

securing very perfect images of the invisible electric discharge without the plates being exposed to either X-rays or light.

This discharge—or possibly, more strictly speaking, the electrified streams of air driven off by it—appears to act upon the plate exactly as light does. It is thus possible to secure

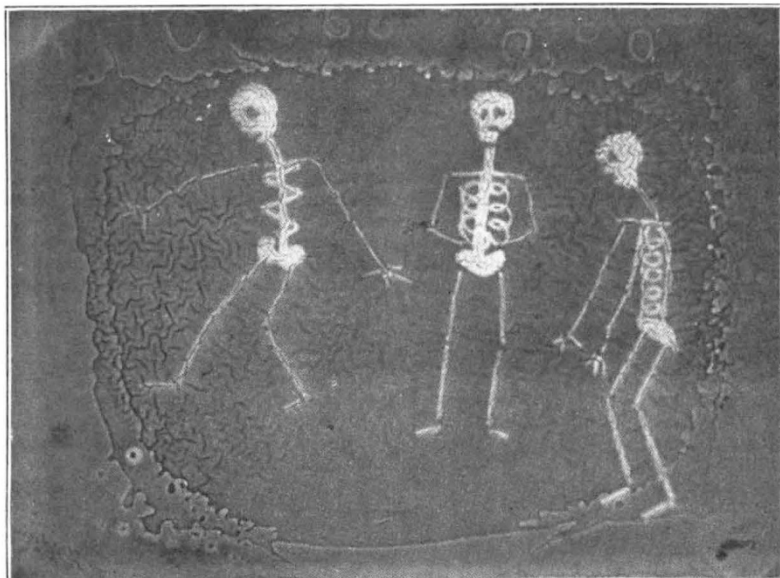


FIG. 1.

impressions of such discharges by simple electrification and subsequent development.

Under certain conditions very perfect images of the relief upon coins and similar objects can be obtained. This seems to

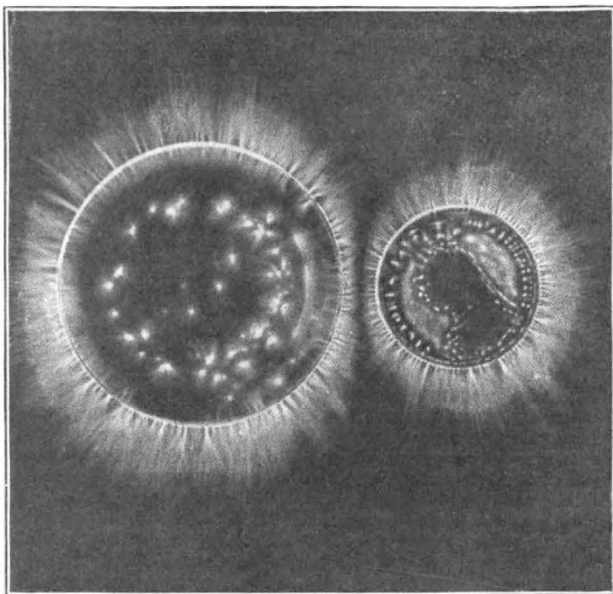


FIG. 2

account fully for the fact that in some cases radiographs of coins have shown some trace of the design upon the under side which was in contact with the film.

I enclose prints of the radiograph showing the set of the silver particles around the skeletons, which effect I have since

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reproduced, and also of what I think may properly be called electrographs of coins, and of discharges from metallic points and surfaces.

I should be glad to know if any similar results have come within the experience of any of your correspondents.

Fig. 1 is a radiograph of wire skeletons enclosed in cardboard figures, developed and fixed, covered with glass plate, and put in lantern. On the heat of the lantern softening the film, the precipitated silver particles set themselves in pattern. The explanation which suggested itself was that this was an electrical effect induced by the Röntgen tube, but I cannot definitely assert that this is the case. It is conceivable that the segregation of the particles may be due to some other play of forces, such as unequal tension in the film; but the first idea seems the most probable. I hope to test this further by experiment. I have reproduced a similar pattern, though not quite so perfectly as in this instance. The irregular edge is the result of the partial drying of the film.

Fig. 2 represents an aluminium medal and gold coin. The coins were laid upon a photographic dry plate, enclosed in a cardboard box, electrified for two seconds from one pole of a small induction coil, and developed. Brush discharge round margin very fine, the discharges from the two objects repelling each other. The larger was in high relief, and the lettering has produced small brush discharges. Some shaded ground in

recessed part of coin, probably due to the electrified film of air, confined within the margin of the coin, resting in contact with the plate.

JAMES FANSON.

Fairfield House, Darlington, January 7.

The Force of a Pound.

PROF. PERRY, in his review of my "Elements of Mechanics" in your issue of November 19, 1896, gives his method of explanation of mechanical units to engineering students.

The method is almost as perplexing as the one he so severely condemns. The source of confusion in both cases is in attaching the term "mass" to the ordinary gravitation system—the system of "weights and measures." Engineers have no need of the term; in its strict sense it is foreign to their work. The engineering unit of quantity is the "pound," as determined by the process of weighing against standard weights.

The engineer deals mainly with bodies at rest, or moving with uniform speed. The system sufficient for him is therefore not sufficient for the physicist, to whom the idea of acceleration is fundamental. The physicist notices that bodies possess a certain quality determinative of acceleration, and to this he gives the name *mass*. Masses are thus to be compared by kinetical methods, fundamentally at least. The term "mass" belongs to the system of the physicist, the so-called absolute system, and to it only.

To sum up. Use the term weight in its legal sense, which is that understood by the engineer and by people in general; define mass with reference to acceleration, and not as "quantity of matter"; understand that the passage from an absolute to a gravitation system [not from mass to weight] is by means of a suitable factor with a corresponding change of unit, and all confusion vanishes.

The agitation in favour of an absolute system involving the "poundal" should be discouraged for the reason, among others, that the adoption of the metric system is delayed in consequence. The metric system alone is sufficient for both engineer and physicist.

T. W. WRIGHT.

Schenectady, N.Y., December 17, 1896.