(For the Scientific American.)

Daguerreotypes without a Camera.

I send you with this two stereoscopic pictures taken by me by means of a box, to be described hereafter, which contained neither lenses, reflectors, nor any refracting or reflecting medium of any kind.

I accidentally made the discovery that photographic pictures could be taken in this manner while prosecuting some experiments relative to Stereoscopic Angles.

It is well known that two pictures taken with two ordinary cameras, placed only 2½ inches apart horizontally, will not, when placed in the stereoscope, show proper or sufficient stereoscopic relief, and yet it is well known that the human eyes are only placed 2½ inches apart, and see solid objects in their proper solidity and relief. To explain the why and wherefore of these facts has challenged the attention of Prof. Wheatstone, Sir David Brewster, and a host of others; leading the above-named gentlemen into a very sharp controversy, leaving the main question—the determination of the proper stereoscopic angles—as far as practical results are concerned, in precisely the same condition in which they found it.

Under the circumstances we may be permitted to ask, why is it that two pictures, taken by two cameras placed 2½ inches apart, do not show sufficient stereoscopic relief? Why is it that we must place the cameras about eight times further apart than the human eyes, in order to produce the proper relief? When these questions first suggested themselves, the following answer occurred to me (without, at that time, being able to prove it to be the correct one,) namely:—"because the lenses in the camera (¼ size) are twelve times larger than the human lenses (eyes.)"

In order to ascertain whether this was the correct answer or not, it was only necessary to take two pictures with two cameras, having a diaphragm in each, the openings of which were ⅛ of an inch in diameter, that being the diameter of the diaphragm of the human eye. In executing this experiment I was very much surprised to find that the focal range of the camera was increased to an extraordinary extent. The cameras had been focussed for a house on the opposite side of the street, but the moment the diaphragm was introduced, the sash in the window, which before was invisible, suddenly became as sharp and distinct as the house on which the focus had been previously drawn. Subsequently on removing the camera to an upper story of my house, it was found that this increase in focal range extended not only from the house towards the camera, but also to an equal extent beyond the house. After ascertaining these facts it became desirable to find out the causes of them. With this end in view the lenses were removed from the tube, and only the diaphragm remained in it. You may well imagine my astonishment at finding the pictures of houses and other objects in the street, faithfully depicted upon the ground glass! The letters of signs, &c., were reversed precisely as if lenses had been used. The next step was to ascertain whether these pictures possessed photogenic properties, which was soon done by substituting a metal diaphragm with an aperture of 1-50 of an inch in diameter, for the paper one of ⅛ of an inch in diameter, putting in a coated plate, allowing it to remain for 15 minutes, and coating it with mercury in the usual manner. The result was a beautiful picture similar to the one I herewith have sent you.

It was self-evident now that we had the means to do that with one camera, for which two were before deemed indispensable, namely, taking two stereoscopic pictures through two apertures situated only 2½ inches apart; but as a ¼-size plate is only 4¼ inches long, and as it was desirable to take the two pictures on one plate, two apertures 1-66 of an inch in diameter were made in the metal plate above alluded to, only 2¼ inches apart. After 20 minutes exposure, the sun shining on the house all the time, the pictures which I send you were the results, thus demonstrating conclusively that two stereoscopic pictures can be taken on one plate, with one camera (or dark chamber without lenses) and simultaneously, without either reflectors or refractors of any kind whatsoever. It may here be remarked, however, that the pictures thus taken on one plate are stereoscopic reverse, that is to say, the right picture is on the side where the left one ought to be, and vice versa, which can, however, be very readily remedied by cutting the plate in too and pasting them together again properly. This stereoscopic reverse was next attempted to be remedied by placing a reflector before the apparatus, but the only effect produced by this device was the same as the reflector produced upon pictures taken by an ordinary camera, viz., making the pictures appear in their natural position, so that letters on signs, &c., could be read correctly.

There is another advantage resulting from this camera, it is this: you may make two, four, six or more sets of holes in the same camera, either all of the same diameter, by which means you will obtain an equal number of stereoscopic pictures with the number of sets of holes, or you may make one set with an aperture 1-200 of an inch, another 1-100 of an inch, one set 1 70 of an inch, and still another set with 1-25 of an inch in diameter, when you will be almost certain to obtain at least one set of pictures properly "timed," especially as the other pictures which are not properly timed, can be rubbed out before gilding, thus saving the plates.

So much for the actual experiments. Let us see what practical conclusions can be derived from them.

A theoretical eye occupies no more room than a mathematical point. The diaphragm in the human eye is ⅛ of an inch in diameter. The lenses commonly employed in taking photographic pictures vary from 1¼ to 6 inches in diameter.

What is the theoretical difference between these three kinds of eyes? What the practical difference?

A board one foot square placed 5 feet distant before a theoretical eye, will obscure or eclipse a space of 576 square inches of a background 10 feet from the eye. The same board, under the same circumstances, placed before the human eye will obscure only 564 square inches. Whereas, if it be placed before a ¼-size camera, under a like condition, it will only obscure 495 square inches? A double whole size camera, with lenses 6 inches in diameter, will merely obscure 3·24 square inches. From this it is apparent that a picture taken with a camera with lenses larger than the human eye, will show more of the object than the eye placed in the same position. A man can place one of his eyes in such a position that he can see only one ear and a portion of the face of a person. A camera, placed in precisely the same position, will take a picture in which not only all the objects which the human eye had previously seen, but also the other ear, &c., will be clearly delineated. Such pictures are anti-stereoscopic; distortions; disfigurations intolerable in proportion to what the lens, with which it is taken, exceeds in diameter the size of the human eye. Such pictures will do for owls to look at. The back and (to the human eye) invisible parts of an object are brought out by such large lenses, as full as the natural prominent portions of such objects themselves, and producing by their contrast flat and inanimate pictures, giving to the face, &c., of the subject a broader, longer, and fuller appearance than they appear to the single human eye. We might with the same propriety call the hide of an ox, when spread upon a flat surface, a portrait of that animal, as to call a picture, taken in a camera with such large lenses, a portrait of the "human face divine." Who has failed to notice the immense difference between the large ("the splendid gilt frames," so called) portraits, both on paper and plate, in Broadway, Chestnut, Washington, and Baltimore streets, and the small miniature likenesses frequently met with in medallions, charms, breastpins, &c., taken with a good, small locket camera. The one looks flat, distorted, and inanimate; the other appears to stand and project right out from the plate, ready, as it were, at a moment's calling, to leap into existence as a living being. So much for single pictures. Let us examine double or stereoscopic pictures.

From what has been said, it will be easy to understand how it is that two common pictures taken at an angle no larger than that of the human eyes, do not show sufficient relief, for if it be true that each individual picture is more flat than the same object appears to a single eye, then it is also true that two pictures, when combined in the stereoscope, will present less relief than what two similar pictures would do that had been taken by means of lenses ⅛ inch diameter, or the same size of the human eye. In the human eye we find, as in all other parts of the body, the most extraordinary wisdom displayed, and it is only the hand of Omnipotence that could have designed and constructed such a wonderful organ. Not only do we find a single eye perfect in all its parts, but we also find the two eyes arranged in such a manner as to give the greatest possible amount of effect to binocular vision. Who can devise anything better? To imitate and equal it ought to challenge our undivided attention. Who ever saw an animal with two eyes, each six inches in diameter, and 16 inches or two feet apart? Or who ever saw two small ones forming an angle with the horizon of 45°? (My friends in Boston will forgive me, as I mean them no harm.) But what is the difference, it may be asked, if we can compensate, by simply moving the cameras a little further apart, for this deficient stereoscopic relief? To which I answer, that we can indeed make such compensation, but it is always at a little expense of the truthfulness of the picture. Others will no doubt have noticed, as I have done, the great apparent shift of positions of prominent objects in some modern stereoscopic pictures. These prominent objects in the left picture will be found thrown, as it, were, to the right, whereas, in the right picture, they will be found to the left, straining the eye, in some instances very much, in endeavoring to coalesce them. This is especially true with groves of trees, &c. This difficulty is not experienced when looking at the objects themselves, nor when looking at pictures of such objects when taken, as the one above alluded to, through two small apertures only 2½ or 2½ inches apart. And I have taken a picture of a street, in which the most prominent object was only one foot from the camera (dark chamber) and the most distant one (Christ Church) at least one mile, yet not only were both in perfect focus (they could not be otherwise) but the eyes could also see them, in the stereoscope, in their proper stereoscopic relief, without experiencing the least contortion or fatigue.

In conclusion, I may say that I think I have proven the superiority of small over large lenses in photography. We can now see that we need not look to the increase in size of the lenses, in our cameras, for the production of large photographic pictures that will at all be entitled to be called correct portraits, but that we must look to the perfection of small lenses, as well as to the quality of the chemicals employed. We want chemicals that will work instantaneously, even with small lenses. The human eye produces instantaneous pictures.

I would suggest a mode of assisting the quick action of small lenses. I would set the subject in the open air, take advantage of all the light that can be obtained. Who will be the first to build a skylight room with the roof and walls removed? J. F. Mascher.

Philadelphia, April 7th, 1855.

A Mill Stone Bursting.

On the 26th ult., a mill stone in rapid motion bursted in the grist mill of U. T. Wooster, at Benton, Ohio, and a piece of about five pounds in weight struck Mr. Wooster in the head, killing him instantly.

Professor Agassiz.

It is stated that Prof. Agassiz has declined an offered Professorship of Natural History in the Edinburgh University, preferring to remain in America, and continue his explorations in the vast field of the Western Continent.

The Proposed Reform of the Patent Laws.

In looking over the Scientific American of the 3rd of March, I was struck with the proposed alteration in the Patent Laws, by the bill advanced by Senator James; and I thought it was a strange thing that a man so high in the public favor as to be elected to a seat in the Senate, should propose anything so diametrically opposed to the interest of the greatest class of inventors; for that it is in opposition to their interests, no sane man will doubt who is acquainted with our country. Mr. James certainly is not very well versed in mechanics, or else he is far from being a friend to the craft. His only object in the bill seems to be "get money by all means;" but if he claims that the revenue of this department is small now, in my humble opinion, his bill would stop it altogether. He ought to know, if he does not, that the majority of patents are taken out by mechanics in moderate circumstances, of which several have come under my own knowledge. Many of our inventors are scarcely able to pay the present very moderate fee, and the cost of models. It seems also that the honorable gentleman has a speedy method in his mind to appropriate the money thus squeezed out of the poor mechanic. I should think that those who wish to increase the Patent Office revenue should be the last to propose a plan which would spend it faster than it could be made, even under such a peculiar nonsensical scale of fees, and I am well convinced that there are few mechanics but will oppose the passage of this bill with spirit, if it is ever again attempted to be imposed upon them. It strikes me, that your proposition of confining the whole matter to our own country would be better. I cannot see what it matters, if something invented by an American mechanic should have been patented in some foreign country, two or three centuries ago, if not introduced here. It is perfectly absurd that we should pay an army of examiners to look over all mechanical books of all nations, to see whether such a thing is new or not. I sincerely believe, on the whole, that if senators, judges, and commissioners, would pay some attention to the many valuable hints thrown out in part, or at large, in the columns of your excellent journal, that they would do more for the interest of inventors than they ever have done.

J, Day Barrow.

Louina, Ala., March 23rd, 1855.

The Boston Steam Fire Engine.

Messrs. Editors—What has become of the Cincinnati Steam Fire Engine, which made its triumphal march through our city a few weeks ago, on its way to Boston?

Can any of our friends there away enlighten us as to its performance after it was left to itself among strangers? And more especially, what means, or whence comes the report that the corporation has sold it for three thousand dollars?

Hoping that the presentation of these questions will again excite comment on this important subject in your valuable paper, I remain, D. S. M.

New York.

The California Condor.

The high mountains of California are frequented by a species of condor, which, although somewhat inferior in size to the condor of the Andes, is probably the largest bird to be found within the confines of the Golden State. A full grown California condor measures upwards of thirteen feet from tip to tip of its wings, and when in its favorite element, the air, is as graceful and majestic as any bird in the world. They make their homes upon the ledges of lofty rocks, or in the old deserted nests of hawks and eagles, upon the upper branches of lofty trees. Their eggs are each about twelve ounces in weight, and are said to be excellent eating. The barrels of the wing-feathers of the condor are about four inches long and three eighths of an inch in diameter, and are used by the inhabitants of Northern Mexico to keep gold dust in.

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