shows its true fluorescent color, and the passing it thus into a visually dark field and its becoming thereby illuminated produce a surprising and interesting effect.

The Spectroscopic Determination of Small Amounts of Lead in Copper. C. W. HILL and G. P. LUCKEY. (*Proceedings of the American Electrochemical Society*, October 3-6, 1917.)—A rapid method for the determination of lead in factory samples of copper depending upon spectroscopic observation has been under development by the authors. A known weight of copper is placed in a slight cavity in a lower positive graphite electrode, and a fixed or rotating carbon negative electrode is used above. A grating spectroscope serves to observe the spectrum. The time required to cause the disappearance of the bright lead line in the spectrum, or to cause its enfeeblement to a certain dimness, is measured with a stop-watch. With a carefully regulated arc, the times vary regularly with the amount of copper used and with its percentage of lead; *e.g.*, from 14 seconds with 0.2 gramme of copper containing 0.004 per cent. lead to 277 seconds with 1 gramme of copper containing 0.038 per cent. lead. The results are sufficiently reliable for practical use in the copper refinery.

The use of the arc is limited to the determination of small amounts of impurities which are volatilized at a comparatively low temperature in the presence of a metal which is not rapidly volatilized at a comparatively high temperature which gives a steady arc, the existence of strong characteristic spectrum lines being assumed. The method might be applied to metals of low boiling-point or even to salts by substituting a heating strip in place of the arc and securing the arc or spark spectrum from the vapors arising from the heating strip.

Extruded Metal. ANON. (*The Metal Industry*, vol. 15, No. 10, p. 435, October, 1917.)—Metal wire and rod made by the extrusion process is coming more and more into common use, according to the *Scovill Bulletin*. For many years wire and rod have been made by the drawing process in which the metal is pulled through dies, successively reducing its diameter or shape. Volume of production was limited at first by the time consumed in attempting to reduce the wire too much at one draft, which resulted in pulling the metal apart, and in the frequent annealings necessary to soften the wire. By the extrusion process the metal is pushed through the die while quite hot, thus overcoming at once the two limiting conditions of wire-drawing. The wire does not break because it is pushed through the die, and it does not get hard because it retains its softening temperature during the extruding. The process has been used in producing lead wire and lead pipe for a number of years. The problem of extruding lead, however, presents very few difficulties, as the softness of the lead allows it to be forced through the steel die cold.