observed on the platinum after heating, and an attempt is made to show that some of these phenomena are characteristic of the effects produced on heating metals which display limited oxidation at high temperature. The intergranular grooves do not seem of particular significance to the present discussion and are considered to represent the typical form of heat etching which results from the heating of a metal in vacuo or in a neutral atmosphere. In their production there is no evidence that any reaction of the surface with oxygen is involved.

On the other hand, the striations appear to be a consequence of an exchange between the metal surface and either a metal vapour or an adsorbed compound. Striations have been previously observed in the heat etching of iron, silver, copper, nickel-chromium alloys and nickel, and it is possible that they are the result of such an exchange on these metals, as well as on platinum. It is noted that in general, striations can only clearly be seen on surfaces which have not been disturbed by mechanical polishing. The conception as presented by M. Lacroix is by no means fully worked out, but the underlying thought is that in the presence of oxygen the mobility of the surface atoms is increased. As a result, surface markings such as the striations observed, as well, perhaps, as the small isolated crystals, are encouraged to form.

J. C. C.

Arc Erosion of Electrical Contacts

Erosion under the action of the arc is one of the determining factors in the operating life of electrical contacts which are required to interrupt currents of the order of several amperes. The loss or transfer of material from the contact surfaces which takes place during arcing may occur by a number of processes, but that most frequently encountered involves a loss of material from the negative contact under the action of the so-called " normal arc ".

Relatively little experimental data are available on the magnitude of arc transfer, but a study now published by Dr. W. B. Ittner and H. B. Ulsh of the International Business Machines Corporation, New York, (*Proc. Inst. Elec. Eng.*, Part B, 1957, **104**, Jan., 63-68), provides a valuable contribution to this subject, more particularly as the materials investigated include a number normally used in industrial practice.

The paper describes measurements of the " normal arc " transfer in resistive and inductive 50 volt circuits interrupting currents of 1.5 to 5 amp. Within the experimental errors the material transfer from the cathode was found to be directly proportional to the total charge passed in the arc, confirming a relationship first proposed by R. Holm. A summary of the results is shown in the table, which gives the average measured values of the cathode loss in microgrammes per coulomb, and—by dividing by the density of the material—in cubic centimetres per coulomb.

Material	Cathode loss	
	$g \times 10^{-6}/C$	$cm^3 \times 10^{-6}/C$
Palladium	**19.4**	**1.59**
Platinum	**8.7**	**0.41**
Silver	**3.6**	**0.34**
Tungsten	**1.1**	**0.06**
50% Copper-palladium	**20.5**	**1.94**
10% Iridium-platinum	**17.6**	**0.82**
15% Iridium-platinum	**16.5**	**0.77**
20% Iridium-platinum	**14.5**	**0.67**
35% Iridium-platinum	**11.6**	**0.54**
5% Ruthenium-palladium	**14.1**	**1.15**
11% Ruthenium-platinum	**13.2**	**0.65**

Agreement between the experimental data and those computed from a modified Llewellyn Jones formula was found to be good, from which it follows that the desirable properties for minimum arc erosion are a high boiling temperature, a high thermal conductivity and a high density.