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Electrolytic Corrosion of Electroplated Objects

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Electrolytic Corrosion of Electroplated Objects.

A paper by Prof. WALTER S. LANDIS, of Lehigh University, referred to the observation that gold-plated steel pens corroded far more rapidly than plain steel pens. This is due to the fact that the friction of the pen point on the paper rapidly wears off the plating on the point, thus exposing the steel; an electrolytic couple consisting of steel, ink, and gold is thus set up and corrosion results.

The e.m.f. of the couple was measured between a fresh gold-plated pen and a like pen, stripped of its gold plating, in different kinds of ink.

“While the corrosion of the plated pens is not a matter of great commercial importance, yet there is to be gained from the experience a certain wholesome lesson on the application of electroplating to the protection of less noble metals: Do not plate with a nobler metal a material that is likely to be subjected to wear on one spot and which spot is to be moistened with liquids. For, as soon as the plating is worn through on that spot, accelerated corrosion will take place, and in the end the resulting corrosion will be far worse than without the plating.”

The paper was discussed at some length by Messrs. Murphy, Walker, Hering, Richards, Hogaboom, Kohn, and Willard. The latter pointed out that nickel-plated iron or steel will invariably rust in a moist atmosphere. Not only the weight of the nickel deposit, but also its continuity are of primary importance, and it seems impossible to insure absolutely the latter in commercial practice.