living things snatching greedily at it all the way down. This dearth of oxygen may be an important factor in the paucity of life in the great abysses.

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IN SCIEN

GEOLOGY

Ice Age Glaciers Possibly Thicker Than Old Estimate

GLACIAL ice may have been piled up ten miles high, during the great pleistocene ice age half a million or more years ago. This extreme figure, ten times greater than the usual estimate, appears necessary to account for the cutting of the steep-sided canyons in the bottom of the sea, some of which have been discovered at depths approaching 3000 feet.

The problem is something like this: The canyons are so much like those cut by rivers on land that it is hard to imagine any other method of formation for them, says Prof. Francis P. Shepard, University of Illinois geologist now working at the Scripps Institution of Oceanography. To make dry land of ocean bottom to such great depths, the water had to be got out of the way.

The only way that can be thought of is the age-long stacking up of the water in the form of ice. To get enough water out of the ocean to lower sea level as much as 3000 feet, it would be necessary for the ice to cover much more territory than is now commonly mapped as glaciated, and probably also to be accumulated to perhaps ten times the formerly estimated depth.

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METALLURGY

Aluminum Smelter Scene Offers Strong Contrasts

See Front Cover

ALUMINUM is very much to the fore nowadays, as this country makes powerful efforts to increase its aircraft production. About four-fifths of the weight of a modern war plane is made of the white metal.

A study in black-and-white, might be an appropriate title for the picture reproduced on the front cover, wherein a brawny Negro workman is tossing fifty-pound ingots of the white metal like loaves of bread. The photograph is by Margaret Bourke-White.

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CE FIELDS

PLANT PHYSIOLOGY

Oxygen Controls Tissue Mass Growth

OXYGEN abundance or lack apparently determines character of growth in masses of plant tissue grown detached from the parent plant. The cultures are comparable to the animal tissue cultures made famous by Dr. Alexis Carrel. So long as they receive plenty of oxygen, plant tissue cultures continue to grow without differentiation among the cells, it has been discovered by Dr. Philip White, of the Rockefeller Institute for Medical Research at Princeton, N. J., a pioneer in this newer field of tissue culture research.

But let a lack of oxygen supervene, and the cell mass begins to differentiate. Simplest case of this kind is that of a tissue mass that has been permitted to grow so large that air does not reach its center very readily. Some of the cells develop into conducting vessels with spirally reinforced walls, resembling those found in the interior of normal plant stems. These presumably let oxygen in and waste products out.

Even more striking are the results when the oxygen starvation is artificially intensified. Then the previously undifferentiated tissue mass proceeds to produce small leaves, supported on short stems. If the full supply of oxygen is then restored, the fledgling foliage gradually reverts to its embryonic, undifferentiated condition.

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PUBLIC HEALTH

Bad Outlook Reported On Infantile Paralysis

ABAD infantile paralysis year is the outlook now, as reported cases of the epidemic, most serious in the Midwest, leaped to 623 for the week ending August 24 from 389 reported the previous week.

In 17 states the disease is on the rise, as shown by U. S. Public Health Service figures. If this were to be an average year, judging by figures for recent years at this stage of summer, only 289 cases would have been reported in the week.

In West Virginia, where 46 cases were reported in a week, a call from health officers has sent Dr. James P. Leake of the U. S. Public Health Service to one scene of the disease battle.

To aid health officials of Indiana—where the week saw 79 new cases of the disease—the National Foundation for Infantile Paralysis is taking action at top speed, to curb the epidemic's spread and to help the stricken. Iron lungs have been rushed to stricken areas. Shipments of splints and frames have been hurried to South Bend and Indianapolis.

After two trips through Indiana, Dr. Don W. Gudakunst, medical director for the Foundation, declared that much of the crippling effect of the disease will be prevented because of splendid work being done by physicians and nurses.

"The important thing," said Basil O'Connor, the Foundation's president, "is to get every case under treatment as quickly as possible and be sure that proper treatment is provided. Instruction has been given by Foundation experts on early treatment."

Possibility that drinking water and swimming pool water can spread infantile paralysis, a theory discounted in recent years, may regain serious attention, since Michigan scientists this summer reported that ordinary chlorination of water does not kill the virus of infantile paralysis, if it is present.

Statistically, the infantile paralysis epidemic on paper is now following the lines of 1937, which had the high total of 9,511 cases when returns were in. The curve may, however, take a more fortunate turn and not entirely repeat history. The peak of the infantile paralysis season usually occurs toward mid-September.

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ENGINEERING

Fluorescent Lighting For Pullman Berths

FLUORESCENT lighting is now possible in many places where the large tubes previously available could not be placed, such as Pullman berths, cabins of airliners, in closets, bed lamps, and over mirrors and portraits in the home. (Westinghouse Lamp Division.) A new fluorescent lamp is only nine inches long, and about the thickness of a man's finger. It takes six watts of current, and is made in two colors, one approximately daylight.

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ENGINEERING

New Unit Provides Air Conditioning in Labs

AIR CONDITIONING for laboratories, where standard conditions of temperature, humidity, etc., are required the year round, is taken care of by a new unit specially designed for the purpose. (Carrier Corporation.) It takes care of cooling, heating, humidifying, dehumidifying, filtering, circulating and ventilating. Only three connections are required, water, drain and electricity. The unit will serve a room of approximately 1200 cubic feet.

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METEOROLOGY

Weather May Force War To Go South For Winter

IF HITLER'S hopes of conquering Britain this year have to be deferred because of the coming of Britain's much-advertised foul autumn weather, the war may possibly go south for the winter.

Bombing of British ports and manufacturing centers will be made more difficult by stormy winds and fogs.

British aviators will, of course, know about clearing conditions before the Germans do, for storms over the North Sea move as they do in this hemisphere, prevailing from west to east. This might often enable British bombers to "ride the tail of the storm" and get over Germany just as the clouds break up.

British planes would not need to be condemned to inactivity even in periods of settled bad weather. So long as they can take off at all, they can climb into the clouds and fly blind toward the south-east, emerging into clear skies over Italy, long a favorite winter resort for English folk. Winter weather protection over Hamburg and Essen may well bring increased air attacks on Milan and Turin.

If developing storms make it inadvisable for the planes to return to Britain at the end of the raid, they might go on to Egypt, where by then another phase of the war gone south for the winter may be developing, with Italy's land attack upon Egypt. With bomb racks reloaded, the planes could then take a whack at the Italian camps and communication lines; and perhaps by that time they might be able to go on home again. A "shuttle service" of this kind was discussed as a possibility when the Polish campaign opened a year ago, but it never had a chance to get started.

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