

arate opaque dots of varying size. If the screen plate were so placed that the opaque lines be in contact with the sensitive film there will be reproduced on the film the lines of the screen, giving a result similar to that of a veil laid over a picture, but, if the sensitive plate and screen plate be separated by a slight distance a different result is obtained. The light reflected from the picture to be photographed is intercepted by the opaque lines of the screen plate, separating it into a number of minute beams. Now, rays of light, in passing through a very small hole or near the edges of an obstacle in their path, will be deviated from their original direction, passing off at an angle. This is known as diffraction and it is exactly what happens in the use of the screen plate.

Let us take for instance, a photograph and mentally follow the making of a half tone negative of it. The light reflected from the high lights on the face or linen, represented on the photograph, will be most intense in its action upon the sensitive film. But the light, in passing by the opaque cross lines of the screen plate, is diffracted—in a way, it seeps around the edges—and thereby affects the sensitive film over a much larger area than that represented by the clear space through which that particular beam of light passed, leaving unaffected, or nearly so, but a minute portion of the sensitive film,—that part protected by the intersection of the screen lines.

The light reflected from the half tones, say the shadows on the face, acts in a similar way; but, as it is not nearly so intense, that portion of the light diffracted is so weak that it has but a slight effect, if any, upon the sensitive film and those parts affected therefore will be only those that are unprotected by the opaque lines of the screen and those parts will be in size about equal to those of the transparent parts of the screen.

Let us now consider the deeper shadows on the photograph. The light reflected from these will be very weak but, nevertheless, it too will suffer diffraction thereby further weakening it until that portion of the beam which is at all capable of affecting the plate in the time of the exposure will be the central portion, and it will affect the sensitive film in a very small spot much less in area than the transparent spot on the screen plate through which this respective beam passed. From pure blacks no action whatever results. Between these two limits, high lights and deep shadows,