NOTES FROM THE RESEARCH LABORATORY EASTMAN KODAK COMPANY.*

NOTE ON THE RELATION BETWEEN SENSITIVENESS AND SIZE OF GRAIN IN PHOTOGRAPHIC EMULSIONS.¹

By S. E. Sheppard and A. P. H. Trivelli.

IN confirmation of Mr. Renwick's emulsion experiments an experiment reported shows that coarse-grained emulsions are not always more sensitive than fine-grained ones, although in the same emulsion statistically there is a probability of greater sensitivity for larger grains. From a theoretical treatment of the subject the conclusion is drawn that the catalytic effect of silver nuclei depends on orientation in relation to the silver halide crystal lattice, and that in turn on the exposure. It is noted that the difference in effect on clumps of grains of developers of high and low reduction potentials should be considered in the experimental work.

QUANTUM THEORY OF PHOTOGRAPHIC EXPOSURE.²

By L. Silberstein.

AFTER a short introduction concerning the structure of the photographic plate, the assumption is made that light consists, either entirely or in part, of discrete energy parcels or light darts, each containing a quantum of energy, and that a silver halide grain is affected, *i.e.*, made developable whenever it is hit by one or more light darts of a sufficiently high frequency or of a sufficiently short wave-length. With these assumptions the problem of the production of the latent image is reduced to a problem in probabilities and its solution gives the percentage number of grains affected as an exponential function of the size (area) of the particular class of grains and of the number of light quanta thrown upon the plate. The integral effect ranging over any finite interval of sizes is then deduced. Further the dependence

* Communicated by the Director.

¹ Communication No. 128 from the Research Laboratory of the Eastman Kodak Company and published in *Phot. J.*, November, 1921, p. 400.

² Communication No. 139 from the Research Laboratory of the Eastman Kodak Company and published in *Phil. Mag.*, July, 1922, p. 257.