amount of lipase can hydrolyze a definite amount of triolein, irrespective of the mass of the latter; that reversion occurs in only negligible amounts when water is present. It is suggested that lipase may not be an important factor in the synthesis and storage of fats in the cell. "Behavior of Molds toward the Stereo-isomers of Unsaturated Dibasic Acids," by Arthur W. Dox. Comparisons of growth of various molds in media containing fumaric, maleic, mesaconic, citraconic and itaconic acids.

NOTES ON METEOROLOGY AND CLIMATOLOGY

Owing to the fact that the horizontal component of falling snow is frequently greater than the vertical, the catchment of the true amount of snow falling at any place has always been a problem of great practical difficulty. The complex whirls and eddies set up by the wind over the ordinary precipitation gauge do not allow the proper amount of snow to fall into the cylinder. For this reason it has frequently been the practise to cut out a cylinder of snow from an open place where the snow lies at an average depth, and convert this into the water equivalent. The increased use of water for irrigation and power purposes in the western part of the United States has resulted in a demand for a more thorough knowledge of the proper manner of measuring rainfall. Some time ago the United States Weather Bureau appointed Professor F. H. Bigelow to supervise a study of the problem. The first report of progress in this investigation has just been published. It consists largely of a summary of the results obtained from a number of stations in thirteen western states, all of which were equipped with similar apparatus. It contains the conclusion, "that it is not proper to give further consideration to any plan of constructing a seasonal snow or rain gauge that depends upon a pipe having a small diameter, such as the usual Weather Bureau rain gauge, the ten-inch standpipe, and the numerous automatic devices fitted with similar pipes for the catchment. . . . We infer that all the stations of the Weather Bureau should be equipped with snow bins, and that the rain gauges should be placed inside, the open top being within a few inches of the floor of the bin." The bin giving the best results thus far consists of a five-foot cubical box, open at the top, with its floor five feet above the ground. It also has inside and outside louver screens which prevent the formation of eddies. This much of the problem having been solved, it is probable that the experiments will be continued with the hope of constructing a seasonal reservoir for remote places where access is only occasionally possible.

In the latest number of the *Monthly Weather Review,* the June number, Professor A. G. McAdie, section director of the United States Weather Bureau at San Francisco, calls attention to some interesting facts in connection with the snowfall at Summit, Cal., the elevation of which is 7,017 feet. A table is published showing the seasonal snowfall for the past forty years, constituting one of the longest periods of snowfall observations in the country. The average annual snowfall for this period is 422.6 inches (35.2 feet), and the maximum for any one winter being that of 1879–80, when it was 783 inches (65.3 feet). Using a similar table as a basis, Professor J. N. LeConte has drawn a curve to show the average rate of melting and the relation between this and travel possibilities. The actual curve of melting for any year may be compared with the mean curve, and if it falls below the mean for the most part, the season will probably be a dry one, and travel in the mountains will be possible at a much earlier date than during a year when the actual curve of melting rises above the mean.

The British Meteorological Office has just issued a volume called "The Trade Winds of the Atlantic Ocean," consisting of three contributions to the study of the northeast and southeast trade winds. As stated in the preface, five years ago Dr. W. N. Shaw called attention to "the analogy between the seasonal variation of the trade wind and that of the rainfall of the south of England," and "added

a number of other considerations that seemed to point to a connection between what may be called the main arterial circulation of the atmosphere as represented by the trade wind and the meteorological consequences of that circulation in other parts of the world." Guided by this suggestion, Commander M. W. C. Hepworth has endeavored to trace, in the first paper in the present volume, the effect of variations in the trade winds upon the temperature of the water in the North Atlantic. The second paper is a lengthy discussion by Mr. J. S. Dines of all the data for St. Helena which the Meteorological Office possesses, especial attention having been paid to the anemograph records. The third paper consists of a mathematical demonstration, by Mr. E. Gold, of the relation between the variation of wind velocity and barometric fluctuation, one of the few meteorological problems amenable to direct mathematical treatment. Here again application of the general theorem to the particular case of St. Helena has been made.

THE first number of the "Monthly Meteorological Report of the Australian Commonwealth" has recently been distributed. This publication will doubtless serve the same purpose in Australia that the *Monthly Weather Review* does in the United States. Under the direction of its meteorologist, Mr. H. A. Hunt, the Commonwealth Bureau of Meteorology has had a remarkable growth, and now ranks with the weather services of older countries. As an example of its work note should be made of its latest bulletin, "On the Possibility of Forecasting the Approximate Winter Rainfall for Northern Victoria," by Mr. E. T. Quayle, an assistant in the bureau. The author has found a close agreement between the winter rains of that country and the preceding monsoonal depressions. The practise of forecasting even the approximate rainfall of a coming season by a government service is not common. The same bureau has also published an average rainfall map of New South Wales, the first of a series, now in the course of preparation, which will include all the states.

THE relation between free air conditions and those prevailing at similar heights on mountains has received considerable attention in Europe within recent years. Berson found from a comparison of the temperatures observed in balloons with those obtained on the Brocken (3,740 feet) that the mountain was 0.9° C. colder than the free atmosphere. Hann deduced from mountain observations that the mean temperature gradient up to 10,000 feet is 5.7° to 5.8° per kilometer, whereas balloon ascents gave a mean of 4.9° to 5.0°, while kite ascents gave 4.7°. Accordingly, air in contact with a mountain 10,000 feet high will be 2° to 3° C. below that at the same height in the free atmosphere. Shaw and Dines found that the results obtained in twenty-eight kite ascents showed that the temperature on Ben Nevis (4,406 feet) was in all cases lower than that in the free atmosphere at the same height over the sea to the west of the mountain, the mean difference being 2.6° C. In comparing the simultaneous values observed on Zugspitze (9,728 feet) and those recorded at the same height in balloon ascents from Munich, 56 miles distant, Schmauss found a mean difference of 1.6° C. between the synchronous temperatures, and 1.1° C. between the temperature recorded in the free air and the mean temperature of the day at Zugspitze. The same investigator also deduced, from a comparison of the temperatures on Zugspitze and Sonnblick, that the latter was 0.6° C. colder than the former at the same height, indicating that a mountain in the middle of a mountainous district is colder than one on the edge of such a district, and offering further evidence that the atmosphere is cooled by the mountain. Shortly before he went to Reno, Nevada, where he is now observer at the University of Nevada, Mr. S. P. Fergusson completed an investigation of this nature which had been carried on in the White Mountains of New Hampshire. Simultaneous observations at similar heights were obtained by means of kites in the free air, and recording instruments in a standard shelter upon the summit of Mount Washington. A brief summary of the results found

was published in *Appalachia* for 1910, but a more complete report will be given in a forthcoming volume of the "Smithsonian Miscellaneous Collections," part of the expense of the work having been provided for by a grant from the Hodgkins Fund.

AT the recent Harvard-Boston Aviation Meet Professor R. W. Willson established what is likely to become a standard method for determining the maximum height reached by an aeroplane in flight. A thermograph, which had been used at Blue Hill Observatory for obtaining the temperature encountered by a sounding balloon, and a water barometer were attached to the aeroplane. The atmospheric pressure prevailing at the highest point reached by the aviator was later corrected for the temperature recorded by the thermograph, and the actual height computed with the aid of the usual tables. As a check upon this height, simultaneous observations of angular altitude were made by means of transit instruments, one at each end of a measured base line, and the height computed from the triangle thus obtained. As the method gives two independent determinations of height, the desired accuracy is attained.

IN an article in "*Umschau*" by Dr. Karl Stoeckel, attention is called to the fact that ultra-violet light, like the rays of radium, decompose water into hydrogen and hydrogen dioxide, without evolution of oxygen. It is believed that the ultra-violet rays of sunlight which fall upon the water vapor suspended in the lower strata of the earth's atmosphere decomposes a small part of it to produce hydrogen, which rises to great heights, and hydrogen dioxide, which has been found in small quantities in rain-water. From spectroscopic observations of high, luminous meteors, Professor Pickering has shown that hydrogen is undoubtedly present. Moreover, Professor J. Hann has calculated that 99.5 per cent. by volume of the atmosphere at a height of 62 miles is hydrogen. A slightly larger proportion, 99.84 per cent., is obtained by Dr. W. I. Humphreys, of the United States Weather Bureau, in a recent research. It is not improbable that these facts will help to solve the problem of the upper inversion, as well as that of the slow desiccation of the earth.

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September 28, 1910

PUBLICATIONS ON THE INDIANS OF THE NORTHERN PLAINS

FOR several years the department of anthropology of the American Museum of Natural History has been engaged with a cultural survey of the Indian tribes occupying the northern plains: viz., the Sarcee, Northern Shoshone, Blackfoot, Crow, Gros Ventre, Assiniboine, Hidatsa, Mandan, Dakota, Plains Cree and Plains Ojibway. Though far from complete practically all of these tribes have been visited and systematic continuous investigation inaugurated for the next five or more years as the case may demand. The formulated results are now appearing in the "Anthropological Papers" of the American Museum of Natural History, seven papers having been issued to date, four of which were previously reviewed in SCIENCE, October 16, 1908. The three to be discussed here are: The Northern Shoshone, Vol. 2, Pt. 2, pp. 165–306, Plate I. and 20 text figures, January, 1909, and The Assiniboine, Vol. 4, Pt. 1, pp. 1–270, Plates I.–III., and 17 text figures, November, 1909, both by Robert H. Lowie; The Material Culture of the Blackfoot Indians, by Clark Wissler, pp. 1–176, Plates I.–VIII., and 103 text figures, March, 1910.

The Northern Shoshone.—In 1906 Dr. Robert H. Lowie began an investigation of the northern Shoshone, or Snake Indians. His results, as published, show that in economic life these Indians manifest predominatingly the traits of the plateau area west of the Great Divide, especially in the use of seed-grains and fish, the buffalo being little more than an incident in whose pursuit they made occasional journeys into the Missouri basin, a practise no doubt greatly stimulated by the acquisition of horses. In costume,