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Color in Underwater Photography

I should like to see the twilight world of underwater penetrated but not overpowered.

ABSTRACT: *Techniques for minimizing the limitations inherent in making color photographs underwater include a careful appraisal of (1) depth and distance, (2) film, (3) filtration, (4) lenses, (5) artificial light, (6) angle of approach, and (7) subject matter. Filtration is unnecessary with color negative films because control during the printing process is more flexible and accurate. But the most versatile tool is artificial lighting.*

WATER, WHEN IT SURROUNDS both camera and subject, imposes severe limitations on color photography—even more severe than those imposed by water on black and white photography. In clear open seas blue predominates and a photograph on most color films shows the overcast of this blue. If the water is filled with plankton or silt, the over-all color cast may tend towards green or even brown, but other colors will always give way to this water color filtration. The more water in the total light path, i.e., the distance from the surface to subject to camera, the more complete this overcast of water color. Reds disappear first. Twenty feet of water plays havoc with red. Orange goes next; then yellow. Green holds out to a considerable depth as anyone can testify who has accidentally cut himself at 75 feet and watched the green blood clouding out of his wound.

The photographer who wants to retain as much of the unaffected color as possible without turning to filtration or artificial light must work very close to the subject and in shallow water. Wide angle lenses permit him to work closely enough to retain some color and still stay away from the closeup category.

In some instances the over-all blue or green may be exactly what the photographer prefers in order to preserve a mood of underwater. Journalistically or pictorially, he may even choose to exaggerate the blue mood by using film balanced for tungsten light. If, however, he wants to control color with the idea of retaining some of the color of his subject, he has two main tools: filters and artificial light.

Effective filtration is limited to depths and distances in which the warmer colors have not yet disappeared. For example, in 30 feet of water with the subject less than 10 feet from the camera, a filter in the CCR series, with the possible addition of a CCY, does much to strengthen the colors not yet destroyed but dulled by the blue. As filters are a nuisance to change underwater, I have been tempted to settle for a CC30R. This compromise suits a journalistic approach, but for more exact work, mathematical computations of degrees of filtration can be worked out according to the total light path in optimum sea conditions.

Coles Phinizy, Senior Editor of *Sports Illustrated* Magazine, probably has experimented more with filters underwater than anyone else. He has based his efforts so far on the fact that the diver's eye—with the compensating mechanism of the human mind behind it—sees more color underwater than the film emulsion can register. He wants to establish filtration which will restore the correct psychological color balance—to help the film see what the diver sees. He uses combinations of heavier CCR's and lighter CCY's at various relatively shallow depths.

Underwater filtration is unnecessary with color negative films. They allow a degree of

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color control in printing far more accurate than any combination of filters with transparency film can provide in the rapidly changing undersea conditions.

Left until last in this report is the most versatile of color-control tools when used skillfully—artificial light. Flash bulbs (both clear and blue), photoflood lamps, quartz iodide lamps, and electronic flash are excellent agents of color restoration. Blue flash bulbs and electronic flash approximate the color temperatures of daylight. For short light-to-subject distances they bring out color well. Longer distances reduce their effectiveness. An ideal light-to-subject distance of 5 to 6 feet gives a subtle, pleasing effect of partial restoration but does not overpower the blue underwater feeling. Flash weak enough to be a fill-in and not a main light source is especially effective at this distance.

Clear flash bulbs, or incandescent lamps burning with a warm light, are effective color controllers at greater distances than colder daylight-balanced light sources. The blue of the water acts as a normalizing filter when the lights are used with a daylight film instead of the tungsten film for which they were designed. When too close to the subject, however, the underwater effect can be lost.

Underwater photography is growing out of its adolescence and equipment is becoming more sophisticated. Some day underwater scenics will show subtle color nuances under the grey-blue mantle, and underwater close-ups will modify the fiery reds and mustard yellows of coral in back of startlingly unreal-looking fish to give a more genuine feeling for the fish's watery environment.

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