organizing an expedition for observing the meteorological conditions on and about the southern portion of the Greenland ice cap beginning in the summer of 1926.

Mr. Ernest Seiter, Nazareth Trade School, Farmingdale, L. I., N. Y., has recently submitted enlarged photographs of his home-made installations of wind vane, anemometer, and black bulb thermometer in vacuo, on the peaked roof of his house, and of a small, white louvered, thermometer shelter on a window bracket.

Special maps for charting storm movements are proposed by Professor Alexander McAdie, of Harvard University, Director, Blue Hill Observatory, in a brief article appearing in the Sept., 1925, issue of the Annals of the Association of American Geographers (Vol. XV, pp. 101-105, 2 maps). Professor McAdie enters a plea for the use of an equal area base map, with topography shown, and with at least a scale of kilometers. He urges ample provision of ocean space for the maps published at coastal stations [as already provided in the San Francisco map—see October BULLETIN, p. 162]. Also he suggests the abandonment of isobars and isotherms. Isobars are not necessary if winds are shown, especially the direction, velocity and duration of the geostrophic wind —that at the level of the low clouds. Isotherms are not essential [as the long time practice of the Canadian Meteorological Office has shown]. He believes also that some indication of the type of atmospheric structure should be given.

Students at Clark University have been experimenting with toy balloons for getting a general idea of the wind direction and velocity up to moderate heights. On several occasions the flights of these balloons, which are followed merely with field glasses, have given information on wind changes with increased elevation which have been decidedly useful in local forecasting. The cost of operating such balloons is very small; 500 balloons were obtained from the Goodyear Tire and Rubber Co., Akron, Ohio, for $6.00, and the cost of hydrogen for inflating the balloons comes to a very small figure, only about half a cubic foot being necessary for each. All together the total cost of each balloon flight does not exceed two cents, and the apparatus required is nil.

A paper hot air balloon sent up at Springfield, Illinois, July 4, and which traveled south till out of sight, was found 60 miles to the north-northeast between Normal and Bloomington. The surface wind had just recently changed from west to north. Higher up, however, the wind was evidently southerly.

The customary "Comparative rainfall chart for Southern California" has been issued by the Security Trust and Savings Bank of Los Angeles. The sheet shows in striking red bars and black numbers the average monthly rainfall, the annual rainfall since 1877, and the monthly rainfalls each season since 1883-84. The dryness of the last three rainfall years is striking.

"The cloudless sky under which the dirigible got away after the long stay at her mooring mast, gave way to the customary patches of clouds when the Gulf Stream was crossed, the message said, causing the 'airship to rise and fall in leisurely fashion,' while maintaining an average height of about 2000 feet."—(From *N. Y. Herald-Tribune* account of the Los Angeles' trip to Porto Rico, May 4).

NOTES ON PUBLICATIONS

W. R. Gregg, Aeronautical Meteorology

Ronald's Aeronautic Library, vol. 1. The Ronald Press Co., New York, 1925, xii+145 pp., 9 pl., 33 diagr. and maps. $2.50.

Gregg's Aeronautical Meteorology is the first American book on this

subject. That it should also be the first volume of an "Aeronautic Library" indicates not only the importance of meteorology in aeronautics, but also the standing of the meteorologist author in aeronautic circles. Mr. Gregg introduces the aviator or balloonist into meteorology far enough to provide him with basic understanding of the elements through which he must fly or float, and to entice him to further reading.

An introduction to meteorological terminology is immediately followed by a chapter on the general circulation of the atmosphere, a concise discussion of the winds of the globe. Instruments and methods of observation are described with the aviator's needs uppermost, half the chapter dealing with wind-measuring or aerological apparatus. The vertical structure of the atmosphere and winds are discussed clearly and accurately, as one would expect by Mr. Gregg, who for so many years has been chief of the aerological division of the U. S. Weather Bureau. Fogs and clouds occupy a number of pages, while visibility is well considered in but three. Thunderstorms, cyclones and anticyclones conclude the treatment of meteorology.

Though the dangers of thunderstorms are discussed, some in detail, the reviewer believes the author places insufficient emphasis on the need for great caution. The sudden destruction of the Shenandoah is an example of what an apparently harmless storm can do. The author minimizes the usual great height of the thundercloud when he says that "the safest course (for a balloonist) as already indicated, is to ascend well above the highest thunderclouds, if that is possible." (p. 77). Suppose it is not possible, but the aeronaut attempts it. He is then not likely to be able to reach the ground without being drawn into the storm if it is at all near. Similarly, the advice to "ascend as rapidly as possible to a height of 2 kilometers or more" in the vicinity of a tornado seems contrary to common sense. Tornadoes are often capped by towering clouds over which it would be impossible to float. Furthermore, an atmospheric condition favoring tornadoes is one of extreme turbulence, full of danger even outside one of these deadly whirlwinds. To encourage an aeronaut to use valuable time in trying to find a current that will take him away from a thunderstorm may invite disaster. Except in the squall very close to the ground and in the spreading anvil top, usually miles high, the air from all sides is flowing into such a local storm. The only safe means of escape for a balloon in proximity to a storm is a quick landing. It is not clear how a balloon by traveling in the wind that carries a growing thunderstorm could keep ahead of it. Thunderstorm fronts commonly travel faster, sometimes much faster, than the general wind carrying the storm.

The practical art of weather forecasting is discussed not only from the official weather map point of view, but also, in a very helpful way, from the standpoint of the local observer, temporarily, at least, without telegraphic weather reports to assist him. The airman must constantly be making his own forecasts from what he can observe around him. The last chapter deals with "Flying over the North Atlantic and in the North Polar regions." Useful appendices on distribution of weather forecasts

by radio, meteorological services of the world, bibliography, conversion tables and factors, and an index, conclude the book.

There can be no doubt as to the reception airmen must accord a book of this sort. It tells them what they ought to know about meteorology, and it does this in such a clear and concise fashion that they cannot fail to grasp the information. Meteorologists will also find this book handy for reference, for it summarizes weather science today as applied in the newest use for it, aeronautics.—*Charles F. Brooks*, Clark University.

The 1926 Yearbook of the National Astronomical Observatory at Tacubaya, Mexico, Ing. Joaquin Gallo, Director, contains a discussion of Mars, and a time-zone map of North America. Sr. Gallo devotes 12 pages (251-262) to a detailed account and presents 9 half-tone illustrations of the appearance of Mars during its close approach to the earth in 1924. The time zones map, folded into the book, shows Haiti, Cuba. Jamaica, Panama and eastern Costa Rica in the Eastern Standard time zone (75th meridian). The rest of Central America and the eastern states of Mexico, west through Vera Cruz and Oaxava have Central Standard time (90th mer.) The bulk of Mexico is on Mountain time (105th mer.), and the northern district of Lower California is in the Pacific belt (120th mer.)

Airplane Observations to Supplement Kite Work

A new feature of free-air observations, which have long been made by means of kites and pilot balloons by the Weather Bureau of the United States Department of Agriculture, is observation by airplane. For the past year this type of observation has been carried on at the naval air station at San Diego, Calif., and recently it has been started at Anacostia, D. C., under a co-operative arrangement between the Navy Department and the Weather Bureau.

Flights are to be made at about 8 A. M. daily, and are to reach a height of at least 3,000 meters. The data obtained will be available to the forecaster by 9.30 A. M. and will include the temperature and relative humidity at various elevations, and many supplementary notes, such as visibility, cloud heights, thickness, etc. The Marvin meteorograph, which is used for regular kite flying, is being employed for this work. It is mounted in a specially constructed iron frame on the top of the upper wing of the plane, and is therefore well exposed and unaffected by heat from the motor.

The practical benefits to be derived by having available these free-air records of temperature and humidity, in addition to the free-air wind movements obtained by using pilot balloons, are obvious. Airplanes have distinct advantages over kites in this work in that they can be used in calms and very light winds, can be flown near populous centers, and require less time to complete a flight, a most important consideration if the data obtained are to be effectively used in current forecasting. —U. S. D. A. *Clip Sheet*, July 13, 1925.