Altitude Barometers

(Hill Measurers)

Taylor Instrument Companies
Rochester, N. Y., U. S. A.

S & M *Tycos* Watch and Pocket Size Aneroid Barometers

Manufactured by SHORT & MASON, *Ltd., London*

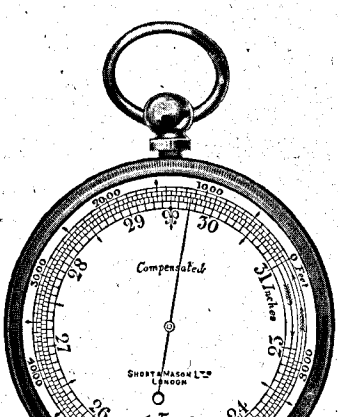
TO the motorist, traveler or tourist the S & M *Tycos* Pocket Barometer is an intensely interesting companion, on account of the valuable instructive data it affords, and is second only to the camera in its capacity for adding pleasure and amusement during any trip.

As weather instruments they are quite reliable. But it is in measuring altitudes —the height of hills and mountains— wherein lies the chief source of pleasure and profit to the traveler. No matter how you are traveling, on foot, horseback, automobile or railroad the ascent or descent is indicated all the time by the altitude scale as change in elevation takes place.

To the pedestrian, tourist or motorist any excursion has an increased interest and enjoyment if a Pocket Barometer is taken along as a traveling companion.

All changes in elevation are indicated by the altitude scale immediately. You can see all the time if the road you are traversing is ascending or descending.

1075 11-27 Printed in U. S. A.



No. 2003

The illustration shows one of the S & M *Tycos* Pocket Barometers. The outer scale figured 0, 1000, 2000, etc., and marked with the word "feet" is the altitude scale. The inner scale figured 28, 29, 30, etc., is the pressure scale and it is engraved on the dial. This pressure scale is the same as you find on the larger Weather Barometers. The figures stand for inches of pressure.

At sea level the pressure of the air is greater than it is at say the top of a mountain 1000 feet above sea level. Similarly the pressure down in a coal mine is greater than it is at sea level. In

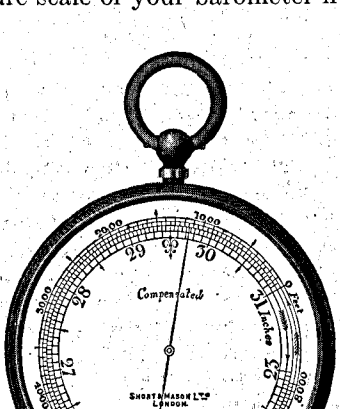
short, as you ascend from any point the air pressure decreases—in other words, it does not weigh so much. As you descend it increases because it weighs more. Think of the barometer as an instrument for weighing the air. This is exactly what it does. It weighs the air from any point to the extremity of the atmosphere.

We do not say that the air weighs so much because we weight it by measuring the length of a column of mercury that it will support. So the figures 29, 30, 31, etc., on the dial of all barometers indicate the weight or pressure of the atmosphere expressed in inches of mercury. If a barometer at sea level shows a reading of 29.92 it means that the pressure or weight of the atmosphere will support a column of mercury 29.92 inches long. This happens to be the mean barometer reading at sea level.

But you say, what do these people mean by talking about inches of mercury in connection with an aneroid? We mean just this: barometer pressure is expressed always in inches of mercury. All aneroids are calibrated by mercurial standards.

For measuring altitudes or elevations with barometers we have to consider the following. The higher you go the thinner or rarer the air becomes. The air surrounding the earth may be compared to layers, the bottom layers bearing the weight of those above, and each layer in

its turn compressed by weight of those overhead. What does this mean? It means that if you started from sea level and ascended 1000 feet the difference in pressure would be 1.07 inches, that is, the pressure scale of your barometer if read-



No. 2042

ing at 30 inches at sea level, would be reading 28.93 inches at an altitude of 1000 feet.

If, however, you were at a place 5000 feet above sea level and made an ascent from there of 1000 feet to a place 6000 feet above sea level the difference in the pressure reading of your barometer would be 0.9 of an inch. That is, if your

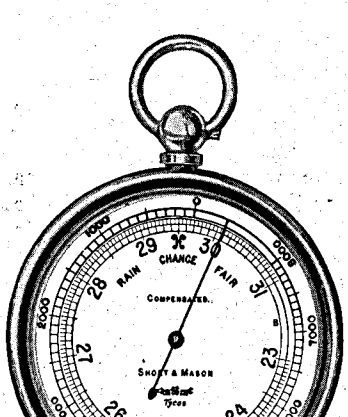
barometer stood at 24.5 inches at 5000 ft. it would drop to 23.6 at 6000 ft.

Until recently *all* altitude barometers were made with equal pressure scales and unequal altitude scales. These two scales are computed for the 0 feet on the altitude scale to be set at the 31 inch mark on the pressure scale. In order to get *strictly* accurate results when measuring altitudes the feet scale should *always* be turned round the pressure scale until this relation is obtained, viz. 0 feet opposite 31 inches. Short & Mason have made their altitude barometers this way for years.

During the war there was a demand for altimeters with regular altitude scale. We made these in great quantities. Since 1918 we have been hoping to introduce the line of S & M *Tycos* altitude barometers made this way. This is now possible. It is without doubt the most important improvement in altitude barometers reported for years. Instead of having to work with the 0 feet opposite the 31 inch pressure mark you can move the scale with the finger and set the 0 under the hand before starting an ascent. This improvement is only available in the S & M *Tycos* line.

The determination of altitudes is much simplified with these new equal scale pocket barometers. When information is required regarding the elevation of a certain point above sea level it can be obtained in two ways:

(1) Find out the altitude above sea level of the starting point and revolve the



No. 2021

altitude scale so that this amount is indicated at the point of the hand on the altitude scale. Set in this manner, the hand will, during travel, indicate the height above sea level of all points to which the instrument is taken.

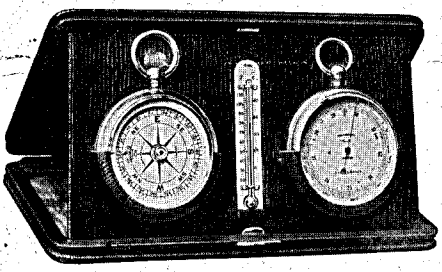
Example:

Suppose a start was made from Chicago, Ill. The average altitude of this city is about 600 feet above sea level. Rotate the altitude scale until the hand points to the 600 feet point and the in-

strument is ready to use. If travel is made to Coburg, the hand will read at the 1,000 feet point. At Hampshire it will read 900 feet; at Wadham 1020 feet and so on as elevations differ.

(2) The other method of reading is to set the "0" of the altitude scale at the point of the hand.

Taking the above examples, and starting from Chicago with the "0" and the point of the hand co-incident, we find we have readings of 400 feet at Coburg, Hampshire 300 feet and Wadham 420 feet. These are the elevation readings



"LIVINGSTONE SET"

No. 2049S

above Chicago. If we need the height of any one of these above sea level, add to it the reading of Chicago (600 feet) and the same results are arrived at as in example 1.

In using barometers for altitude work they may show slight errors in the read-

ings due to weather changes. In the ordinary way these changes are so slight that the tourist or traveller need not worry about them.

It is advisable when you reach a place where you are likely to be any time, to take careful note of your altitude reading. You can then carefully set the instrument to the same point when starting out from the place. In the meantime you can use the instrument as a weather barometer. This is done by using the 0 of the altitude scale as an index. Set the 0 opposite the hand and you can see a few hours later if there is any alteration in the barometric pressure. Increasing pressure means continued fine cool weather. Decreasing pressure means rain or wind—snow in the winter.

All altitude barometers are compensated against temperature changes. The levers in the movement are controlled in such a way that errors due to extreme temperature are reduced to a negligible quantity.

Altitude scales for $1\frac{3}{4}''$ and $2\frac{3}{4}''$ instruments.

3000	feet	subdivided	to	10	feet
8000	"	"	"	50	"
12000	"	"	"	100	"
16000	"	"	"	100	"

Prices

Super Grade

2000	1¾″	8000 ft.	$45.00
2000B	1¾″	3000 ft.	48.00
2000E	1¾″	12000 ft.	48.00
2000F	1¾″	16000 ft.	51.00

Best Quality

2003	1¾″	8000 ft.	$36.00
2003B	1¾″	3000 ft.	35.50
2003E	1¾″	12000 ft.	39.00
2003F	1¾″	16000 ft.	42.00

Super Grade

2040	2¾″	8000 ft.	$50.00
2040B	2¾″	3000 ft.	53.00
2040E	2¾″	12000 ft.	53.00

Best Quality

2042	2¾″	8000 ft.	45.00
2042B	2¾″	3000 ft.	48.00
2042E	2¾″	12000 ft.	48.00
2042F	2¾″	16000 ft.	51.00
2047½	2¾″	5000 ft. in double circle of divisions sub-divided to five feet.	70.00

Second Quality

2021	1¾″	8000 ft.	$25.00
2021E	1¾″	12000 ft.	27.00

All above are furnished in soft leather cases.

Livingstone Sets

First quality Aneroid, Compass and Ivory scale thermometer.

In Blue Leather Case

2049 S	with aneroid to	8000 ft.	$60.00
2049 SB	" " "	3000 ft.	63.00
2049 SE	" " "	12000 ft.	63.00
2049 SF	" " "	16000 ft.	64.50