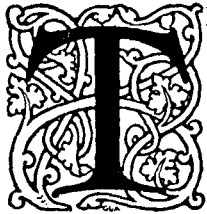


MY IMPRESSIONS OF "KINEMACOLOR."

By HENRY JOY.



THAT the world is full of wonderful things is truism, and we realize it the more when we consider the latest achievements in chemical, optical, mechanical and electrical science; and especially the recent advances in natural colour photography.

The latest invention, resulting from a happy combination of these mysterious forces has now arrived at the commercial stage, and is being publicly exhibited at the Scala Theatre, London, in the form of an entertainment known as "Kinemacolor"—otherwise nature photographed and reproduced as she really is in all her glories of life and colour.

That this long-sought-for invention had been achieved was very much doubted, not only by the writer, but by the photographic world at large. However, it has been the writer's good fortune to witness this wonderful exhibition, and he was speedily converted from a sceptic to a believer and, from a fascinating desire to know how such a marvel could be created, a visit was paid to Charles Urban, Esq., the father of the practical application of natural colours to kinematography, and also the managing director of The Natural Color Kinematograph Co., Ltd.

This gentleman freely admitted that one of his greatest difficulties had been to contend with the discouragement he had received from scientists in general and animated photograph experts in particular, but now "seeing is believing," and instead of opposition, congratulations from all and sundry; in fact, Mr. Urban produced with pardonable triumph numerous letters from eminent men of science, of both England and abroad, referring to the invention with overwhelming exuberance, and saying that what was considered an impossibility had at last been realized. They were unanimous in declaring that while "Kinemacolor" displays were acknowledged to be the most scientific and most beautiful invention as yet produced by the aid of photography, the most marvellous feature of all was the extraordinary simplicity by which natural colours were obtained.

For the enlightenment of numerous interested enthusiasts, perhaps a short explanation as given by Mr. Urban to the writer, will be appreciated.

It is apparent that "Kinemacolor" differs but very little from the manner of producing an ordinary black-and-white picture, except that to produce an animated picture in natural colours by the "Kinemacolor" process it is necessary to use a specially sensitized film running

in the ordinary way in a kinematograph camera containing a set of revolving filters, filtering the light as it passes from the lens to the film. This revolving filter is composed of two screens, each of two combined colours, one being red-orange, the other a blue-green. The red-orange and blue-green pictures, or colour records, are taken alternately one at a time, and one lens only is employed, the light being cut off entirely during the movement of the film, which is, of course, stationary at the time of exposing.

The negative film is then developed in total darkness, and a positive film transparency printed from it in the ordinary manner. The positive film is not coloured or tinted in any way, and is used as a register of black silver deposit of varying densities of alternating red-orange and blue-green colour values, as recorded on the negative by the re-revolving screen in the camera.

In order to project the positive in colour, it is obvious that there being no



Positive Film.



Negative Film.

colour in the film, colour must be supplied or produced from an independent source. Herein lies the simplicity of the invention. The cone of light that is used for projecting is coloured either red or green by means of a revolving colour screen (identical to the one as used in the camera) before it passes through the film to the lens. The revolving filters are so geared or arranged that when say, a red-orange record picture is being projected, the screen is in such a position that it will colour the light red-orange, and blue-green when a blue-green record picture is being projected, and so on.

In "Kinemacolor" projection, one source of light, one picture (either red-orange or blue-green) and one lens only are employed.

From these remarks it can be well understood that one picture only is visible at one time.

It may be argued that this procedure cannot produce direct a natural colour effect. Quite right, it cannot. The projection of a "Kinemacolor" picture is purely an optical illusion, in which the inability of the human eye to detect an object in a lesser fraction of time than $1/10$ th of a second is taken advantage of.

A total of about forty pictures per second is shown, that is to say, twenty red-orange record pictures and twenty blue-green record pictures are made to alternate in rapid succession, the brain of the observer automatically selecting such varying intensities of red-orange and blue-green light as are allowed to fall on the screen by the different densities of the positive film, as required to produce the tints of nature.

It is well known amongst photographers that in all three-colour processes the camera screens are red, blue and green. This fact prompted the writer to enquire how the blue was produced, which, by the way, was especially apparent in a "Kinemacolor" picture of a violet-blue pansy flower study, the light-blue of the cornflower, and the numerous shades (from light to very deep purple, and, in one case, indigo) of a collection of *Daily Mail* sweet peas. This, it was explained, was due, first, to the use of a blue-green screen in the camera and projector, and, second, by the use of the electric arc for projecting purposes, which, on account of its exceedingly high temperature, produces an intense white light of a greater value in the blue-violet rays than even sunlight itself.

As simple as all this really is, it is astounding to conceive that an admixture of red-orange and blue-green light can also reproduce the effect of sheen on horse's coats, iridescence of soap bubbles and bird's plumage, transparency of colourless water and liquids, the coldness of marble statuary, the glitter of polished woods and metals, the effect of polarized light on crystals as seen through the microscope, even the rainbow itself, the glories of sunsets, the sparkling sea, etc., etc.

Not until the "Kinemacolor" process was perfected was it possible to faithfully reproduce the absence of all colour known as "black;" of course, we all take and produce "black-and-white" photographs, but the black does not convey the same impression of black as we see reflected by black wood, black cloth, the "visage" of a black man or woman, black boots, etc.

It has been the dream of many an inventor to produce stereoscopic pictures in projection without the use of hand or mechanical apparatus. Here, again, "Kinemacolor" scores, for in addition to it giving us the colours of nature, all objects are made to stand out in bold relief; all idea of a flat picture on a sheet is lost, in fact it is difficult for one to realize that one is looking at a canvas and not at the real scene. This stereoscopic effect was by no means looked for during the early experiments; it was simply a natural sequence, and is no doubt due to the fact that colour gives to all objects a sense of solidity and roundness, which is much preferable to the sharp outline and flat effect of an ordinary black-and-white picture.

In order to better grasp the actual working of "Kinemacolor," reference may be made to the blocks on page 162 representing a negative and a positive:—

The letter "r" indicates "Red-orange" sensations. The letter "g" indicates "Blue-green" sensations. The numericals give the sequence in which the exposures were made.

The negative No. 1 picture is taken first through the "Red-orange" screen; the lens is then completely masked, during which period of time the film moves from No. 1 to No. 2, and the revolving screens make a half revolution, bringing the "Blue-green" portion of the screen into position behind the lens, which is now uncovered, allowing the picture No. 2 to be taken. No. 3 is next exposed under the "Red-orange" screen, No. 4 under the "Blue-green," and so on, until the whole picture has been recorded. The subject of this picture is Julius Cæsar and Calphurnia, and it may be noticed that the cloak of Julius Cæsar in No. 1 *negative* picture is denoted by a dense deposit indicating a *red* cloak, while in No. 2 *negative* picture, the cloak is of a lighter deposit, indicating a small amount of "blue-green;" had there been no deposit in the "blue-green" negative, the cloak would be projected by an opaque positive, thus cutting out the "blue-green" entirely, allowing the "red-orange" projecting filter full transmission, which would consequently render the cloak the same colour as the "red-orange" screen itself; but Julius Cæsar's cloak is purple and not red-orange, therefore blue-green is necessary to tone down to the proper colour, hence the deposit in No. 2 positive is not quite opaque.

From this it can be easily noted that the varying amounts of light transmitted by either filter give the different spectral colours, providing the negative film is truly panchromatic, which seemingly impossible achievement has been obtained in the "Kinemacolor" negative film, as witnessed by the writer.

