

MELBOURNE'S HIGHEST TEMPERATURE ON RECORD, 117°F (47.2°C), ON BLACK THURSDAY, 6 FEBRUARY 1851 – BUT IS IT VALID?

Harvey Stern^{*1}, John Cornall-Reilly¹, Patrizia McBride¹, and Adrian Fitzgerald²

¹Bureau of Meteorology, Australia

²La Trobe University, Australia



William Strutt, artist, *Black Thursday, February 6th 1851*, Oil on canvas, 106.5 x 34.3 cm, H28049, Latrobe Picture Collection

1. INTRODUCTION

Melbourne's *Argus* newspaper of Saturday, 8th February 1851, reports: "Thursday was one of the most oppressive hot-days we have experienced ... In the early morning the atmosphere was perfectly scorching, and at eleven o'clock the thermometer stood as high as 117 degrees (47.2°C) in the shade; at one o'clock it had fallen to 109 degrees (42.8°C) and at four in the afternoon was up to 113 degrees (45.0°C). The blasts of air were ... impregnated with smoke ... in the evening, after an hour's battle for the supremacy, the cool breeze came ..."

However, the *Abstract of the Meteorological Journal kept at Melbourne Port Phillip, during the month of February 1851* as recorded by the *New South Wales Government Gazette* did not suggest that temperatures reached such extreme levels. It reported temperatures of 96°F (35.6°C) at 8.30am, 108°F (42.2°C) at 2.30pm, 106°F (41.1°C) at sunset (~7pm) and 88°F (31.1°C) at 9pm.

Andrew May at <http://www.emelbourne.net.au/biogs/EM00199b.htm> writes:

"On 6 February 1851, three months after news of Separation from New South Wales had reached Melbourne, severe bushfires gave the soon-to-be-proclaimed state of Victoria a fiery baptism and are remembered as one of the State's worst natural disasters.

Fires around Macedon, the Dandenong Ranges, the Pentland Hills, Portland, Port Fairy, Geelong and in the Plenty Ranges showered the city with charred matter, while a blasting wind carried singed leaves as far as Tasmania, scattering ash upon the decks of ships in Bass Strait ...

William Strutt's painting *Black Thursday* (1864) graphically depicts a melee of terrified people and animals fleeing ahead of the conflagration. Strutt described in his journal the overwhelming heat of 'that scorching Thursday' where at breakfast 'the butter in the butter dish was melted to oil, and the bread when cut turned to rusk'.

2. ANALYSIS

A regression analysis was performed on 1979-2008 9am, noon, 3pm, and 6pm temperature data to yield an equation giving Melbourne's maximum temperature as a function of temperatures at 9am, noon, 3pm, and 6pm, and the highest of these four temperatures.

This proved to be an effective method of deriving the likely maximum temperature, the standard error of estimate being only 0.65°C.

$$\text{Maximum} = 0.491 + 0.020*9\text{am} + 0.087*Noon - 0.023*3\text{pm} + 0.026*6\text{pm} + 0.929*Highest$$

A regression analysis was then performed on the temperature data reported by the *New South Wales Government Gazette* to yield an equation giving Melbourne's temperature on 6th February 1851, as a function of time of day.

*Corresponding author address: Dr. Harvey Stern, Bureau of Meteorology, Box 1636, Melbourne, Vic., 3001, Australia; e-mail: h.stern@bom.gov.au

$$\text{Temperature} = -0.0205 \cdot \text{time}^3 + 0.758 \cdot \text{time}^2 - 8.035 \cdot \text{time} + 60.863$$

The second equation was then solved to obtain estimates of 9am, noon, 3pm, and 6pm temperatures for 6th February 1851 (these being, respectively, 35.0°C, 38.2°C, 41.7°C, and 42.2°C), the solutions so derived being inserted in the first equation.

This yielded an estimate of Melbourne's maximum temperature on that day of 43.9°C. This new estimate is 3.3°C (or about five standard deviations)

2. CONCLUSION

Assuming that the temperature data reported by the New South Wales Government Gazette at 8.30am, at 2.30pm, at sunset, and at 9pm are valid, it seems unlikely that Melbourne's temperature reached 47.2°C (117°F) on 6th February 1851 and that a better estimate of the day's maximum temperature is 43.9°C.



George Rowe 1796–1864 lithographer: Melbourne, 1858. Lithograph with hand colouring. A panoramic view of Melbourne taken from the Observatory (later Flagstaff) Hill, showing Emerald Hill, Batman's Hill, Sandridge, Gas Works, Railway Works, Barracks, Williams Town. H2544.