

DOUBLE PHOTOGRAPHS.

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The art of taking double photographs, or making two pictures appear as one is both interesting and entertaining. That it gives scope to great ingenuity is exemplified in many popular films.

Some enthusiasts have modestly endeavored to hide from the public their own cleverness in the art by suggesting the assistance of spirits. Other photographers occasionally obtain unexpected combinations of faces or figures by accident or oversight.

The writer once saw a snap shot of a lady in a wide sunbonnet. In the shadow where the face should have been appeared, at first sight, a grinning death's head! On closer inspection the impression of a skull proved to be built up from a very small portrait of the same lady sitting under a tree. Both pictures had been taken during a picnic and, by mistake, upon the same negative.

Still other photographers get results which they are quite unable to explain. Those interested in psychical research and abnormal phenomena are often called upon to express an opinion upon all three kinds of pictures. It seems therefore that a short description of the photographic process may be of use to those readers unacquainted with it, to assist them in picking out from among the large number of double photographs, so to speak, "on the market" those few which do not fit into the current scheme of material things, and which cannot be accounted for out of our present stock of knowledge concerning chemistry, physics and human nature.

The production of a photograph is primarily a chemical process carried out in two steps. The photographic plate used in the camera is a sheet of glass (or celluloid) covered with an opaque emulsion of gelatine containing some compounds of silver. This plate is prepared in a dull red light, it does not, however, change its appearance upon a short exposure to white light. It is impossible to tell the difference between an exposed and an unexposed plate by examination, but, if the two are immersed in one or other of certain chemical solutions, called developers, the silver

compounds on the exposed plate will decompose and make a black deposit of silver in the gelatine. No change will take place in the unexposed plate. There are few facts or experiences more amazing than this, when one comes to think of it.

If the plates are now washed and immersed in another solution, called the fixing bath, the undecomposed salts will be washed out, leaving in the one case clear gelatine, in the other gelatine blackened with silver.

If, instead of exposing the whole of the second plate to white light, we cover it with a transparent picture,—say of a head with black hair,—considerable light will pass through the clear part of the face and the whites of the eyes, less through the shadows on the face and none through the dark hair. Consequently the plate after development and fixing will show a dark face with white hair. It is therefore called a negative, because the light and shade are reversed. To obtain a true copy of the original picture we simply use it as a transparency to cover a second plate, or an emulsion coated paper, and proceed with exposure and development as before. As in the well known rule of grammar “two negatives make a positive.”

A dirty or badly mixed developer will make clouds or spots on the negative, especially if it is an old one. Some plates were once left by the writer in a dark slide for over two years and when finally exposed and developed they made quite good pictures, except that they were marked with finger prints, where they had been touched in putting them into the slide. A search for the reason of an unexpected cloud appearing on a plate, left overnight in a laboratory drawer, led to the discovery of radium.

Now let us go a step further and expose our photographic plate first under one transparent picture and then under another. The clear parts of the second picture that come over opaque parts of the first will be reproduced on the negative, and the clear parts of the first picture which come under opaque parts of the second will also appear. Thus a number of pictures of faces, taken against a dark background can be combined into one negative.

We must next consider the part played in photography by the camera.

Every object which produces, or reflects, light throws off waves (or vibrations) of various sizes in all directions, Waves

have the peculiar property of being able to pass through one another without interference, and the lens of the eye, or that of the camera, has the peculiar property of changing the direction of those light waves which strike it, in a greater or less degree, according to the point upon which they strike, so as to bring together again at a certain distance behind the lens all those waves coming to it from a particular point in front. Thus if we aim the camera at a pin head, all the waves reaching its lens from the pin head will be brought together so as to form a picture of that object somewhere inside the camera. If a photographic plate is placed at this point the waves will affect it just as if they had reached it through an actual transparent picture of the pin head, and a negative will be obtained as in "contact" exposure. Finding the position of the picture in the camera is called focusing.

Some waves which have little or no chemical effect on a photographic plate give us the sensation of red light through our eyes and of heat through our fingers. Other waves, the ultra violet ones, will affect the plate and will also give us "sunburn", though we cannot see them. The very short ultra-violet waves, and the X-rays, which are shorter still, are not deflected by a glass lens, so we cannot obtain a definite picture with them in a camera; but we can use them for contact exposures, and, as some of them will pass through substances (such as flesh and blood) which stop visible waves, we can by their aid obtain chemical pictures of things which we cannot see, such as our bones.

Some substances have the property of giving off ordinary light waves when struck by ultra-violet waves or X-rays. Thus the presence of these can be detected directly as well as by the round about processes of photography. These materials range from some kinds of diamond to ordinary coal oil, but a chemical known as Barium-Platino-Cyanide is the substance mostly used in X-ray work.

Fortified with the above facts let us see how a modest photographer could hide from a client the means by which he adds a second face, or some writing, or even a ghostly halo, to her portrait, if he wishes to do so. (We will call the client she merely for clearness in the use of pronouns.) She would, no doubt, bring her own box of plates. The photographer would look this over and if it were of a standard make he might risk substituting, by

légerdemain, a similar box of previously exposed plates, from his own varied assortment. There are less than a dozen kinds of plates in common use. In selecting pictures he would be guided by the probability that his client would prefer one out of the following list:

- A baby face.
- A fair boy, girl, man or woman.
- A dark boy, girl, man or woman.

Nine variations. Therefore he could satisfy, on the average, one client out of nine at the first exposure, and any client after two sittings with four or five exposures at each.

Having inspected the box of plates, the photographer will take his client into his dark room. Under the red light he will ask her to open the box, take out two plates and put them in the dark slide ready for exposure. He may ask her to initial the plates so that she can recognize the particular pair again. He can do this safely if substitution has already been made. In any case he will most likely make a point of not handling the plates himself at this juncture, but he may just touch one of them with a finger tip to assist a clumsy or nervous person, and, if that finger tip had on it a little strong developing solution, or fixing solution, a dark or light cloud would ultimately appear upon the negative.

He will next ask his client to examine the camera and especially the lens, in this way he finds out how much she knows about such things. The examination proving satisfactory he will pose her for the portrait against a dark background and proceed to focus the camera. For that purpose he has to cover the back of it with a dark cloth under which he puts his head and one of his hands. Whilst focusing he has ample opportunity to insert a transparency where it will stand immediately in front of the plate when being exposed.

He can now take the slide containing the marked plates which the client will no doubt have kept in her possession, place it in the camera in her sight, draw the shutter, expose first one plate and then the other (doing a little "focusing" in between), hand the closed slide back to her, and ask her to take it into the dark room. She may then open it, identify the plates, and develop

them herself and behold a face or a message will appear upon the negative in addition to her own portrait.

In this example of double photography the cause of the phenomenon is "human nature"; in that resulting from the effects of radium it was a chemico-physical reaction previously unsuspected.

These examples are not unique. They point to interesting lines of investigation, this leading to new conceptions of the ultimate composition of matter, that (let us hope) to some appreciation of those reactions of the mind which make some persons honest and others dishonest.

Other examples will undoubtedly occur as a result of conditions as yet but partially understood or, it may be, altogether hidden even from the leaders of scientific thought. The wisest of us really know very little when all is said, and the only way to learn more is to observe, and to use what knowledge we have in making deductions from our observations.