A Simple Method of Stereoscopic Photomicrography

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CITATION:

Shimadzu, Shinichi. A Simple Method of Stereoscopic Photomicrography. Memoirs of the College of Science, Kyoto Imperial University. Series A 1937, 20(1): 1-2

ISSUE DATE:

1937-01-31

URL:

http://hdl.handle.net/2433/257163

A Simple Method of Stereoscopic Photomicrography

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(Received Dec. 15, 1936)

Abstract

A simple method of taking stereoscopic photomicrographs with an ordinary microscope is described.

Two optical axes of a binocular microscope are inclined differently towards the object, as shown in Fig. 1. If we give the object certain inclinations on both sides of the optical axis of an ordinary microscope as shown in Fig. 2, the relative positions of the objective lens and the object are the same as in Fig. 1. The writer took two photomicrographs by giving inclinations of about 10 degrees to the surface of the object on both sides of the optical axis of the microscope and the photomicrographs thus taken by looking at the object from two different directions were observed with a stereoscope.

Fig. 1

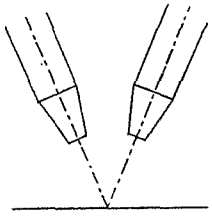
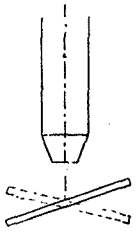


Fig. 2



The difference of the tilted angle of the surface of the object, which was about 20 degrees in the present experiment, corresponds to the optical angle in looking at the object with a binocular microscope; and the deepness of relief can be adjusted to any desired degree by merely changing the angle of tilting, irrespective of the amount of magnification.

When SUMP (Suzuki's Universal Micro-Printing) method[1] is employed, we obtain a good copy of the fine structure of the surface of a substance on the surface of a celluloid plate, and the photomicrographs of the replica can be taken with transmission light. The photographs reproduced in Plates I and II are obtained by means of the SUMP method. In these Plates Fig. 1 is the etched surface of a lead plate solidified from its melt, Fig. 2 the top portion of a rice-hulls,

1. By this method one obtains on a thin celluloid plate a detailed printing of the detailed surface structure of a solid body by pressing the plate, which has been previously smeared with amylacetate, on the surface of the solid body.

Fig. 3 a portion of a leaf of clover, and Fig. 4 the surface of a fibrous gypsum.

In these photographs the focusing is sharp at the middle portion, but not near the border. This is due to the tilting of the replica plate and is unavoidable with high magnification. Limited by this fact, the usual magnification employed in the present experiment was less than 200. However, with narrower visual field the magnification can be still more increased; and the writer could take some stereoscopic photomicrographs magnified more than 600 times.

In conclusion the writer wishes to express his sincere thanks to Prof. U. Yoshida for his kind guidance during the course of this experiment.

Plate I

Fig. 1

Etched surface of a lead plate (×130)

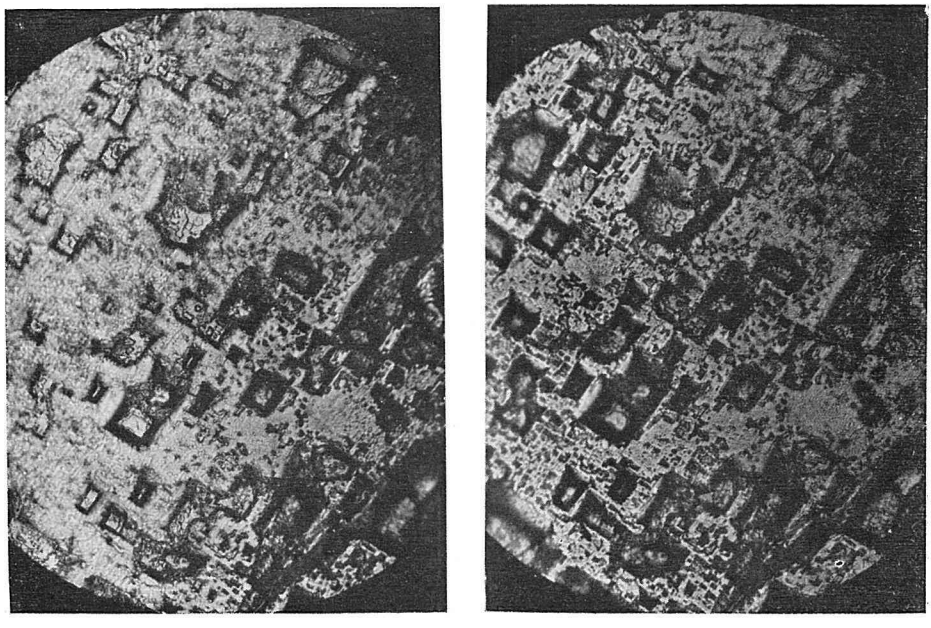


Fig. 2

Rice-hulls (×20)

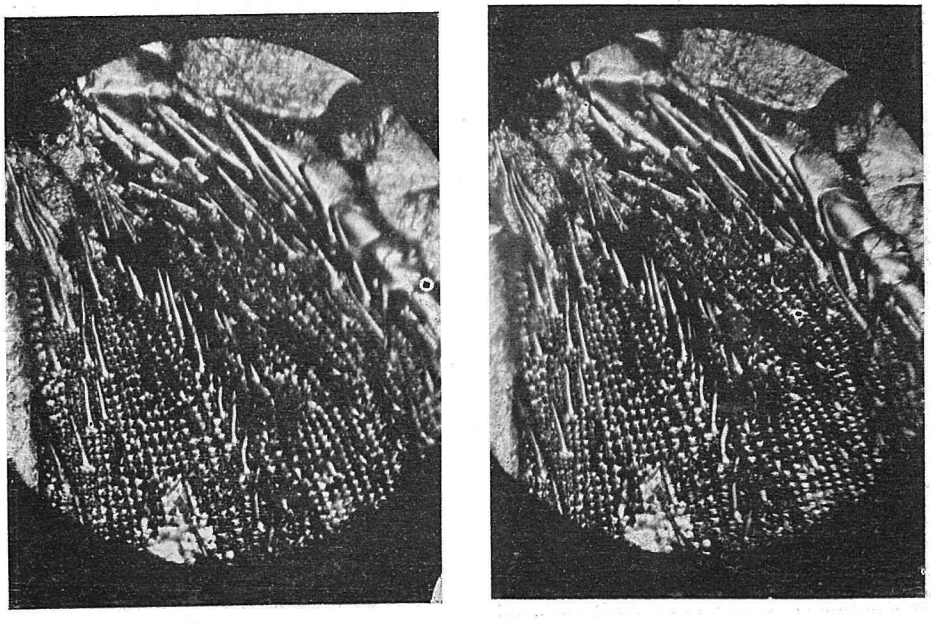


Plate II

Fig. 3
Leaf of clover (×20)

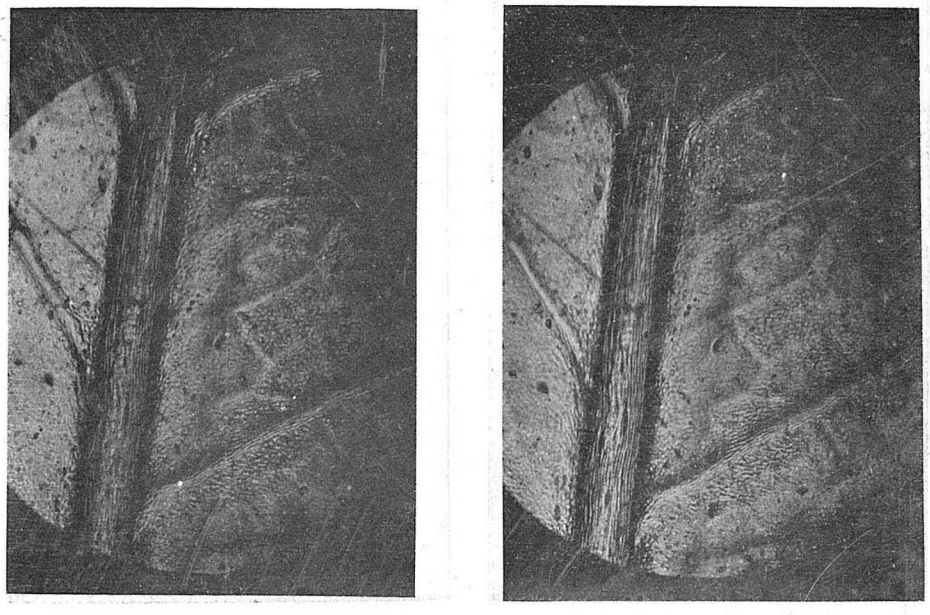


Fig. 4
Fibrous gypsum (×25)