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A SIMPLE DEVICE FOR SINGLE-LENS STEREOPHOTOGRAPHY OF PALEONTOLOGICAL SPECIMENS

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5. A Simple Device for Single-lens Stereophotography of Paleontological Specimens, by Herbert W. Wienert. Pages 121–124, with 1 plate.

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CONTENTS

INTRODUCTION

STEREOPHOTOGRAPHY has been successfully used in paleontology since shortly after the turn of the century. In 1913, George H. Hudson, one of its first advocates, presented thirteen plates of stereograms in his paper *The Use of Stereograms in Paleobiology* (N. Y. State Mus., Bull. 164, pp. 103–30). Since then the technique has been employed in most branches of paleontology to give to certain illustrations an illusion of depth and relief obtainable only through 3-dimensional photography.

The device described in this paper is helpful in making stereo pairs with a single-lens camera. The construction has purposely been kept simple; duplication is possible in a minimum of time with materials readily available. Dimensions of the device are determined, within broad limits, by the size of the specimens to be photographed. The only hard and fast requirement is that the swing, intercepted by the optical axis, must have a total angle between 4° and 12°. I determined, by trial and error, that a swing of 4° to either side of the axis (resulting in an 8° over-all angle) creates the most natural 3-dimensional effect in the end result. The proportions given (Fig. 1) for the device proved convenient and expedient in photographing most of the specimens that are normally chosen for this type of illustration. The taking of stereophotographs of micropaleontological subjects, however, requires a different method than the one described here.

EQUIPMENT

Any vertical camera that is suited for conventional photography can be used for single-lens stereophotography. Cameras adapted for sheet film of any size, and also miniature cameras employing 35 mm. film, are equally serviceable. A good tripod or a rugged support as provided in most macrocamera outfits is essential. A microscope stage was used to hold the device (see Pl. I, Figs. 2–3). Its knurled knob allows fine adjustment of focus without moving the camera after the object has been rough-focused.

CONSTRUCTION OF DEVICE

The device is made almost entirely from wood, a material chosen for its light weight and because it can easily be worked. The weight is of importance only insofar as the apparatus is to be placed on a microscope stage with limited carrying capacity. The only nonwooden part of the device is a piece of thin sheet metal that is glued to the movable top. There are three accessories: two small kitchen magnets (available in hardware stores) and a metal bar serving as a counterweight. Figure 1 shows how the parts are assembled. The counterweight, when placed on the left (as in the diagram) tilts the device to the left. The specimen is mounted on a small cardboard and held firm on the top by the two magnets which adhere to the metal covering.

PHOTOGRAPHIC PROCEDURE

Taking stereophotographs with the aid of this device is as simple as in the 2-dimensional process. The specimen is coated with sublimated ammonium chloride to accentuate detail, fastened to a cardboard mount of appropriate size, and placed on the metal sheet and secured by the two magnets. The whole contrivance is then placed under the camera and the specimen rough-focused to the desired scale. Fine focus is achieved by concentrating at a point on the object at the end of the first third of the total vertical dimension, as seen from above.

The smallest diaphragm opening on the lens normally provides sufficient depth of field, but the depth can be increased considerably by photographing on a smaller scale and, subsequently, enlarging to the desired scale.

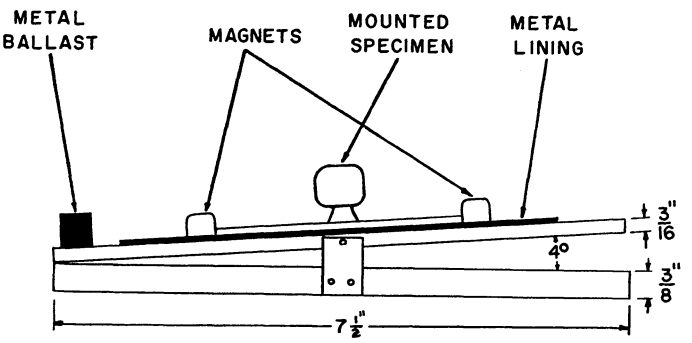

FIG. 1. Diagram of device used for single-lens stereophotography.

The metal weight is put in place at one end or the other as shown in Figure 1. After the first photograph is taken, it is moved to the opposite end. Now, the second is taken, but it is not necessary to refocus or to reset the diaphragm. What results is a stereo pair of photographs of equal scale, focus, depth of field, and negative density.

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PLATE

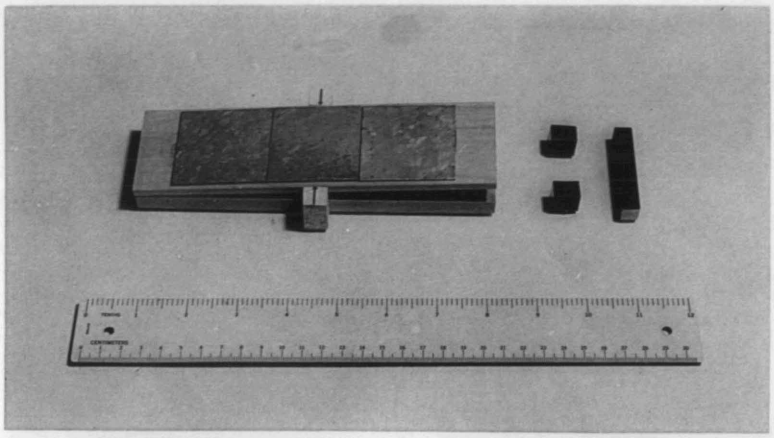
EXPLANATION OF PLATE I

FIG. 1. Stereophotographic device with accessories. Note metal covering on movable top plate. Two arrows show axis of swing. The center of the specimen is placed in line with the arrows. At right are the two magnets and metal counterweight.

FIGS. 2–3. Camera, device, specimen, and microscope stage in "shooting position." Metal weight is on the right in Figure 2 and on the left in Figure 3. For clarity of illustration the light source is not shown. A ringlight was used for the photographs in Figures 4–5, below.

FIGS. 4–5. Stereo pair taken with aid of the device. Original photograph of Figure 4 was taken with outfit in position shown in Figure 2; that of Figure 5 with it as in Figure 3. The two photographic prints are mounted with a distance, from center to center of specimen, of 68 mm. and can be viewed with a normal stereoscope.

PLATE I



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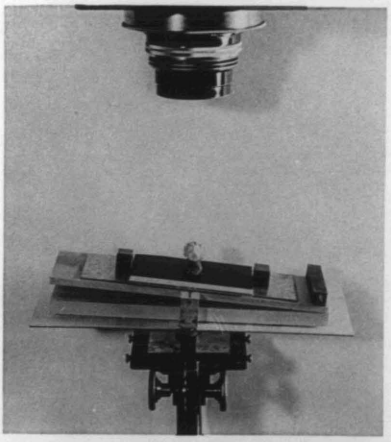

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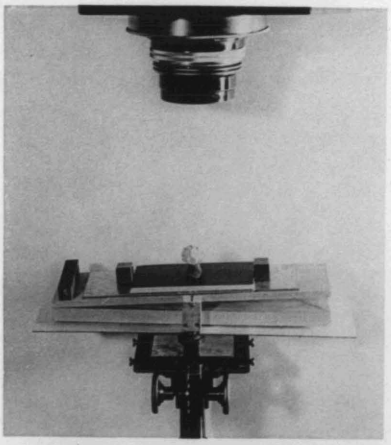

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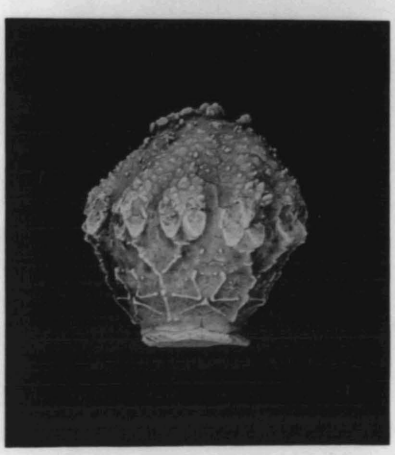

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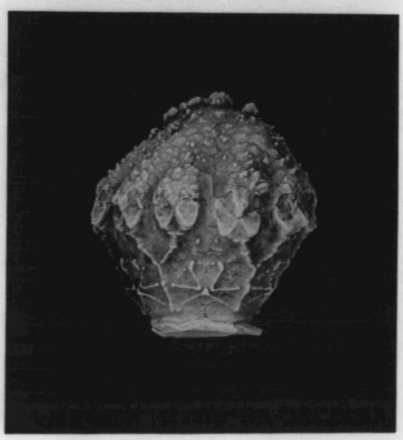

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