

# THE FIRST SERIES OF METEOROLOGICAL OBSERVATIONS IN AUSTRALIA

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## SUMMARY

The earliest available meteorological series for a year on the continent of Australia seems to be that at Sydney from May 1821 to April 1822, closely followed by the observations at Hobart from January and at Macquarie Harbour from April 1822 to December 1822, and by those at Parramatta from May 1822 to, at least, April 1823.

Shortly after the arrival of the First Fleet meteorological observations were taken on ships in Australian waters (Russell, 1888). Gentili (1967) gives a comprehensive summary of the history of meteorology in Australia. Understandably, it took a considerable time for regular observations on the continent to begin.

The first series of observations extending over one year in Australia seems to have started at Sydney on 1 May 1821, not a year later at Parramatta (then Paramatta) as stated by Hunt (1916). The data (Goulburn, 1825) are published in a collection of scientific reports from New South Wales and Van Diemen's Land (Field, 1825). They have probably not been published in Australia (R. Soc. N. S. W., 1921). The data were supplied by Frederick Goulburn. Major Goulburn, brother of the then Undersecretary for the Colonies, was the first person to be appointed Secretary and Registrar of the Records in New South Wales (Australian Dictionary, 1966). He arrived in Sydney in December 1820 and took over his position on 1 February 1821. The observations began shortly afterwards. As there is no text to the published observations, the exact place is not known.

From May to August 1821 the observations were taken at 6 a. m., noon and 8 p. m., from September 1821 to April 1822 at "morning", "noon" and "evening". This change probably means that the morning observations were somewhat delayed. Major Goulburn was also one of the founders of the Philosophical Society of New South Wales (R. Soc. N. S. W., 1921); but in view of his administrative occupation he probably did not make the observations regularly himself.

The published observations in which some obvious misprints have been corrected, comprise temperature, pressure, direction of the wind, and weather. Nothing is said about the height of the barometer and an eventual reduction to sea level. The mean pressure for the year is 30.05 in. (1017.6 mb) compared with the long-term sea level pressure of 30.00 in. (1016 mb). The highest pressure for the year is 30.51 in. (1033 mb) and the lowest 29.32 in. (993 mb), compared with the mean extremes for 56 years of 30.57 in. (1035 mb) and 29.29 in. (992 mb) (Hunt, 1916). The mean of the daily temperatures at 6, 12 and 20 hr is only about 0.2°F higher than the mean of 24 hours and 0.3° lower than the mean of the extremes (Foley, 1945a); it is therefore a satisfactory combination. The corrected annual average of 64.4°F is somewhat high but just within the range of observed annual temperatures. In 87 years it has been exceeded six times and equalized four times

by the means of the extremes (Warren, 1948). If the data are reduced to 24 hour means, the temperature of  $64.4^{\circ}\text{F}$  has still occasionally been exceeded. It must, however, be pointed out that this near-correspondence of the daily means is brought about by temperatures that are considerably too high near the time of the daily minimum and too low at midday compared with the hourly means of 7 years (Foley, 1945a). This would happen if the thermometer was located inside a ventilated building as was occasionally done at that time.

The prevailing wind from WSW in the morning and more variable winds, mainly from easterly directions during midday, the land- and sea-breeze effect, correspond to present conditions (R. A. A. F.)

Shortly after these observations at Sydney, meteorological observations were started in 1822 at Hobart's Town (Hobart) and Macquarie Harbour in Tasmania (Brisbane, 1825). They comprise observations from January to December. These observations antedate considerably those started in 1840, under the direction of the then Governor Franklin, which Foley (Bureau of Met., 1936) considers the first in Tasmania. The data contain three-hourly observations between 9 a. m. and 9 p. m. The editor of the Edinburgh Journal of Science who summarises the observations, derives from the mean of 9 a. m. and 9 p. m. an annual mean at Hobart of  $52.4^{\circ}\text{F}$ . This mean is  $0.4^{\circ}$  lower than the average of 24 hours and  $1.1^{\circ}$  lower than the mean of maximum and minimum (Foley, 1945a). The resulting true mean temperature of  $52.8^{\circ}\text{F}$  for 1822 compares with the true mean of  $53.7^{\circ}\text{F}$  for 1911-1940 (Bureau of Met., 1965).

The observations at Macquarie Harbour in 1822 seem to have covered only the months from April to December. The values for January to March are given as "estimated". Those for January and February are identical with that for December; the "estimated" value for March is unlikely to be correct being lower than April. The temperature of September as given is probably  $10^{\circ}\text{F}$  too high. The corrected mean from April to December coincides within  $1^{\circ}\text{F}$  with the long-series mean at the slightly more oceanic exposure of Cape Sorell (Bureau of Met., 1936). More observations have evidently been taken, as some from June 1824 have been published (Brisbane, 1827).

Sir Thomas Brisbane, Governor of New South Wales from 1822 to 1825, was undoubtedly the driving force for the start of meteorological observations in Australia. (Brisbane, 1860; R. Soc. of London, 1867; Russell, 1888; Aust. Dict., 1966.) He arrived in Sydney in November 1821. He might even have been instrumental in Goulburn's observations before his arrival in the colony. Goulburn had left England in 1820; but the appointment of Brisbane as his superior, although finalised only in November 1821, had been under consideration for quite a long time. It is also likely that Brisbane arranged the Tasmanian observations whilst stopping over at Hobart on his way to Sydney. This would explain why it was Brisbane who submitted them for publication (Brisbane, 1825).

Immediately after his arrival at Sydney, Brisbane started to build an observatory alongside his residence at Parramatta. This was neither the first nor the last astronomical observatory built and equipped at his own expense by this enthusiastic amateur astronomer. The meteorological observations at Parramatta started in May 1822; monthly means are available for the twelve months till April 1823 (Brisbane, 1824). They comprise the monthly means and extremes of temperature and pressure, means of the atmospheric moisture in an unknown scale and, from September to April, of rainfall. The mean pressure for the year is almost identical with the general mean sea level pressure at Sydney. The mean temperature,  $63.2^{\circ}\text{F}$ , compares with  $63.3^{\circ}\text{F}$  for a long series at Parramatta. The mean March temperature, given as  $60^{\circ}\text{F}$ , is surprisingly low. Minima of  $26^{\circ}\text{F}$  for June and  $27^{\circ}\text{F}$  for July also appear rather low but possible (Foley, 1945b). The rainfall for the eight available months is 19.0 in. which corresponds to a long-time mean of 20.7 in.

Apart from building his own observatory, Brisbane also brought with him two private assistants, Rümker and Dunlop. The first assistant was Karl Ludwig Christian Rümker who, with Dunlop, did presumably a considerable part of the actual work of observation. It might be of some interest to outline the life story of this, the first professional meteorological observer in Australia. He appears in Australian publications as "Charles Stargard Rumker", and the addition "Stargard" has led to some errors. When Rümker resigned his position with Sir Thomas Brisbane, he retired to a farm not far away to which he gave the name "Stargard" and at which he continued his astronomical work. "Stargard" is the name of a village near his birthplace in Mecklenburg. I venture to suggest that he choose as an astronomer this name for his farm, and possibly as an addition to his own, because as an English word it would be a literal translation of the German word for an astronomical observatory, "Sternwarte".

The career of the first Australian "Government Meteorologist", Georg Neumayer, (Loewe, 1965) is surprisingly, and perhaps not fortuitously, similar to that of Rumker (*Allgemeine Deutsche Biographie*, 1889). Rumker graduated at an Institute of Technology as Neumayer did later. Rumker then became interested in astronomy, as Neumayer did in the magnetism of the earth. Both after graduation went to sea, eventually qualifying as ship's captain. Rumker afterwards entered the Royal Navy in which he served for some years as a Lieutenant. He was luckier than Neumayer who did not succeed in obtaining a sea-going position in the Navy of Austria-Hungary. After a few years as head of the School of Navigation at Hamburg, Rumker found a sponsor in Sir Thomas Brisbane who made it possible for him to come to Australia, just as 25 years later Neumayer succeeded through the help of Humboldt and the munificence of the King of Bavaria. Rumker's principal work in Australia was not in meteorology but in astronomy; Neumayer's main task was originally in the field of magnetism and not in that of meteorology. After his return to Germany in 1831, Rumker was for many years the Director of the Observatory and of the School of Navigation at Hamburg, at which Neumayer acquired (under Rumker) the certificate as a ship's captain. After his return from Australia, Neumayer became the President of the "Deutsche Seewarte" (German Hydrographic Office) in the same city.

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