N_{PP} air relative to the N_{PC} air. The winds are N. and NE. from the ground up to 1,200 meters. Between 600 meters and 1,400 meters there is evidently a transitional zone between the N_{PP} air and the T_G air. The wind shifts from NE. to NW. and q increases from 8.0 to 9.1 grams and remains quite high until about 2,600 meters. The layer from 2,400 to 3,000 meters shows a moisture decrease from 7.6 to 3.6 grams. Above 3,000 meters, the lapse rate is fairly steep and the moisture content low. This air is the T_S air that has been present above the N_{PC} (T_G) air at Dallas for the past 2 days. Whether or not the N_{TP} air exists above the T_S air as it did previously cannot be said, since the sounding does not extend to sufficient height.

ERRATA IN THE ILLUSTRATIONS

(For explanation of the symbols in the illustrations, see p. 213)

FIGURE 1.—At Bismarck, N.Dak., Huron, S.Dak., and Valentine, Nebr., the pressure tendencies should be steady *falls* instead of steady rises.

FIGURE 4.—At Sault Ste. Marie the pressure tendency should be a steady *fall* instead of a steady rise. The front over the Gulf of St. Lawrence should be a *warm* front instead of an occluded front.

PRELIMINARY MEASUREMENTS OF ULTRA-VIOLET AT BLUE HILL METEOROLOGICAL OBSERVATORY

By RICHARD F. BAKER [1]

[Blue Hill Meteorological Observatory of Harvard University, Milton, Mass., July 1935]

Preliminary measurements of solar ultra-violet radiation were initiated at the Blue Hill Meteorological Observatory in April 1934, with an instrument loaned by the Biological Laboratory of the Long Island Biological Association through the courtesy of Dr. Hugo Fricke.

The sensitive element consisted of a cadmium photoelectric cell, the construction of which merits a brief description. The cell was of the vacuum type, and was constructed of Corex D glass. In shape it was spherical, 2 inches in diameter; attached was a tubular neck 5 inches long, through which passed the anode lead. The anode itself was a nickel ring one-half inch in diameter supported in the center of the cell by the anode lead. The cadmium was deposited directly on the glass surface by a process of successive distillations through a series of small bulbs. To provide a window, the cadmium was then locally distilled off a circular area one-half inch in diameter on the side of the cell. Contact with the cadmium surface was made through a tungsten-Corex D seal in the end of the bulb opposite the neck.

The anode of the cell was connected directly to the fiber of a string electrometer through a metal tube to insure shielding from outside electrical disturbances.

In practice, the electrometer was charged by means of B batteries to 135 volts, the string being at a positive potential with respect to the cadmium surface. After focussing the cell on the source of radiation by means of a pin-hole focussing device, the photoelectric current generated by the radiation was allowed to discharge the electrometer.

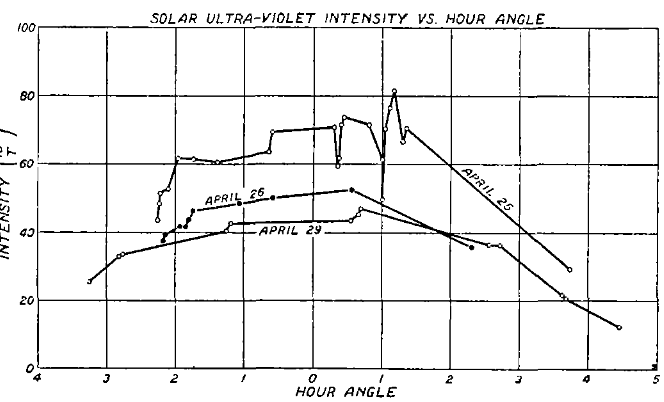
The number of electrons released from a photosensitive surface per unit time is directly proportional to the radiation intensity of given wave-length incident on the surface. Since the rate of discharge of the electrometer is directly proportional to the number of electrons coming to the string from the cell in unit time, it is obvious that the rate of discharge is directly proportional to the radiation intensity of those wave lengths to which the cell is sensitive.

The long wave threshold for cadmium is very close to 3,150 Å; [2] consequently the cell measured no radiation of wave length greater than 3,150 Å. The Corex D glass of the thickness used transmitted no radiation of wave length less than 2,800 Å. Accordingly, the cell was sensitive only to radiation in the spectral range 2,800–3,150 Å. The sensitivity curve of the cell in this range corresponded closely to the sensitivity curve of the human skin to erythema, since the instrument was designed originally for an investigation of the biological effects of solar radiation. The intensities as measured, then, are directly proportional to the erythemal effectiveness of the radiation.

An illuminated scale and telescope were built into the instrument to give a means of measuring the rate of discharge of the electrometer. The rate of discharge was taken as the reciprocal of the time required for a five division fall on the scale. $10^3/t$ was taken for convenience rather than $1/t$, in reducing the data.

The cell aperture consisted of a system of concentric circular brass rings which fitted snugly in a hole in the metal case which held the cell. The aperture used in this investigation was such that when focussed on the solar disk the cell intercepted radiation from a solid angle of 1.8 steradians, or 28.8 percent of the maximum possible area.

The natural leak of the instrument was zero at the time of the observations.



Curves I, II, and III are for three typical days, and represent ultra-violet intensity plotted as a function of hour angle. Table 1 contains the complete set of data, including pertinent comment on the state of the sky at the time of the observations. The marked variations of intensity over a short period, particularly on April 25, are rather remarkable. A cause of these variations cannot be certainly assigned at this time. It seems plausible, however, that absorption and scattering by cloud formations are responsible, at least in some degree.

From the standpoint of the science of meteorology, and also in view of the practical importance to public health of this region of the solar spectrum, it is obvious that the problem of short-time changes in solar ultra-violet intensity merits further investigation.

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[2] Hughes and Du Bridge. Photoelectric Phenomena. New York, 1932.

TABLE 1

Date	Hour angle	$\frac{10^3}{t}$	Comments
1934	a. m.		
April 25	2:16	43.3	Wind W. 5-6.
	2:14	48.7	
	2:07	52.6	Visibility 8.
	1:58	61.7	
	1:46	52.6	Clouds O.
	1:44	61.7	
	1:42	61.7	Blue sky 4.
	1:24	60.6	
	0:39	63.7	
	0:37	69.9	
	p. m.		
	0:19	70.4	Clouds—Ci. fil.
	0:21	59.8	
	0:22	61.7	Ci. unc., Cu., .3.
	0:23	71.4	∢15° from sun.
	0:25	71.9	Wind NW.X W. 5-7.
	0:49	71.9	
	1:00	49.5	Cu. near sun.
	1:01	70.4	
	1:10	81.9	Fr.cu. 2° from sun.
	1:12	76.9	
	1:18	66.6	Fr.cu. 10° from sun.
	1:20	70.4	
	3:43	29.5	
	a. m.		
April 28	2:11	37.7	
	2:08	39.8	Cist. in N.
	1:56	41.7	Wind SW. 3-4.
	1:52	41.3	Blue sky 4.
	1:48	43.5	
	1:42	45.2	
	1:03	48.1	
	0:35	50.0	
	p. m.		
	0:33	52.6	
	2:18	36.0	
	a. m.		
April 29	3:15	25.4	Wind NW. 2.
	2:49	33.0	Visibility 9.
	2:47	33.3	Blue sky 4.
	1:15	40.5	
	1:11	42.2	
	p. m.		
	0:33	43.4	Conditions—excellent.
	0:38	45.3	
	0:41	46.5	
	2:33	36.4	
	2:43	37.4	
	3:37	21.4	
	3:42	20.8	
	4:26	12.2	
	a. m.		
Apr. 30	2:42	25.0	
	2:40	25.4	

TABLE 1—Continued

Date	Hour angle	$\frac{10^3}{t}$	Comments
1934	a.m.		
Apr. 30	2:39	25.3	
	1:49	31.2	
	1:48	32.4	
	0:51	31.8	
	0:49	36.4	
	p. m.		
	1:26	37.0	
	1:27	36.2	
	1:28	36.5	
	2:32	28.5	Light Ci. fil. near sun.
	p. m.		
May 1	2:05	32.0	
	2:08	31.6	
	2:12	37.3	Thin Ci. film over sun.
	a. m.		
May 5	2:02	63.3	
	2:01	62.5	
	0:59	81.3	Rel. Hum. 95 percent.
	0:56	83.3	Clouds 0.
	0:06	76.9	
	0:04	78.1	
	p. m.		
	0:41	54.6	
	0:43	38.5	Clouds Cu.
	a. m.		
May 8	3:09	29.6	
	1:50	23.9	
	1:48	23.9	
	0:43	22.2	Cist film over 0.7 sky,density 0.
	p. m.		
	1:06	33.4	
	1:07	35.7	
	1:22	41.7	
	a. m.		
May 9	3:05	30.8	Conditions—good.
	3:02	36.9	
	3:00	37.0	
	2:57	38.5	
	2:55	38.5	
	1:55	45.9	
	1:54	46.5	
	1:52	46.3	
	1:32	52.6	
	1:31	49.3	
	0:31	49.7	
	p. m.		
	0:25	49.7	Cu. coming up and increasing.
	0:54	55.5	
	0:56	52.3	Cu. 3° from sun.
	1:00	53.2	

FORECASTING FROM BAROMETRIC CHARACTERISTICS

By ADALBERTO BARRANJARD SERRA

[Meteorological Institute of Brazil, Rio de Janeiro, March 1935]

By the term "barometric characteristic" is meant the form of the barograph curve during the 3-hour interval previous to observations. For telegraphic-code purposes nine types of characteristics are recognized, as follows:

1. Continuous rise.
2. Steady, and now rising.
3. Falling, and now rising.
4. Rising, and now steady.
5. Steady.
6. Falling, and now steady.
7. Steady, and now falling.
8. Rising, and now falling.
9. Continuous fall.

The observations are made at all Brazilian meteorological stations at 9 o'clock Rio de Janeiro legal time, which corresponds to 12 o'clock Greenwich time. The characteristic therefore refers to the period from 6:00 to 9:00. The stations included are the following:

Stations	Belém	F. de Noronha	São Salvador	Cuiabá	Victoria	Tres Lagoas	Rio de Janeiro	Paranaguá	St. Maria
Latitude south	1°28′	3°50′	12°58′	15°36′	20°10′	20°47′	22°54′	25°31′	29°41′
Lontitude west Greenwich	48°27′	32°25′	38°32′	56°06′	40°18′	51°42′	43°10′	48°31′	53°49′
Altitude (meters)	14	106	64	165	32	315	18	9	144

The normal diurnal variation at the various stations is not known; but since in general the pressure is everywhere a maximum about 10 and 22 o'clock, and a minimum at 4 and 16 o'clock, local time, it is easily seen that during the period from 6 to 9 o'clock the normal characteristic should be 1 (continuous rise) at the above stations. The secondary circulations, however, may completely obscure the normal tendency: a rise of the barometer above normal takes place with the appearance of an