the 15th—Minimum 29.12 on the 9th—monthly mean of thermometer 46.92—of Barometer 29.641. Amount of rain 4.87 inches. Peach tree in blossom on the 27th.

March came in mildly and gave fine weather, with the exception of a few days, until about the time of the Equinox. Thunder storms on the 2nd and 20th days, and another of great severity on the 23rd, during which four buildings in this city, without conductors, were struck by the lightning. Since that time the weather has been marked by great changes. On the 30th there were frequent storms of hail and rain with cold winds from W. and N. W. Much high wind during the month. Maximum of Thermometer 79 on the 18th—Minimum 23 on the 31st—Range 56—Maximum of Barometer 29.83 on the 21st—Minimum 29.10 on the 16th at 6 P. M.—Range .73. Mean temperature of March 54.25—Mean of Barometer 29.453—Rain 4.05 inches.

As you seem to have forgotten that in my observations the italic *c* denotes *cloudy*, and the roman *c* *clear*, it may not be improper to state that in the notes on the winter Solstice of 1839, the 24th day only presented a clear sky.

Very respectfully, yours, &c.,

JAMES HAMILTON.

University of Nashville, April 1, 1840.

Meteorological Observations, at the Vernal Equinox of 1840, made in conformity with the instructions of the South African Literary and Philosophical Institution, at the University of Nashville, Tennessee, in North Latitude, 36° 09' 33", W. Long. 86° 49' 03;" by JAMES HAMILTON, Prof. Math. and N. Philos.

March 21, 1840.

External Attach'd Barom. Therm. Therm.					
				W.	
6 A. M.	34	49	29.82 c	N.E. by E.	2 At 6h 50m rain and hail for 10m with gust of wind, which ceased with the rain.
7	32.5	48.5	29.82 c	Do	1
8	32.5	48	29.83 c	Do	1 Again from 7h 20m to 7h 45m, during which
9	34	48	29.83 c	Do	1 Thermometer fell to 31°.
10	37	47.5	29.85 c	Do	1 At 9h clouds begin to break in N. but were
				W.	dense in S.
11	41	47.5	29.84 c	N.E.	1
12	34	47.5	29.83 c	Do	1 Clouds gradually dispersing, and sun was seen
1 P. M.	45	48	29.81 c	Do	1 through Transit at noon. Clear at 12½h,
2	47.5	48	29.78 c	Do	1 except that a few cirrus clouds stretch
3	49	48.5	29.76 c	Do	1 from W. to E. forming an arch at N.
4	49	48.5	29.75 c	Do	1
5	48.5	48.5	29.748 c	Do	1
6	47	48.25	29.745 c	Do	1 At 1 P. M. cirrus thinner and vertex of arch in
				W.	N.N.W.; continues to become clearer un-
7	45	48	29.74 c	N.	1 til at 8, clouds form in the west.
8	43	48	29.74 c	Do	1 At 8h 40m wind 2.
9	42	48	29.742 c	N.W.	1 At 9h vertex of arch in N. W.
10	40.5	48	29.76 c	Do	1 10h a thin stratum of clouds in W.
11	39	47.5	29.74 c	Do	1 10h 40m the same continues but is higher, and two others appear in the east.
				N.W.	
12	36	47	29.70 c	N.E.	1 Dew point at 3 P. M. 33°.

March 22.

1 A. M.	36	46.5	29.68 c	N.W. E.	1	Vapours collect and form the nebulus about 3 A. M.
2	36	46	29.70 c	N.W. N.E.	1	
3	35	46	29.68 c	W. N.E.	1	
4	34.5	46	29.67 c	Do	0	
5	34.5	45.5	29.67 c	Do	1	
6	35	45.5	29.68 c	Do	1	

Mean time found by Transit and kept by a superior clock. Fahrenheit's Thermometer—Barometer by Dolland—diameter of tube .4 inch, cup 2 inch.; height above ground 38 feet, and 128 feet above low water of the Cumberland river. External Thermometer, 35 feet above ground, north exposure.

On the day preceding the Equinox, double currents of wind were observed, the upper from the west and the under from the east. At sunrise the Thermometer was at 51° and the Barometer at 29.63. Clouds were gathering in the west and continued to become more and more dense until ten minutes past noon, at which time there was a storm of rain and hail, with thunder and lightning, that lasted until 1 P. M. When the storm began, the thermometer was at 45 and had fallen to 39 before its end. The double currents were perceptible, with the exception of a few hours, until the evening of the 23rd when a very violent thunder storm commenced at half-past 8 P. M. and lasted until 10 P. M., at which time the N. W. wind prevailed and blew very violently till sunset on the 25th. The clouds disappeared during the night of the 24th.

The double currents are marked in the table with the upper above a line and the under below.

J. H.

Civil Engineering.

A Popular Exposition of the Incorrectness of the Tariffs of Toll in use on the Public Improvements of the United States. By CHARLES ELLET, Jr., Civil Engineer.

[Concluded from Page 172.]

§ 4. *Of the most judicious charge on articles of heavy burden and small value.*

12. I conceive that it is essential to the fulfilment of the condition, that the tax levied on the trade of the line shall be reconcilable with principles of equity, that the charge at each point shall be proportional to the ability of the article to sustain it; and, it fortunately happens, that when the charges are regulated in the mode that will produce the maximum revenue, this condition will be fully satisfied.

We are to understand by the ability of a commodity to sustain a charge for carriage, the difference between the cost of production and the market value of the object. If the article be worth \$10 in market, and it costs \$6 to produce and prepare it for market, it will sustain any charge for transportation, including both freight and toll, not exceeding \$4. But its ability to sustain a charge *for toll only*, depends on the position in which it reaches