

ORIGIN OF THE WORD 'BAROMETER.'

The following article, by Dr. H. C. Bolton, is reprinted from *Science*, Vol. XVII, p. 548:

The instrument familiar to us all as the barometer was first universally known by the name of its inventor as 'Torricelli's tube'; de Guericke, the inventor of the air pump, called his huge water-barometer 'Semper Vivum,' also 'Weather Mannikin,' with the Latin form 'Anemoscopium.'

Soon after the year 1665 the words 'baroscope' and 'barometer' came into general use in England, but the individual to whom the credit belongs for originating these terms has not been certainly known; the assertion made by a contributor to the *Edinburgh Review* for 1812 that 'baroscope' was first used by Prof. George Sinclair, of Scotland, in 1668, is an error, for both words occur in the *Philosophical Transactions* four years earlier. The passage is unsigned and reads thus:

"Modern Philosophers, to avoid Circumlocutions, call that Instrument, wherein a Cylinder of Quicksilver, of between 28 and 31 inches in Altitude, is kept suspended after the manner of the Torricellian Experiment, a Barometer or Baroscope, first made publick by that Noble Searcher of Nature, Mr. Boyle, and employed by him and others to detect all the minut variations in the Pressure and Weight of the Air."

The mention of the words in connection with the name of Robert Boyle has led me to make a close examination of his voluminous and prolix writings. In Boyle's first publication, 'New Experiments Physico-Mechanical touching the Spring and Weight of the Air,' dated 1660, the words baroscope and barometer do not occur; he uses the common term 'tube,' and often writes of the 'mercurial cylinder.' Nor are these words used by him in his 'Defense of the Doctrine touching the Spring and the Weight of the Air * * * against the objections of Franciscus Linus,' a paper published in 1662.

Their use by the anonymous writer to the *Philosophical Transactions*

in 1665 has been shown, and the question arises, who was this person who modestly concealed his name? I believe it was Boyle himself. This eminent man, who was so devoid of personal ambition that he declined a peerage, had a habit of writing about himself and his scientific labors in the third person, and often spoke of himself by fanciful, fictitious names, such as 'Philaretus' (in his fragmentary autobiography) and 'Carneades' (in the 'Sceptical Chymist'). That he should send an unsigned communication to a journal was not surprising, particularly as he had occasion to mention himself.

Be this as it may, my claim that Boyle originated the word barometer does not rest on such slender conjectures as these. One year later than the communication in the *Philosophical Transactions*, Boyle wrote to this journal (dated April 2, 1666) and said, 'barometrical observations (as for brevity's sake I call them),' using the personal pronoun this time. Elsewhere in the same paper are found the terms barometer, baroscope and baroscopical observations.

In his 'Continuation of New Experiments Physico-Mechanical * * * of which the preface is dated 1667, occurs the following phrase: 'But though about the barometer (as others have by their imitation allowed me to call the instrument mentioned),' (Boyle's Works, Birch's edition, Vol. III, p. 219, London, 1744.)

This sentence is virtually an admission by Boyle that he had coined the word, since others imitating him had allowed and encouraged him to use the term to designate the tube of Torricelli.

I conclude, therefore, that the word 'barometer' was introduced into our language by the English philosopher, the Hon. Robert Boyle, about the year 1665. Boyle, by the way, was a scholar and able to use Greek in forming an English word. Finally, I may add that examination of Murray's Skeats' and other standard English dictionaries throws no light on the origin of the word; they merely refer to the *Philosophical Transactions* and give its obvious etymology.

THE WEATHER OF THE MONTH.

By Mr. W. B. STOCKMAN, Forecast Official, in charge of Division of Meteorological Records.

CHARACTERISTICS OF THE WEATHER FOR FEBRUARY.

The mean barometric pressure was high over the northwestern quarter of the United States, and low over northeastern New England.

The temperature was above the normal in mean daily values ranging from $+0.8^{\circ}$ to $+2.5^{\circ}$ in the Atlantic coast districts and the Lake region; elsewhere it was below the normal, and as a rule the mean daily departures were greater than in the districts where it was above the normal. In the middle Plateau region the mean daily departures amounted to -13.0° .

The precipitation was deficient in the upper Lake region, North Dakota, upper Mississippi Valley, the Plateau, and Pacific coast districts, the departures, however, being slight except in the northern Plateau and the middle and north Pacific districts, where they ranged from -1.3 to -3.7 inches; elsewhere the precipitation was in excess, the departures in the South Atlantic States, Florida Peninsula, Gulf States, Ohio Valley and Tennessee, and the southern slope region, ranging from $+1.4$ to $+5.7$ inches.

The relative humidity was below the normal in values of from 1 to 5 per cent in the Atlantic coast and east Gulf districts, the upper Lake region, North Dakota, the northern Plateau, and south Pacific districts; 7 per cent in the north Pacific and 8 per cent in the middle Pacific districts; elsewhere it was above normal, and markedly so in the following districts: Middle slope region, where the departure amounted to $+10$ per cent, $+11$ per cent in the northern slope region, and $+15$ per cent in the middle Plateau district.

The cloudiness was above the average in the South Atlantic and Gulf States, Florida Peninsula, upper Mississippi Valley, middle and southern slope, and southern Plateau regions. In the remaining geographical districts it was below the average, the most marked departures occurring in North Dakota and the middle and northern Plateau and Pacific districts.

The month was very stormy in New England. In North Carolina there was an unusual number of gales, that of the 16th being the heaviest of the winter.

PRESSURE.

The distribution of monthly mean pressure is shown graphically on Chart VI and the numerical values are given in Tables I and VI.

The crest of the highest barometric pressure overlay southwestern Idaho, with a mean reading of 30.31 inches at Boise. The lowest mean pressure was reported from northeastern Maine, with a reading of 29.86 inches at Eastport. Another area of relatively low pressure overlay the upper Rio Grande Valley, the mean at El Paso, Tex., being 29.95 inches.

The pressure was below the normal in New England, generally in the Middle Atlantic States and lower Lake region, and in the extreme southwestern part of California, with the greatest departures at Maine stations, the departure at Eastport amounting to -0.12 inch; elsewhere the pressure was above the normal.

Generally over the region west of the Missouri River the departures were quite decided, especially over Wyoming and northwestern Colorado, and thence northwestward over Idaho, Washington, northern and eastern Oregon, and the northern parts of Nevada and Utah. The pressure diminished from that of January, 1903, in southern Texas, New Mexico, southwestern Colorado, Arizona, and central and southern California, but in none of these districts did the departure amount to -0.10 inch except at San Diego, Cal., where it amounted to -0.12 ; elsewhere the pressure increased over that of January, with generally very decided departures in the lower Lake region, lower Ohio Valley, the southern part of the middle slope and middle Plateau regions, and thence westward and northwestward to the coasts of Oregon and Washington, the greatest increases, $+0.20$ inch to $+0.23$ inch, being reported from North Dakota, eastern Montana, and the northern part of South Dakota.

TEMPERATURE OF THE AIR.

The mean temperature was above the normal in the Atlantic States, except western Georgia, in the greater portion of the Lake region, in northwestern Minnesota, and portions of north-central and western Montana, but the departures were,

as a rule, small, the greatest being $+4.3^{\circ}$; elsewhere the temperature was below the normal, and over the middle slope, southern parts of the northern slope and Plateau, and the middle and southern Plateau regions the departures were very marked, the daily averages ranging from -11.8° to -16.7° over western Colorado, Utah, and Nevada.

The isotherms of mean temperature lay to the northward of their position in February, 1902, over the eastern part of the country, and to the southward of it over the Western States and Territories. Over Florida the isotherm of 70° occupied about the same position that 60° did in 1902. Higher maximum temperatures were reported from the eastern half of the country and lower maximum from the western part, while, as a rule, lower minimum temperatures occurred in all sections. Freezing temperatures occurred as far south as central Florida and portions of southwestern California.

Severe frosts occurred in California during the week ending the 2d, also in most sections during the week ending on the 9th; killing frosts and thick ice during the week ending the 16th, and low temperatures and severe frosts during the week ending the 22d.

The average temperatures for the several geographic districts and the departures from the normal values are shown in the following table:

Average temperatures and departures from normal.

Districts.	Number of stations.	Average temperatures for the current month.	Departures for the current month.	Accumulated departures since January 1.	Average departures since January 1.
New England	8	28.2	+ 2.2	+ 3.1	+ 1.6
Middle Atlantic	12	36.6	+ 2.1	+ 2.4	+ 1.2
South Atlantic	10	50.8	+ 1.3	+ 0.2	+ 0.1
Florida Peninsula*	8	64.9	+ 2.5	+ 2.6	+ 1.3
East Gulf	9	51.9	- 1.9	- 3.2	- 1.6
West Gulf	7	48.2	- 3.4	- 1.9	- 1.0
Ohio Valley and Tennessee	11	37.1	- 1.1	- 1.4	- 0.7
Lower Lake	8	27.3	+ 0.8	+ 0.8	+ 0.4
Upper Lake	10	20.5	+ 1.3	+ 3.3	+ 1.6
North Dakota*	8	3.5	- 4.8	+ 1.3	+ 0.6
Upper Mississippi Valley	11	24.4	- 1.7	+ 2.0	+ 1.0
Missouri Valley	11	20.6	- 3.8	+ 1.9	+ 1.0
Northern Slope	7	17.0	- 4.1	+ 4.8	+ 2.4
Middle Slope	6	26.9	- 5.5	- 0.2	- 0.1
Southern Slope*	6	36.2	- 4.3	- 1.9	- 1.0
Southern Plateau*	13	35.6	- 6.1	- 3.4	- 1.7
Middle Plateau*	9	16.6	-13.0	-11.5	- 5.8
Northern Plateau*	12	26.1	- 3.0	+ 2.8	+ 1.4
North Pacific	7	40.3	- 0.3	+ 2.9	+ 1.4
Middle Pacific	5	47.6	- 2.7	- 2.9	- 1.4
South Pacific	4	49.8	- 3.7	- 1.2	- 0.6

* Regular Weather Bureau and selected voluntary stations.

In Canada.—Prof. R. F. Stupart says:

The temperature was just about the average over British Columbia and in the extreme eastern portions of the Province of Quebec and the Maritime Provinces, and elsewhere in the Dominion it was above the average. The plus departure was especially marked in Alberta, both Edmonton and Calgary recording an excess of 9° . It was also well marked in Manitoba, with an excess of from 3° to 4° , and over a large portion of Ontario, with an excess of from 3° to 5° .

PRECIPITATION.

The precipitation was below normal west of the upper Lake region, in the Pacific districts, and generally in the middle and southern Plateau regions, and above normal generally in all other sections. In the middle and north Pacific districts the deficiencies were quite marked, as were the excesses in the Gulf States generally, and in portions of the Ohio Valley and Tennessee, the western part of the South Atlantic States, and the south-central part of the southern slope region, the most marked departures occurred in the east Gulf States and portions of the west Gulf States, in which districts monthly amounts ranging from 10.0 inches to 15.0 inches were reported.

In many sections the snowfall was heavy, and occurred every-

where, except in portions of the South Atlantic States, and along the coast of the Gulf of Mexico.

At the end of the month there was snow on the ground in portions of New York, Pennsylvania, New England, and in the upper Lake region, and thence southwestward to central New Mexico and westward to about the one hundred and twentieth meridian.

HAIL.

The following are the dates on which hail fell in the respective States:

Alabama, 5. Arizona, 6, 14, 15, 24. Arkansas, 2, 3, 6, 7, 15, 16. California, 1, 2, 3, 4, 5, 7, 11, 13, 14, 22. Connecticut, 8, 15. Delaware, 1, 14, 16. Florida, 21. Indiana, 28. Indian Territory, 2, 13. Iowa, 3. Kansas, 3, 14. Kentucky, 16. Maine, 4, 11. Maryland, 1, 4, 14, 16, 17. Massachusetts, 8, 16. Michigan, 2, 3, 4, 12, 28. Minnesota, 3, 27. Mississippi, 3, 14, 26, 27. Missouri, 2, 3. New Hampshire, 2, 3, 4, 8. New Jersey, 4, 8, 11, 12, 14, 15, 16. New York, 8, 28. North Carolina, 6, 17, 28. Ohio, 2, 3, 28. Oklahoma, 2, 3, 15. Oregon, 7, 9, 10. Pennsylvania, 8, 14, 15, 16, 28. Rhode Island, 8. Tennessee, 4, 16. Texas, 2, 6, 10, 12, 15, 16, 19, 25, 26, 27. Virginia, 7, 17. Washington, 20. West Virginia, 1, 11, 28. Wisconsin, 2. Wyoming, 10.

SLEET.

The following are the dates on which sleet fell in the respective States:

Alabama, 6, 16. Arizona, 2, 26. Arkansas, 5, 6, 13, 14, 15, 16, 19, 20. California, 1, 2, 3, 7, 8, 11, 13. Connecticut, 8, 14, 15. District of Columbia, 1, 16, 17. Georgia, 6, 16. Idaho, 10. Illinois, 1, 2, 3, 9, 10, 11, 14, 15, 20, 24, 25, 26, 27, 28. Indiana, 2, 3, 14, 15, 16, 23, 24, 28. Indian Territory, 6, 10, 13, 15. Iowa, 2, 3, 19, 26, 27, 28. Kansas, 2, 3, 6, 7, 13, 14, 15, 26, 27. Kentucky, 7, 8, 15, 16, 24. Louisiana, 5, 6, 15, 16, 19. Maine, 2, 4, 5. Maryland, 1, 8, 14, 15, 16, 17. Massachusetts, 4, 8, 11, 16, 28. Michigan, 2, 3, 4, 27. Minnesota, 27, 28. Mississippi, 5, 7, 15, 16, 17, 19, 20. Missouri, 2, 3, 7, 13, 14, 15, 16. Montana, 9, 22. Nebraska, 3, 11, 26, 27. New Hampshire, 4, 5, 8. New Jersey, 4, 8, 11, 14, 15, 16, 17. New Mexico, 2, 15, 19. New York, 2, 3, 4, 6, 8, 12, 15, 16. North Carolina, 6, 16. Ohio, 2, 3, 7, 8, 13, 14, 15, 16, 18, 28. Oklahoma, 7, 13, 14, 15. Oregon, 7. Pennsylvania, 1, 8, 11, 14, 15, 16, 17. Rhode Island, 8, 16. South Carolina, 5, 6, 7. South Dakota, 27. Tennessee, 6, 7, 10, 15, 16, 17. Texas, 5, 6, 7, 13, 14, 15, 16, 18, 19, 25, 28. Utah, 27. Vermont, 4, 8, 11. Virginia, 1, 7, 8, 16, 17. Washington, 7, 8, 9, 10, 13. West Virginia, 1, 8, 15, 16, 17. Wisconsin, 2, 13.

Average precipitation and departure from the normal.

Districts.	Number of stations.	Average.		Departure.	
		Current month.	Percentage of normal.	Current month.	Accumulated since Jan. 1.
New England	8	3.97	111	+0.4	+0.1
Middle Atlantic	12	4.16	124	+0.8	+0.6
South Atlantic	10	5.09	141	+1.4	+1.0
Florida Peninsula*	8	5.15	169	+2.1	+4.8
East Gulf	9	10.50	219	+5.7	+4.7
West Gulf	7	6.30	185	+2.9	+2.0
Ohio Valley and Tennessee	11	6.04	142	+1.8	-0.1
Lower Lake	8	3.23	122	+0.6	+0.2
Upper Lake	10	1.76	95	-0.1	-0.9
North Dakota*	8	0.27	40	-0.4	-0.2
Upper Mississippi Valley	11	1.87	95	-0.1	-0.1
Missouri Valley	11	1.47	116	+0.2	-0.3
Northern Slope	7	0.74	137	+0.2	-0.1
Middle Slope	6	1.61	199	+0.8	+0.2
Southern Slope*	6	3.25	340	+2.3	+1.8
Southern Plateau*	13	0.87	90	-0.1	-0.9
Middle Plateau*	8	0.92	75	-0.3	-0.2
Northern Plateau*	12	0.31	19	-1.3	-1.7
North Pacific	7	1.98	35	-3.7	-4.2
Middle Pacific	5	2.04	49	-2.1	-1.8
South Pacific	4	1.90	73	-0.7	-1.3

* Regular Weather Bureau and selected voluntary stations.

In Canada.—Professor Stupart says:

In Ontario the precipitation was above the average east to the boundary of the Province from an imaginary line drawn north and south from the Georgian Bay district, the excess increasing gradually until 1.50 inches was reached on the eastern margin. Throughout Quebec the average was exceeded by from 2.25 inches to over 3.00 inches. In the Maritime Provinces there was an excess of about an inch in the northern parts and a deficiency in the extreme south and southwest portions of from 1.00 inch to nearly 2.00 inches; elsewhere in Canada the average was not maintained, but the minus departure was not marked, except in portions of British Columbia where it was very much so, Barkerville and Victoria recording 2.50 inches below the average, and New Westminster close on to 6.00 inches below.

HUMIDITY.

The averages by districts appear in the subjoined table:

Average relative humidity and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England	73	- 2	Missouri Valley	81	+ 4
Middle Atlantic	72	- 2	Northern Slope	80	+11
South Atlantic	74	- 4	Middle Slope	76	+10
Florida Peninsula	80	- 2	Southern Slope	78	+ 8
East Gulf	77	- 1	Southern Plateau	53	+ 5
West Gulf	79	+ 6	Middle Plateau	77	+15
Ohio Valley and Tennessee	77	+ 3	Northern Plateau	75	- 3
Lower Lake	81	+ 1	North Pacific	78	- 7
Upper Lake	80	- 1	Middle Pacific	68	- 8
North Dakota	76	- 5	South Pacific	68	- 3
Upper Mississippi Valley	80	+ 3			

SUNSHINE AND CLOUDINESS.

The distribution of sunshine is graphically shown on Chart VII, and the numerical values of average daylight cloudiness, both for individual stations and by geographical districts, appear in Table I.

The averages for the various districts, with departures from the normal, are shown in the table below:

Average cloudiness and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England	5.4	- 0.1	Missouri Valley	4.9	- 0.5
Middle Atlantic	5.3	- 0.3	Northern Slope	4.4	- 0.4
South Atlantic	5.7	+ 0.4	Middle Slope	4.8	+ 0.4
Florida Peninsula	5.6	+ 1.0	Southern Slope	6.4	+ 1.6
East Gulf	6.9	+ 1.4	Southern Plateau	3.3	+ 0.3
West Gulf	6.5	+ 0.7	Middle Plateau	3.4	+ 1.4
Ohio Valley and Tennessee	6.0	- 0.2	Northern Plateau	4.8	- 1.9
Lower Lake	6.4	- 0.4	North Pacific	5.5	- 1.5
Upper Lake	5.8	- 0.5	Middle Pacific	3.8	- 1.0
North Dakota	3.0	- 2.1	South Pacific	3.0	- 1.1
Upper Mississippi Valley	5.4	+ 0.1			

WIND.

The maximum wind velocity at each Weather Bureau station

for a period of five minutes is given in Table I, which also gives the altitude of Weather Bureau anemometers above ground.

Following are the velocities of 50 miles and over per hour registered during the month:

Maximum wind velocities.

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
Amarillo, Tex	3	50	w.	Havre, Mont	9	60	sw.
Atlanta, Ga.	16	60	nw.	Huron, S. D.	28	52	nw.
Block Island, R. I.	5	56	nw.	Jacksonville, Fla.	16	75	sw.
Do.	6	50	nw.	Knoxville, Tenn.	4	60	sw.
Do.	9	56	nw.	Lexington, Ky.	4	50	w.
Do.	17	60	ne.	Lincoln, Nebr.	28	52	nw.
Do.	18	50	w.	Milwaukee, Wis.	4	56	ne.
Do.	28	56	s.	Minneapolis, Minn.	28	50	n.
Buffalo, N. Y.	2	51	w.	Mount Tamalpais, Cal.	11	56	nw.
Do.	4	59	sw.	Do.	13	56	ne.
Do.	5	50	sw.	Do.	14	50	ne.
Do.	8	72	sw.	New York, N. Y.	4	63	w.
Do.	17	50	sw.	Do.	5	72	nw.
Do.	18	54	w.	Do.	9	59	nw.
Do.	19	50	w.	Do.	17	55	nw.
Do.	28	60	w.	Do.	18	52	w.
Cairo, Ill.	4	53	sw.	Do.	28	50	s.
Chicago, Ill.	3	50	ne.	North Head, Wash.	7	71	se.
Do.	22	50	s.	Do.	8	72	s.
Cleveland, Ohio	4	56	w.	Do.	9	80	s.
Do.	5	57	w.	Point Reyes Light, Cal.	1	60	nw.
Do.	18	50	w.	Do.	7	74	s.
Columbia, S. C.	16	60	sw.	Do.	11	65	nw.
Do.	17	56	sw.	Do.	12	60	nw.
Columbus, Ohio	4	61	sw.	St. Louis, Mo.	4	51	sw.
Do.	28	56	w.	Sioux City, Iowa	27	50	nw.
Duluth, Minn.	18	56	nw.	Do.	28	52	nw.
Do.	28	52	nw.	Syracuse, N. Y.	11	50	s.
Eastport, Me.	8	51	e.	Do.	28	59	sw.
Do.	17	52	ne.	Tatoosh Island, Wash.	7	54	s.
Do.	28	50	sw.	Do.	8	52	nw.
Green Bay, Wis.	4	55	n.	Do.	9	72	sw.
Harrisburg, Pa.	5	50	nw.	Do.	10	60	nw.
Hatteras, N. C.	16	59	sw.	Williston, N. Dak.	27	50	n.

ATMOSPHERIC ELECTRICITY.

Numerical statistics relative to auroras and thunderstorms are given in Table IV, which shows the number of stations from which meteorological reports were received, and the number of such stations reporting thunderstorms (T) and auroras (A) in each State and on each day of the month, respectively.

Thunderstorms.—Reports of 802 thunderstorms were received during the current month as against 975 in 1902 and 372 during the preceding month.

The dates on which the number of reports of thunderstorms for the whole country was most numerous were: 3d, 129; 2d, 110; 4th, 100.

Reports were most numerous from: Texas, 96; Louisiana, 74; Mississippi, 70.

Auroras.—The evenings on which bright moonlight must have interfered with observations of faint auroras are assumed to be the four preceding and following the date of full moon, viz: 7th to 15th.

In Canada: Thunderstorms were reported at Chatham, 5th; Ottawa, 4th; Parry Sound, 2d. Auroras were reported at Qu'Appelle, 21st; Swift Current, 23d.

DESCRIPTION OF TABLES AND CHARTS.

By Mr. W. B. STOCKMAN, Forecast Official, in charge of Division of Meteorological Records.

For description of tables and charts see page 582 of REVIEW for December, 1902.