MODIFICATION OF THE KAPLAN SHAKE APPARATUS FOR ALGAL GROWTH

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ABSTRACT. — The design of an illuminated shake culture apparatus for algal growth studies is described. Growth of *Chlorella pyrenoidosa* is uniform in all shaker positions and is linear with time.

The Kaplan shake apparatus (Kaplan, 1956) originally designed for fungal studies, was modified to provide an illuminated shake unit suitable for studies of algal growth. Such a unit is

satisfactory for instructional use in the laboratory where less-carefully-controlled conditions prevail.

A unit (Fig. 1) was built to provide the rotary motion found in the Kaplan shake apparatus but was modified to include a second, easily removable platform as well as an illuminator. This permits the use of platforms having holders for flasks of various sizes (48

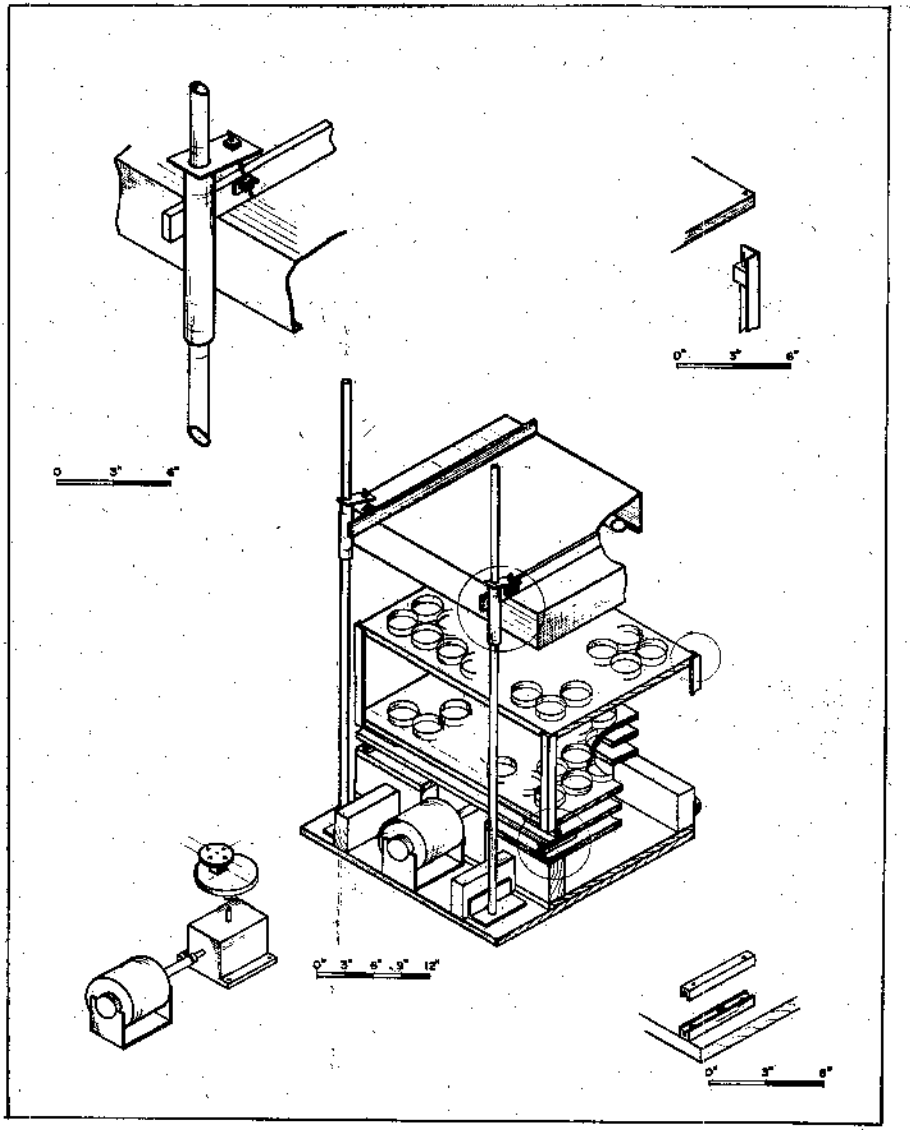

FIGURE 1. — Diagram of the modified Kaplan shake apparatus. The apparatus shown is equipped with platforms each having a capacity of 48 125-ml Erlenmeyer flasks. Center, rear view of the apparatus; upper left, detail of the method used to hold, and to raise and lower the illuminator; upper right, detail for mounting upper platform; lower left, detail of the drive mechanism; and lower right, detail of channels with ball bearings.

holders for 125 ml Erlenmeyer flasks). The illuminator is adjustable with respect to height above the level of the culture flasks. In this way, addition or removal of culture flasks is facilitated. Raising or lowering the illuminator controls the light intensity. Light is provided by four Gro-lux fluorescent tubes wired in parallel. When the lamps are 7 inches above the platform, the light intensity varies from about 200 foot candles at the outer edges and corners to 300 foot candles in the center of the platform. The apparatus is powered with a ¼ hp motor and the speed (110 rpm) is maintained with a gear-box.

This shake culture apparatus has been employed in studies of growth of the green algae *Chlorella pyrenoidosa*. When grown on modified Chu medium (Gerloff et al., 1952), the algal cultures attained a dry weight of about 15 mg per 50 ml of nutrient medium in 4 days. Growth was linearly related to time. Growth, in terms of dry weight yield, was uniform in flasks whether they were in the center of the illuminated platform or at the edge, indicating that variation in incident light was not limiting growth.

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