

PHYSICS

Stratosphere Flights May Pierce the Ozone Layer

Latest Studies Indicate Ozone Ocean of Upper Air Is Much Lower Than Had Been Thought in Past

THE earth's protective layer of ozone, that cuts down the burning ultraviolet rays from the sun, may be tapped by the next stratosphere flight.

Without the presence of ozone in the stratosphere, life on earth probably would not exist in its present form because the ultraviolet radiation from the sun affects man and other organisms. Tanning and sunburn are but mild forms of what could occur if ozone were not present in the air.

The possibility that forthcoming stratosphere flights may reach the ozone layer arose in discussion on the report of Prof. Rudolf Ladenburg of Princeton University before the joint meeting of the American Physical Society and the Optical Society of America at Columbia University.

Reviewing recent studies of the earth's ozone layer, Prof. Ladenburg indicated that instead of being some thirty-one miles above the region of man the layer appeared to be but fifteen miles up.

Stratosphere balloons with a "ceiling" of 75,000 feet like the proposed ascension of the National Geographic Society-U. S. Army Air Corps will thus be able to get into, and study, the ozone layer.

Important problems await solution by studies of the ozone layer, Prof. Ladenburg indicated. Studies already made show that the amount of ozone in the atmosphere reaches high values in the spring and drops to low values in the fall. Sunlight apparently tends to destroy ozone, rather than to produce it.

Should Search For Other Causes

Future studies of the air's ozone should be directed, Prof. Ladenburg said, to a search for other causes of the protective gas than mere sunlight. It may turn out that electric particles shot off from the sun may create ozone just as they cause the aurora borealis or northern lights. Not only has recent research showed the ozone layer is only about half as high up as science formerly thought, Prof. Ladenburg said,

but there is good evidence that it is not a narrow layer as previously pictured. It probably extends from 60,000 to 100,000 feet, with its maximum concentration coming near 78,000 feet.

How absorbing is ozone for sunlight is shown, the Princeton physicist indicated, by the fact that all the ozone in the earth's atmosphere, if compressed to normal temperatures and pressures, need be but one-tenth of an inch thick to account for sunlight's intensity in the ultraviolet as now measured.

Science News Letter, March 9, 1935

PUBLIC HEALTH

Fewer Deaths Among Wage Earners Than Ever Before

THE general mortality of the United States was probably slightly higher in 1934 than in 1933, figures thus far available indicate, but the year marked a new low record of mortality among wage earners, Metropolitan Life Insurance Company statisticians find.

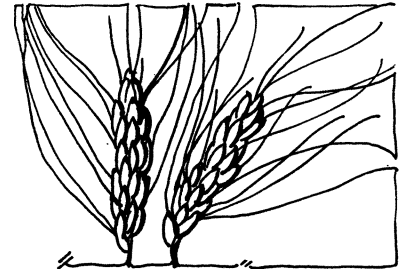
The new low death rates apparent in their records show that health conditions have been maintained on a very high level among insured wage earners and their families in the United States and Canada, it is pointed out.

"It is particularly noteworthy that among this insured group the downward trend of mortality over more than two decades has not been interrupted during five years of economic disturbance."

About 68,000 lives were saved in the year 1934 alone over those that would have been lost if 1911 conditions had prevailed, the statisticians figure from comparing their mortality figures for the two years. Over the entire period since 1911 the accumulated saving of lives is now close to 1,000,000.

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Disappearance of a tiny glass needle of radium from a Michigan doctor's office was recently solved by an electro-scope which detected the missing radium under the flooring of a janitor's closet.



What Price Wheat?

DUST, riding devastatingly on the wings of Western storms, has once more written its warning large, against the national folly of raising too much wheat and destroying the old cover of soil-binding grass. More than a month ago, U. S. Weather Bureau scientists warned that when the late-February and early-March storms began to blow, dust storms might be expected. And the recent storm may be only the first of the season; others as bad or worse may follow. It is impossible to predict whether any of them will blanket the country as did the tremendous dust storm of mid-April, 1934; but the recurrence of such a portent over the East is not at all impossible.

The cause for such a dust storm is the same as the cause for any wind-storm: large, sluggish masses of air over the mid-continent, warmed by the returning sun, tending to rise as its specific gravity becomes less. Approach of a colder, heavier air mass from the northwest, sliding under the warm air, boosts it up the faster, and the high-velocity winds along the earth's surface suck up the dust and carry it along.

The moral for us of the present generation, scientists point out, is that unless the dust were there, dry and loose, the storm would be little more than an ordinary late-winter windstorm, blustery and uncomfortable, to be sure, but not a menace to crops and a supreme irritation to all business and housekeeping. And the dust is loose because man made it loose. We plowed parts of the West for wheat that nobody ever had any business plowing; the scientists warned us beforehand, and they rub it in now. The dust is good pastureland soil, once held anchored by the roots of

billions of grass plants. We turned out those roots, and plowed and disked and harrowed and loosened the soil to plant wheat. A dry, warm winter kept the soil loose—and the wind did the rest.

Secretary of Agriculture Wallace, "dirt scientist" before he became an administrator, has warned persistently against the loosening of Great Plains

soil in the windstorm belt. The remedy, he and his fellow agronomists and ecologists keep telling us, is: get that dry country back into grass. Plant tree belts, too, if you like, to break the force of the wind; but to tie down every square inch of now truant soil, use the living cords of grass roots.

Science News Letter, March 9, 1935

PHYSIOLOGY

Sex Gland May Manufacture Scurvy-Preventing Vitamin C

SCURVY-preventing vitamin C, found in certain fruits and vegetables, is manufactured in the bodies of infants and probably also in the bodies of mothers for a time before the infants' birth. Evidence suggesting the maternal manufacture of this important vitamin, apparently as part of nature's provision for prenatal nourishment of the young, has been found by Dr. Geoffrey Bourne of the Australian Institute of Anatomy, at Canberra, Australia.

The discovery is significant because for the most part man at all ages has to depend on his food for his supply of necessary vitamins. So do most other animals. The mother substance of rickets-preventing vitamin D, to be sure, exists in the skin, but irradiation with ultraviolet light is required to convert this substance into the vitamin. The only other exception is the probability that fish like the cod manufacture in their bodies at least some vitamin D.

The starting point for Dr. Bourne's experiments, it appears from his technical report (*Nature*, Jan. 26) was the research of other scientists who found that the human infant up to the age of five months manufactures vitamin C in

its own body, and that pregnant guinea pigs fed a scurvy-producing diet developed the disease only very slightly or not at all.

Dr. Bourne also knew that the ovarian structure known as the corpus luteum has a high concentration of vitamin C in its cells. This structure produces a hormone, progesterin, which prepares certain maternal tissues for the reception and nourishment of the beginning embryo.

In Dr. Bourne's experiment a pituitary gland hormone was given to young virgin rats to stimulate the production of the corpus luteum tissue. These rats and two other groups of rats, some pregnant and the others untreated virgin animals, were then fed a scurvy-producing diet. The untreated animals all died of typical scurvy within a fortnight. The pregnant rats lost very little weight and appeared much the same at the end of the experiment as at the beginning. The treated rats lost considerable weight but were active and showed no signs of scurvy, although two died of an acute infection.

The experiment "suggests," in Dr. Bourne's scientifically conservative words, that the corpus luteum which is

already known to prepare the uterus for the reception and nourishment of the developing offspring also can manufacture vitamin C. The experiment, however, does not disprove the manufacture of vitamin C by the unborn infant. Dr. Bourne says it is probable that the vitamin manufacture takes place first in the corpus luteum and then is either taken over or supplemented by the infant once it has developed from the embryo to the fetal stage.

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METEOROLOGY

Much Snow on Mountains For Next Summer's Needs

WEATHER observers in the mountain areas of the West, where summer irrigation must depend on snows of the preceding winter, report encouraging conditions to the central office of the U. S. Weather Bureau in Washington, D. C. In the mountains of the Pacific coast states especially the snow packs are deep and heavy, and on the whole much greater than last year's; at the same time the water already in the soil is more abundant. Farther east, in the Great Basin and Rocky Mountain regions, soil water is not so nearly up to standard, due to cumulative drought of several years, but the snow supplies on the upper slopes are encouragingly large.

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PHYSICS

New Theory Increases Electron's Size Ten Times

A NEW theory of the electron's size which makes it ten times larger than previously held concepts of scientists was announced by the world-famous physicists, Prof. Max Born of Cambridge University and Prof. Erwin Schroedinger of Oxford University. (*Nature*, March 2.)

The electron is one of the fundamental particles out of which all matter is composed. Present estimates of the electron's size suggest that some ten trillions of them side by side would be less than a half inch long.

Prof. Schroedinger was co-winner of the 1933 Nobel Prize in Physics, and Prof. Born has long been noted for his mathematical theories of atomic structure. Both men are former German scientists now in the academic shelter of England.

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