

**THE STEREOSCOPE:  
ITS HISTORY, THEORY,  
AND CONSTRUCTION**

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The Stereoscope: Its History, Theory, and Construction by Sir David Brewster

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**SIR DAVID BREWSTER**

**THE STEREOSCOPE:  
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AND CONSTRUCTION**



THE  
STEREOSCOPE.

ITS HISTORY, THEORY, AND CONSTRUCTION

WITH ITS APPLICATION TO THE FINE AND USEFUL ARTS  
AND TO EDUCATION.

BY

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# ON THE STEREOSCOPE.

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## INTRODUCTION.

THE *Stereoscope*, a word derived from *stereos*, *solid*, and *skopein*, to *see*, is an optical instrument, of modern invention, for representing, in apparent relief and solidity, all natural objects and all groups or combinations of objects, by uniting into one image two plane representations of these objects or groups as seen by each eye separately. In its most general form the Stereoscope is a *binocular* instrument, that is, is applied to *both* eyes; but in two of its forms it is *monocular*, or applied only to *one* eye, though the use of the other eye, without any instrumental aid, is necessary in the combination of the two plane pictures, or of one plane picture and its reflected image. The Stereoscope, therefore, cannot, like the telescope and microscope, be used by persons who have lost the use of one eye, and its remarkable effects cannot be properly appreciated by those whose eyes are not equally good.

When the artist represents living objects, or groups of them, and delineates buildings or landscapes, or when he



copies from statues or models, he produces apparent solidity, and difference of distance from the eye, by light and shade, by the diminished size of known objects as regulated by the principles of geometrical perspective, and by those variations in distinctness and colour which constitute what has been called aerial perspective. But when all these appliances have been used in the most skilful manner, and art has exhausted its powers, we seldom, if ever, mistake the plane picture for the solid which it represents. The two eyes scan its surface, and by their distance-giving power indicate to the observer that every point of the picture is nearly at the same distance from his eye. But if the observer closes one eye, and thus deprives himself of the power of determining differences of distance by the convergency of the optical axes, the relief of the picture is increased. When the pictures are truthful photographs, in which the variations of light and shade are perfectly represented, a very considerable degree of relief and solidity is thus obtained; and when we have practised for a while this species of monocular vision, the drawing, whether it be of a statue, a living figure, or a building, will appear to rise in its different parts from the canvas, though only to a limited extent.

In these observations we refer chiefly to ordinary drawings held in the hand, or to portraits and landscapes hung in rooms and galleries, where the proximity of the observer, and lights from various directions, reveal the surface of the paper or the canvas; for in panoramic and dioramic representations, where the light, concealed from the observer, is introduced in an oblique direction, and where the distance of the picture is such that the convergency of the

optic axes loses much of its distance-giving power, the illusion is very perfect, especially when aided by correct geometrical and aerial perspective. But when the panorama is illuminated by light from various directions, and the slightest motion imparted to the canvas, its surface becomes distinctly visible, and the illusion instantly disappears.

The effects of stereoscopic representation are of a very different kind, and are produced by a very different cause. The singular relief which it imparts is independent of light and shade, and of geometrical as well as of aerial perspective. These important accessories, so necessary in the visual perception of the drawings *in plano*, avail nothing in the evolution of their *relievo*, or third dimension. They add, doubtless, to the beauty of the binocular pictures; but the stereoscopic creation is due solely to the superposition of the two plane pictures by the optical apparatus employed, and to the distinct and instantaneous perception of distance by the convergency of the optic axes upon the similar points of the two pictures which the stereoscope has united.

If we close one eye while looking at photographic pictures in the stereoscope, the perception of relief is still considerable, and approximates to the binocular representation; but when the pictures are mere diagrams consisting of white lines upon a black ground, or black lines upon a white ground, the relief is instantly lost by the shutting of the eye, and it is only with such binocular pictures that we see the true power of the stereoscope.

As an amusing and useful instrument the stereoscope derives much of its value from photography. The most

skilful artist would have been incapable of delineating two equal representations of a figure or a landscape as seen by two eyes, or as viewed from two different points of sight ; but the binocular camera, when rightly constructed, enables us to produce and to multiply photographically the pictures which we require, with all the perfection of that interesting art. With this instrument, indeed, even before the invention of the Daguerreotype and the Talbotype, we might have exhibited temporarily upon ground glass, or suspended in the air, the most perfect stereoscopic creations, by placing a Stereoscope behind the two dissimilar pictures formed by the camera.