As yet only a few readings have been made, and these were obtained incidentally while conducting the investigation referred to above. A curve was platted (Fig. 2) in which temperatures are abscissas, and the corresponding currents are ordinates. Only the upper portion of the curve is shown in the figure. The density increases very slowly at first, and becomes constant when the critical temperature is passed.

This method furnishes a means of determining the critical temperature and critical pressure, as well as the critical volume of a liquid.

An Improved Wehnelt Interrupter.

[Abstract]

By Arthur L. Foley and R. E. Nyswander.

The chief difficulties encountered in working with the ordinary type of Wehnelt Interrupter are that the glass tube which holds the platinum wire is continually breaking and that the length and size of the projecting platinum wire can be changed only by constructing new tubes.

In the improved interrupter a lead vessel serves as electrode and to contain the electrolyte. The platinum wire is held in a brass tube having its lower end slotted and conical. A collar, sliding on the conical end, serves to press the jaws together and to clamp the platinum wire. The projecting end of the wire may be about 1 cm. long; the remainder of the wire may extend up the inside of the tube.

The lead vessel should be filled half full of the electrolyte and over this should be poured a layer of coal oil 2 or 3 cm. deep. The brass tube is gradually lowered until the platinum point extends to the desired depth in the electrolyte. The remainder of the platinum wire and the brass tube are entirely protected by the oil. The oil serves also to decrease the spray and fumes from the electrolyte. A platinum loop instead of a point is preferable in many cases. The action of the interrupter is made more constant.

Many other electrolytes may be used besides the usual 10 per cent. solution of sulphuric acid and water. As a matter of fact for high or low voltages some other electrolytes are superior. The following tables gives some data concerning a few of many electrolytes that have been used with this form of interrupter:

Solution (in water).	Voltage.	Spark.	Remarks.
1% sulphuric acid	40- 50	Short and thin.....	Fairly constant.
5% sulphuric acid	25- 40	Short and thin.....	Fairly constant.
10% sulphuric acid	20- 50	Strong	Fairly constant on high voltage.
20% sulphuric acid	20- 30	Very strong.....	Unsteady. Will not work on high or low voltage.
5% sulphuric acid ..... 5% nitric acid.....	12- 20	Average.....	Fairly constant.
5% caustic potash	40- 50	Average.....	Stops frequently but, starts again without interruption.
10% sodium sulphite	75-115	Very heavy	Quite constant. High frequency. Used on 115 circuit without resistance.
10% sodium hyposulphite	40- 90	Strident.....	Ceases if short circuit is made on secondary.
10% acetic acid	.....	.....	Will not work on any voltage.
10% potassium sulphate.....	70-115	Average.....	Fairly constant.
10% ammonium nitrate	35- 85	Strong	More constant if secondary short circuited.
10% potassium nitrate.....	90-115	Very heavy	Not constant when t° increased.
5% nitric acid (glass vessel and platinum sheet electrode).	30- 50	Strong and strident..	Steady.

A Method of Measuring the Absolute Dilatation of Mercury.

[Abstract.]

By Arthur L. Foley.

The forms of apparatus used by Dulong and Petit, and Regnault, in determining the absolute dilatation of mercury are open to one or both of the following objections: (1) Some parts of the mercury columns are exposed and so the termperature can not be exactly the same throughout; (2) the heights of the columns must be measured from some assumed point of equilibrium in a horizontal connecting tube. The method proposed in this investigation is entirely free from both these objections.

The two arms of a vertical U tube are jacketed in the usual way, except that the jacketing tubes are of glass to permit the heights of the mercury columns to be taken with a cathetometer, at any level. Into the tube is poured a quantity of mercury sufficient to stand several centimeters high in each arm. When the required temperature has been attained the two heights are carefully measured. More mercury is added and under the same temperature conditions the heights are again measured. The differences in the heights before and after adding the mercury, together with the temperature difference of the two arms, are all the data required. Many independent determinations may be made by adding or removing mercury. As the readings are in every case difference readings any effects that might come from capillary and convection currents in the horizontal tube are eliminated. Two of my students, J. G. Gentry and O. A. Rawlins, have obtained remarkably consistent results by this method, though the coefficient of dilatation obtained by them is slightly less than that obtained by Regnault.

The Geodesic Line of the Space $ds^2 = dx^2 + \sin^2 x dy^2 + dz^2$.

By S. C. Davisson.