quartz, but slightly thicker layers gave persistently high potentials, and an aging effect appeared. A freshly deposited film renders the plate inactive for several minutes but a gradual change takes place and the potential obtainable on exposure to ultra-violet light increases for several hours going up finally to 25 or 30 volts. A platinum plate cleaned with French chalk gave a potential of 6.2 volts when first placed in the tube. On being covered with a cathode deposit of platinum not more than 10^{-7} cm. in thickness and standing for several hours it gave a potential of 44 volts. A slight increase in the thickness of the film restored the original lower potential and the high values could not be regained till the film had been removed by using the plate as cathode and then covering it with a fresh deposit.

Very thin films of platinum cathodically deposited have been shown to possess extreme photo-electric activity as measured by the velocity with which the electrons are projected, giving potentials as high as 44 volts, which is about twenty times the potential ordinarily obtained and nearly double Millikan's highest reported value for copper.

A slight increase beyond the critical thickness restores the metal to its normal condition.

The same effect is obtained even when platinum is deposited on platinum.

Further experiments with thin films are in progress.

Department of Physics,
University of Wisconsin,
April 17, 1911.

A New Determination of the Selective Radiation from Tantalum.[1]

By Edw. P. Hyde.

It has been shown elsewhere[2] that, if two incandescent bodies are at a color match and have different luminous efficiencies, then one of the bodies radiates selectively with respect to the other. The existence of a color match is a consequence of there being approximately the same energy distribution in the visible spectra. A difference in the luminous efficiencies indicates that, for the entire spectrum taken as a whole, there exists a difference in the distribution of the radiated energies from the two sources. If two bodies are not selective in their radiation with respect to one another,

[1] Abstract of a paper presented at the Washington meeting of the Physical Society, April 21 and 22, 1911.

[2] Edw. P. Hyde, Jour. of Frank. Inst., 169, 439; 170, 26; 1910.

it was shown that at a color match they must have the same luminous efficiency. The test for a difference in their radiating selectivities is then logically that which has been stated above. A color match may be determined with considerable accuracy with the aid of a photometer. The luminous efficiencies, in case the substances are mounted as incandescent lamp filaments, may be determined by standard methods. In the paper already noted there were presented results on various types of incandescent lamps when compared with a black body. Among other things it was found that untreated carbon was very closely non-selective. These results did not include corrections due to losses in efficiency resulting from the cooling effects of the supports for the filaments, to energy dissipated in the base and the leading-in and connecting wires, and to the absorption of the radiated luminous energy by the glass bulb and the deposits thereon. In some recent work[1] these losses have been investigated. It seemed worth while to redetermine the relative selectivity of tantalum and carbon taking into account the losses just mentioned. Two special lamps, one with an untreated carbon filament, the other with a tantalum filament, were used in which these losses could be carefully measured. The results are included in the following table:

Approx. Black Body Temp.	Measured Luminous Efficiencies in Lumens per Watt.		Corrected Luminous Efficiencies in Lumens per Watt.		Ratio of the Luminous Efficiency of Tantalum to that of Carbon.	
	Carbon.	Tantalum.	Carbon.	Tantalum.	Present Results.	Previous Results.
1420° C.	$.37_3$	$.48_1$	$.41_9$	$.51_9$	1.2_4	1.3
1610	1.4_1	1.7_0	1.5_9	1.8_2	1.1_4	1.15
1780	3.1_5	3.5_6	3.5_2	3.7_6	1.0_7	1.1

It is to be noted that the corrections for the losses mentioned above have changed but little the previous values for the ratio of the luminous efficiency of tantalum to that of untreated carbon, obtained by using ordinary lamps.

A Kinetic Theory of Gravitation.[2]

By Charles F. Brush.

THE author discusses at length the origin of the energy acquired by a falling body, and concludes that the gathered energy comes from the ether through which the body falls. Conversely, equivalent

[1] Hyde, Cady & Worthing, Elec. World, March 9, 1911, p. 624. The complete paper will appear shortly in the Trans. of the Ill. Eng. Soc., and in the London Illuminating Engineer.

[2] Abstract of a paper presented at the Minneapolis meeting of the Physical Society, December 30, 1910.