Solutions of these resins were also used in making permanent mounts of moulds. The slide was first covered with a uniform layer of the resin in precisely the same manner as described above. The film was then air dried for two to three minutes, at the end of which time it still presented a slightly sticky surface. This surface was then impregnated with the fungus in one of two ways. Either the resin side of the slide was laid gently on the colony, removed and air dried, or a portion of the colony was "fished out" with a platinum loop and these fragments placed on the partially solidified resinous layer, allowing the latter to air dry. Then, employing the methods of the mycologist, the organism was fixed, using any solution which has as a solvent, water, *e.g.*, mercuric chloride—formaldehyde solution. A fixing agent having an organic solvent can not be used because of its effect upon the resin. The preparation was then stained, applying any of the dyes used in aqueous solution, such as safranin, erythrosin or fuchsin.

It is believed that the application of the synthetic resin is superior to the use of Canada balsam from the standpoint of ease of manipulation, simplicity, rapidity and cost.

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A PRACTICAL DEVICE FOR THE RAPID QUANTITATIVE DETERMINATION OF PLANT PIGMENTS

IF the wave-length of the light employed in measuring the absorption of light by a solution is restricted to one of the absorption bands of the solution, the specific transmissive index, symbolized by k, is expressed closely by the equation,

$$k \equiv -\log_{10} T,$$

in which T is the transmittancy.

If, for practical reasons, the wave-lengths of the light employed can not be restricted to a single absorption band, the relation between the light absorbed and the concentration can not be expressed in so simple a manner. The relative transmission can, however, be plotted against the relative concentration; and the concentration of an unknown solution can be determined from the known relative transmission. Evidently, the ideal conditions should be approached as nearly as possible.

In the device we employed, a filter was used, that permitted the passage of only the light having wave-lengths ranging from 4,000 to 5,000 Angstrom units. All three plant pigments have absorption bands in this region. The filter was very dense, so that it was necessary to use a powerful light source.

A standard projection lantern having a 500-watt lamp was used. The condenser lenses and the projection lens were set so that the beam of light that fell upon the absorption cell containing the solution was plane parallel. The absorption cell was the kind used in spectrometry. It was in the form of a parallelopipedon and was closed with a glass stopper. Two such cells were mounted in such a manner that the one could quickly be interchanged for the other. The transmitted light was registered by means of a microammeter which recorded the current produced by a photronic cell after being excited by the transmitted light. When the two absorption cells were filled with water, they registered equally 50 arbitrary units when they stood in the same relative position with respect to the optical system and the photo-electric cell.

In practice, one cell was filled with water and the other with the solution to be studied. By means of a shutter device, the light fell upon the absorption cell for only a short time while a test was being made. The light source was kept constant by properly balancing the electrical system. The water reading was made before and after each solution reading. When the solution reading was multiplied by 2 the percentage transmission was obtained when referred to water, since the water was 50.

Standard solutions were prepared for all three plant pigments, using the pure chlorophyll, xanthophyll and carotene. The solutions ranged in intervals of 2.5 per cent. from 0 to 10 per cent., and in 5 per cent. intervals from 10 per cent. to 100 per cent. The 100 per cent. chlorophyll solution represented 5 milligrams per 100 cc of solution, while the 100 per cent. for the other two pigments represented 0.5 milligrams per 100 cc of solution. The values obtained were plotted against the known concentration, and a graph for each pigment was drawn. From the graphs, tables were made that made it possible to read quickly the concentration of any unknown solution from the relative per cent. transmission. Care was taken that all parts of the instrument were constantly in the same position.

The probable error was calculated and was found to be less than 2 per cent.

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