

NOTES AND EXTRACTS.

WEATHER BUREAU MEN AS INSTRUCTORS.

Mr. Norman B. Conger, Inspector, Weather Bureau, reports a short address by himself on Weather Bureau warnings and their use, delivered in Detroit, Mich., November 30, under the auspices of the Educational Committee of the North Woodward Methodist Church.

Mr. Weston M. Fulton, Local Forecaster at Knoxville, Tenn., delivered an illustrated lecture on meteorology in the auditorium at Chattanooga, Tenn., on December 23. Mr. L. M. Pindell, Observer in charge at Chattanooga, was successful in arousing the enthusiastic support of the business men and public-spirited citizens of Chattanooga, who guaranteed to bear all the expense of this free lecture for the benefit of the community at large. In accordance with the general policy of the Department of Agriculture, Mr. Fulton was granted leave of absence from his station for the purpose of delivering the lecture. Mr. Pindell has established a department of meteorology as one of the courses of education in the high school, which is proving very popular. A library of 75 volumes on meteorology has been provided and money for the purchase of instruments has been raised by popular subscription.

Mr. Frank P. Chaffee, Section Director at Montgomery, Ala., reports that he lectured in that city on November 18 before 4 teachers and 120 pupils of the Girl's High School. The lecture, which was on "The Atmosphere, its Elements and Movements, with Particular Attention to the Laws of Storms," was illustrated with blackboard drawings and printed climatic charts.

As a result of the lecture, the weather maps issued by his office will be taken up as a regular class study in connection with that of physical geography.

CLIMATOLOGY OF CALIFORNIA.

Under the above title the Weather Bureau has published a memoir by Prof. Alexander G. McAdie, to be known as Bulletin L, of the quarto series, or W. B. No. 292. Besides the large amount of material compiled by himself, a number of special chapters have been written by Weather Bureau officials, e. g.: The climate of Los Angeles, by Mr. George E. Franklin; Sacramento, by Mr. James A. Barwick; San Diego, by Mr. Ford A. Carpenter; Red Bluff, by Mr. Maurice Connell; Eureka, by Mr. Aaron H. Bell; Fresno, by Mr. J. P. Bolton; San Luis Obispo, by Mr. J. R. Williams; Independence, by Mr. J. J. McLean. A number of other acknowledgments are made, among them the contribution of the Rainfall Data at High Stations, by Mr. J. B. Lippincott, Hydrographer of the United States Geological Survey. In his opening chapter Professor McAdie enumerates the four controlling factors on which the climate of California depends:

1. The locations and changes of both the permanent areas of high and low pressure and the smaller individual areas of pressure.
2. The prevailing drift of the atmosphere from west to east.
3. The proximity of the Pacific Ocean, considered as a natural reservoir of heat.
4. The exceedingly diversified topography for a distance of 200 miles east of the coast line.

Under these heads a considerable amount of data is given. The corrected table of altitudes and locations of all summits exceeding a thousand meters in altitude will doubtless often be referred to. The chapters relating to the climate of the north and central coast, the southern coast, the Great Valley,

and the Santa Clara Valley consist essentially of tabular data, showing the mean temperature, the minimum and maximum temperatures, and the rainfall, and in some cases all the other climatological data, month by month, for each year since the beginning of meteorological records. Similar tables are then given for individual stations in the section of local climatology. The last page of this section is devoted to the minimum winter temperatures recorded on the summit of Mount Lyell (13,041 feet altitude). On July 8, 1897, a minimum thermometer was left upon the summit, inclosed in a thin wooden box about 6 inches square and 2 feet long. This was visited on June 5, 1898, and again in July, 1899. The minimum readings were -13.6° F., or -25.3° C., for the winter of 1897-8, and -17.6° F., or -27.6° C., for the winter of 1898-9. Professor McAdie compares those with the corresponding minimum temperatures observed at Bodie, a few miles to the east and at an elevation of 8248 feet, where the minimum temperatures were -24° F. and -30° F.

The third section of Bulletin L, or pages 168-213, consists entirely of tables of monthly and annual precipitation. One hundred and thirty-three stations are included in this collection, which are additional to those printed in the previous part of the book. We think the students of climatology will regret that in these and similar tables, the observations by different observers at neighboring localities, with different instruments, are combined together into one continuous series without any indication as to where the individual component series begin and end, thus preventing any attempt at reducing the components to a homogeneous system. The next portion of the volume, pages 215-255 is devoted to snowfall, frosts, and fog. The snowfall is given for each month for the years 1878-1900 for 4 stations, Boca, Emigrant Gap, Summit, and Truckee, and for many other stations for shorter periods. The very heavy snowfall recorded for the winter months shows that a slightly higher elevation would almost certainly give rise to a permanent glaciation of the summits of this portion of the Sierras. The article on fog is illustrated by a number of striking photographs of cloud and fog views that Professor McAdie succeeded in taking from the summit of Mount Tamalpais. The volume concludes with short chapters on the thunderstorms and earthquakes recorded in California. It seems that though lightning is rare in California lowlands, yet is common enough on the Sierras. The whole volume of 270 pages must be recognized as a valuable collection of data and a monument to the intellectual activity of Professor McAdie and his staff of collaborators.

PROPOSED PILOT CHARTS OF THE SOUTH ATLANTIC AND OF THE SOUTH PACIFIC OCEANS.

According to a notice published on the Pilot Chart for January, 1904, the United States Hydrographic Office has in view the publication of meteorological charts of the South Atlantic and of the South Pacific oceans, similar in scope to the present monthly Pilot Charts of the North Atlantic and North Pacific oceans.

The proposed charts will be published quarterly instead of monthly, the first to appear being the chart of the South Atlantic Ocean for its winter months of 1904. It is hoped to have this ready for distribution June 1, 1904.

Successive seasonal charts of the South Atlantic Ocean will appear at quarterly intervals until the entire year has been included, after which a like series will be taken up for the South Pacific Ocean.

The United States Hydrographic Office earnestly requests the cooperation of mariners navigating these waters in the preparation of these charts. The assistance of masters of sailing

vessels is especially desired. Blank forms for meteorological observations, with instructions for taking the same, will be furnished upon application either by mail or in person to the Hydrograper, United States Hydrographic Office, Navy Department, Washington, D. C., or to any one of the branch offices.

The charts will be furnished free of charge to cooperating observers, irrespective of nationality.

The charts contemplated in the above notice will be gladly welcomed by meteorologists, who necessarily study the whole globe rather than any one small section. Of course they will at first be made up largely from the normal data already accessible, but after a few years the accumulated publications of current data will constitute a very important and convenient addition to our limited knowledge of the Southern Hemisphere. It is to be hoped that the whole Southern Hemisphere is to be included in the two charts entitled South Atlantic and South Pacific oceans. It certainly would be a great pity to omit the South Indian Ocean.

A DAILY WEATHER MAP FOR THE NORTHERN AND SOUTHERN HEMISPHERES.

In a recent letter from Sir John Eliot, Meteorological Reporter to the government of India and Director-General of Indian Observatories, he says:

Meteorology is a question of thermodynamics and aerodynamics. There are probably some general relations between sun spots and terrestrial magnetism and some of the broader and most general features of terrestrial meteorology. They can, however, only be of use as indications of large local variations of weather (such as are experienced in India) after we have investigated the problems from the hydrodynamical side, or as questions of variations of air movement depending upon variations of absorption of solar radiant energy, etc.

When I was in England recently, Sir Norman Lockyer, Mr. W. N. Shaw (the head of the Meteorological Office), and myself discussed the possibility of a daily weather report and chart of the British Empire. It is quite in the air at present, but I have already consulted the government of India and the present authorities fully sympathize and would be prepared to do their share. Perhaps if the United States and England joined hands in this, it might eventually lead to the world map which you suggest.

THE METEOROLOGICAL OBSERVATORY AT SAN FERNANDO, SPAIN.

A letter of October 15, 1903, announces that by royal decree of August 20, Captain Fuenoy de Azearte has been appointed director of the Marine Institute and Observatory at San Fernando, in the Province of Cadiz, Spain. This institution was established in 1753 by King Iorge Juan. It was then located at Cadiz, but was transferred to San Fernando at the beginning of the 19th century. It is at present conducted under the regulations laid down in 1873. It publishes a nautical almanac for the use of Spanish navigators, and a volume of astronomical, magnetic, and meteorological observations, and also examines the nautical instruments used by the Spanish Navy for the purpose of detecting errors.

EDUCATION OF METEOROLOGISTS.

The gradual development of meteorology has for two hundred years been due to the activity and faithfulness of innumerable observers throughout the world and it has not been supposed that the labor of reading instruments and making weather records required anything but ordinary intelligence, good habits, and perseverance on the part of the observers. Those who have tried to penetrate the laws of atmospheric phenomena generally found the problems too difficult and very few profound theories have, as yet, been accepted as satisfactory to the best students. At the present time, however, the so-called practical man is being very hard pushed in order to keep abreast with the progress that is be-

ing made by a new race of investigators who are applying to the atmosphere the best that is now known relative to all the laws of physics and mechanics. It will no longer do to say that the practical man is ahead of the theoretical or that the college graduate is inferior to one who is not a collegian. Whatever advance may be made in the practical business operations of the thirty or forty national weather bureaus now in existence; however much they may extend the telegraphic work, and the areas covered by the daily weather maps, or the accuracy and minuteness of the daily weather forecasts, yet, there will always be use for those who are delving deeper and searching further. There is a divine instinct that leads men to strive upward and forward in the realm of knowledge. We are confident that everything is governed by law and that these laws are not beyond our knowledge. Little by little we shall dissipate the ignorance around us; we shall unveil the arcana of the universe; we shall find the work of the observer confirming our theories; we shall honor those leaders of science whose fancies have not led them astray in their efforts to discover the laws of nature.

An article by Prof. Edwin G. Dexter, published not long since in the "Popular Science Monthly," shows very clearly that the high grade college graduates also attain a high grade in subsequent practical life in the world at large. He concludes by saying:

The statistical evidences that the high grade man maintains his status in after life, which are here presented, though open to all the criticisms of the statistical method are nevertheless in accord with our general belief of what should be. If the college course is a true preparation for life, it is but natural to expect that he who best fulfils the requirements of the former is best fitted for the latter. Were this not so we should pronounce the preparation a failure.

May we not add that if education is good for the business man it may also be good for the meteorological observer. Shall we not make better observers in proportion as we study meteorology more thoroughly and learn to appreciate all the fine points that have been brought out by centuries of records and studies? Shall we not make better climatologists by having regard to the rules that govern the legitimate methods of studying statistics, rules that are as rigid as the laws of chance or the play of roulette or cards at the gaming table? Shall we not make better meteorologists by familiarizing ourselves with the laws of physics that pervade the whole atmosphere. The winds and clouds, heat and cold, rain, storm, and drought can not vary, except in obedience to the laws of nature.

COOPERATION IN GOVERNMENT WORK IN SCIENCE.

In its issue of April 16, 1903, Nature, London, prints in full the resolutions recently promulgated by the government of India, with the purpose of so directing the energies of the various departments as to promote an effective cooperation and prevent useless duplication in scientific work.

Steps in this direction were taken six years ago, when the policy of the government in establishing departments of scientific research was clearly set forth and the desirability of coordinating the labors of the different departments was pointed out. The broadening and development of scientific work in pursuance of the policy then outlined has but served to emphasize the necessity of the cooperation suggested at that time.

The work of many members of the scientific staff covers fields in which experiments of a similar or cognate character are being independently conducted. Thus in chemistry we have several investigators following parallel lines of research; in economic botany there are two departments working independently of each other; in economic entomology there have been two specialists, each charged with investigations similar to character.

It is therefore proposed to appoint a board of scientific advisors, which will review and advise generally upon the work of the departments, and will endeavor, not only to effect such consolidation as may be expedient, but also to direct the sci-