merely a matter of division or multiplication to calculate the exposure for any given subject.

It is a very difficult matter to lay down any hard and fast table for exposures, but the following is from the writer's experience, based on a plate of a speed varying from 200–300 H.D. (average of 250) in a good light:

| Subject. | Stop. | Time. |
|---|---|---|
| Distant landscape | 8–11 | 1/100 second. |
| Rivers, snow scenes | 8–11 | 1/100 second. |
| Light foreground | 8–11 | 1/25 second. |
| Heavy foreground | 8–11 | 1/5 second. |
| Portraits near windows | 8–11 | 4 seconds. |
| Shady banks, brocks | 8–11 | 1/5–1/2 second. |
| Ravines and under trees | 8–11 | 1/4–1 second. |
| Interiors, light | 8–11 | 5 seconds. |
| Interiors, medium | 8–11 | 60 seconds. |
| Interiors, dark | 8–11 | 30 minutes. |
| Interiors, very dark | 8–11 | 60/100 minutes. |

In photographing interiors with plates a decided improvement will be found by using "backed" plates, which may be purchased from most dealers at a slight advance in price over the unbacked. Failing to procure the article in this form, the dealer will generally suggest the application of a backing preparation contained in a small jar or pot. The glass side of the plate may be coated with:

| | |
|---|---|
| Strong gum solution | 1 oz. |
| Caromel | 1 oz. |
| Burnt sienna (powder) | 1 oz. |

This is applied in the dark room and the plates dried in a dark box. It is a good plan to use the plate box by securing small blocks of wood to the side; or they may be stood on a drying rack and then enclosed and protected from the light during the drying period.

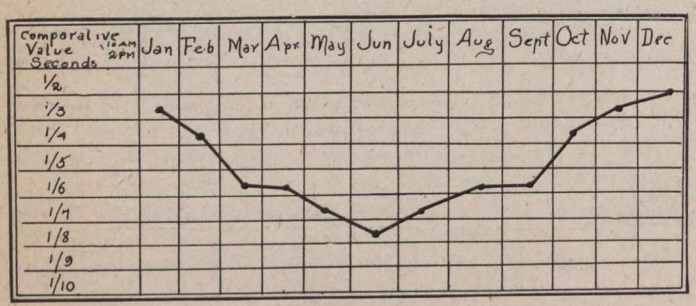


**Fig. 3.**

**Orthochromatic Photography.**—The average photographer is usually not long in discovering that his pictures do do not reproduce in the corresponding shades of brilliancy as compared with the colors of the object. This is due to the varying actinic powers of the various light rays, which is more prominent in the blue and violet light than in the yellow and reds. If an exposure is made of any brilliant colored object the resulting negative will be denser in the blue portions and thinner in the red portions than the actual color comparison appeared in nature. To remedy this an orthochromatic plate was introduced, which consisted of an ordinary plate immersed in a solution of certain analine dyes which left a slight yellowish stain on the film, and to a certain extent held back the blue and violet rays while the red, yellow and brown rays were affecting the silver solution. The color correcting properties of an orthochromatic plate are a distinct advance over an "ordinary" plate, but the full correcting properties are only brought out when a yellow screen is placed over the lens either on the front or rear combinations. These yellow screens are usually sold with a factor generally expressed as 2x, 4x, 6x or 8x, and often higher. This factor represents the length of time in which to increase the normal exposure to secure normal results. As an example, let us suppose a subject is arranged and the normal exposure is found to be 1/50 second; then, if the first screen were used 2x it would be necessary to double the exposure, which would be 2/50 or 1/25 second. Similarly the others would be used 4/50, 4x; 6/50, 6x; 8/50, 8x. Many camera shutters do not allow of such a fine range of adjustment as above; however, the average shutters purchased on cameras of today are automatic. As a rule, the speed possibilities are limited to 1/100, 1/50, 1/25, 1/5, ½, 1 seconds, and should the operator require an exposure of 1/12 second he may secure this speed or length of opening by quickly releasing his shutter twice when set at 1/25. Of course this does not give satisfactory results when the subject is in motion, but will illustrate the method of using the shutter to the greatest advantage.

Orthochromatic plates are, of course, much more sensitive to red light than "ordinary" ones, consequently must be handled during loading, unloading, and development with much more care than that bestowed on ordinary plates. They should be developed with pyro soda or pyro metal developers, as it is extremely difficult to secure satisfactory results with metal quinol (M.Q.) on orthochromatic plates. A good formulae for pyro soda and pyro metal is compounded thus:

| **Pyro Soda—** | | Metric. |
|---|---|---|
| Pyro | 2 grains | 4 grams |
| Sodium sulphite | 12 grains | 24 grams |
| Sodium carbonate (cryst.)* | 22 grains | 44 grams |
| Potassium bromide | ½ grain | 1 gram |
| Water | 1 ounce | 1 litre |
| Factor | 6 | |

| **Pyro Metal—** | | Metric. |
|---|---|---|
| Pyro | 1½ grains | 3 grams |
| Metal | 1 grain | 2 grams |
| Pot Metabisulphide | 3 grains | 6 grains |
| Pot bromide | ½ grain | 1 gram |
| Sodium carbonate | 48 grains | 96 grams |
| Water | 1 ounce | 1 litre |
| Factor | 9 | |

These formulae are given in ounce proportions and, if made to the above strength, will answer to the factor quoted below each one, provided that the water is not too cold. This factor is a most useful feature of development, doing away with all guess work. It is used by noting the time in seconds between the flowing of the developer on the plate and the **first** appearance of the image; this time is then multiplied by the factor, the plate and the tray covered for the number of seconds resulting from the multiplication, and at the end of the time specified the development will be at its best for that particular plate or film. Example: Pyro soda developer, factor 6; time from first appearance of highlights to flowing developer 50 seconds. Then 50 seconds × factor 6 = 300; 300 seconds = 5 minutes = time to leave plate in dish covered.

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*When sodium carbonate (washing soda) is purchased in crystals it contains considerable water of crystalization which reduced the available $Na_2Co_3$ considerably. If the dry powder is purchased divide the figure in the formulae by 2.5, which gives 9 grams to the ounce. The pyro is the pyrogallic acid of commerce, usually sold at 25.30 cents per ounce. It is, however, very bulky—an ounce of the loose acid occupying as much space as 15 or 20 ounces of water.