excited in radiators of Sn, Ag, Mo, and Se placed in the direct beam from the tube. The nature of the radiation was tested roughly by absorption measurements and found to be substantially pure.

This fluorescence radiation was collimated by a slit system into a beam one-half inch square in the path of which were placed hollow cylindrical scattering blocks of C, Al, Fe, Ag, Sn, and Au.

Scattered radiation from these blocks passed into a large ionization chamber the window of which was shaped like a segment of a sphere with the scattering block at its center. The chamber was of uniform depth and was filled with argon at atmospheric pressure.

A second ionization chamber, likewise filled with argon, was placed in the direct beam for absorption measurements. The electrodes of both chambers were connected to a Compton electrometer the sensitivity of which was about 10,000 mm scale divisions per volt at 2 meters. Lead screens were used to reduce the air scattering as much as possible.

The scattering blocks were mounted on supports of silk thread attached to wire frames and were so placed in the path of the x-ray beam that radiation from every part of the first slit reached every part of the scattering block. Suitable filters were used to prevent fluorescence radiation excited in the scatterers from entering the ionization chamber.

The cylindrical scattering blocks were made of such a thickness that one-half of the radiation used was absorbed by passing through them. For convenience the scattering of carbon, iron, silver, tin and gold was compared with aluminum and where it was not possible to obtain scattering blocks absorbing exactly half of the radiation, great care was taken to compare them with aluminum blocks of the same absorbing power.

The gold foil used was mounted on a celluloid base and was compared with an aluminum block also mounted on celluloid. In correcting for the scattering of the celluloid an amount was deducted equal to one-half the scattering from a celluloid block of the same dimensions.

For this and for all the other blocks corrections were made for air scattering and natural leak of the electrometer system. Due to the length of air path in front of the chamber and to the size of the chamber itself these were appreciable and their magnitude for longer wave-lengths and higher atomic numbers than those used made measurements by this method impracticable.

The results obtained are shown in Table I. The effective wave-length of the radiation used was determined by averaging the wave-lengths of the $K\alpha$ and $K\beta$ lines weighted by their relative intensitives.

TABLE I. *Ratio of mass scattering coefficients of elements to aluminum for different wave-lengths.*

Scatterer	Radiator			
	Sn	Ag	Mo	Se
Au	5.49	6.75		
Sn	2.33	2.82	3.44	
Ag		2.65	3.51	
Fe	1.41	1.65	2.09	
C	1.07	0.95	0.87	0.79
Effective wave-length (calc.)	0.48 A	0.55	0.70	1.09

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Fluorescent Dry Plates for Photographic Photometry

We have recently shown (J.O.S.A. **20**, 313, 1930) that problems of homochromatic photographic photometry can be greatly simplified (especially in the Schumann region, where they had previously been impracticable) by coating ordinary dry plates with fluorescent oils in the manner which Duclaux and Jeantet used to obtain increased sensitivity at short wave-lengths. We now find that a similar result can be obtained much more conveniently by using a dry transparent coating containing an aesculine solution as the fluorescing agent, while broadening of images and other difficulties can be minimized by making this coating an integral part of the plate. A Cramer Contrast Process Plate usually shows extreme variations of contrast between 3700 and 2300A; when such a plate was coated by pouring over it a mixture of two parts saturated solution of aesculine in water and one part 5% gelatine solution in water, which was allowed to dry for three days, it showed uniform contrast over the same range. A much more uniform coating can be obtained in this way than with the oils, and nothing need be removed prior to development, which should, however, be about twice as long as usual. The variation of sensitivity with wave-length is much less than with ordinary plates, and we believe that it can be made as negligible as the variation of contrast. The presence of the fluorescent layer appears to decrease greatly the amount of chemical fog produced, as was clearly shown by coating plates in certain regions only.

While the method can be applied in principle at all wave-lengths, its satisfactory extension to the region below 2000A depends on finding a carrier more transparent in that region than gelatin, while it could be used at wave-lengths greater than 3700A by coating a red sensitive plate with a substance fluorescing in that region. Preliminary experiments with a solution of chlorophyll have proven successful in giving uniform contrast up to where the green absorption band begins.

It should be emphasized that a decrease in sensitivity results at many wave-lengths when the fluorescent coating is used, as is indeed true of oil coatings also. This is usually an advantage in photometry, since the decrease is greatest at long wave-lengths where most other causes unite to give the greatest response. We expect to publish shortly a detailed account of our new methods of fluorescent photometry, which promise to greatly simplify not only homochromatic but heterochromatic photographic photometry as well.

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August 1, 1930.