Local Forecaster, United States Weather Bureau. San Diego Chamber of Commerce. 1913. Pp. xii + 118.

That a chamber of commence thinks it advisable to publish such a volume as this speaks well for the city represented. The book bears little resemblance to the ordinary "boom literature" of pushing cities, with which we are too familiar.

The book is distinctly readable and interesting. The weather phenomena of the southern California region are treated in a somewhat popular, but thoroughly scientific manner. The elements, which make up the complex called climate, are considered separately; both the conditions more or less peculiar to the region and those of more widespread occurrence are considered from the standpoint of their causes. The climate of San Diego, from the records of the Weather Bureau and its predecessor, the Signal Service, is shown by the usual tables of data and is also described in words. The record is uninterrupted from its beginning, July 1, 1849, when meteorological work was established in San Diego as a part of the duties of the post surgeon of the army; therefore the data form one of the longest records in the United States. The book is well illustrated with photographs of the region and the meteorological instruments, as well as with maps and diagrams.

This volume may well serve not only as a sample of the kind of thing which can and ought to be done by a progressive chamber of commerce or similar organization in a region climatically favored, but it is also well suited as an introduction to the whole subject of meteorology and should give a better understanding to the processes which control the weather. Both Dr. Carpenter and the city of San Diego are to be congratulated on the appearance of this volume. It is to be hoped that as interesting and accurate discussions of the climates of particular places will become the rule, instead of the exception as at present.

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NOTES ON METEOROLOGY AND CLIMATOLOGY

INTERNATIONAL METEOROLOGY

THE report of the secretary (Dr. G. Hellmann) of the meeting of the International Meteorological Committee (composed, in general, of the directors of national weather services), held in Rome, April 7–12, 1913, has recently appeared.[1]

Assistance on the question of the influence of weather on agriculture having been asked by the president of the International Institute of Agriculture, the Meteorological Committee responded by appointing a permanent commission consisting of Messrs. Angot, Börnstein, Brounow, Louis Dop, Hergesell, Palazzo and Stupart.

The recommendations of the Commission on Weather Telegraphy, which met in London in September, 1912, were adopted with but few changes. Thus on May 1, 1914, the long-desired, uniform telegraphic code throughout Europe will come into use.

The report drawn up by Messrs. Palazzo, Köppen and Lempfert showed that the mean wind velocities equivalent to the numbers of the Beaufort scale of wind force in use in different countries are widely variant. The Meteorological Committee asked for a further investigation, to consider gusts of wind as well as mean velocities for the force equivalents of the 10- or 12-point Beaufort scale.

The proposal of the International Committee for Scientific Aeronautics to have international cooperation in upper-air observations in many parts of the Arctic in 1915, during Captain Amundsen's polar expedition, was warmly supported and a small subcommittee consisting of Messrs. Hergesell, Rykatchew, Ryder and Stupart was appointed to deal with the question.

To have aerological data in convenient form for the purposes of dynamic meteorology, Professor V. Bjerknes, of Leipzig, at the meeting

[1] "Bericht über die Versammlung des internationalen meteorologischen Komitees Rom 1913," No. 260, Veröffentlichungen des Kgl. Preuss. Met. Inst. Berlin. See also *Nature*, London, Vol. 91, p. 198.

of the International Commission for Scientific Aeronautics in Vienna, May 27–June 1, 1912,[2] proposed (1) that the results of upper-air observations shall be arranged according to definite steps of pressure instead of steps of height; (2) that the heights shall be given in "dynamic meters," *i. e.*, a step corresponding with a certain difference of gravity potential, not of geometric height; (3) that pressures shall be recorded in millibars (C.G.S. units), instead of in millimeters or inches. There was so much objection against a change of units, that the Meteorological Committee resolved that, for the present at least, aerological pressure results should be published both in millimeters and in millibars. The substitution of pressure steps for linear steps was favorably passed upon, but the proposition as to "dynamic meters" was referred back to the commission at the request of its president, Dr. Hergesell, for further consideration.

On the recommendation of the radiation commission, it was resolved that specifications as to sunshine recorders be drawn up, to facilitate comparison between sunshine records in different countries.

The resolution of the Paris conference (1896), calling for the standardization of thermometer exposure, was discussed and tests of English thermometer shelters in the tropics were recommended.

A system of signals for international use was recommended by the Commission on Maritime Meteorology and Storm-warning Signals, and accepted by the Meteorological Committee with a few minor changes. Thus a substantial measure of international agreement on day and night storm-warning signals has been attained.

The next conference of the committee will come in 1915, in Holland.

EVAPORATION FROM LAKE SURFACES

In the *Meteorologische Zeitschrift* for May, 1913, Dr. J. Maurer, director of the Swiss Weather Service, gives the results of his measurements of evaporation from the surfaces of Lakes Zuger and Ägeri in northern Switzerland, December, 1911–November, 1912, inclusive. By the method used, the evaporation is the difference between the amount of water entering a lake and that flowing out, if the water-surface level remains constant. The amount entering in streams was determined as closely as possible by frequent measurements of the cross-sections and velocities of the streams flowing into the two lakes. To these the amounts of rainfall on the lake surfaces were added. The water flowing through the outlet streams was also carefully measured. With the aid of measurements of the variations in height of the lake surface as indicated on gauges for the purpose, the results from the other measurements could be checked to some extent. The totals of monthly evaporation are probably correct within 0.5 cm. The unknown amount of gain or loss of water through the lake bottom was disregarded, for, on the whole, these lakes have impervious basins and no large springs are known. Supplementary observations of the temperature of the water surface, humidity at the water surface, and of the air-temperature, wind, cloudiness, etc., were taken at selected points. In 1912, a year with a cool and rainy August and September, the measurements showed an evaporation of 775 mm. from Zuger Lake (417 m. above sea level, area 34 sq. km.) and 740 mm. from Ägeri Lake (727 m. above sea level, area 7 sq. km.). In a year with a normal summer, the annual evaporation would probably exceed 900 mm. These interesting results are the first of their kind yet published, and bid fair to lead the way for other similar measurements on lakes and reservoirs elsewhere.

VOLCANOES AND CLIMATE

The solar radiation observations of Messrs. C. G. Abbot and F. E. Fowle[3] and Professor H. H. Kimball[4] show that the Katmai volcanic dust cloud in the atmosphere in the summer of 1912 in the northern hemisphere, so increased diffuse reflection into space and absorption of heat in the upper atmosphere, that the normal

[2] See *Nature*, London, Vol. 90, p. 110.

[3] "Volcanoes and Climate," Smithsonian Misc. Coll., Vol. 60, No. 29.

[4] *Mt. Weather Bull.*, Vol. V., Part 5.

amount of solar radiation received at the earth's surface was decreased by about 10 per cent. Observations of terrestrial radiation made at the same time by Mr. A. K. Ångström, showed that the presence of the dust likewise hindered terrestrial radiation, but not to such an extent as the solar radiation (of shorter wave-length). The net result of these opposite tendencies, however, seems to have been a decrease of heat available to warm the lower atmospheres. Temperature observations of high-level stations in Europe and America bear this out, showing a marked decrease of temperature with the beginning of the volcanic dust cloud at the end of June.

Other periods of marked decrease in the solar radiation received as observed during the last thirty years were the period 1883–1885 following the Krakatoa eruption; 1888–1894 after the great eruptions of Bandai-San, Mayon and other volcanoes; and the period 1902–1904 following the tremendous eruptions of Santa Maria and Colima.

In comparing Abbot's and Fowle's composite curve of Wolfer's sunspot numbers and Kimball's solar-radiation departures, with the mean departures of maximum temperature of 15 stations in the United States, it is interesting to note that the temperature effects of these dust-haze periods seem to explain the discrepancies in the apparent synchronism between terrestrial temperatures and the 11-year sun-spot period.

In an extra number of the *Bulletin of the Mount Weather Observatory*,[5] Professor W. J. Humphreys has discussed at length the subject "Volcanic Dust and Other Factors in the Production of Climatic Changes, and Their Possible Relation to Ice Ages." Particular attention is given to sun-spots and great volcanic eruptions as related to variations in temperature at the earth's surface since 1750. The phase of this subject concerning geological changes of climate is treated by the same author in the *Scientific American* Supplement, August 23, 1913, p. 114.

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[5] Vol. VI., Part 1, 34 pp.

DEGREES CONFERRED BY THE UNIVERSITY OF BIRMINGHAM

AT the Birmingham meeting of the British Association the university of the city conferred, as has already been noted here, the degree of doctor of laws on several of the foreign guests. In introducing them Sir Oliver Lodge, president of the association and principal of the university, spoke as follows:

DR. ARRHENIUS: Director of the Nobel Institute for Physics and Chemistry, at Stockholm, fellow of the Swedish Academy of Sciences, and foreign member of our own Royal Society. The courageous way in which Dr. Arrhenius applied the theory of electrolytic dissociation to a quantitative study of chemical reactions has profoundly modified the trend of chemical science during the past thirty years, enlarging the scope of chemical investigation, harmonizing previously disconnected facts, and bringing an ever-increasing number of chemical phenomena within the range of quantitative and mathematical treatment. He is thus one of the most prominent of the founders of modern physical chemistry, the principles of which he has even applied, with singular success, to some of the most subtle phenomena of organic life. Recently his writings on cosmogony have aroused wide interest; terrestrial electricity and the aurora have yielded to him some of their secrets; and his speculations on worlds in the making are more than interesting and suggestive. A man of genius, and one of the founders of physical chemistry, I present for the honorary degree of doctor of laws, Svante August Arrhenius.

MADAME CURIE: The discoverer of radium, director of the Physical Laboratory at the Sorbonne, and member of the Imperial Academy of Sciences at Cracow. All the world knows how Madame Curie (coming from Warsaw as Marie Sklodowska to work in Paris), inspired by the spontaneous radioactivity newly discovered by Becquerel, began in 1896 a metrical examination of the radioactivity of minerals of all kinds; and how, when a uranium residue showed a value larger than could have been expected from its uranium content, she, with exemplary skill and perseverance, worked down some tons of this