To examine their resistance the rods were laid side by side about 1 em. apart in two sets of four each, and their ends soldered together in series. In this way four rods at a time were placed in the bath and examined in succession. The resistance of each specimen was deduced from the observed value of the potential difference at the ends of a five em. length of the alloy, and from the value of the current passing through it according to the equation—

$$R = \frac{V}{C};$$

and from this result the specific resistance was calculated according to the equation

$$\sigma = \frac{R\,A}{L}$$

where A = the cross section

L = the length of the specimen.

Apparatus:—The current traversing the alloys was supplied from a storage battery, a rheostat being used to make small adjustments when desired. To measure the current at any time, the difference of potential at the ends of a $\frac{1}{1000}$ ohm standard resistance in circuit with the alloys was observed by means of a Siemens and Halske potentiometer provided with a sensitive galvanometer.

To determine the potential difference at the ends of a 5 cm. length of the alloy, a pair of calipers fitted with ebonite arms bearing brass V-shaped tips with platinum edges made a sliding contact at any two points desired along the specimen and wires leading from the brass tips served to make connection with the same potentiometer, the readings for current and potential difference at the points of contact being taken in succession. To determine the resistance of the 5 cm. length of a specimen, the calipers were adjusted to a length of 10½ ems. and the difference of potential observed. The calipers were then shortened to 5½ ems. and the potential difference again noted. The difference of the two readings gave the potential difference at the ends of a 5 cm. length of a specimen, and from this, the dimensions of the rod being known, the specific resistance was deduced.

No special difficulty was encountered in preparing baths at the chosen temperatures. For the highest temperature a narrow copper vessel was used long enough to contain the alloys laid upon proper insulating blocks. The paraffin was heated by gas and kept at a constant temperature of 160° C.

For the lowest temperature a quantity of liquid air was poured over the alloys while resting in a narrow dish made of thin brass placed in