3. An iron wire, of which the resistance is to be measured, is stretched in a room whose temperature is 40° Fahr. The wire is connected to the measuring apparatus, which is in another room whose temperature is 50° Fahr, through 500 yards of insulated copper cable exposed to a temperature of $-10°$ Fahr. The measured resistance of the cable and wire together is 35.27 ohms, and that of the cable is 2.72 ohms, at 60° Fahr. Find the resistance of the iron wire at 60° Fahr.

4. A resistance has to be accurately measured by means of Wheatstone's bridge. The ratio $\frac{100}{1000}$ is employed, and it is found that, when 319 ohms are unplugged in the box, the galvanometer deflects 21 divisions to the right, and that when 320 ohms are unplugged, the deflection is 5 divisions to the left. What is the true resistance ?

5. The resistances r_1 and r_2 of a defective Wheatstone's bridge are marked 10 and 100, but in reality they are 9.8 and 100.5 ohms. A resistance is measured, and it is found to be 106 ohms. What error, in ohms, is caused by the inaccuracy in the bridge ?

6. Investigate the effect on the measurement of resistance by Wheatstone's bridge, when the unknown resistance contains a feeble source of E. M. F.

7. Show that no definite result can be obtained with Wheatstone's bridge method if r_1 and r_2 are both zero.

8. Show that with Wheatstone's bridge, more accurate results can be expected when r_1 and r_2 are each 1000 ohms than when they are each 10 ohms, if r_x lies between 1,000 and 10,000 ohms.

9. Can the liquid resistance of a cell be found, by measuring the deflection given by one cell through a known resistance, and the deflection given by two similar cells through another known resistance?

10. A cell, a box of resistance coils and a galvanometer are connected in simple circuit. A second circuit is also connected to the cell, and the resistance in this circuit is made equal to that of the galvanometer and that unplugged in the box of coils, together. The deflection of the galvanometer is noted. The second circuit is then removed, and the resistance in the box of coils is altered until the same deflection is obtained. Show that the resistance added is equal to the liquid resistance of the cell.

11. The difference of potential between two points in a circuit is measured as explained in § 227, and it is found that $r_b = 100$ ohms, $r'_b = 1,100$ ohms, $r = 100$ ohms, $R = 940$ ohms ; also $g = 1000$ ohms, $\rho = 10$ ohms, $V = 1.07$ volt. What error, in volts, is caused by not making the correction given in § 228 ?