VICTORIA'S HIGHEST TEMPERATURE ON RECORD, 123.5°F (50.8°C), AT MILDURA, ON 6 JANUARY 1906 – BUT IS IT VALID?

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1. INTRODUCTION

1.1 *Newspaper headline: "The hot weather. Victorian record broken."*

Melbourne's *The Argus* newspaper of Saturday 6th January 1906 headlined: *The hot weather. Victorian record broken. Mildura, 123 degrees.* It reported that "yesterday was the continuation of a period of fierce heat, of which Mr Baracchi *(Government Astronomer of Victoria 1900-1915)* will not yet prophesy the end … (and that) the outlook for today is worse than the memory of yesterday. Yesterday was hot; today will probably be hotter."

It **was** hotter - *The Mildura Cultivator* of Saturday 13th January 1906 reported a top temperature to 9am 7th January of 123.5°F (50.8°C).

Figure 1 Mildura record heat
Source:
http://www.news.com.au/gallery/1,20039,5027866-5014238,00.html

1.2 *Purpose*

The Argus newspaper of Saturday 6th January 1906 declares that: "The thermometers are supplied from the Observatory, and are reliable instruments, and the screens and other devices by means of which the shade is produced are the same as those in use at the Observatory itself."

Notwithstanding this protestation, there is evidence that, between 1902 and 1906, high temperatures during the hot season (November to March) were overestimated at the official Mildura Post Office weather station by some 2.5°C. The purpose of this paper is to document some of that evidence.
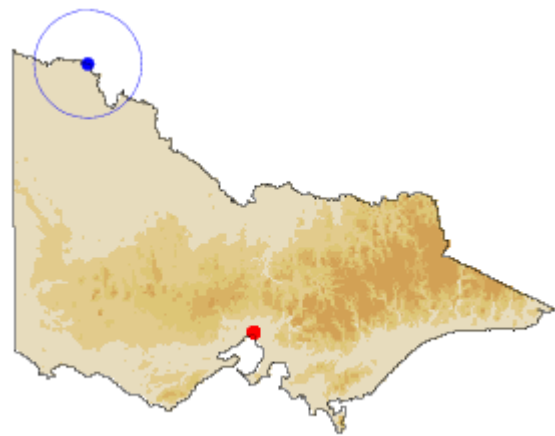
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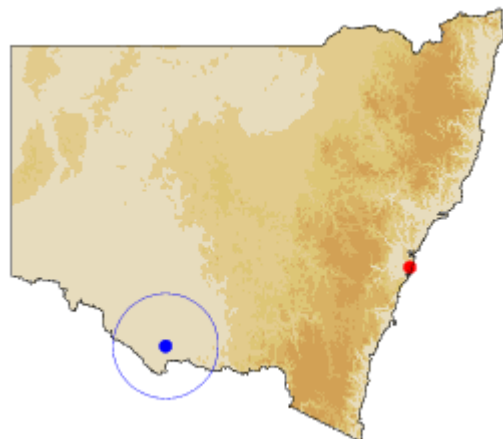
2. ANALYSIS

2.1 *Location*

Mildura (Figure 2) is located on the Murray River in a mostly flat region of NW Victoria, and the official Mildura Post Office weather station opened in January 1889 (Figure 2).

Figure 2 Location of Mildura
Source: http://www.bom.gov.au

Deniliquin (Figure 3) is located several hundred km to the ESE of Mildura in a mostly flat region of southern New South Wales. The official Deniliquin Post Office weather station opened in January 1858.
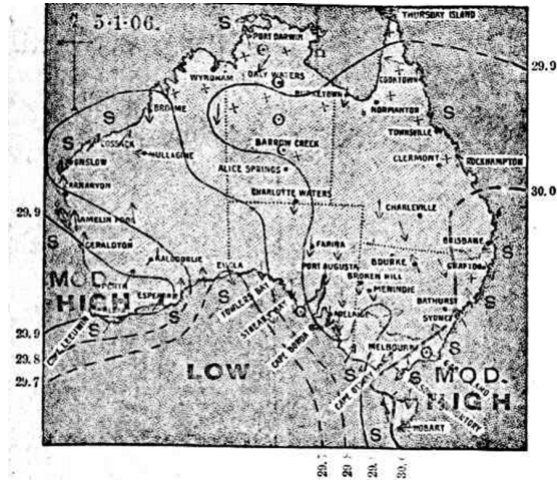

Figure 3 Location of Deniliquin
Source: http://www.bom.gov.au

Both towns are distant from the ocean and are usually affected in similar ways by most broadscale
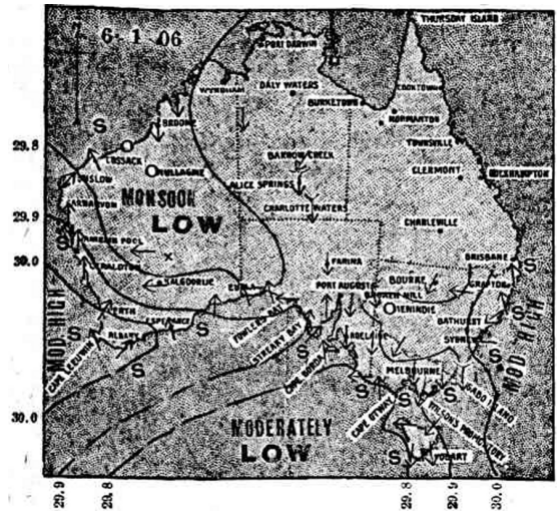
weather systems. Maximum temperature data from weather stations located at Mildura and Deniliquin Post Offices are available from 1889 to 1949.

2.2 *Synoptic situation*

The synoptic chart for 5 January 1906 (source: *Advertiser* newspaper of 6 January 1906) shows a high pressure system over the Tasman Sea directing a northerly air-flow, with a long overland trajectory) across eastern Australia. A deep depression and trough was approaching from the west.

The synoptic chart for 6 January 1906 (source: *Advertiser* newspaper of 8 January 1906) showed that the high had moved away to the east, and that the depression and trough was approaching the west coast of Victoria.

2.3 *Regression*

A regression analysis was performed on those data to yield Mildura's monthly extreme maximum temperature as a function of Deniliquin maximum, sine (month), cosine (month), sine (month)*Deniliquin maximum, and cosine (month)*Deniliquin maximum.

The regression relationship was then utilised to estimate Mildura's monthly extreme maximum from that at Deniliquin.

2.3 *Results*

It emerged that, during the hot season (November to March) there were four distinct error distribution clusters: from 1889/90 to 1896/97, the average error was −0.82°C; from 1897/98 to 1901/02, the average error was +0.22°C; from 1902/03 to 1905/06, the average error was 2.33°C; and, from 1908/09 to 1949, the average error was −0.13°C.

Making the assumption that there was appropriate siting and exposure of the instrumentation at both weather stations during the latter period leads one to suggest a bias in the Mildura monthly extreme maxima during the period from 1902/03 to 1905/06 of +2.46°C (2.33°C + 0.13°C).

3. CONCLUSION

Consequently, it is concluded that, whilst it is often stated that Victoria's highest temperature on record is 123.5°F (50.8°C), recorded at Mildura on Saturday 6th January 1906, the maximum temperature at Mildura on that day was more likely to have been closer to 48.3°C than to 50.8°C.

APPENDIX: ABOUT THERMOMETER SCREENS

Source: Bureau of Meteorology, 1993, Differences in temperature recording between the Glaisher Stand and the Stevenson Screen – A project undertaken for the Bureau of Meteorology Research Centre by Department of Mathematics, Swinburne University of Technology, October 1993.

Only one screen or "device by which the shade is produced" would usually be in use at any station at any one time. The actual type of shelter in use at Mildura Post Office in 1906 is not clearly defined in the Bureau's records.

There were two main shelters in use in 1906 in which thermometers were placed - the *Stevenson Screen*, which was not accepted as the standard in Australia until about 1910, and the *Glaisher Stand*. From a photo of the first Mildura Post Office, the thermometer shelter appears to be in an open area between the main building and a fence and is likely to have been a *Glaisher Stand* rather than a *Stevenson Screen*.

A.1 The *Stevenson Screen*

The *Stevenson Screen* (Figure 4) is the World Meteorological Organisation's standard screen for housing temperature recordings for meteorological purposes. It consists of a white painted wooden box with a double roof and doubly louvered sides supported on a stand approximately 120cm above the ground. One of the louvered sides is hinged to give access to the box.
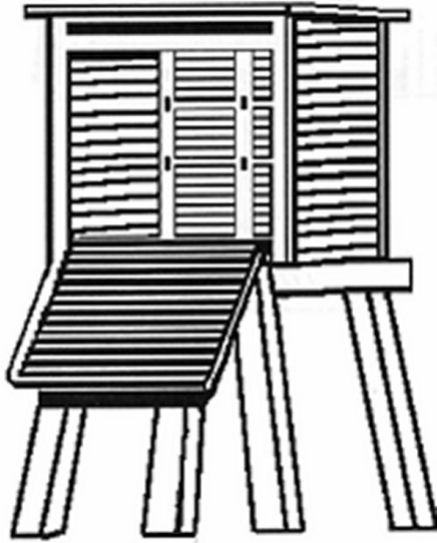
Figure 4 *The Stevenson Screen*

A.2 *The Glaisher Stand*

The *Glaisher Stand* (Figure 5) is a wooden structure with an apex roof, which is mounted on a stand. The significant difference between the *Glaisher Stand* and the *Stevenson Screen* is that it is open to sun light reflection. A disadvantage with the *Glaisher Stand* is that it needed to be manually rotated to prevent direct sunlight hitting the thermometer.
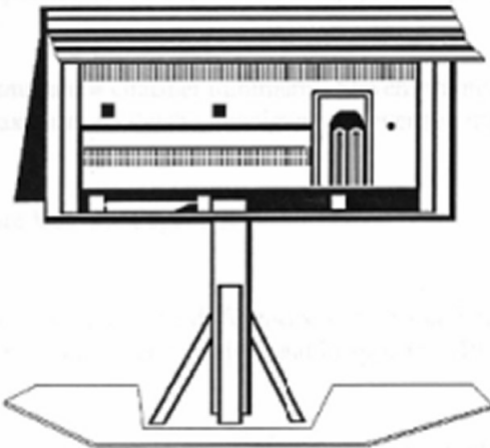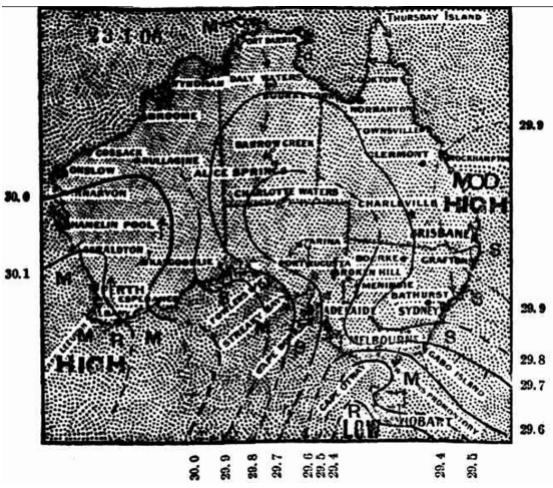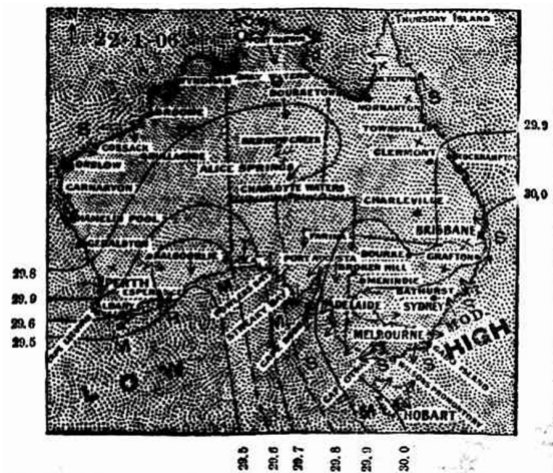

Figure 5 The *Glaisher Stand*

POSTSCRIPT

January 1906 was an extraordinarily hot month and, some weeks later, a temperature of 50.6°C was recorded at Eucla in South Australia on the 22nd (the highest official record for this State at that time). The next day, referred to as "Black Tuesday,

January 23, 1906, so-named because on that day almost the whole of the State (of Victoria) was ablaze" (source: *A brief history – South Gippsland Mount 'A" (Mount Best) 1892-1982 by Alf Lonsdale*), it was Victoria's turn to be once again be assailed by extreme heat, with Mildura recording 49.4°C[1], and even in Melbourne, 43.1°C was reached. The bushfires cost the lives of many, including six children from one family (that of Frank and Sarah Lonsdale of Mount Best).

The synoptic charts for 22 January 1906 and 23 January (source: *Advertiser* newspaper of 23 and 24 January 1906), shows a very intense depression moving towards Tasmania and associated strengthening N to NW winds across Victoria ahead of a cooler SW change.

This suggests that this event possessed similarities to more recent fire catastrophes that have affected Victoria (13 January 1939, 16 February 1983, and 7 February 2009).

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[1] In the light of the foregoing analysis, a better estimate of Mildura's maximum temperature on 23 January 1906 would be 46.9°C.