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AUTOMATIC WEATHER INSTRUMENTS ON BALLOONS

"ROBOT" weather instruments, carried high aloft on small unmanned balloons, proved their worth during the seventh annual National Soaring Contest at Elmira, N. Y. Each one automatically reported by radio the altitude of the balloon, relative humidity and temperature every minute throughout its flight into the upper atmosphere.

The information secured in this way has been added to the periodic meteorological data collected for the use of soaring pilots in their annual assault upon world and national records in motorless flight. The radiometeorograph ascensions have been conducted by representatives of the Blue Hill Observatory, Harvard University, Milton, Mass., under the direction of Dr. K. O. Lange, who has pioneered in the development of this new type of medium for collecting meteorological data.

The first ascension during the soaring contest was made from Harris Hill on June 27. The twin balloons needed to carry the tiny apparatus rose to an altitude of 68,000 feet and signals were heard for 64 minutes from the take-off time—4:10 in the afternoon. During the second ascension, made on the following day, the balloons carrying the instruments reached an altitude of about 80,000 feet and the signals were heard for 1 hour, 58 minutes. The balloons reached an altitude of about 100,000 feet on June 29, the signals being heard from 12:14 P. M. to 2:57 P. M.

A specially interesting ascension was made on June 29. The balloons were released after dark in the evening and were followed to 13,200 feet. At that point the signals began to record a descent. They were followed to a point where the temperature was lower than at the take-off site, indicating that the apparatus had landed. The failure of the balloons to go higher in this flight probably was due to the bursting of one of them.

Beginning in 1932, the contests conducted by the Soaring Society of America have had the advantage of the most advanced meteorological service available. The pilots were among the first in this country to be taught to use the air-mass system of weather forecasting and interpretation and the continuation of the Blue Hill Observatory experiments with the radiometeorograph through the two-week period of the contest is in line with the society's policy of investigating every promising medium for securing weather information.

DANGER OF DEATH FROM LIGHTNING

THERE is little chance of being killed by lightning in the United States, for only three persons in every million of the population have been struck down annually by electricity from the sky in the last ten years.

New figures compiled by statisticians of the Metropolitan Life Insurance Company show that, despite the low general mortality, there are areas, including New Mexico, Arizona, Georgia and Mississippi, where each year about ten persons in a million lose their lives from this cause.

Frequency of thunderstorms is an important factor, but workers in the outdoors are in much greater danger than city dwellers. In a city like New York, with many tall buildings built on a solidly connected steel skeleton, almost complete protection from death by lightning is afforded not only to the persons within such buildings, but also to those in the vicinity. These tall buildings act as most efficient lightning conductors, partly by dissipating the electric tension without any actual lightning discharge, and partly by receiving the lightning discharge when it does occur, and passing it harmlessly to the ground. It is a matter of relatively common occurrence in thunderstorms for these tall buildings to be struck without the slightest damage to the buildings or their occupants.

There is a continuous band of states, including Montana, Wyoming, Colorado, New Mexico and Arizona, running from north to south, characterized by annual death-rates of six per million and over; another continuous patch of states with these high rates is found in the southeast corner of the United States, including South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana and Arkansas. States bordering on these areas also had in most cases higher than average death-rates from this cause.

In contrast, the Pacific Coast States and the highly industrialized states of New England and the Middle Atlantic Division ranked as the least hazardous parts of the country as regards fatalities from lightning. Outstanding among the states with low rates may be mentioned California, with a population of approximately six million, where there have been only five deaths from lightning in a ten-year period studied, and the State of Washington with a population of approximately a million and a half and only eight deaths in the same period.

In the death registration area of the nation during the period 1924–1933 there were recorded 3,849 lightning deaths, the equivalent of 385 per year.

EFFECTS OF THE DROUGHT ON WILDLIFE

DROUGHT has developed a new menacing front in the Northwest—big game animals in the U. S. National Parks, now on parched pasturage, are threatened with starvation next winter through shortage of the hay crop that has ordinarily supplied supplementary feed.

The situation is most acute at present in Wind Cave National Park, a small park on the south slope of the Black Hills in South Dakota. Although the total number of bison, elk, antelope and deer on this comes to less than 500 head, lack of pasturage now and hay for next winter makes even this small number look like too much of a load.

In Rocky Mountain National Park there has long been a deer-and-elk problem, because the natural range north

of Estes Park is over-stocked, and efforts of the National Park Service to get it extended have thus far been unsuccessful. Glacier National Park, on the other hand, offers less of a problem, because the deer pasturage there depends primarily on winter snows, and these have been abundant even when the Plains have suffered from both summer and winter drought.

Yellowstone National Park of course has the biggest problems to face, because it supports the largest herds of big game, and because droughts of the past few years have left the range in bad shape. The present state of the range where the thousand buffalo feed is not accurately known at the moment, but a survey has been started. The ten thousand head of elk which constitute the so-called Northern and Gallatin herds are known to be a grave over-load on their natural range, but efforts to get more land have been stymied by the opposition of ranchers whose lands run up to the northern boundary of the park. The southern elk herd feeds in Yellowstone Park only during the summer, and lives most of the time outside the park boundaries, so that while it presents a serious problem, the responsibility for solving it does not rest primarily on the National Park Service.

Distress and possible wholesale starvation of the Yellowstone elk herds, the largest surviving groups of these animals left in the United States, will undoubtedly be intensified by the difficulty of procuring supplementary feed. In past "distress winters," public-spirited citizens have often dug down into their own pockets to purchase hay from outside sources, but this year they will have to bid against the urgent need for feed of all kinds to save the herds of domestic animals throughout the drought-swept Northwest.

VOLCANIC ACTIVITY ON THE ISLAND OF MONTSERRAT

MONTSERRAT, a small volcanic island in the British West Indies where Dr. Thomas A. Jaggar is now investigating the almost continuous disquieting earth tremors, has always been regarded as a "safe" island until the last few years. There is no record of anything like a real eruption since the first discovery of the island by white men.

In fact, the first description of Montserrat does not even mention its volcanic nature, except to refer to it as rugged or mountainous. For example, the encyclopedic "Accurate Description of the New World," published in 1671 by the English geographer John Ogilby, merely says:

"Montserrat, lying just at the seventeenth degree, is so called from a Spanish Hill beyond Barcellona, whose shape this Island represents off at Sea; It is about three Leagues in length, and almost as much in breadth, and is very Mountainous, except a little towards the East, and as much Westward. The English have a Church here, lin'd in the in-side with Cedar, which this Island produces in great abundance."

Montserrat's present activity seems to have begun in comparatively recent years, in a rather "simmery" fashion. Early in the present century the German volcanologist, Dr. Karl Sapper, was interested enough to land there and make a hasty reconnaissance of the island, during the course of an expedition devoted mainly to the investigation of the more formidable volcanoes elsewhere in the Caribbean region. At that time he reported that fumarolic and solfataric activity had apparently increased a great deal since the end of the nineteenth century, because he found many trees killed off, where they had previously grown unmolested.

Yet at some time there must have been major eruptive activity, for there are three major mountain masses on the island, all of which appear to be the much fragmented relics of a volcanic framework. The highest of these is Mount Chance with an altitude of about 2,900 feet; it is thickly wooded, and has a good-sized pond near its summit, in what appears to be a crater-pocket. Another peak, St. George's Hill, still has a definite crater form, though it is much eroded.

Montserrat is a small island, lying about midway between the Virgin Islands and the tragic French possession Martinique, devastated in 1902 by the explosion of Mount Pelée. It is about eleven miles long and three miles wide. It has the nickname of the "Emerald Isle of the Antilles," partly because of its green tropical beauty, partly probably because its 12,000 inhabitants are mainly of Irish descent. They are still noted, even in the hospitable West Indies, for their hospitality, and also for their easy wit and a tendency to "blarney."

THE EARLIEST ALL-AMERICAN BOTANY

AFTER existing for four centuries as a single manuscript copy, the oldest all-American botany book is to be put into print by the Smithsonian Institution, aided by generous contributions from private individuals and organizations.

The book is known as the Badianus Manuscript, and it is kept in the Vatican Library. It is a carefully written treatise on all the medicinal plants used by the Aztecs before the time of the Spanish Conquest, with accounts of the diseases they were supposed to be good for.

The work is by native Americans throughout. The original was written in the Aztec language by an educated Aztec named Martin de la Cruz, and was translated into Latin by another Aztec, Juannes Badianus. The illustrations are vividly done in colors, in the native Aztec style; they are still as bright as new, and most of them can be identified by botanists.

The task of translation and annotating the Latin and Aztec text was performed by Dr. Emily Walcott Emmart, of the Johns Hopkins University. Dr. Emmart was also active in finding the needed supplementary funds for publication.

The Badianus Manuscript is a monument alike to Aztec civilization and to the intelligence of the Spanish conquerors. The Conquistadores were not the mere brutal freebooters long pictured in popular histories. Close on the heels of the conquering soldiers followed able administrators, learned educators and zealous missionaries. Within a few years of the conquest, and a hundred years before Harvard College opened its doors, there was in

Mexico City an officially sponsored institution of learning for "sons of Indian gentlemen," with a faculty of Franciscan friars.

In this place, Santa Cruz College, the curriculum included all the subjects commonly taught in the European universities of the time, plus Aztec language and Aztec medicine. The friars taught the Indians how to write their own language (for Aztec had no alphabet of its own), and even made some of them fluent in Latin.

The redskinned Senores de la Cruz and Badianus collaborated in making a permanent record of Aztec medical and botanical learning in their little book, intended first for the eyes of the viceroy, and possibly of the Spanish king. The text is entirely in Latin, with the exception of the names of the plants themselves, which were wisely left in the original Aztec. And now for the first time the scientific world at large is given access to this treasure of early American knowledge, through the action of the Smithsonian Institution and the generosity of its friends.

ITEMS

NEW experiments with apples revealing that different apple varieties show marked differences in the amount of vitamin C they contain were reported to nutritionists, at the meeting of the American Home Economics Association, in Seattle. Using guinea-pigs to test the nutritive value of western apple varieties, Dr. E. N. Todhunter, of the State College of Washington, reported that apples lose vitamin C when stored. Destruction of vitamin C, he said, increases with the length of time apples are kept in storage and is progressively greater with storage temperatures above 32 degrees Fahrenheit. Dr. Todhunter also reported that the peel contains about half the vitamin C value in an apple.

SEATTLE'S experiment in requiring meat to be graded, watched by cities throughout the country, is giving the public better beef with no advance in price. So the American Home Economics Association, meeting at Seattle on July 1, was told by Dr. F. E. Smith, of the Seattle Department of Health and Sanitation. Seattle is the first city in the United States to make the grading of beef, mutton and lamb compulsory. The system, now in use for a year and a half, was developed by the U. S. Bureau of Agricultural Economics with the idea of marking meat in a common language understood by both buyer and seller. Describing the meat grading system as "a service rendered to consumers, which protects them against fraud and misrepresentation," Dr. Smith said that opposition to the system continues "stubborn and persistent."

DIFFERENT colors of light not only produce different rates of growth in plants, but in some way cause neighboring seedling-tips to seek or shun each other, according to Dr. Enoch Karrer, of the Smithsonian Institution. Dr. Karrer grew large numbers of oat seedlings, and exposed sets of them to the rainbow-band of light obtained by splitting up the white light of an electric arc. Seedlings exposed to blue light showed the expected reaction of bending toward the light. But they also showed an unexpected reaction: they also bent toward each other. Red light produced an opposite "social" effect: red-illuminated oat seedling tips bent away from each other. Plants receiving orange light became greener than their neighbors, while those receiving only blue-green light developed the most marked yellowish color. Roots grew longest in the extreme blue and shortest in the orange-red.

THE biggest beast that ever trod on dry land, Central Asia's giant Baluchitherium, is now shown as he was in life, at the American Museum of Natural History, in a restoration sculpture which will be placed on display in the near future. Museum artists are now putting the finishing touches on the enormous image, which mounts a body as big as two elephants on top of massive six-foot-high legs. Towering higher than any living giraffe, the Baluchitherium was a primitive representative of the rhinoceros family. It lived some 25,000,000 years ago, when what is now the Gobi Desert was a well-watered, richly vegetated land. The genus was given its name, which is rather loose-jointed Greek for "beast of Baluchistan," because its fossil remains were first found in that country.

PHYSICIANS and surgeons are viewing with interest a report presented at the meeting of the American Institute of Electrical Engineers that an Italian, stabbed in a fight and about to die on an operating table, was brought back to life when the surgeon applied a counter-shock previously given animals in experiments to revive them after suffering an electric shock. Dr. William B. Kouwenhoven, assistant dean of the School of Engineering of the Johns Hopkins University, reported how a surgeon, while sewing up the Italian's heart, saw from the fibrillation of the organ that he would die, and gave him an electrical counter-shock. The surgeon had previously visited the Hopkins laboratory. It took two days to convince him by experiments on animals that counter-shock is effective in reviving the fibrillating heart. The surgeon, whose home city and name was not disclosed, previously skeptical but convinced by actually making experiments in the Hopkins laboratory, is believed to be the first man to apply the counter-shock principle to reviving a human being.

DR. HOWARD L. EDER, of the Santa Barbara Clinic, has found that new-born babies get a better start in life when they are fed a special sugar solution and sodium citrate during their first few days. The sugar solution, a combination of maltose and dextrin, is already widely used as a supplement to cow's milk in infant feeding. Combining sodium citrate with the sugar solution is the new departure. In a report, appearing in the current issue of the *Archives of Pediatrics*, Dr. Eder states that this solution lessens the weight loss following birth and prevents the acidosis, fever and jaundice which "have been a grave source of concern to the medical profession for many years." Babies given the citrate-sugar mixture regain their birth weight more rapidly, nurse more vigorously and are in generally better condition.