

Weather Observations

For the more than fifty years that Thomas Jefferson was a systematic weather observer, Monticello was the focus of his efforts to understand the American climate. Well before 1776, the date of his earliest surviving meteorological diary, he was carefully assembling information on the weather of Virginia and making his own observations at Williamsburg and Monticello. The fruits of these endeavors appeared in the chapter on climate in his *Notes on the State of Virginia*, which, when published in 1785, established his membership in the international fraternity of scientists and natural philosophers.



The image shows a page from a handwritten diary, likely a weather journal, with a table structure. The text is written in cursive and is somewhat faded. The table has several columns, with the first column containing dates and the subsequent columns containing various weather-related observations. The handwriting is dense and fills most of the page.

This is a page from Jefferson's 1796 weather observations (Library of Congress).

From 1776, Jefferson kept a consistent and, with inevitable interruptions, continuous record of his weather observations, in America, in Europe, and even in the mid-Atlantic. His practices and those of National Weather Service observers today are basically the same: to measure precipitation and to record the daily temperature range. The modern station at Monticello requires one daily reading of two thermometers which indicate maximum and minimum temperatures for the preceding twenty-four hours. Jefferson had no need of a maximum-minimum thermometer because he rose every day at dawn, which he considered the coldest time of day. He described his daily ritual, the results of which are illustrated in the page from his meteorological diary here reproduced, as follows: "My method is to make two observations a day, the one as early as possible in the morning, the other from 3. to 4. a'clock, because I have found 4. a'clock the hottest and day light the coldest point of the 24hours. I state them in an ivory pocket book in the following form, and copy them out once a week. The 1st. column is the day of the month. The 2d. the thermometer in the morning. The 4th do. in the evening. The 3d. the weather in the morning. The 5th do. in the afternoon. The 6th is for miscellanies, such as the appearance of birds, leafing and flowering of trees, frosts remarkably late or early, Aurora borealis, &c. In the 3d. and 5th. columns, a. is after: c, cloudy: f, fair: h, hail: r, rain: s, snow. Thus c a r h s means, cloudy after rain, hail and snow. Whenever it has rained, hailed or snowed between two observations I note it thus, f a r (i.e. fair after rain) c a s (cloudy after snow &c.) otherwise the falling weather would escape notation. I distinguish weather into fair or cloudy, according as the sky is more or less than half covered with clouds."¹

Jefferson went beyond the scope of the present weather station by attempting to collect data on winds and humidity, but he was hampered by the imperfect instruments then available to him. An accurate anemometer was not invented until 1850 and the hygrometer was not perfected in his lifetime. While living in Paris, Jefferson experimented with three different types of hygrometer.² He recorded their readings daily for five years in the hope of finding an instrument that could be trusted to provide accurate comparative observations. His initial, patriotic motive was to topple one of the two "pillars" of the theory of degeneracy of animal life in America advanced by the Comte de Buffon and other European scholars – America's alleged excessive humidity.³ Also in his role as champion of the North American continent, Jefferson began in Paris to compile a record of the ratio of cloudy to sunny skies. After a five-year residence in France, he had proved to himself that America completely eclipsed Europe in the

sunshine contest and he appreciated more than ever the "cheerful" sunny climate of his native country.⁴

While responding to international rivalry over climate was at times irresistible, Jefferson's motives for recording comparative weather data were of course much grander. The patient accumulation of details of what he called "the indexes of climate" – temperature, prevailing winds, precipitation, and related biological events like the flowering of plants and the migration of birds – was intended to form the foundation of a reliable theory of weather and climate.⁵ The advancement of meteorology, which in Jefferson's opinion had made the least progress of any science in his lifetime, was at the root of his own data gathering and inspired him to enlist everyone he could in the process. In the 1770s, he had planned to provide a thermometer to one dependable deputy for each county of Virginia and to exact from them twice-daily observations of temperature and wind direction. This ambitious scheme, which was meant to be the foundation of a national network of weather observers, was frustrated by the Revolutionary War, but ever afterward Jefferson called on every available watchman to take up his own observation post. Young Americans making the grand tour of Europe, stationary scholars, official explorers, sons-in-law, daughters, and grandchildren, were all enlisted to swell the stream of information. When Jefferson left for Europe in 1784, he practically commanded the two James Madisons – the professor in Williamsburg and the politician in Orange County – to carry on the daily meteorological ritual in his absence.⁶ An important clause of his official instructions to Lewis and Clark in 1803 enjoined them to observe "climate as characterized by the thermometer, by the proportion of rainy, cloudy & clear days, by lightening, hail, snow, ice, by the access & recess of frost, by the winds prevailing at different seasons, the dates at which particular plants put forth their flower, or leaf, time of appearance of particular birds, reptiles or insects."⁷

If, in his lifetime, Jefferson never found his own equal in committed and unfaltering attention to the details of his climate, his dream of simultaneous observations across the land is real today. Monticello is one of 12,000 weather stations now under the National Weather Service, which has claimed Jefferson as the "father of weather observers." It is unquestionable that Jefferson considered his observations a pleasure as well as a duty, especially the contemplation of his own climate at Monticello. "... climate is one of the sources of the greatest sensual enjoyment," he wrote while President.⁸ And from Lake Champlain, in May of 1791, he penned a well-known tribute to his native air: "On the whole I find nothing any where else

in point of climate which Virginia need envy to any part of the world. Here they are locked up in ice and snow for six months. Spring and autumn, which make a paradise of our country, are rigorous winter with them, and a Tropical summer breaks on them all at once. When we consider how much climate contributes to the happiness of our condition, by the fine sensations it excites, and the productions it is the parent of, we have reason to value highly the accident of birth in such a one as that of Virginia."⁹
- Lucia Stanton, originally published as *Fall Dinner at Monticello, November 5, 1982, in Memory of Thomas Jefferson.*

Further Sources

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- *MB*, 1:432-35, 771-806.
- Monticello Classroom. "[Weather Memorandum Book, 1 July 1776, Philadelphia.](#)" An image of the original manuscript from the Coolidge Collection of Thomas Jefferson Manuscripts, Massachusetts Historical Society.
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- Solomon, Susan S., John S. Daniel, and Daniel L. Druckenbrod. "Revolutionary *American Scientist* 95 (2007): 430-37. The article relates how "Thomas Jefferson and James Madison participated in a small 'revolution' against British weather-monitoring practices."
- Thomson, Keith. *Jefferson's Shadow: The Story of His Science.* New Haven: Yale University Press, 2012.
 - [1.](#) Jefferson to Thomas Mann Randolph, Jr., April 18, 1790, in *PTJ*, 16:351-52. Transcription available at Founders Online.
 - [2.](#) See Jefferson to Benjamin Vaughan, July 23, 1788, in *PTJ*, 13:394-98. Transcription available at Founders Online.
 - [3.](#) See Jefferson to Chaste lux, June 7, 1785, in *PTJ*, 8:184-86. [Transcription](#) available at Founders Online.
 - [4.](#) See Jefferson to Constantin François Chasseboeuf Volney, February 8, 1805, Thomas Jefferson Papers, Library of Congress. [Polygraph](#) copy available online. Transcription available at Founders Online.

- 5. See Jefferson to Lewis E. Beck, July 16, 1824, Union College Library, and Schenectady, NY. Transcription available at Founders Online.
- 6. See Jefferson to Madison, February 20, 1784, in *PTJ*, 6:545. [Transcription](#) available at Founders Online. See also Jefferson to Madison, March 16, 1784, in *PTJ*, 7:31. Transcription available at Founders Online.
- 7. Instructions for Meriwether Lewis, [April 13, 1803], in *PTJ*, 40:178-79.
- 8. Jefferson to Joseph Priestley, June 19, 1802, in *PTJ*, 37:626. [Transcription](#) available at Founders Online.
- 9. Jefferson to Martha Jefferson Randolph May 31, 1791, in *PTJ*, 20:464. Transcription available at Founders Online.