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thermometer stem which passes thru the liquid surface should be isolated (by a vacuum jacket) from contact with the liquid (Cataland of N. B. S.). If less accurate measurements (less accurate than  $\pm .001^{\circ}\text{K}$ ) are required than one may measure the vapor pressure of the helium gas above the liquid.

For temperatures below  $1^{\circ}\text{K}$  the thermodynamic temperature scale is based on the magnetic thermometer i. e. the measurement of the magnetic susceptibility of materials such as cerous magnesium nitrate. (Paper A. 3.1 by Dr. Hudson of N. B. S.) This material obeys the Curie Law accurately to  $.01^{\circ}\text{K}$  ( $X = CT^{-1} + a$ ). In practice the magnetic thermometer is calibrated against the  $\text{He}^4$  thermometer in the  $1-4^{\circ}\text{K}$  range and then measurements of  $X$  can be related to temperatures below  $1^{\circ}\text{K}$ .

Dr. R. D. Taylor of Los Alamos suggested using the Mossbauer effect as the basis for a thermometer. In this region the populations of nuclear spin sub levels at very low temperatures is a function of temperature and the relative populations are given by  $e^{-\frac{\Delta E}{kt}}$ . Excellent agreement between theory and measured results were reported in the temperature range between  $.85-4^{\circ}\text{K}$ . Modification of the present set-up is expected to produce accurate and detailed measurements to as low as  $.3^{\circ}\text{K}$ . Some of the suggested advantages of this method are direct metal-metal contacts for relatively high thermal conductivity, ease of source preparation and applicability of method to lower temperatures. Although this method does not appear to be as convenient as others in this range it is desirable as an alternate thermodynamic thermometer. Thermocouples are very useful laboratory thermometers which may cover a wide range of temperatures and where the precision of some of the previously discussed methods are not required. Although the specially developed gold-cobalt vs. copper gives a relatively high thermoelectric e. m. f. the inhomogeneities along the wires and the deviations between different lots makes it less desirable than copper-constantan. (Dr. Powell of N. B. S.)

The papers mentioned above represent but a sampling of those presented which dealt with temperature measurements below  $90^{\circ}\text{K}$  and with some of the basic concepts of temperature and thermometry. The others of equal significance and interest have been left unmentioned since multiple simultaneous sessions, at times as many as five only permitted the attendance at selected sessions. The papers on physiological response to heat and cold for example should have been of interest even to the layman in the field. Preprints for some of the papers were made available by their authors, However the volumes containing the proceedings of the symposium will be eagerly awaited as a valuable reference for any type of temperature measurement.