Whitewashing the exposed trunks reflects the sun's rays, keeping the tree at or a little below atmospheric temperature. This keeps the tissues of the tree dormant, even during a sunny day, and not subject to injury when the temperature drops gradually at night.

Heretofore it was thought that sun scald occurs during the hot dry days of summer. A study of the temperature of the trunks and twigs of the trees during summer shows that this is not the case.

The upward passage of cool water from the roots and its evaporation from the twigs and leaves cools the parts of the tree above ground. During a hot, dry day in summer the trunk and twigs of a tree are usually cooled to a temperature from 15° to 20° below the temperature of the air. This cooling is most marked adjacent to green leaves, which evaporate much water. It is least marked on long, bare trunks and main limbs which have no twigs and leaves to evaporate water. This emphasizes the desirability of preserving rosettes of leaves and short fruiting twigs all up and down the trunks and main limbs to shade and cool the parts where sun scald usually occurs. It also emphasizes the desirability of low-headed trees. These leaves also digest plant food to nourish the limbs, trunks, and roots, maintaining a thicker, healthier annual ring of new sap wood.

If sun scald begins on the south side of the trunk and main limbs in winter, it can continue during summer. Winter sun scald dries out the tissues and opposes the development of sap wood and green leafy twigs on the exposed parts. Cool sap is not readily carried through these dried and injured parts so they are less cooled during hot summer days.

A good whitewash which will stick may be made as follows: Slack 15 pounds of lime, in which 2 pounds of salt and 3 pounds of sulphur are sifted while the lime is slacking. The heat of the slacking lime acts on the salt and sulphur so as to form a wash which will stick. Add water to make a thick whitewash and apply to the tree trunks by means of a spray pump or a brush.

Whitewashing the trunks of young trees or sunscalded parts of older trees is desirable, especially in winter. It is not necessary on older trees with thick bark and which possess twigs that shade the limbs.

ABSTRACTS, REVIEWS, AND NOTES.

BRITISH RAINFALL ORGANIZATION.

On July 25, 1919, in accordance with an arrangement approved by H. M. Treasury, the responsibility for the management of the British rainfall organization was transferred by the trustees of the organization to the director of the meteorological office. In accordance with the terms of the transfer, the publication of *British Rainfall* will be continued and *Symons's Meteorological Magazine* is also assured of continuance in association with the *Circular* of the Meteorological Office.

The news of the retirement of Dr. H. R. Mill on account of his impaired eyesight was recently announced, and has been received with much regret by all who are interested in the study of rainfall. The 19 years of his connection with the organization have shown continuous development of the study of the subject on scientific lines.—*Meteorological Office Circular, 39, Sept. 1, 1919, p. 1.*

THE "METEOROLOGICAL GLOSSARY" OF THE BRITISH METEOROLOGICAL OFFICE.[1]

The title of this exceedingly useful compend is somewhat misleading. It is really a pocket encyclopædia of meteorology and kindred sciences. The name "glossary" suggests that one may find here definitions of at least all the more usual words and expressions pertaining to meteorology, but such is not the case. No meteorological glossary worthy of the name has yet been published. The lists of definitions found in Bartholomew's "Atlas of Meteorology" and Marriott's "Hints to Meteorological Observers" supply even less adequately than the new publication of the Meteorological Office the lexicographic information needed by meteorologists.

Only about 400 terms or subjects are treated in the work under review. Taking the letter "A" as a sample of the book in general, we note the omission of *afterglow, air-drainage, Alpenglow, anchor-ice, anomaly, antitrade, arched squall,* and *atmometer* (*atmidometer*), besides hosts of rarer expressions belonging to the language of meteorology, such as *advection, aelloscope, Æolus, aerobioscope, aeroclinoscope, aeroconiscope, aeroscope, aerotherm, æthrioscope, air-tester, All-Hallown summer, allobar, ammil,* etc.

The size of the meteorological vocabulary is realized by very few meteorologists. The present reviewer has labored desultorily during the past 10 years in gathering material toward a comprehensive meteorological dictionary, including in its scope both scientific and nonscientific terms relating to weather and climate, and although upward of 10,000 terms have already been listed the enumeration is still fragmentary.

While the glossary of the Meteorological Office contains many definitions, it is primarily a series of articles, some of them several pages in length, on topics that either are directly meteorological or have some important meteorological application. Under the latter head we find several physical and mathematical articles of rather exceptional interest to the meteorologist, to whom they supply information not easily obtainable elsewhere in a form so convenient for his use. There are, for example, excellent brief discussions of harmonic analysis, correlation, heat, entropy, and buoyancy.

The articles on purely meteorological subjects represent the fruit of the latest investigations, and are therefore a valuable and indispensable supplement to all existing textbooks of meteorology. Aerological subjects are well represented, and there are succinct presentations of recent views and data relating to such topics as the audibility of explosions, visibility, gusts, eddies, and gradients.

The definitions of terms are generally valid and accurate, though a few are open to improvement. We regret to find that British meteorologists persist in using the word *isopleth* (p. 168) as a synonym of *isogram,* the generic name for the "iso-" lines. Ever since the former term was introduced by Ch. Vogler, in 1877, it has been applied almost exclusively, outside of recent British writings, to an isogram drawn on a system of coordinates at least one of which indicates *time* rather than space. Isograms of this class are described by Hann, in his "Lehrbuch der Meteorologie," 3d ed., p. 91, and in this connection he says: "Der Name 'Isoplethen,' der eigentlich Kurven gleicher Zahlenwerte beteutet, was ja auch z. B. die Isothermen usw. sind, *wird nur auf diese Darstellungsmethode angewendet.*" (Our italics.) The important

[1] Great Britain. Meteorological office. Meteorological glossary. 4th issue. London. 1918. 358 p. 24°. (M. O. 225 ll.)

point is, of course, that the group of isograms drawn on time coordinates is left without a specific name if the term *isopleth* is applied to isograms in general.

On page 78 we note a curious attempt to distinguish between a "*dekad*" and a decade. We have not previously encountered the term *dekad*, but it is obviously a truncated form of the German word *Dekade*, which is precisely equivalent in meaning and application to the English word *decade*. Any group of 10 is a decade, whether it be of days, years, or what not. Decades of days were a feature of the French republican calendar, and have been used to some extent in meteorology (e. g., in the "Dekadenberichte" of the Deutsche Seewarte), though not so frequently as pentads.

The definition of *cumulo-stratus* on page 77 should be rewritten or omitted. "The name given to a certain combination of cloud forms which is no longer used in the international classification" is a sentence that, besides inviting the animadversion of grammarians, does not help us to identify the clouds in question; and the reference "See *Clouds*" leads nowhere, as this term is not mentioned under "Clouds." The history of the name *cumulo-stratus* is traced at some length by Clayton in the Annals of Harvard College Observatory, volume 30, part 4, page 328–329.—*C. F. Talman.*

SOME OFFICIAL PUBLICATIONS OF THE BRITISH METEOROLOGICAL OFFICE.

[From Met'l. Off. Circs. 29, 30 and 37, 1919.]

Professional Notes.—A new series of publications has been started recently with the general title *Professional Notes.*

These notes are printed on sheets uniform with this [Met'l Off.] Circular [8 vo.] so that they are more convenient for handling and for binding than the *Geophysical Memoirs.*

Professional Notes, No. 1. ON THE INTERRELATION OF WIND DIRECTION AND CLOUD AMOUNT AT RICHMOND (KEW OBSERVATORY.) *By David Brunt.*

This note was published "confidentially" in April, 1918. The aim of the investigation was to discover, if possible, whether a relationship, which would be of aid in forecasting cloud amount, could be established between the direction of the wind and the cloud amount, and further to determine the frequency of the clearing of the sky at night with winds of different directions. For this purpose tables of frequencies of different cloud amounts for different wind directions have been compiled for the hours of 10h., 16h., and 22h. for each month, the observations of wind and cloud at Kew Observatory for the years 1899–1913 being used. In the discussion of these tables the following points have been brought out: Firstly, that the months group themselves into two distinct types, winter and summer, between which are two months of transition, April and October; secondly, that SW. and W. winds are by far the most prevalent, forming 50 per cent of the total; thirdly, that the tables for 22h. show a marked increase of clear skies for all months, but the most striking cases of diurnal variation are shown by E. winds in August, SW. winds from July to October and W. winds especially during August and November.

Each of the wind directions (eight points) have been discussed separately from the point of view of cloud amount, and it was noticed that winds with an easterly component give very cloudy skies at Richmond. In order to get some indication as to how far this is due to London smoke being carried by such winds tables for Greenwich for January and July have been compiled. Greenwich appears to be less cloudy on the whole than Richmond, but the differences are not sufficiently great to be important.

Professional Notes, No. 2. NOTES ON EXAMPLES OF KATABATIC WIND IN THE VALLEY OF THE UPPER THAMES AT THE AEROLOGICAL OBSERVATORY OF THE METEOROLOGICAL OFFICE AT BENSON, OXON. *By E. V. Newnham.*

This is a short discussion on the night breeze which occurs in settled fine weather at Benson and which blows from the direction of the Chiltern Hills. From the records of the tube anemometer the writer chooses nine examples of this type of wind for discussion and shows that it must be classified as a "katabatic" wind representing the downward flow of air cooled by radiation on the slopes of the hills. Anemograms for six of these cases are reproduced as halftone illustrations. For the nine selected nights hourly means of the wind velocity, temperature, and gustiness are worked out and the results plotted.

Professional Notes, No. 3. INCIDENCE OF FOG IN LONDON ON JANUARY 31, 1918. *By C. E. P. Brooks.*

This is an account of the development and distribution of the fog which prevailed in the London area during the three days January 30 to February 1, 1918. From various personal experiences and accounts of the disorganization of traffic, the writer has compiled a map of the fog intensity, assigning to the various districts figures 0 to 5 on the scale of the London Fog Inquiry. This map shows that the thick fog was chiefly confined to the low ground in the valley of the Thames upstream from Fulham and to the tributary valleys of the Beverly Brook and the River Wandle, the high ground on the north and south being relatively clear.

Particulars of the pressure, wind and temperature for the three days so far as they are known to the meteorological office are given. The maps show a high-pressure area over southeast England, France, and Germany, with light easterly airs. These conditions at the surface appear to have been accompanied by a wind from 10 to 20 miles per hour from the south up above and by a marked temperature inversion. The writer describes the fog as a "typical radiation fog of anticyclonic weather," and suggests that the hills on either side contributed a gravitational flow of cold air sweeping the fog from the higher ground into the valley of the Thames and preventing any tendency to overflow north and south.

Professional Notes, No. 4. UPPER AIR TEMPERATURES AT MARTLESHAM HEATH, FEBRUARY, 1917, to JANUARY, 1918. *W. F. Stacey.*

The temperature observations of the upper air made in aeroplanes by the testing squadron of the R. F. C. stationed at Martlesham Heath, Ipswich, have been utilized in the preparation of this note.

Professional Notes, No. 5. ON THE USE OF THE NORMAL CURVE OF ERRORS IN CLASSIFYING OBSERVATIONS IN METEOROLOGY. *By Capt. E. H. Chapman.*

In this paper the theory of statistics is applied to the discussion of such questions as the interpretation of the terms "usual," "not unusual," and "exceptional" with reference to various meteorological phenomena.

Professional Notes, No. 6. THE VARIATION OF WIND VELOCITY WITH HEIGHT. *By Capt E. H. Chapman.*

The author puts forward an empirical rule that the speed of the wind in the lower layers is a linear function of the logarithm of the height.

Professional Notes, No. 7. "THE CLIMATE OF NORTH-WEST RUSSIA."

This was prepared for the use of the British forces acting on the Murman coast. The general climate is discussed for the district extending from the Arctic Ocean on the north to Petrograd and the Gulf of Finland on the south, and from the Swedish frontier on the west to 45° E. on the east. It deals with the dates of the thawing and freezing of the rivers. The temperature of the upper air is discussed, and other meteorological information is given.

SMITHSONIAN METEOROLOGICAL TABLES.

[Fourth revised edition. Preface reprinted.]

The original edition of the Smithsonian Meteorological Tables was issued in 1893, and revised editions were published in 1896, 1897, and 1907. A fourth revised edition is here presented, which has been prepared under the direction of Prof. Charles F. Marvin, Chief of the United States Weather Bureau, assisted by Prof. Herbert H. Kimball. They have had at their disposal numerous notes left by the late Prof. Cleveland Abbe, and have consulted with officials of the United States Bureau of Standards and of other Government bureaus relative to the value of certain physical constants that have entered into the calculation of the tables.

All errata thus far detected in the earlier editions have here been corrected. New vapor pressure tables, derived from the latest experimental values by means of a modification of Van der Waals interpolation formula, devised by Prof. Marvin, have been introduced.* The table of relative acceleration of gravity at different latitudes has been recomputed from a new equation based upon the latest investigations of the United States Coast and Geodetic Survey. These values have been employed in

* A discussion of these is being prepared for a later issue of the REVIEW.