

erable distance, so that the image of the grating on the plate is only about one millimeter long, and since the spacing of the grating is known, a numerical expression for resolving power can be found by observing how far down the grating the image is resolved. This resolution is usually expressed in terms of the distance between two lines which will just be separated in the photograph. The measurements so made bear out the conclusion that the resolving power of an emulsion is the product of the three factors—graininess, turbidity, and contrast—all three factors playing a part in the determination of the resolving power as observed and thus giving a very complex relation between the size of grain, the wave-length, and the effective resolving power, while the practical resolving power obtained, like the sharpness of an edge, is affected by the diffusion phenomena of development which at the present time are very imperfectly understood.

ROCHESTER, N. Y.,
February, 1921.

The Construction of the Highway System in Morocco. (*Génie Civile*, February 26, 1921.)—From 1913 to 1919 the French Protectorate in Morocco built more than 2000 km. of highways. The indigenous population furnished an abundance of workmen at low wages whose employment had also a serious political aspect, since it helped to render contented the inhabitants of this land which had only recently come under French influence and which like all other parts of the earth suffered from the economic conditions resultant from the war.

Owing to fuel difficulties in war time mechanical road-rollers were often replaced by lighter and slower rollers drawn by animals. This arrangement had the merit of saving money, especially in the south of the country, where 5 or 6 francs a day would hire a camel and his driver. A roller, weighing 5 tons, drawn by eight camels, cost 40 centimes per ton-kilometer for operation, while a roller propelled by a gasoline motor cost from 50 to 75 per cent. more.

G. F. S.

The Constitution of the Alkali Metals. F. W. ASTON. (*Nature*, March 17, 1921.)—The method of positive ray analysis is applied to the alkali metals. Lithium has already been found to consist of two isotopes of atomic weights 6 and 7. Sodium atoms are of one kind only; potassium is made up of two isotopes having the atomic weights 41 and 39, the latter greatly preponderating. There are two rubidium isotopes, 85 and 87. Thus far only one type of caesium atom has manifested itself, but the evidence in this case is not final.

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