

top there are two glass bulbs, united by a bent capillary tube; the left-hand bulb is filled with creosote, the capillary tube contains some mercury, and the right-hand bulb constitutes a vacuum except for a little creosote. When the thermometer is heated, the creosote on the left side expands, driving the mercury through the tube so that it rises in the right-hand branch; the mercury lifts a small index, a pin that is so constructed that it sticks at the place where the mercury leaves it. When the thermometer is cooled the creosote contracts, and the creosote-vapours in the right-hand bulb propel the mercury farther into the left-hand branch, where there is a similar index. In this way the index on the right shows the maximum temperature, and that on the left the minimum temperature. The thermometer is fastened to a rectangular plate carrying the temperature scale, and the whole instrument is put inside a protecting tube of copper.

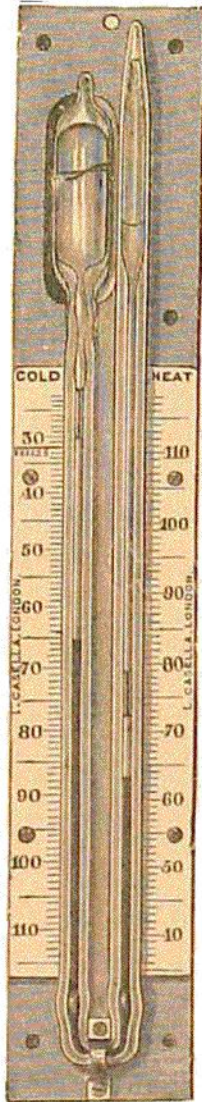


FIG. 154.
MILLER-CASELLA
THERMOMETER.

thermometer has, however, done very good service; it is, for instance, astonishing how correct the temperature determinations taken on board the "Challenger" have proved to be. In the great depths of the ocean the variations of temperature from year to year are so small that it is possible to verify now the observations of earlier expeditions.

The French physicist Aimé about seventy years ago introduced the reversing thermometer, which is caused—either by a