METEOROLOGY—RADIO

Radio Waves To Transmit Weather Maps

LOPPING $470,000 from the U. S. Bureau of Air Commerce expenditures, radio typewriters may soon give the skies a chance to replace 13,000 miles of leased telephone wires now used in sending out weather maps.

Because of the great saving a method of radio-typing would effect over present telegraphic costs contained in the U. S. Department of Commerce aeronautical bureau's $4,000,000 appropriation, Rex Martin, Assistant Director of Air Navigation, and engineers under him are eagerly testing a new device for sending out weather forecasts.

The radiotype transmitter resembles an ordinary typewriter. A key is punched and immediately radio wave impulses travel through the ether and cause the same letter to be struck at the receiving end. The speed of this method of communication is 75 words a minute, but it can be stepped up to 210 words. Seven and a half minutes were required to send out a complete weather map by the new method in comparison to 15 minutes by telegraph.

Weather data is sent out similarly by an instrument resembling a tabulating machine with perforated holes on a drum corresponding to the position of the data on a map.

If experiments near Washington prove successful the Bureau of Air Commerce expects to provide stations every 50 miles along the 20,000 miles of airway over which flights are taking place daily. Anyone who had suitable receiving equipment could obtain the weather information.

Science News Letter, July 21, 1934

ENGINEERING

Safety in Air Travel By Keeping Ice From Engine

ICE may cause airplane wrecks in hot weather as well as in cold by forming a coating inside the carburetor, interfering with its proper functioning by cutting off the intake. This danger to aviation can be eliminated without lowering engine power by applying exhaust heat directly to the carburetor walls.

It is believed that some otherwise mysterious airplane accidents have been due to ice-lined carburetors.

In a number of experiments conducted under the direction of H. K. Cummings, division chief at the National Bureau of Standards, it has been found that fuel volatility, altitude, and weather conditions are all factors in engine failures of this origin. If the gasoline is highly volatile, like ether or naphtha, it absorbs more heat from the carburetor walls, leaving them cold enough for water vapor in the intake mixture to condense and form a coat of ice which grows thicker and thicker until the channel is nearly plugged. At high altitudes the air is thinner. This increases volatility, and therefore the chance of ice formation, but unless the plane is flying through a cloud there is less vapor in the air giving a balancing effect.

Heating of the intake air was tried, but it was found that this lowered engine efficiency because the expansion involved on the application of heat permitted actually less combustible mixture to enter the cylinders. The most satisfactory method found was to heat the carburetor walls directly, using either the exhaust or heat supplied electrically by a coil of wire.

Science News Letter, July 21, 1934

AERONAUTICS

Astronomer May Train Telescope on Balloon

PLANS are being perfected for astronomers at Des Moines Municipal Observatory to watch the stratosphere balloon of the National Geographic Society-U. S. Army Air Corps if its path through the upper atmosphere comes within seeing range of telescopes there.

Dr. D. W. Morehouse, president of Drake University and well-known astronomer, told Science Service that with his eight and one-half inch diameter refracting or lens telescope the balloon should be visible at a distance of 100 miles if the sky is clear but proportionally less if it is hazy.

If the balloon is seen it should be possible to estimate its distance from the instrument by measuring, with a micrometer, the small angle subtended by the bag's diameter as seen by the observer.

With telescopes astronomers can see stars millions of miles away through space. What will limit observations on the stratosphere balloon to 100 miles is the absorption of light which has to pass through long lengths of the earth's atmosphere, and the limitation fixed by the curvature of the earth.

Science News Letter, July 21, 1934

IN SCIEN

METEOROLOGY

More Heat and Drought Predicted for July

HOTTER weather, and continued less-than-normal rainfall, are to be expected in the great western grain belt during the rest of July, on the basis of statistical probabilities indicated by the June-July temperature records. So Charles D. Reed, senior meteorologist of the U. S. Weather Bureau office, Des Moines, informed a representative of Science Service.

Mr. Reed, who was a member of the Science Advisory Board's special committee on the reorganization of the work of the Weather Bureau, has found in the course of many years' study of weather trends that if the average June temperatures run considerably higher than normal, July following may be expected to have more heat than normal. Moreover, it will probably have less than the normal rainfall.

Mr. Reed's figures show that this correlation between excess temperature and deficient rainfall can be counted on as practically one hundred per cent., when June averages two or three degrees hotter than normal. June this year in Iowa has averaged about eight degrees hotter than normal, so that it looks as nearly like a sure-fire prediction as anything can be that has to do with the weather.

Records from other states in the Midwest indicate that what holds for Iowa will be true for them also. So it looks like more heat and more drought for this grievous summer of 1934.

Mr. Reed hastens to add, however, that less-than-normal rainfall during July will not necessarily mean the ruin of the corn, if the month is not too excessively hot and dry. Throughout the corn belt this most important crop has been thriving astonishingly on the late and rather scanty rains it has received, and if the soil is replenished with even moderate moisture during the rest of the summer, the nation's principal grain crop will be at least adequate, if not exactly of bumper proportions.

Science News Letter, July 21, 1934

CE FIELDS

NUTRITION

Find Zinc Essential In Animal Diet

ZINC is a necessary part of animal diet, Drs. Gabriel Bertrand and R. C. Bhattacherjee have reported to the Paris Academy of Sciences.

Their conclusion is based on studies of mice. Baby mice as soon as they could be separated from their mothers were divided into two groups. To one group was given food entirely free from zinc, to the other the same food to which a minute quantity of zinc had been added, one part in fifty thousand.

The first group did not thrive from the start. They became thin, emaciated, lost their hair, and died from various ailments after an average life of 17 days.

The second group survived for an average life of 64 days. Post-mortem examinations of this group showed that about a fifth of the zinc administered had been incorporated in the body tissues.

All the mice had the proper amount of vitamins. But without zinc they quickly died.

Science News Letter, July 21, 1934

METALLURGY

Control of Minerals Would Make War More Difficult

CONTROL of minerals vital for wartime use might be a way to prevent world-wide conflicts in the future, suggests Dr. Ward V. Evans, professor of physical chemistry of Northwestern University, in a paper just prepared for the American Chemical Society.

During the World War, says Dr. Evans, Germany turned to nickel for making high-speed tool steel with which to turn out shells. With insufficient nickel ore in Central Europe, Germany bought nickel from Norway. Norway, in turn, purchased nickel from Canada so that England faced the situation of having her soldiers killed by products from within her territorial domain.

"Since the boundaries of nations were established originally from an agricultural viewpoint with no reference to mineral wealth," declared Dr. Evans, "it might be possible now, by properly controlling the materials upon which modern warfare depends, to prevent war entirely. If substances like rare minerals were controlled there might be an assurance of peace."

Two things would be necessary for such a plan to work, however, suggests the Chicago scientist: First, the world must really desire international peace. Second, a survey must be made of mineral wealth as technical progress changes the makeup of the economic pattern of the world.

The key minerals to be controlled at the present time, which are not abundantly supplied to all nations, are chromium, vanadium, manganese and nickel, says Dr. Evans.

Restrictive control of free export and import of these substances at least would make war much more difficult.

Science News Letter, July 21, 1934

PHYSIOLOGY

Existence of New Vitamin Revealed By Experiments

POSSIBLE existence of another hitherto unknown vitamin, with ability to prevent hemorrhage, is seen in experiments just reported by H. Dam of the Biochemical Institute, University, Copenhagen.

Chicks fed an experimental diet developed a disease very much like scurvy, the chief feature being extensive internal hemorrhages, Mr. Dam reported in a note to the British scientific journal, *Nature*. Large doses of anti-scurvy vitamin C in the form of lemon juice and ascorbic acid did not have any effect on the disease. But a diet consisting entirely of cereals or seeds plus salts prevented the occurrence of the hemorrhages.

"The cause of the disease," concluded Mr. Dam, "must therefore be a deficiency in an antihemorrhagic factor different from vitamin C and occurring in cereals and seeds."

Whether this new vitamin is essential for the well-being of men as well as chicks and whether its absence from the diet is responsible for hemorrhagic diseases in human beings has not yet been determined. Mr. Dam is investigating further the nature of the disease in chicks and of the new dietary essential itself.

Science News Letter, July 21, 1934

PUBLIC HEALTH

Health of Nation Is Not So Good in 1934

THE HEALTH of the country is not so good this year as it was last, study of life insurance and U. S. Census Bureau figures shows.

To be sure, 1933 was an all time record year for good health and officials of the Metropolitan Life Insurance Company consider 1934 "by no means an unsatisfactory year from the standpoint of public health." Yet up to the end of May the cumulative mortality rate was 4.4 per cent. higher than for the same months of 1933 their records show, and according to the U. S. Census Bureau's records for 86 leading cities, the deathrate up to the week ending June 2 was 5.1 per cent. above that for the corresponding part of last year.

Deaths from measles and whooping cough were twice the number recorded last year. There have also been increases in the deathrates for cancer, heart disease, diabetes, cerebral hemorrhage, chronic kidney disease, pneumonia, accidents and automobile accidents.

"An unusual element in the record of the current year is the greatly increased death toll of pneumonia, as registered for the very same months that have witnessed a drop of more than one-half in deaths from influenza," officials of the Metropolitan Life Insurance Company pointed out.

"It is obvious, first, that most of the fatal pneumonia cases of 1934, to date, have not been of influenzal origin; and, second, that an extremely cold winter has played a large part in bringing about this abrupt increase in the mortality from pneumonia."

Science News Letter, July 21, 1934

PHYSICS

Tube Which Opened Fair Goes to Stratosphere

THE SAME radio tube which helped "catch" starlight from Arcturus, that had traveled 40 years on the way, and used it to open the Century of Progress in Chicago last year will go up in the stratosphere balloon of the National Geographic Society and the U. S. Army Air Corps. On its present fifteen-mile journey the tube will be used in apparatus for studies of cosmic ray intensity during the ascension.

Science News Letter, July 21, 1934