Upon having unbolted this system, pieces of commercial Welsbach mantle about one inch square are placed on both sides of the tongues T and are ashed with a small, pointed gas flame. Care must be taken that these pieces of mantle be quite free, *i.e.*, not clamped, since otherwise the mantle will tear upon warping when heated. Having reassembled the system it is introduced into the tube at G—the opening being closed subsequently with a waxed-in plug. Connections (not shown) to vacuum pump, manometer, etc., are made at H. The opening I at the upper end of the tube is closed with de Khotinsky cement.

At a potential of about 10,000 volts the discharge strikes if the pressure be 30 cm of mercury or less. The glow discharge raises the temperature of the mantle to incandescence. The current is not carried by the mantle, since the radiant emission is not affected measurably when the mantle has a crack running squarely across the line of discharge. Other things being equal, the discharge current is virtually independent of the gas pressure, *i.e.*, between 25 cm and 1 cm of mercury. However, the luminosity, which is very feeble at low pressures, becomes intense at higher pressures. While the discharge, once initiated, will proceed even at atmospheric pressure, the light emission is somewhat unsteady. Probably the most satisfactory operation at moderate intensities is realized at a pressure of 20 cm and a current of 40 m.a. Under these conditions the intensity of radiation is remarkably constant—being limited only by the voltage constancy of the alternating current supply.

As previously stated, for the visible and near infrared the high-intensity mantle and rock-salt window are used, while, for the far infrared, the low-intensity mantle and quartz window are employed. The usefulness of this new lamp in vacuum spectrographs is evident.

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LOCALIZED VITAL STAINING OF TELEOSTEAN EMBRYOS

SLIGHT modifications of the technique devised by Vogt[1] for local vital staining of amphibian embryos have been most practicable in the study of teleostean development. Pasteels[2,3] has used Vogt's method in studying the blastula of the trout egg. In the present investigation the cleavage blastomeres as well as later stages have been locally stained by applying stain-impregnated Cellophane. This is employed as the carrier of the stain in place of the agar used in Vogt's technique. It is, however, prepared in the same manner, colorless Cellophane being treated with aqueous solution (1 to 5 per cent.) of the dye. The embryos take up the stain just as readily from Cellophane as from agar. In addition, Cellophane is not a bacterial medium, it does not swell, it is more easily cut to a desired shape which it maintains, and it is more rigid and more easily manipulated than agar.

Nile blue sulfate and neutral red are both satisfactory for staining the teleostean blastoderm. Fundulus eggs take up the vital dye far more readily when handled in a solution of double-strength Ringer's solution than when in normal Ringer's solution or seawater. Normal Ringer's solution is favorable for use when staining perch eggs. It has been found that Nile blue stain remains definitely localized for a longer period of time when used in combination with neutral red than when used alone. In work on Fundulus, the greatest degree of success was obtained by staining the blastoderms with Cellophane that was treated in a mixture of equal parts of 1 per cent. neutral red and 1 per cent. Nile blue.

When the early blastomeres of Fundulus are stained, the dye is retained in cell inclusions throughout the blastomere to which the Cellophane is applied. The inclusions are first purple in color, but become blue in a few hours; the blue remains localized throughout gastrulation and is visible even when the stained cells form yolk-sac epithelium. Experiments performed by this method show not only that the embryonic axis does not necessarily coincide with the axis of the first cleavage plane, but that it frequently follows the second plane of cleavage or an intermediate axis.

When stain is applied to the blastula, the dye remains localized until after the differentiation of somites and brain-vesicles, and even after its diffusion the white chromatophores of the stained region contain pale blue dye. This method is applicable to the study of the extensive migrations which the blastular cells undergo in attaining their definitive locations in the embryonic shield. It has also afforded proof by direct observation that during gastrulation cellular materials pass from extra-embryonic regions into the shield at its anterior part as well as at the blastoporic lip.

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