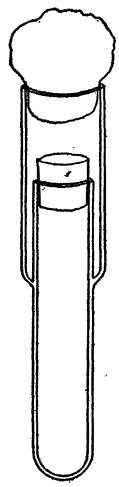
ing each time to avoid infection and is time consuming. Used in this operation the double-necked tube



is supported in the ice pack at an angle of 45°. When the inner plug has once been removed it is left out, the outer cotton plug alone being used. This may freely be removed and replaced many times without flaming. The tube can thus be used throughout the operation (in our case thirty cultures) without removal from the ice pack, with much saving of time and no danger of infection. Even in experiments where heparin is used to prevent clotting and the ice pack dispensed with the double-necked tube saves much time and is an additional precaution against contamination.

As will be seen from the diagram this tube consists of a small test-tube 7½ cms in length, 1½ cms in diameter and rounded off at one end. A collar is fused to this tube about 2 cms from the open end. It projects 3 cms beyond the open end of the inner tube. The jacket has a total length of 5 cms and a diameter of 2 cms.

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SPECIAL ARTICLES

VITAMIN B_2

WHEREAS considerable progress has been made on the concentration of vitamin B_1, comparatively little work has been reported on the purification and concentration of vitamin B_2. Within the last year only two communications, one by Chick and Roscoe,[1] and the other by Narayanan and Drummond,[2] have appeared on this subject. In the first paper a partial separation of the B_2 fraction from B_1 is reported. The process leading to the separation was very complicated, involving many steps. In the second paper, which has appeared very recently, vitamin B_2 is active in daily doses of 0.006 gm.

Over a year ago, we succeeded in separating the B_2 fraction from B_1 in a very simple way. Itself added to a vitamin B-free diet, it did not maintain growth of white rats; with 0.00015 to 0.0002 gm of our vitamin B_1 fraction, it maintained normal growth.

Fraction B_1 is adsorbed on silica gel at pH 3. The filtrate is rich in vitamin B_2, but still contains some vitamin B_1. By precipitation with acetone a material is obtained of which daily doses of 0.015 gm in addition to 0.0002 gm of B_1, both added to the standard diet, suffice to maintain normal growth of white rats. By repeating the extraction six times, a material is obtained from the filtrate of which daily doses of 0.005 gm are required. Finally, when this material is dissolved in water and precipitated with alcohol containing one per cent. of hydroiodic acid, a material is obtained of which daily doses of 0.0007 gm suffice to maintain normal growth of white rats.

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1. Chick, H., and Roscoe, M. H., *Biochem. J.*, 23: 504 (1929).

2. Narayanan, B. T., and Drummond, J. C., *Biochem. J.*, 24: 19 (1930).

THE BEHAVIOR OF WINTER WHEAT IN ARTIFICIAL ENVIRONMENTS

IN physiological investigations of diseased as well as healthy winter wheat plants, frequently it has not been possible to obtain satisfactory results with the plants produced in greenhouses and experimental culture chambers. Such plants produce abnormally long leaves and leaf sheaths, and tillering tends to be reduced during the early growth stage (predormant stage) previous to the stage of winter dormancy as compared with plants grown in the open. These abnormalities have made it practically impossible to study the rosette phase of the wheat-mosaic disease under controlled conditions throughout the year, and to obtain satisfactory heading in winter varieties.

In 1925, studies were started with the definite aim of determining methods for obtaining normal winter wheat, especially during the predormant growth stage in experimental culture chambers.

As a basis for determining normal development, measurements were made on field-grown Harvest