



### Measuring Liquids

Calibrated glassware (e.g., beakers, flasks, and pipettes) are required for the preparation of culture media. Graduated cylinders of 10-, 25-, 100-, and 1000-ml capacities are used for many measuring operations, but volumetric flasks and pipettes are required for more precise measurements. Measurement of solutions with pipettes or graduated cylinders is only accurate when the bottom of the curved air-liquid interface is aligned with the measuring mark.

Pipettes should be filled with a hand-operated device, called a pipettor, which eliminated the hazards of pipetting by mouth. Never pipette by mouth!! Three types of pipettors are commonly used. The first is a bulb-type pipettor, which is controlled by a series of valves. Simply rotating a small wheel on the side of the handle operates the second type of pipettor. Rotating the wheel upward creates a suction bringing the liquid into the pipette; rotating the wheel in the opposite direction releases the liquid. A third type of pipettor utilizes an electric air pump. Liquid is drawn into the pipette by pressing the top button and released by pressing the lower button.

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