THE HISTORY OF CHEMISTRY AS APPLIED TO PHOTOGRAPHY

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The history of photography and the history of chemistry are, naturally, closely parallel. The relationship is much closer than between physics and photography. With the exception of the invention of a new glass or two, the devising of a few new lens combinations, and more recently, the introduction of new polarizing screens and a glass-coating, reflection-reducing technique (in themselves, partly chemical), most of the advances in the art-science of photography have been made as almost direct offshoots of the discoveries of the chemists.

In fact, the alacrity with which these discoveries have been incorporated into the body of photographic theory and usage has been little short of amazing. Iodine, isolated in 1811 was used by Daguerre some time before 1835 and bromine discovered in 1828 was put to photographic use in 1840 by Goddard to increase the sensitivity of Daguerreotype plates. In 1819 Herschel pointed out the action of sodium thiosulfate upon silver salts and in 1839 he urged Talbot to use the same salt for fixing photographic images. That salt is still by far the most commonly used fixing agent today. For this contribution it would seem that Herschel deserves a much more prominent place in the annals of photography than he is usually allotted.

To fully appreciate the importance of chemical discoveries in the history of photography, let us list what would seem the major advances made in the latter field and note how many of them are an outgrowth of chemical advances.

First, there was the noting of the effect of light and the differential effect of light of different colors upon silver compounds by the Swedish chemist, Scheele. Schulte, Wedgewood, Davy and others made use of these facts in securing printed silhouettes. These they did not know how to fix. This major contribution (though it was on entirely different chemicals) was made by Niepce. Herschel's contribution, already mentioned, made fixation possible on silver salts which were and have always been the most commonly used metallic constituents of the light sensitive materials used in photography. Then came the profound and revoluntionary contribution of Daguerre; namely, the concept of a latent image capable of later intensification or development as it is now called. Prior to that idea, the notion of obtaining a positive image directly in the camera had obsessed the minds of investigators to the point where no other solution of the difficulties encountered seemed possible.

Thus the most fundamental discoveries were made; a light sensitive medium, development, and fixation. Later came many contributions. Important among these were the negative-positive technique of Talbot's calotype process making possible images that were not mirror-images and also the possibility of many positive prints from one negative; a long series of improvements in the sensitivity of photographic emulsions, both as to speed and to orthochromatics, outstanding of which were the contributions of Schönbein (discovery of collodion) and Scott-Archer (use of collodion in the form in which it is still used photographically), Vogel's work on sensitizing films to green light (as a natural aftermath to the discoveries of Hofmann and Perkin), Rev. Goodwin's perfection of the gelatino-bromide film base (more commonly credited to Eastman), and the publication of the work of the Lumière's on the chemical properties which make organic substances photographic developers. Kekule's prior contributions concerning the benzene ring structure (the basis for nearly all the photographic reducing agents) must not be overlooked.

The whole story of reduction, intensification, sensitization, toning, color processes (exception must be made here to the pioneering work of the physicist Clerk Maxwell), image reversal, and the use of magnesium for lighting is the story of chemical progress, out of phase with photographic history by only a few years.

To paraphrase a political adage, one might say "As chemistry goes, so goes photography."