

Library
M.O. 2(b)

*Corrections made
Lm et. 27/5/43.*

"Meteorological Magazine" February
1943.

Will you please make the following
amendment to page 3 of the typescript
Met.Mag. for February 1943:

Paragraph 2. line 5:
for Kew substitute Greenwich
for 1889 substitute 1850

Line 6.

delete semicolon after 'there',
and

add full stop after
'particulars.'

Delete from "and do not know"
to end of paragraph.

Add asterisk and footnote
"Details supplied by
Mr. E. L. Hawke May 22nd
1943."

Parsin

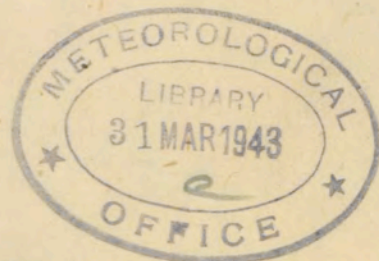
M.O. 3a.

27 May, 1943.

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"METEOROLOGICAL MAGAZINE"

February 1943.

Fundamentals of Physical Climatology.

Climatology at present appears to be developing along two principal lines, dynamical or "air-mass" climatology, and a three dimensional analytical physical climatology. In this little book Dr. Conrad has given us a very interesting and succinct account of the elements of the latter science. Logically, he begins with the balance of radiation in the atmosphere, providing power for "the huge machine called atmosphere". Temperature distribution is illustrated by charts and examples, and by some detailed studies of the lapse-rate, including super-adiabatic changes and inversions. The latter, which are classified into static and dynamic, are shown to have considerable climatic importance. The exchange of heat between air and land or water is also discussed illuminatingly, and it is shown that the much greater daily range of temperature over land is due essentially to the fact that in rock only molecular conduction is possible, while in water heat exchanges are carried by convection. Extreme cold however is due to topographic conditions.

ST 27
The working of the machine called atmosphere is illustrated by a number of examples of local circulations, such as land and sea breezes, monsoons, and the great meridional exchanges which lead to the general atmospheric circulation and the "elements of turbulence" (cyclones and anticyclones). Later chapters deal with humidity, cloudiness and precipitation, and finally, with "synthetical climatology" (including an account of cooling power as a function of temperature and wind velocity) and, very briefly indeed, climatic provinces.

FC 5
The underlying idea is stated to be to use only some few physical principles to explain as many climatological phenomena, as possible, in an easy and nearly

* Fundamentals of physical Climatology. By V. Conrad.

Harvard University 1942. 9 x 6 pp.viii + 122 illus. price \$1.25

quantitative way. The author has in this way produced neither a book of reference nor a "primer", but a sort of intermediate text-book which should be of great interest to all students of meteorology.

One comment may be added. A photograph is included showing a juniper forest on the Canaries deformed by the trade wind. It is a remarkable illustration of the power of the wind that trees, which can by their growth move great rocks and split walls, are yet so helpless against a comparatively moderate, but persistent, breeze.

BRILLIANT MOONBOW AT MALTA ON
NOVEMBER 25th 1942.

It is thought that the following notes may prove of interest.

On the evening of Wednesday, November 25th, 1942, I observed an exceptionally vivid and persistent moonbow, and proceeded to the roof of the Cavalier to obtain a more unobstructed view.

The time, when first observed, was 1853 G.M.T. and it remained clear and distinct until 1920 G.M.T. The sky was approximately a third covered with small cumulonimbus and ragged cumulus, but the sky in the vicinity of the moon, which was at an elevation of 11° , was clear. A light shower was in progress. The arc stretched from 213° to 292° , and the elevation of its zenith was 29° . A faint coloration was visible at the base of the arc, but it was not possible to distinguish the actual colours.

W.D. MAY.

NOCTURNAL RADIATION.

By A. Hampton Brown.

On the night of January 14-14, 1942 a temperature of -7.7°F. was recorded at Boundstone, Farnham, over the surface of the snow, by the grass minimum thermometer, the screen minimum during the same period being 11.7° . These figures give a difference between the two thermometers of 19.4° . A reading of -7.5° was recorded at Rickmansworth, Herts, on the same date and of -4.5° at Dagnall, Bucks, three days earlier, thus indicating that great radiation was experienced about that time over a wide area.

This difference between the screen minimum and the grass minimum of 19.4° is exceptional and I am wondering whether there are authentic records of a difference greater than 20° for this country. Mr. E.L. Hawke informs me that at ^{Greenwich} Observatory in ~~1885~~ ¹⁸⁵⁰ a difference of 20° was registered there, but I am unable to refer to the particulars, and do not know whether the screen minimum was recorded in a Stevenson screen or from the North wall screen. If the latter, the difference might well have been substantially reduced as the Stevenson screen minima are occasionally from one to three degrees lower than those from the North wall screen.

The time to observe the greatest differences between screen and grass temperatures is soon after sunset on clear evenings in the spring months, when divergences of 20 degrees and over are occasionally noticed. Radiation seems very intense at about that time and then appreciably slackens while the air temperature continues to decrease, reaching its lowest point in the early morning. On May 2nd, 1942, Mr. Hawke at Dagnall observed at 20 hrs. G.M.T. a dry-bulb reading of 47.6°F. with the grass thermometer recording at 22.1° , showing a difference of 25.5° . The sky was cloudless at the time with a light northerly wind and a relative humidity of 44%. The next morning the screen minimum was 31.8 and the grass minimum 14.6 giving a difference of only 17.2° . It will thus be seen that while the air temperature after 20 hrs. fell as much as 15.8° the grass temperature only decreased by 7.5° . Similar wide differences of over 20 degrees are occasionally observed

* Details supplied by E.L. Hawke, May 22nd, 1943.

here soon after sunset but such differences are seldom maintained throughout the night.

There → It would be interesting to know (1) what is the greatest difference ever recorded in this country at the normal observing hour between the screen and grass minima; and (2) what is the actual lowest "grass" temperature ever reported at British stations. Probably the latter reading will be found in the observations for January 1940 when screen minima of -6° to -10° were recorded; but it is possible that falls of snow during that month prevented in some cases the recording of the lowest radiation temperatures.

It would also be interesting to know where the greatest radiation temperatures are to be met with. While the lowest screen temperatures are to be found on sloping ground, generally in valley bottoms, extreme radiation temperatures seldom occur there, but are more often experienced at elevations between 300 and 700 feet above sea level. Personally I think that the clearer air at the higher levels accounts for the greater depression of the ground level temperature, but possibly other factors must also be taken into consideration. At much higher levels, such as positions at Buxton, Braemar etc. very low grass temperatures relative to the screen minima do not often occur; but possibly these positions are in a sense "valley stations" in that there is higher ground in their neighbourhood.

UNUSUAL IRIDESCENCE ON LOW CLOUD.

On October 12th, 1942, I was, in company with Mr. W.E. Richardson, investigating a tree which was thought to have been damaged by lightning at Tanyfron, on the slopes of the mountains N.W. of Wrexham. At 17h.02m. G.M.T. seven tenths of the sky was covered with wild-looking fracto-cumulus, and a few lenticular clouds near the setting sun showed iridescence. Looking in the opposite direction, at a point directly opposite to the sun and of the same altitude, we observed a bank of low cloud, dark in colour, with a well-defined upper edge. Behind this, and showing above it, was a bank of brilliant orange cloud, smooth and structureless. It was difficult to classify this cloud, but it was definitely of low altitude. At the apparent junction of these two clouds, the dark and light, appeared a wavy line of well-defined iridescence, the green, red, and orange being distinguishable. The angular length of this iridescent line was about 15° , and its breadth about 30'. It was visible for about a minute after it was first observed. As I have never heard of a case of iridescence in such a position, I think the observation is worth while bringing to the attention of others.

S.E. Ashmore.

"FRIGHTFULNESS IN THE STATION"

A number of stations have recently reported thefts of meteorological instruments and interference with the station.

Buxton, in particular, has suffered severely and the observer remarks:-

"Once more the burglars have been busy and lifted the grass minimum thermometer. Please send another as soon as possible complete with surrounding minefield or padlock and chain to anchor it to the ground or other safety device".

Stat. Reel

RIVER FLOWS RECORDS OF THE NESS BASIN.

Captain McClean has sent a copy of a report, consisting of 11 pages, on the Organization of River Flow Records of the Ness Basin, 1929-42, published in November 1942, price 2/6d. The aim of the Survey has been to obtain as full knowledge as possible of the water resources of this area. Captain McClean gives details of the sites, of the methods of recording, of published accounts of the records and of the cost of equipment and maintenance of such a survey. In 1931 Captain McClean required one of his staff to check the flow in the Ness at a period of flood without spending time in the area waiting for flood conditions and the Meteorological Office comes in for a word of praise:- "on the forecast of the Air Ministry Mr. Chapman travelled all night to Scotland and was gauging the river at 2 p.m. in May 1931 with the flood at its height". A summary of some of the results has been published in the Records of the Surface Water Year Book of the Ministry of Health and Scottish Office. During the war this survey has been suspended and Captain McClean's trained staff are all on war service. It is satisfactory, however, to find that the fundamental returns are being maintained against the time when consideration can be given to the best uses of this potential source of power and water supply.

J.G.

THE GALE OF JANUARY 31st 1943.

Several climatological stations have reported damage to instruments during the gale of January 31st 1943.

At Aberystwyth the Stevenson screen was blown off the stand and the four thermometers were smashed; at Terrington St. Clement also the screen was blown from the stand but in this case the thermometers were not injured. At Boston (North Sea Camp) the sunshine sphere was blown off the tower.

The observers note on the storm may be of interest:-

"At 0000h weather was fair with a high wind but cloud started to increase after 0100h. The wind backed SW to SSE and continued to rise becoming very strong and attaining Force 7 late a.m. Rain fell from 0500h. to 0800h. and light rain to 1040h. with slight intermittent light rain and light drizzle to 1450h. Then came a short period of rain to 1505h. heavy rain to 1510h. and rain to 1520h, followed by light intermittent rain to 1645h. At 1400h. the wind reached a force of 9, and between 1400 and 1515h. Force 10, particularly in the latter part of this period. During the period of heavy rain the wind was sufficient to lash the water from the road and lift it twelve to fifteen feet in the air in the form of spray. About 1515h. the wind veered west suddenly and backed SW, falling almost immediately to Force 4. A sunset of a remarkable ochre hue was noticed. The clouds cleared after 1800h. and the wind fell almost completely, though towards the end of the day it rose again slightly and the cloud increased. Between 1400 and 1515h. it was possible to lean at an angle of about 45 degrees and to be supported by the wind. A large pighut on the reclaimed land near the station was torn completely to pieces, and corrugated asbestos sheets on the main buildings of the camp were torn off and thrown to the ground. A substantial military hut on the leeside of the old bank was blown bodily into the dyke. At 1410h. the crystal from the sunshine recorder, M.O.621/37 was found by an Officer lying on the gravel road near the water tower on the top of which the sunshine recorder is fixed."