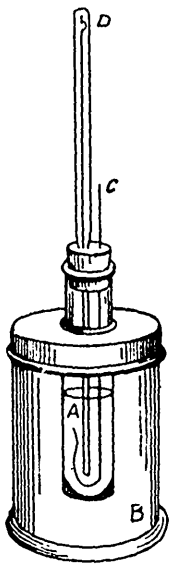
The apparatus used for the determination of the freezing point is that of Beckmann:—



It consists of an outer jar, B, in which the freezing mixture of ice and salt is placed. Suspended in the jar is the tube, A, and projecting into this is a wire stirring-rod, C, and a thermometer, D. This thermometer is graduated in one-hundredths of a degree centigrade, usually from one degree above to four degrees below zero. The scale is sufficiently coarse to allow of the reading of 1-200 of a degree.

Heidenhain's modification differs only in having an extra tube around the tube A, thus providing an air space between the liquid to be tested and the freezing mixture, so that the cooling will be more gradual. There is also a somewhat simpler apparatus in which the freezing is done with carbon dioxide gas.

Before using the thermometer it must be tested by taking the freezing point of distilled water, and any variation from the zero point noted, subsequent reading being corrected by this difference.

The ice and salt, in large pieces are placed in the jar in alternate layers, and from 10 to 20 cubic centimeters of the fluid to be tested poured into the inner tube. While the solution is cooling it is constantly stirred by means of the rod, to insure a thorough mixing and a uniform temperature throughout. The mercury at first sinks below the freezing point, but as coagulation takes place it again rises and the freezing point read.

In testing the urine, Claude uses a portion of the mixed 24 hour amount; while others use a fresh specimen from each kidney. Blood for the test may be withdrawn from one of the large veins in the arm, by means of an aspirator, about 10 c c being required to determine the freezing point.

Lindermann finds that there is no deviation from the normal freezing point so long as the suppurative process is limited to the bladder and pelvis of the kidney, but as soon as the parenchyma of the kidney is involved, there is a deviation at once i. e., the freezing point of the urine is higher than normal and approaches that of distilled water. There is also a change in the freezing point of the blood if the kidneys are affected to a pronounced degree and the blood will freeze lower than normal i. e., below —0.56° centigrade.