SCIENCE NEWS

THE LAST FLIGHT OF DR. MEISINGER

Science Service

THE storms have conquered. While on his ninth free-balloon flight to study their paths and their causes, Dr. C. L. Meisinger, of the U. S. Weather Bureau, and his pilot, Lieutenant J. T. Neeley, of the Army Air Service, were dashed to earth and killed as a result of the destruction of their balloon near midnight of June 2 over central Illinois. They had left Scott Field, near East St. Louis, about seven hours earlier.

The cause of the disaster will always be a mystery. The balloon was burned in the air, but the cause of the fire may have been either a bolt of lightning or a spark from static electricity. According to Weather Bureau records, thunderstorms occurred at scattered points over central Illinois during the fatal night, and a generally electrified condition of the atmosphere was prevalent.

The balloon, one of 80,000 cubic feet capacity and the largest yet used in the series of flights, was filled with inflammable hydrogen gas, as were all the other balloons used. Officers of the Army Air Service, which furnished the balloon and pilot, when asked why the non-inflammable helium gas, such as is used in the *Shenandoah*, was not used, said the reason was the prohibitive cost. Helium now costs about $90 a thousand cubic feet, so that the expense of having filled the big balloon with it would have been about $7,200 as against about one tenth of that amount when hydrogen is used. The gas used in free-balloons is a total loss, all of it escaping when the descent is made, while the helium used in dirigibles is conserved as much as possible.

Speaking to a Science Service reporter shortly before leaving Washington to begin the series of flights, Dr. Meisinger said that lightning was one of the two things he feared while in the air, and that he would take no chances with thunderstorms. The other peril was that of landing in water. Aside from these two dangers he considered free-ballooning as a safe method of investigating the secrets of the air, and as something of a recreation besides. His service was entirely voluntary, the flights having been taken at his own suggestion which was approved after much consideration by the Weather Bureau authorities. While in the Signal Service during the war, Dr. Meisinger had made a number of flights in balloons and airplanes.

The purpose of the whole investigation was to make the air safer for aviation and to learn more about the ways of storms. On each flight a set of instruments for making a study of atmospheric conditions was taken up and frequent observations made at different levels. None of these results had been reported to the Weather Bureau at the time of Dr. Meisinger's death, as he had been operating from Scott Field, and was on the ground only a few days between flights.

Of all the flights, the first was the longest. It began on the afternoon of April 1, at Scott Field, and ended more than 23 hours later when a landing was made at Walterboro, S. C., about 40 miles from the ocean, the total distance traversed having been about 650 miles. Another long flight ended at Palmyra, Ontario, the near approach of the lake forcing a descent. On another flight the intrepid scientist was carried out over Lake Michigan in a snowstorm, but managed to strike a landward current and make a safe descent in Wisconsin. A thunderstorm caused another premature landing.

In reporting his next to the last flight, Dr. Meisinger told Science Service that he expected important results from this last flight, as he intended, by using the large balloon, to be able to stay in the air 48 hours. He declared he expected it to be "a specially interesting story."

It will be an unwritten one. Mourned by his many friends and associates, and, although only 29 years old, respected throughout the scientific world for his achievements and scholarship, Dr. C. Leroy Meisinger's name, with that of his army pilot, Lieutenant James T. Neeley, will go down on that long roll of scientists who died martyrs to human progress.

JUPITER AND SATURN

Science Service

THE two largest planets of the solar system, Jupiter and Saturn, are now in fine position for observation in the evening.

Saturn will be found nearly due south at 9 o'clock in the evening in the constellation of Virgo, The Maiden. It is yellowish in color and about twice as bright as the white, first magnitude star Spica, the brightest star in Virgo, lying a little to the west of it.

Jupiter is just appearing above the southeastern horizon at this time and is by far the brightest object in view, now that Venus is drawing in toward the sun and setting earlier in the evening. On the date of its opposition with the sun, June 5, Jupiter will be on the meridian at midnight and will be visible throughout the night.

If it were possible to take the stuff of which these two huge worlds are made and fashion them into many balls the same size as the earth, 1,309 earth-globes could be made out of Jupiter and 760 out of Saturn, not counting the material that exists in Saturn's rings. This would be by no means a negligible quantity for though the rings are mere sheets, scarcely one hundred miles in thickness, their width is enormous. The inner, dusky ring is nearly eleven thousand miles wide, the middle or bright ring is eighteen thousand miles wide, and the outer ring which is less bright than the middle ring is 11,000 miles wide. These widths total nearly 40,000 miles, more than half the diameter of the planet itself. Then there are the satellites, ten belonging to Saturn, nine to Jupiter. These are good-sized worlds, some of them larger than our moon, two as large, or larger, than Mercury. We could get a few more globes as large as our own from this material.

Compared to our own substantial planet, though, these globes would be rather flimsy worlds. The material of which Saturn is made has only six tenths the density of water. A ball made of it would float, like those the children toss about in the water in summer. The Jupiter globes would be more molasses-like in their consistency or rather like the dense, compressed vapors of which the main body of the sun consists. The sun and Jupiter are almost the same in density and Jupiter is believed to be a very small sun that has cooled off.

Compared with these globes, our own earth, with an average density twice that of its surface rocks, is like a ball of iron. Possibly our earth has a core of iron. Its interior may be made of the same stuff as the iron meteorites that get trapped by the earth's atmosphere now and then and fall to the surface of the earth. Some think these are fragments of an exploded world or remnants of the stuff from which the solar system was originally fashioned.

Now is an opportune time to take a look at either of these giants of the solar system. Even a small, three-inch telescope will show much that is interesting on either of them. The rings of Saturn are now well opened up and present a unique and beautiful sight. You may see the belts running parallel to the planet's equator and at least one or two of the brighter satellites. On Jupiter the belts can be seen very clearly, and the white spots and splotches of color, too. Perhaps there will also be visible a satellite or its shadow projected on the disk. Or, by chance another of its satellites may be caught suddenly disappearing as it dips into the shadow of the huge planet.—*Isabel M. Lewis.*

"CRATERS OF THE MOON"

Bulletin of the National Geographic Society

"Craters of the Moon" is the United States' youngest national monument.

On May 2, President Coolidge signed the order setting aside a little-known district in Idaho for a national monument. It is a wild, colorful region containing one of the most unusual volcanic fields in America. From the twisted brilliant contours of frozen lava fields and crimson cones and the absence of verdure, it takes its official name, "Craters of the Moon National Monument."

Of "Craters of the Moon," lying along the Lincoln highway between Carey and Arco, Idaho, R. W. Limbert writes in a communication to the National Geographic Society: "Although almost totally unknown at present, this section is destined some day to attract tourists from all America, for its lava flows are as interesting as those of Vesuvius, Mauna Loa or Kilauea. The district consists of some 63 volcanic craters, lava and cinder cones, all at present extinct or dormant. The largest and most conspicuous is 600 feet high, rising in the midst of a belt of craters two or three miles wide and 30 miles long. The major flows, the Blue Dragon Flow and the Pahoehoe Flow roughly parallel the Lincoln highway and are but two to five miles from it. A wagon trail from the national road goes into the rocky volcanic desert a short way.

"Stretching to the southwest for about 11 miles, we saw perhaps one of the most remarkable lava flows in the world," continues R. W. Limbert, describing the Blue Dragon Flow. "Its color is a deep cobalt blue with generally a high gloss, as if the flow had been given a coat of blue varnish. The surface is netted and veined with small cracks, having the appearance of the scales of some prehistoric reptile. It merits the name Blue Dragon, as in many places it has burst through the crevasse of an older flow, and the ropy twists of blue lava spreading out in branches, together with its scaled surface, need but little stretch of imagination to suggest the claws and legs of a dragon.

"In appearance the 'Craters of the Moon' flows seem as if they had happened only yesterday, but in reality the latest probably occurred about 150 or possibly 200 years ago. The total area of the six young lava flows is about 300 square miles, while that extending above and below this point along the Snake River plains reaches the astounding total of approximately 27,000 square miles. Of the 300 square miles of lava desert, some 40 square miles have been set aside by President Coolidge. 'Craters of the Moon Nationa Monument' is about 150 miles southwest of Yellowstone National Park.

"Picture yourself standing in some vast amphitheater whose towering walls are a riot of yellow, green, orange, brown and black, with brick red and vermillion predominating," Mr. Limbert writes in describing the district. "Imagine, too, an awesome, enveloping silence. I noticed that at places we had nothing to say. It was little wonder the Indians feared and shunned the region.

"East of the Bridge of Tears we came to the entrance of what we afterwards decided to call Amphitheater Cave. Climbing down, we found ourselves on the east side of a room some 40 feet wide and 60 feet long, with a domed ceiling 20 feet high. As we sat on the north side, we beheld to the south a perfect stage. The floor was double, the lower section being about 8 feet lower than the top of the floor above, which was 15 feet wide. It was almost an exact model of a modern theater. At the top of the dome the roof had caved in, leaving a circular skylight 6 inches in diameter.

"By lining flights of doves, five water holes were located in old volcanic blowholes or fumaroles. Dipping up a cupful of water we were astonished to find it icy cold, so cold, in fact, that it hurt our teeth, and we put the cup down on the hot rocks to warm. This phenomenon can only be accounted for by the supposition that it was the seepage water from one of the ice caves, of which we found a number. One water hole was covered with an inch coat of drowned hornets that had been chilled and had fallen in. The water underneath was pure and sweet. We called this Yellow Jacket Water Hole."

ACIDOPHILUS MILK

Yale University News Statement

ACIDOPHILUS milk, which represents more than ten

years of research work by Professor Leo F. Rettger, of Yale University, has been put on the market as a therapeutic agent and a beverage to be dispensed at soda fountains, etc. The preparation is designed to supplant with a harmless bacterium (*Bacillus acidophilus*) the fermentative and putrefactive bacteria in the intestine which have been found to be the cause of many ailments such as constipation, diarrhea, colitis, sprue, etc.

Through experiments on the white rat, Professor Rettger and his students determined that the addition of milk or sugar of milk to a fixed diet resulted in a large and rapid increase in the number of *Bacillus acidophilus* present in the intestine, with a corresponding decrease in the harmful types. They also discovered that the best methods could be obtained by feeding a preparation containing the bacilli themselves, particularly acidophilus milk, this treatment resulting often in a 95 per cent. implantation in from four to six days.

The experiments were transferred to man, first to normal subjects and then to persons suffering from chronic constipation, chronic diarrhea, colitis, sprue and dermatitis (eczema). With the consumption of the *Bacillus acidophilus* milk, in varying quantities, it was found that the condition of the patients improved rapidly and that in most instances these ailments were cured.

During the past two years Professor Rettger and his associates have sent stock cultures to almost all parts of this country and to foreign countries for the production of the acidophilus milk. They have found that large concerns are able to produce a pure and uniform product under proper supervision. Eventually they hope that its manufacture will be completely under the control of a central laboratory or laboratories.

The preparation of the milk requires unusual skill and care in order to prevent contamination. Fresh skimmed cow's milk is sterilized, cooled and inoculated with a pure strain of *Bacillus acidophilus* which has been grown in and accustomed to milk a sufficiently long time to develop rapidly and bring about coagulation of casein within twenty-four hours. At the end of this time the casein appears as a soft curd, with a very thin layer of whey; when shaken it assumes the consistency of thin cream. Both odor and taste are pleasant. This is taken daily in quantities varying from a pint to a quart, with or without the addition of sugar of milk, in accordance with the requirements of the individual. It may also be taken as a healthful and appetizing beverage.

THUNDERSTORMS IN SAN FRANCISCO

Science Service

ACCORDING to 20 year records compiled by W. H. Alexander, of the U. S. Weather Bureau, San Francisco has fewer thunderstorms than any other inhabited place in the United States. Only 31 thunderstorms occurred in the Pacific Coast City in the years 1904 to 1923 inclusive.

The place with the most thunderstorms is Tampa, Florida, which scored a total of 1,883 in the same period. Another place whose inhabitants are accustomed to lightning flashes and rolling thunder is Sante Fe, N. M., where 1,456 storms occurred in 20 years.

For the year as a whole, thunderstorms have been found to be most abundant in the lower Mississippi valley and along the eastern Gulf Coast, averaging more than 50 a year in those regions. Next to that section they are most prevalent in New Mexico. In the eastern half of the country the number gradually diminishes to the northwards. In the 20 year period, Charleston, S. C., had 1,174, Washington 792, New York 612, Boston 377, and Halifax, 100.

The number is least near the sea, increasing inland. For example, in the two decades, Syracuse, N. Y., in about the same latitude as Boston, had 676 thunderstorms or nearly twice as many, while Cleveland had 757, Chicago 813 and St. Louis 1,000. Duluth, well to the north, and cooled by the water of Lake Superior, has relatively few, the total for the time measured having been 589.

ITEMS

Science Service

THE modern industrial worker is becoming hatchet-faced. In a recent lecture, Sir Arthur Keith stated that comparisons of modern skulls with those of earlier times showed a distinct tendency for the face to become longer and narrower. This same tendency will probably be found to be the result of a disturbance of the elaborate system of hormones or internal gland secretions, and this disturbance also manifests inself in such other abnormalities as enlarged tonsils, irregular teeth and contracted palates. Dr. Keith also suggested that the interference with the normal development might ultimately be due to some cause underlying modern industrialism such as a diet in which some vital quality was missing, or to insufficient light. His researches had shown, he said, that, whatever the cause, the shape of the mouth was changing, the palate becoming more narrow and the face longer. These conditions were not found in England until after the development of industrialism in the eighteenth century. Keith has shown that 25 per cent. of modern Englishmen suffer from dental abnormalities unknown in the bronze age, and that while the upper and lower teeth of early man met evenly, the upper teeth of modern men overlap the lower.

THAT grain fertilized by manure produced by living creatures has more nutritive value than grain fertilized by the best known combinations of artificial fertilizers is indicated by experiments recently carried out at the agricultural station in India. Grain grown from land artificially fertilized was found to be lacking in vitamins as compared with grain grown from soil fertilized with animal manure. The report of the work is published in a recent number of the *British Medical Journal*. The experiments were conducted with pigeons, fed a diet of natural millet. The birds fed with millet grown from artificially fertilized land tended to develop the characteristic paralysis resulting from vitamin deficiency and they also suffered loss of weight. It was found that the efficacy of grain in promoting nutrition and preventing beri-beri bore no relation to the yield per acre, for although land well fertilized by artificial materials gave twice the yield of well-manured soil, the grain from the latter was decidedly the best in the content of vitamins.