form. It is not inactivated by refluxing with acidulated methanol, but this process gives an active compound which is chloroform soluble. It is stable under treatment by hydrochloric acid and sodium hydroxide, is readily adsorbed by animal char and dialyzes readily through a collodion membrane. It is thermostable but is rendered completely inactive by nitrous acid.

A culture of *Saccharomyces cerevisiae* obtained from Dr. L. H. Leonian grew rapidly in the "B medium" used by Robbins and Schmidt[4] if a little of the staled medium was first added. Without the addition of the staled solution this "B solution" supported only a sparse development of the yeast.

It is known that vitamin H deficiency injury is induced in rats by a diet containing too much raw egg white.[5] A recent report states that raw egg albumen will also inactivate biotin *in vitro*. A test somewhat similar to that of Eakin, Snell and Williams[6] was applied to the staled medium. The white of a fresh egg and 10 ml of an aqueous solution of a concentrate of the staled medium were autoclaved for 20 minutes. The required aliquots of dextrose and minerals were then added and the solution re-autoclaved. Both *D. zeae* and *D. macrospora* grew well in this medium. Raw egg white added aseptically to a 500 ml of sterile medium containing 10 ml of staled solution completely inhibited growth of *D. macrospora* and markedly reduced growth by *D. zeae*.

These properties of the staled concentrate are very similar to many of those of vitamin H and coenzyme R which now are considered identical with biotin.[7, 8]

The details of the work on which the foregoing statements are based will be contained in a thesis submitted by the junior author.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

A MODIFIED PHOTRONREFLECTOMETER FOR USE WITH TEST-TUBES[1]

THE substitution of test-tubes for refraction cells in photronreflectometric turbidity determinations has many desirable advantages, such as the simplification of technics, the elimination of the cost of the refraction cells and the availability of test-tubes.

One of the difficulties in adapting the use of test-tubes for photoelectric measurements has been the inherently poor optical qualities of the rounded sides of the tubes. This difficulty has been largely eliminated in the design of the "test-tube photronreflectometer," since a beam of light is directed up through the bottom of the test-tube instead of through the sides as in all conventional designs.

If an optically clear solution is placed in a test-tube and a beam of light is directed up through it the rounded bottom of the test-tube acts as a condensing lens and the light passes up through the solution. Since little or no light is reflected, the photronic cell, which is set at a 90° angle to the test-tube, is not activated and a zero reading is obtained on the galvanometer. If, however, a turbid solution is placed in the test-tube some of the light passing up through is reflected by the suspended particles and falls on the active surface of the photronic cell.

The amount of current generated by the photronic cell is dependent on the amount of light reaching it; this in turn is dependent on the number of particles in the suspension. This relationship holds over a range of turbidities—the lower limit of which is determined by the amount of light put through the system, the sensitivity of the photronic cell and the sensitivity of the recording galvanometer; the upper limit of which is determined by the factor of adsorption of light in too dense suspensions.

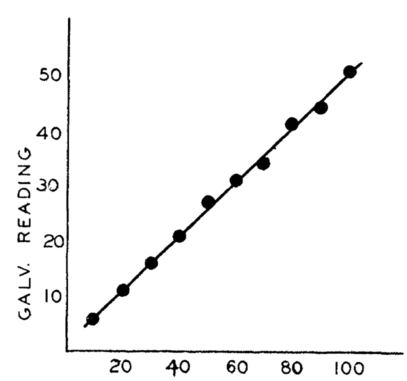

FIG. 1

Fig. 1 is a typical sample of a plot of galvanometer readings against known percentage dilutions of a bac-

[4] W. J. Robbins and Mary B. Schmidt, *Bull. Torrey Bot. Club*, 66: 139–50, 1939.
[5] Paul György, *Jour. Biol. Chem.*, 131: 733–44, 1939.
[6] Robert E. Eakin, Esmond E. Snell and R. J. Williams, *Jour. Biol. Chem.*, 136: 801–02, 1940.
[1] R. L. Libby, *Jour. Immunol.*, 34: 71–73, 1938.
[7] P. M. West and P. W. Wilson, SCIENCE, 89: 607–08, 1939.
[8] Paul György, Catharine S. Rose, Klaus Hofmann, Donald B. Melville and Vincent du Vigneaud, SCIENCE, 92: 609, 1940.

terial suspension. As indicated, a linear relationship is obtained between the galvanometer reading and the turbidity of the solution over a range of galvanometer readings from 10 to 60.

A 32 candlepower, 6-volt lamp furnished the light source. Current for the lamp was supplied by a constant current voltage regulator. A galvanometer with a sensitivity of 1 mm deflection per 0.125 microamperes was used to record the current generated by the photronic cell. Round bottom 100×13 mm soft glass or pyrex test-tubes were used to hold the turbid solutions.

In checking several hundred of the above test-tubes it was found that only 1 in 10 gave a deviation in reading of over ± 1.0 per cent. with a constant suspension.

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AN IMPROVED WATER BOTTLE FOR SMALL "CAGED" ANIMALS

INVESTIGATORS working with albino rats are constantly aware of the inefficiency of the various types of water bottles necessary for large stock cages. Containers which have an opening large enough for the animal to enter its head likewise serve as receptacles for excreta. An improvement over this type of container is the inverted bottle carrying a straight glass tube. Yet, it, too, offers disadvantages, since proper functioning depends on an equal pressure both inside and out. Thus, whenever from one third to one half of the contents are consumed, a vigorous regurgitation is initiated and continues until the container is empty. As a result of such action, the animals may go several hours without water or other liquids. The cages become and remain wet, which gives rise to obnoxious odors and contamination. This problem is particularly evident when the attendants find it impossible to keep a close check on the water bottles.

To meet the problem of inefficient water bottles for rats, an adaptable unit has been devised. The apparatus required is simple and can be put together from materials available in the laboratory. The apparatus used here has a capacity of approximately 500 cc, a number eleven stopper and 7 mm glass tubing. This improved container, schematically shown in Fig. 1, will not leak or regurgitate when properly adjusted. Tubes C and D should be of equal length when in place. This is best attained after the end C has been introduced through the stopper. Place the inside of the stopper along the straight edge of a laboratory table, thus permitting the ends of the tubes C and D to rest flat against the top surface of the table. Mark both tubes at an even length from the straight edge, cut and fire polish. Tube A–B should be a short close bend, and the length between the center of the bend to the end of B from 1 to $1\frac{1}{2}$ inches.

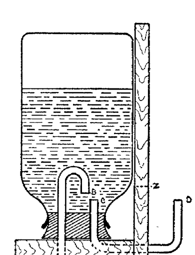

FIG. 1

Fill the bottle, put stopper in place and invert. Tube A–B will serve as an air inlet. By means of the inverted siphon C–D the water will flow through the tube without the aid of force. However, since C and D are at the same height the water will not flow beyond D without additional pressure. This pressure is supplied through the air inlet tube A–B, whenever the animal removes the slightest amount of water. The ideal distance between B and C is $\frac{1}{8}$ inch. In the event that the contents flow too freely, the distance between B and C should be shortened. On the other hand, should the supply be insufficient the distance between B and C should be lengthened. The container can be attached to the side of the cage. However, the apparatus is conveniently handled when allowed to rest on a simple rack, as shown in Fig. 1. The rack can be made from two pieces of wood nailed at right angles, and permanently fastened to the side of the cage by screws or bolts. It is necessary to saw a block of wood one quarter inch wide from the center of the rack through xyz for the passage of the two tubes. This will allow the bottle to slide in place, thus permitting tube D to enter the cage.

Through evaporation, removal of water by the animals or changes in temperature, the equilibrium is maintained. The balance is most delicate and remains constant when properly adjusted.

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