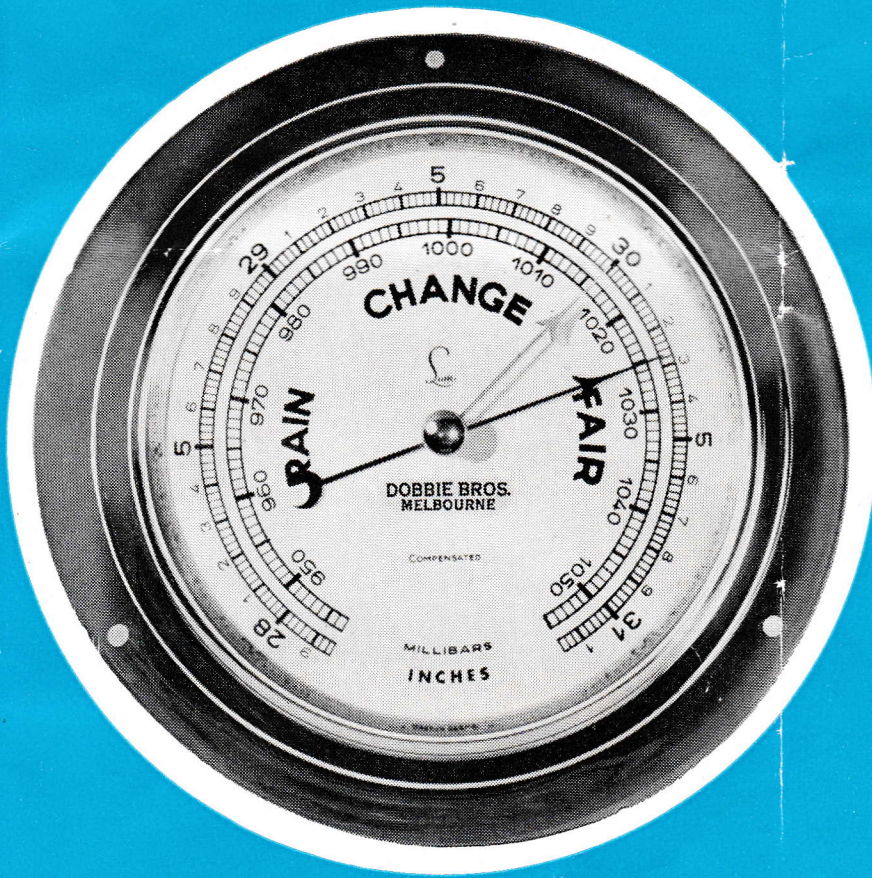


# THE ANEROID BAROMETER



AND HOW TO USE IT

# THE ANEROID BAROMETER

## WHAT A BAROMETER DOES

A barometer is an instrument for measuring the weight (or, as it is more frequently expressed, the "pressure") of the air above it. It is well known that air has weight, but the earth's atmosphere gets thinner with increasing height. It follows that as we ascend from sea level and low-lying parts of the earth's surface, the weight of the air will grow less, that is, the pressure will fall. An ordinary clock face type of barometer placed in your car will give a rough estimate of altitude as you drive through the country. If we use rough figures, we can say that the reading decreases by one inch for each thousand feet of ascent. For example, if the barometer reads 30 inches at the sea coast and you drive over a mountain road 1,200 feet high, the hand should move down the scale to about 28.8 inches.

A barometer's main use, however, is not to measure altitude, but to measure the actual changes in the weight of air in a particular place. High and low pressure systems in the atmosphere move around the earth's surface, and the movements shown on the face of a stationary barometer attached to the wall of your home, for instance, indicate the changes of pressure as they occur directly above you. These changes, when they are considered together with wind, temperature, moisture and cloud indications, can be a great help in forecasting approaching weather.

## WHO INVENTED IT?

About 1645, an Italian mathematician named Torricelli discovered the principle of the barometer by using a long glass tube closed at one end, which he put upside down in an open container holding liquid. He found that the pressure of the air bearing down on the liquid in the container forced it up the tube, and the measurement of the various lengths of the column of liquid was therefore a means of expressing the changes in air pressure. In order to have a tube of manageable length, the heaviest of all liquids, mercury, was later used.

Today we have accurately constructed mercurial barometers capable of giving readings to one-thousandth of an inch. They are costly and they need special care in handling. For general use an easier though less precise means of measurement has been devised — the ANEROID BAROMETER (Aneroid = without fluid).

## HOW IT WORKS

The Aneroid Barometer is operated by a metal cell containing only a very small amount of air, or a series of such cells joined together. Increased air pressure causes the sides of the cell or cells to come closer together. One side is fixed to the base of the instrument while the other

is connected by means of a system of levers and pulleys to a rotating or pointer hand that moves over a scale on the face of the instrument. This "reading hand" is usually black.

So that we can compare readings made at sea level with those made at more elevated places, where the pressure of the air is much lower, we must establish a uniform standard. Therefore all barometers must be reduced to mean sea level, or in other words, to the pressure each barometer would record if it were at sea level directly below the place where it is situated. Your barometer, too, must be set to show sea level pressure if it is to give readings which can be compared with official barometric reports and used as a weather indicator.

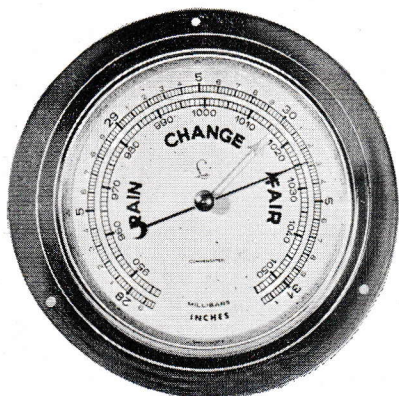
## ADJUSTING YOUR BAROMETER

If the instrument is set to read correctly at sea level, you can allow for the fall in pressure caused by a higher elevation (i.e., correct the reading to sea level standard, by increasing the pressure) by ADVANCING the pointer about one-tenth of an inch every 100 feet above sea level. This can be done by turning the screw at the back of the instrument until the pointer registers the desired adjusted reading.

To make sure that the reading is correct you can compare it with local televised or broadcast pressure readings which are already corrected to sea level. If a nearby post office (within thirty or forty miles) has a mercurial barometer, you could check a reading by telephone.

In the country you may not be able to use any of these means. The best procedure then is to take a series of readings at 9 a.m. or 3 p.m. for several days and forward them to the Regional Office of the Bureau of Meteorology in your State. An officer will compare them with the isobaric charts and inform you what adjustment (if any) is needed.

## READING YOUR BAROMETER



THIS BAROMETER READS  
30.28 INCHES OR 1025  
MILLIBARS.

To read your barometer, first tap the glass lightly, but firmly, to ensure that the linkage mechanism is not sticking. Your barometer will most likely be marked in inches (28, 29, 30, 31) and subdivided into tenths. (These divisions may again be halved, giving twentieths.) By mentally subdividing the tenths (or twentieths) of an inch, a reading can easily be made to one hundredth of an inch (see diagram).

The other hand that is found on most instruments is the Set Hand (usually brass). This can be turned by means of the knob at the centre of the glass so that it covers the Reading Hand. In this way you can tell, next time you check your barometer, whether the pressure has risen or fallen, and by how much.

Perhaps your barometer is graduated in millimetres (if it is of European manufacture) or in millibars, the International system. Here is a conversion table which will help you.

INCHES	MILLIMETRES	MILLIBARS
29.5	749.3	999.0
29.6	751.9	1002.4
29.7	754.4	1005.8
29.8	757.0	1009.1
29.9	759.5	1012.5
30.0	762.0	1015.9
30.1	764.5	1019.3
30.2	767.0	1022.7
30.3	769.6	1026.1
30.4	772.1	1029.5
30.5	774.7	1032.9

## USE OF THE BAROMETER IN FORECASTING

To repeat what was said at the beginning, a barometer is an instrument which measures air pressure. It does NOT foretell weather, so you would be well advised to put little faith in the words STORMY, RAIN, CHANGE, FAIR and DRY which appear on the face of many popular makes of barometer.

Many of you will know from the weather charts displayed on television or published in the city newspapers that highs and lows move in general from west to east, especially in the more southern latitudes. Bad weather is often associated with the lows, though moist onshore winds can cause rain in coastal areas even if the pressure is high. In other words, the actual reading of the barometer does not give unmistakable information concerning the weather to come.

Your barometer will show whether pressure is rising or falling, that is, whether a high or low pressure system is approaching, or perhaps developing in intensity.

But here, a word of caution! Owing to a daily atmospheric tide effect, the pressure will normally fall by about one-tenth to one-twentieth of an inch between 9 a.m. and 3 p.m. and will rise by a nearly similar amount between 3 p.m. and 9 p.m., even if weather systems are stationary. A smaller rise and fall occurs during the night and early morning. These daily ("diurnal") changes must be allowed for before you can really say whether the "glass" is rising or falling due to weather systems. The best way to avoid this difficulty is to observe changes over 24-hour periods, using your movable pointer or Set Hand. In other words, check your barometer at the same time each day.

When there is a fairly large fall, say more than two-tenths of an inch in 24 hours, you can assume that a high is moving away or that a depression is approaching, or both.

DEPARTMENT OF THE INTERIOR  
COMMONWEALTH BUREAU OF METEOROLOGY

Director of Meteorology: W. J. Gibbs.

CENTRAL OFFICE	Director of Meteorology, Bureau of Meteorology, 2 Drummond Street, CARLTON, Victoria.
REGIONAL OFFICE FOR N.S.W.	Regional Director, Bureau of Meteorology, 18th Floor, Commonwealth Centre, Elizabeth St., SYDNEY, N.S.W.
REGIONAL OFFICE FOR VICTORIA	Regional Director, Bureau of Meteorology, Block 2, Commonwealth Centre, La Trobe Street, MELBOURNE, Victoria.
REGIONAL OFFICE FOR S.A.	Regional Director, Bureau of Meteorology, 5 West Terrace, ADELAIDE, S.A.
REGIONAL OFFICE FOR Q'LAND	Regional Director, Bureau of Meteorology, Wickham Terrace, BRISBANE, Queensland.
REGIONAL OFFICE FOR W.A.	Regional Director, Bureau of Meteorology, 127 Wellington Street, PERTH, W.A.
REGIONAL OFFICE FOR TASMANIA	Regional Director, Bureau of Meteorology, Ellerslie Road, HOBART, Tasmania.
REGIONAL OFFICE FOR NORTHERN TERRITORY	Regional Director, Bureau of Meteorology, Administration Building, No. 3, Mitchell Street, DARWIN.
REGIONAL OFFICE FOR A.C.T.	Regional Director, Manchester Unity Building Mort Street CANNBERRA CITY.

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