



CAMERA MACHINE GUN

*For training aerial gunners is this type of machine gun camera demonstrated at the National Academy of Sciences in Washington. Such cameras are mounted in the combat planes of the Army and Navy during maneuvers and train pilots in aerial attack. As the trigger is pressed the object in the "line of fire" of the dummy gun is photographed. Later the films from the various planes are developed to see who killed whom in the dummy war.*

## METEOROLOGY

## Upper Air Data Will Aid In Forecasting the Weather

The Word "Probably" Will be Seen Less Frequently In Prognostications Because of Air Mass Analysis

By COMDR. FRANCIS W. REICHELDERFER  
Chief, U. S. Weather Bureau

THE WORD "probably" will be seen less frequently in the daily weather forecast when the observations of conditions in the upper air are further extended by the U. S. Weather Bureau.

In its efforts to meet modern demands for specialized weather service, the Weather Bureau has in recent years given more and more attention to what goes on in the air far above the earth's surface. It was recognized by meteorologists many years ago that the weather experienced by man on the ground resulted from nature's processes in the vast upper air as well as from elements observed at the earth's surface.

In fact, the layer of air next to the

ground in which man normally lives and moves is but a very thin portion of the atmosphere above us, thousands of feet in height, most of which in one way or another takes part in the "manufacture" of the weather.

One of the difficult problems of meteorology is to obtain observations of these important conditions in the upper air—the temperature, the humidity or moisture content, the pressure and the winds at significant heights in the atmosphere—and having obtained these data, to analyze them quickly and to determine how the various air masses will interact to change the weather. If we understand these changes we can forecast what the weather will be tomorrow.

How can an observer on the ground

tell what the temperature, humidity and other elements are at several thousand feet altitude?

The upper winds he can determine in clear air by observing a small pilot balloon through a kind of "telescope" called a theodolite. But in general he cannot tell the temperature and humidity accurately unless he goes up in an aircraft with instruments and makes the observations personally, or sends a recording instrument up in some sort of aircraft.

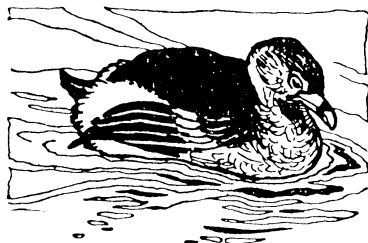
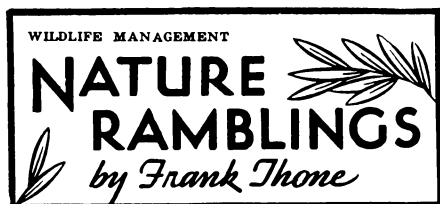
### Several Methods

Several methods have been used. Small sounding balloons have been and in some cases still are employed with recording instruments attached. But this method is very slow because the observer must wait until the recording instrument drifts to the ground on its small parachute and is found by some chance passerby and returned by mail—sometimes weeks or months later. In some cases it is never found.

A somewhat faster method is the use of box kites with recording instrument attached. After ascent with the instrument, the kite, or kites in tandem, are hauled down and the instrument record obtained. But this method also is slow and depends upon favorable winds to take the kites even to moderate heights. It is no longer used in this country because of attendant hazards.

Other methods include sending instrument and observer up in an airplane, or occasionally even a free balloon. Upper air observations by airplane are still in use daily at six Weather Bureau stations in the United States, at eight naval stations, and until last July, at seven army stations.

But the newest method of obtaining the temperature and humidity of the air high above the surface is the use of the radio-meteorograph, or the radio-sonde as it is called in this country. This is actually a modern development of the earlier sounding balloon with its recording meteorograph. But with the radio-sonde the instrument transmits by radio signals which indicate the air pressure, temperature and humidity every few hundred feet up to 60 or 70 thousand feet. The observer on the ground receives this information through his special radio recorder as rapidly as the balloon ascends. This method is speedier than others and promises to become the most commonly used. Today there are six Weather Bureau, (*Turn to Page 110*)



### Smaller Homes

WITH the lion's share of a continent at our disposal, we Americans are rather given to thinking of wildlife conservation in very large and spacious terms. The idea that anything worth while can be done in less than a thousand square miles seems hardly worth considering.

Yet two of Europe's smaller countries, Denmark and the Netherlands, have well-worked-out systems for the protection and encouragement of wildlife, despite the intensive utilization of the last inch of cultivable land necessitated by their limited territories and dense populations.

In Denmark, the government may create wildlife preserves, upon suitable compensation to the landowners. But landowners themselves may set up preserves if they so desire, with the scientific advice and assistance of the government. Two types of wildlife preserves are provided for, intended respectively for game-providing and scientific purposes.

In the Netherlands the cause of wildlife conservation is a genuinely popular one. There is a well-organized society

for nature protection, with a membership of 13,000, who are backed by other and even larger organizations such as the bicyclists' union, with over 100,000 members. These groups have been so well able to swing public opinion—not to mention fiscal legislation—that in the past 31 years no less than 39 game and wildlife sanctuaries have been established.

As in Denmark, private landowners are encouraged to put some of their lands to use for the benefit of wildlife. In the Netherlands, this encouragement takes the practical and highly tempting form of a partial remission of taxation. As a result, more than 325 large estates, with a total of over 125,000 acres, have taken advantage of this law—and given the country the advantage of their utilization as homes for game and wildfowl.

*Science News Letter, February 18, 1939*

#### ETHNOLOGY

### Cult of Sundowners Linked to Cocktail Habit

OF SERIOUS aspect was a communication handed to those in attendance at an anthropology section "tea" during the recent meeting of the British Association for the Advancement of Science at Cambridge. It was headed: "The Sundowner, its distribution, ritual and sociology."

Excerpts from this weighty report:

"The Sundowner appears to have been limited to Africa and Australia and the neighbouring islands . . . From America and the West Indies we have evidence of a similar custom, known as the cocktail habit. . . . it may be performed at any time during the 24 hours. In England the custom has recently appeared in the form of sherry parties. This culture seems to have reached England from the West, reversing the usual European culture-drift from east to west, the infer-

ence being that it is not of Nordic origin.

"Evidence as to its ritual significance is not wanting. First, there is the evidence of its name, 'Sundowner'; philologists are agreed on this point, if on no other; and with this is linked the regularity with which the ceremony is performed at the hour of sunset in the countries where the custom originated.

"Secondly, in its original and austere form, the ritual seems more often to have been performed by men in seclusion after several hours of fasting, and both these facts point to its origin being based on magic.

"Thirdly, part of the ritual consists of raising the glass, uttering an incantation, and then drinking some of the liquid. The incantation varies in different countries, and is often quite unintelligible, e.g. 'Chin-Chin', 'Here's How', and the like are now meaningless phrases but occasionally in country places one hears the phrase 'Happy Days', which unquestionably connects the rite with Sun-Worship, and in particular with the setting of the sun, a point which has hitherto been overlooked by our leading anthropologists."

*Science News Letter, February 18, 1939*

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two Army and two Navy radio-sonde stations.

The balloon which carries the instrument is about 3 feet in diameter before inflation and 5 or 6 feet in diameter after inflation. It can lift almost three pounds, but the instrument, including its inexpensive radio transmitter, weighs only about 1½ pounds. The instrument now in use for Weather Bureau observations is that developed by the National Bureau of Standards for use of the Navy Department.

The balloon and the instrument rise at a rate of about 1,300 feet per minute. They ascend for sixty minutes or more to an altitude of about fifteen

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miles, after which the balloon bursts and the instrument slowly descends to earth by parachute. A tag attached requests the finder to return the instrument, offering a small reward for safe return. A large per cent. of the instruments are thus recovered.

But, the observer on the ground has received the desired upper air data promptly by radio. With these data the weather forecaster tries to analyze the numerous elements which determine our weather and to present them systematically on the weather map in the form known as air mass analysis. This assists the forecaster in estimating how the various air masses and their characteristic elements will interact to produce future

weather. In this way he makes up the weather forecast.

With an extension of these upper air observations to fill in the wide gaps which now exist in our information of atmospheric conditions and processes, it is expected that the day to day changes in weather can be better analyzed and more thoroughly understood, and their future trend more accurately anticipated. Then the demands of the farmer and the aviator, the engineer, the business man and the general public for specialized forecasts of a positive nature can be more adequately satisfied.

For an official explanation of the daily weather map prepared by the U. S. Weather Bureau, send a postal card to SCIENCE NEWS LETTER, 2101 Constitution Ave., Washington, D. C., asking for weather map bulletin.

*Science News Letter, February 18, 1939*

#### PHYSIOLOGY

## New Life-Saving Property Discovered in Hormone

### Gland Essence That Prepares Mother for Child-bearing Can Pinch Hit for Cortin To Treat Addison's Disease

**N**EW, life-saving power has just been discovered in a hormone that is primarily concerned with the life-creating process.

This fact, termed "amazing" by its discoverers, is reported by Dr. Robert Gaunt, of Washington Square College, New York University, and Dr. Harry W. Hays, of Princeton University. (*Science*, Dec. 16.)

Crystalline progesterone, the hormone that functions primarily to prepare the maternal body for child-bearing, can double for the life-essential hormone, cortin, to save lives threatened by disease or failure of the adrenal glands.

Cortin is a product of one part of the adrenal glands, the other part of the glands producing the more familiar adrenalin or epinephrin. Life cannot go on when these glands fail to produce cortin, as they do in Addison's disease, unless the deficiency is made up by giving the patient doses of cortin, just as diabetics get insulin to supply this deficiency of their own body.

Crystalline progesterone, Drs. Gaunt and Hays now report, will keep animals alive and healthy apparently indefinitely after total removal of the adrenal glands. Neither cortin nor salt need be given,

if the animals get small daily doses of the progesterone.

Progesterone is not likely to take the place of cortin in treatment of Addison's disease sufferers, Dr. Gaunt said, because it is much more expensive. Only possible advantage of progesterone over cortin for such patients is the fact that progesterone can be obtained in chemically pure crystals, which is not yet possible for cortin.

The significance of the discovery that progesterone can double for cortin is not yet known. Dr. Gaunt said, however, that studies are under way now which he hopes will show what the discovery means in terms of body function and possible clinical application.

*Science News Letter, February 18, 1939*

#### PSYCHOLOGY

### Blind Spot Hampers One-Eyed Drivers

**T**HE next time you are a passenger in the front seat of an automobile (we won't recommend it for the driver) shut one of your eyes and see how restricted is your view ahead. See how much your field of vision is decreased and your judgment of distance impaired.

Then realize the handicap faced by from one to two per cent. of all American motorists who, it is estimated, possess only one eye.

Studies of drivers with handicapped vision have been made recently by Dr. Harry R. DeSilva, W. H. Frisbee, Jr., and P. Robinson of Harvard University. They find that while a person with two eyes can see through a field of view of about 190 degrees—more than a half circle—a one-eyed driver has his vision restricted to 110 degrees or to 135 degrees depending on how much his good eye protrudes and how far out from his face is the bridge of his nose.

Although normal people never realize it, each normal eye has a blind spot which corresponds to the small round region where the optic nerve enters the eyeball and which is not receptive to images cast upon it. With two good eyes these blind spots do not coincide. What is a blind spot for one eye is not a blind spot for the other. Persons with only one eye can only overcome the handicap of such a blind spot by regularly turning their head while viewing the road ahead.

The blind spot covers an area of only 7 degrees, report the Harvard scientists and, at the distance of the windshield, this area amounts to a circle about three inches in extent. However at a distance of 50 feet ahead of the car this same angle blocks out an area of six feet. At a twelve-foot distance a standard road sign falls within the blind spot. A child four feet tall is concealed at a distance of 32 feet, a man at 48 feet, and a whole truck at a distance of 57 feet.

*Science News Letter, February 18, 1939*

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