THE MILLIBAR ENTERS OLD AGE

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Traditionally the pressure of the air has been measured by the length of a column of fluid, generally mercury, in millimetres or inches, which balances the pressure of the air. It was clear from early times that air pressure being a force would be more appropriately expressed in units of force, in the "absolute" units of the cgs system as dynes cm^{-2} or g cm^{-1} s^{-2} (Sprung, 1885). In physics different terms have been suggested for units of pressure. In 1888 a committee of the British Association for the Advancement of Science recommended that "the unit of pressure on the cgs system of units, *ie*, the pressure of one dyne per square centimetre to be called one 'barad'"(British Association, 1889, 28). Ch. - É. Guillaume suggested in 1900 to the Congrès International de Physique at Paris on behalf of a committee of the French Physical Society that as a unit of pressure a column of mercury 75 cm long and with a cross section 1 cm^2 at 0^oC under standard gravity conditions, with the name 'barye' be adopted (Guillaume et Poincaré, 1900-01, 1). A committee of the congress established to report on these propositions attributed the name 'barye' to the pressure of one dyne per square centimetre, and named the pressure of a column of mercury of 75 cm one 'megabarye'. These terms are still in use. Other physicists have suggested the term 'bar' for one dyne per cm^2. In this unit the normal pressure of the atmosphere near sea level would be close to 10^6 bar or one 'megabar', one thousand of these bars would be one kilobar (McAdie, 1936). Earlier McAdie had advocated to accept the pressure of 760 mm of mercury under standard conditions as 1000 units (McAdie, 1908).

Bjerknes and Sandström (1906) suggested the use of cgs units for atmospheric pressure (Sverdrup *et al*, 1942). As the bar of the physicists and the barad of the British Association are very small units, they advocated the term 'bar', in accordance with Guillaume's original barye, for one million dynes per square centimetre. This is close to the mean pressure of the atmosphere at sea level. It is also likely that Bjerknes and his collaborators preferred a unit which was then readily applicable (1910, 1911) in hydrography being within $1\frac{1}{2}$ percent of the pressure of a column of 10 metres of sea water. For use in the atmosphere they introduced as a suitable unit the thousandth part of their bar as millibar, in consonance with the millimetre then widely used. The introduction of these absolute units was strongly favoured by Köppen (1909).

In 1910 a proposal to introduce the unit 'bar' equal to one megadyne per cm^2 came before the International Meteorological Committee during its meeting in Berlin (Moore, 1912). Moore informed the meeting that the Board of Meteorological Units, set up by the United States Weather Bureau, recommends the use of megadyne or bar, but only for upper air work. The 'International Commission for Scientific Aeronautics', at that time the guiding and coordinating body for the study of the free atmosphere, meeting at Monaco, resolved in 1912 the introduction of Bjerknes's bar and millibar for upper air work, conditional upon agreement of the International Meteorological Committee (International Commission, 1913; Gold, 1913). The decision caused lively discussion (Bjerknes, 1912; Köppen, 1912). The International Meteorological Committee at its meeting in Rome 1913 permitted the use of millibar in upper air work, but stipulated that the observations had to be published as well in the old unit millimetre (Int. Met. Comm., 1914).

The new unit millibar was gradually accepted. As early as 1912 the Geophysical Journal published by the British Meteorological Office used millibars and on 1 May 1914 the British Daily Weather Report followed. The United States Weather Bureau, resuming in January 1914 the publication of weather maps for the northern hemisphere, began to use millibars (Khrgian, 1959).

Originally the abbreviation m-bar was used for millibar. The now used abbreviation 'mb' for millibar was first found in Köppen (1909) where he states that 'naturally, the appropriate abbreviations for the 'bar' units should be b, db, cb, mb, corresponding to the length units m, dm, cm, mm. It is likely that the first official use of 'mb' was made by the International Commission for Scientific Aeronautics in 1912; the International Meteorological Committee (1914) quotes the resolution of the former as 1000 mb = 750 mm. The millibar (mb) is thus celebrating its sixtieth official anniversary.

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THE COLD SPELL OF MID-MARCH IN VICTORIA RE-EXAMINED

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During the two periods 1859-1878 and 1879-1898 the daily temperatures at Melbourne showed a marked drop from about 11 March to 20 March followed by a distinct rise of temperature (Barnard, 1900). This trend was continued from 1908 to 1937 (Loewe, 1939) with a cooling of almost 6°F from 12 to 15 March. The feature appeared to be persistent in the climate of Victoria; it was also found at other stations as far west as Eucla and was accompanied by a turn of the resulting wind at Melbourne from nearly due north to nearly south and a complete reversal in the mean synoptic charts for 30 years for 12 and 15 March. Now new observations for 34 years have become available and it seemed worthwhile to check the persistence of this seemingly well established 'singularity'.

After applying a correction for the mean temperature trend during the month for the days around the middle of March the following deviations from the mean of the month have been found for the different periods (Table 1). The values for 1859-98 are doubly overlapping 5 day-means; this smooths the curve of temperature changes, diminishes the size of the deviations and delays the onset of the minimum temperature near the middle of the month. The table shows that the singularity of temperature which seemed quite persistent during 70 years around the turn of the century, has since 1937 almost completely disappeared, a revealing sign of the unreliability of this kind of atmospheric anomalies.

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