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TECHNIQUES IN THE PHOTOGRAPHY OF FOSSILIZED PLANTS

BY

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TECHNIQUES IN THE PHOTOGRAPHY OF FOSSILIZED PLANTS

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CONTENTS

INTRODUCTION

SEVERAL techniques are described in this paper that are useful in the photographing of fossil plants, but their application is not limited to paleobotanical specimens. The use of New Coccine (an Ansco product), ringlighting, color filters, and interchange of varying exposure and developing times are equally effective in securing good results with specimens in the field of invertebrate paleontology.

To allow uniform comparison between the illustrations figured (Pls. I–III), photographic printing paper of the same sensitivity (AZO No. 3) and one kind of negative material were employed. The negative material (Kodak Contrast Process Ortho) has an orthrochromatic emulsion of very high contrast. Negatives were developed in Kodak DK-50 developer at 68° F., with agitation at 1-minute intervals.

With respect to illumination of the specimens illustrated in the plates, when reflector flood lamps were used, care was taken to place them at a distance from the object that gave the same lightmeter reading as for the ringlight. By so doing, exposure times for both light sources were comparable. The data sheet contains the pertinent information in regard to exposure time, kind of light, emulsion of the film, and so forth, for each figure illustrated.

Figures on the plates are in series of two or three of each specimen, but the last one in each group is not necessarily to be preferred for reproduction purposes. Although this paper illustrates what one can achieve

with certain photographic techniques, it covers a relatively small range of possibilities. In practice, it is paramount to satisfy the intent of the illustrator.

APPLICATION OF NEW COCCINE (Pl. I)

Elimination of unsightly discoloration and the subduing of undesirable features in the background can be obtained through the application of New Coccine. This material is a water-soluble red dye perfected for local control of negative densities. It comes in powder form and is available at most photographic retail stores. In highly diluted solutions it is applied with a brush on the emulsion side of the negative over those areas where greater density of the negative is desired. The dye deposits are built up with a series of weak washes of color, one over the other, until the desired density is reached. One's progress during this operation can be checked by viewing the negative through a green filter (Kodak Wratten No. 61, or a similar filter) from time to time. The required materials and equipment are shown in Figure 3 (Pl. I). The bottle of stock solution contains 8 ounces of liquid New Coccine, made up from the powdered form according to the instructions on the package. Working solutions (in the vials) are further dilutions, one-part stock solution to 10, 20, and 40 parts of water.

Figures 1–2 (Pl. I) show how an unsightly discoloration was eliminated and the background subdued by this dye. Note that such subduing of the background in no way changes its appearance. Every detail of the rock is still visible, yet the specimen itself stands out more clearly in the print (Fig. 2) from the New Coccine-treated negative than in the one (Fig. 1) from the untreated.

Figures 4–5 (Pl. I) are two other examples that illustrate the effectiveness of the New Coccine technique. The specimen to be photographed was surrounded by fragments of fossilized plant material, which tended to distract the eye from the main object. Before the dye treatment (Fig. 4) these were plainly visible; after it (Fig. 5), while still to be seen, they are relegated to a comparatively unimportant place in the background.

Remarks.—New Coccine differs from the widely used "opaque" in that opaquing "blocks out" irrelevant detail, whereas the dye merely changes the density of the negative. Retouching negatives or prints of paleontological specimens is generally frowned upon. This reluctance to employ artificial means to show something which the photographic emulsion did not "see" is shared by many paleontologists. A photograph altered, however cleverly, by a retouching pencil ceases to be a true representation, no matter how pleasing the result may be. Use of New

Coccine does not constitute a retouching process in this sense. It neither adds something, not already visible, to the film negative nor takes anything away from the image. This conforms to the opinion expressed in Triebel's statement (1958, p. 143, my translation) that New Coccine, discriminately used, does not bring about changes in the structure of an object, since it does not add nor subtract anything. It merely changes tone values in a desired manner.

RINGLIGHTING
(Pl. II)

By the old, but still dependable method of trial and error, I found that many fossil plant and invertebrate specimens can be most effectively photographed with a ring-shaped light source. The main distinction between the ringlight employed and conventional lamps is that, owing to its

TABLE I

PHOTOGRAPHIC DATA

Aperture: f32. Negatives: Kodak Contrast Process Ortho.
Developer: Kodak DK-50. Printing paper: AZO No. 3.

Plate	Fig.	Light Source	Exposure Time (minutes)	Developing Time (minutes)	Filter Used	Immersion of the Specimen	Treatment of the Negative
I	1	Ringlight	1½	3½	None	Xylene	None
	2	Ringlight	1½	3½	None	Xylene	New Coccine
	4	Ringlight	1½	3½	None	Xylene	None
	5	Ringlight	1½	3½	None	Xylene	New Coccine
II	1	2 Reflector-flood No. 2	1½	3½	None	Xylene	None
	2	Ringlight	1½	3½	None	Xylene	None
	5	2 Reflector-flood No. 2	1½	3½	None	None	None
	6	Ringlight	1½	3½	None	None	None
III	1	Ringlight	1½	3½	None	None	None
	2	Ringlight	2¼	3½	Yellow K-2	None	None
	3	Ringlight	⅓	9	None	Xylene	None
	4	Ringlight	1½	3½	None	Xylene	None
	5	Ringlight	4	2	None	Xylene	None

circular shape and fluorescence, the light is practically shadowless and closely approaches the character of diffused daylight. Fine-detailed objects like crinoid heads, corals with deep cavities, and so on, respond favorably to ringlighting.

Figures 1 and 5 (Pl. II) are of two specimens each of which was photographed with two No. 2 reflector flood lamps; Figures 2 and 6 are of the same specimens but photographed with a ringlight. In both instances, the top specimen (Figs. 1 and 2) were submerged in xylene.

Figure 3 (Pl. II) shows the ringlight as set for operation; Figure 4 the ringlight and supporting stand. The light itself is part of an inexpensive ceiling fixture, available in any electrical appliance store. A hole, about twice the size of the lens used on the camera, has been cut through the middle of the metal cover. The shiny inside of the cover has been masked with black tape to avoid reflections.

USE OF COLOR FILTERS
(Pl. III, Figs. 1–2)

Greater contrast between the image and its background, which will show off the specimen to better advantage, can be brought about through color filters. Briefly stated, the effect of a colored filter is to subdue its own color. In so doing, it creates a higher contrast between an object of a different color and one of its own. In Figures 1–2 (Pl. III) the specimen was imbedded in yellowish rock. It was first (Fig. 1) photographed without a filter; then (Fig. 2) with a yellow K-2 filter over the lens. With the filter the brown of the specimen was heightened, the yellowish of the rock subdued, and the image shown to greater advantage.

Photographic filters of most common colors can be used. The effect that a certain filter will have on an object can always be checked by viewing the object to be photographed through it. This can be done either by placing the filter in front of the lens and judging the resulting change in the image on the ground glass of the camera, or by hand-holding the filter a few inches above the specimen. If a red filter is selected, the emulsion of the negative material has to be panchromatic.

VARIATION OF EXPOSURE AND DEVELOPING TIMES
(Pl. III, Figs. 3–5)

Interchange of exposure and developing times, depending on whether the object to be photographed is light or dark, improves the quality of a negative. It is a photographic rule of thumb to overexpose and underdevelop a dark object and to underexpose and overdevelop a light object, to emphasize respectively details in dark and light areas. Figures 3–5 (Pl. III) show the effect when length of exposure and development times are varied. The specimen was dark, almost black. In Figure 3, the negative was underexposed and overdeveloped; in Figure 4, it was given normal exposure and development times; and in Figure 5, it was overexposed

and underdeveloped. Improvement of the image brought about by the last is obvious. The method, however, works just as well in reverse. The light-colored object would reveal most detail when the negative was underexposed and overdeveloped, as did the dark-colored one when it was overexposed and underdeveloped.

LITERATURE CITED

TRIEBEL, ERICH. 1958. Die Photographie im Dienste der Mikropaläontologie. *In:* Handbuch der Mikroskopie in der Technik (Hugo Freund, ed.), Band 2, Teil 3, Mikroskopie in der Geology sedimentärer Lagerstätten (Mikropaläontologie), pp. 83–144, 37 figs. Frankfurt am Main, Germany: Umschau Verlag.

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PLATES

EXPLANATION OF PLATE I

(All figures × 1 except as noted)

Application of New Coccine

FIGS. 1–2. Two prints from the same negative before and after treatment with New Coccine, showing the elimination of an unsightly discoloration in the background.

FIG. 3. Materials and equipment used in the treatment of negatives with New Coccine. Scale indicated by man's hand.

FIGS. 4–5. Two prints from the same negative before and after treatment with New Coccine. Treatment with the dye has subdued the background and thus concentrates the observer's attention on the single specimen the author wished to illustrate, rather than on the extraneous fossil-plant material.

PLATE I

1

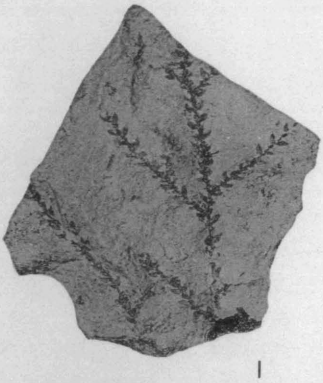
2

3

4

5

PLATE II



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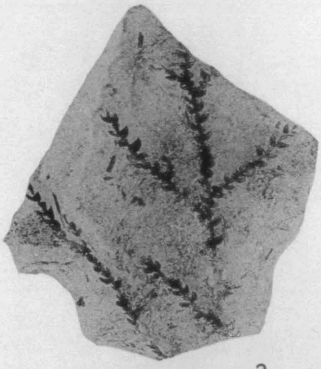

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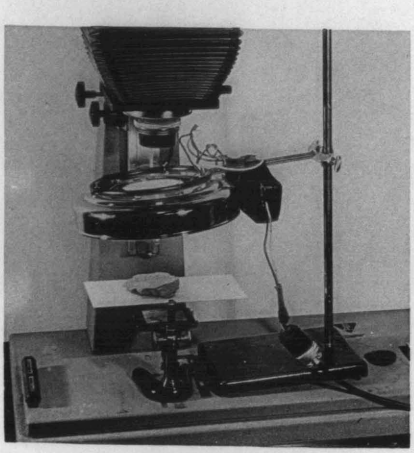

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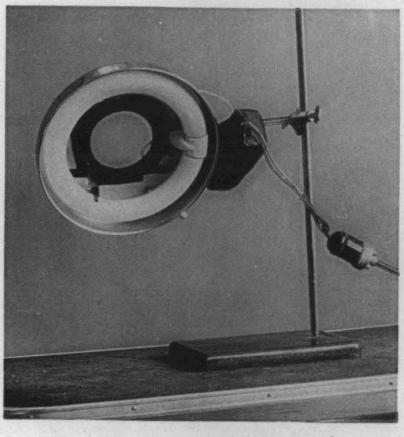

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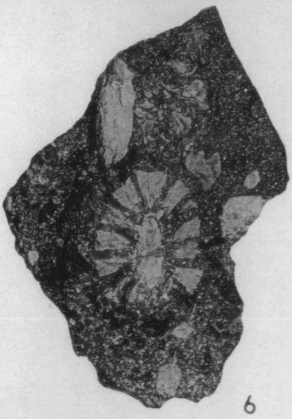

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EXPLANATION OF PLATE II

(All figures × 1 except as noted)

Ringlighting in Photography

FIG. 1. Specimen immersed in xylene and photographed with two No. 2 reflector flood lamps.

FIG. 2. Same specimen as in Figure 1, immersed in xylene and photographed with a fluorescent ringlight.

FIG. 3. Fluorescent ringlight in position for photographing a specimen. Diameter of ring 8 inches.

FIG. 4. Fluorescent ringlight, a ceiling fixture adapted for photography by cutting a round hole in the metal cover and masking it on the inside with black tape to prevent reflections. Diameter of the ring 8 inches.

FIG. 5. Specimen photographed with two No. 2 reflector flood lamps.

FIG. 6. Same specimen as in Figure 5, photographed with a fluorescent ringlight.

EXPLANATION OF PLATE III

(All figures × 1)

Use of Color Filters

FIGS. 1–2. Specimen photographed first without a filter (Fig. 1) and then with a yellow K-2 filter (Fig. 2).

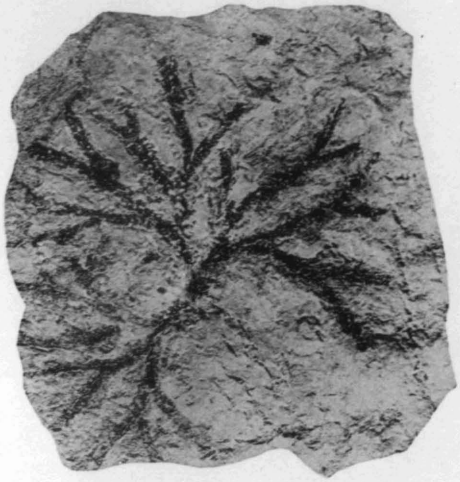
Times of Exposure and Development

FIG. 3. A fossil leaf photographed immersed in xylene; the negative was underexposed and overdeveloped.

FIG. 4. Same specimen as in Figure 3, immersed in xylene and photographed with normal exposure and developing time.

FIG. 5. Same specimen as in Figures 3 and 4, immersed in xylene and the negative overexposed and underdeveloped.

PLATE III



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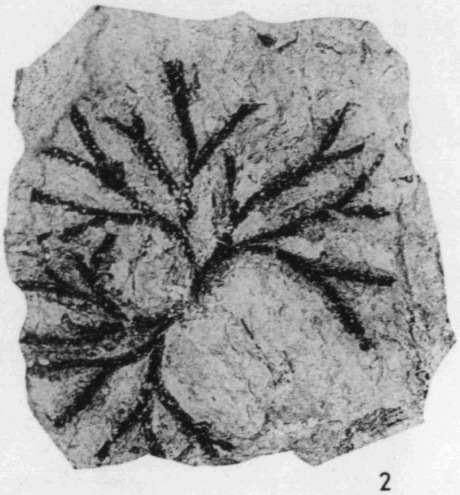

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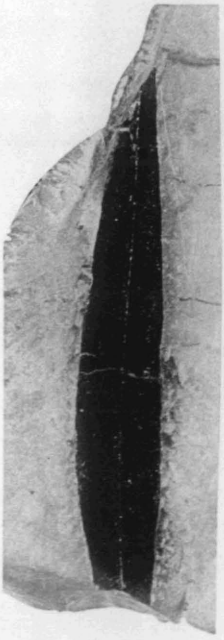

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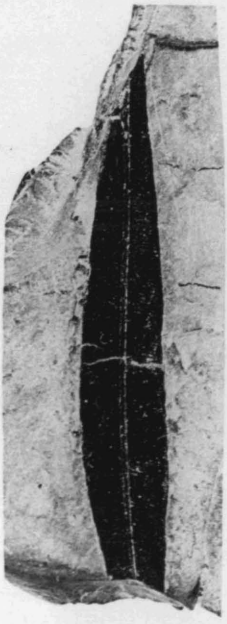

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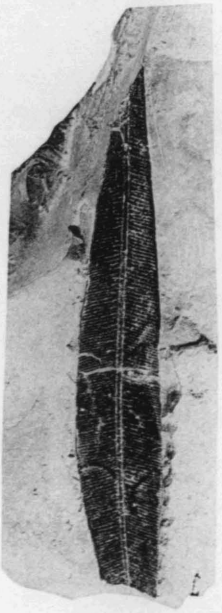

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