after ten days, with larvae reduced to a minimum. By the end of three weeks her condition was markedly improved and the stools were formed. In less than five weeks she had left the hospital, having gained several pounds and with evidence pointing toward complete recovery.

Thirty-two heavy strains of Strongyloides were cultured and examined daily over a period covering approximately two and a half months. Five of these were duplicate strains from the same individuals. Of the total number, twenty-three strains showed direct development only, four showed indirect development only and five consisted of combined types. Clinical importance is attached to those direct strains which metamorphose into the filariform larvae without a previous feeding period. Larvae of this filariform type are frequently passed in stools of individuals showing clinical symptoms. Evidence is accumulating to indicate that this is the type which is responsible for hyperinfection of individuals.

RARE PARASITES ENCOUNTERED

Balantidium coli. This ciliate protozoon was encountered in four cases during the investigations. These cases gave a history of probable contamination from porcine sources. Red spider monkeys in the animal house also had this same infestation.

Hepaticola hepatica. This infection is common in rats and mice in various parts of the world but there is only one human case on record, from autopsy of a British soldier in India. Nine cases of this rare human infestation were diagnosed from the Chagres River Basin.

Gongylonema pulchrum. One case of this rare human infestation was diagnosed on the basis of eggs from the Chagres River Basin.

EXAMINATION OF ANIMALS IN THE JUNGLE OF DARIEN PROVINCE

Altogether 45 animals were examined during the trip up the Tiura River in Darien Province. The majority of these were monkeys. Filarial infections were found in two types, the marmoset and the white faced monkeys. In the poncho (*Hydrochoerus hydrochoerus*) amphistomate flukes were obtained from the abdominal cavity. This is possibly the same fluke which was recovered by Dr. Clark from the wild hog in the Coto region of Panama in February, 1929. Other helminth and protozoa parasites were obtained from the agoutis, the ponchos and the monkeys.

CONCLUSIONS

The material obtained from these investigations has indicated to the writer that the area studied offers extremely valuable opportunities for helminthological and protozoological work. The data obtained will serve as the basis for several important papers which will be published in the near future.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

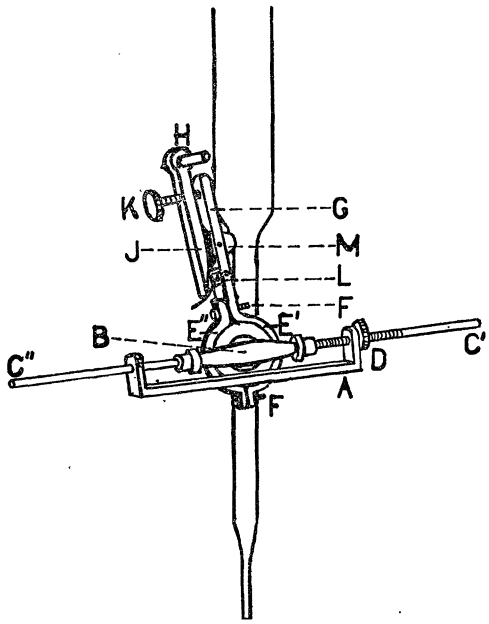
AN ADJUSTABLE DROP-CONTROL FOR BURETTES

FOR some time past, the writer has been performing micro-titrations to determine free and total acidities on one half to one cc of gastric juice. To insure an accuracy of better than one per cent., the burette employed was graduated so that one could estimate volumes to 0.002 cc. Since end-points were determined by comparison with colorimetric standards of definite pH, it was necessary to use drops of this order of magnitude in approaching the end-point. In order to obtain such drops, the burette tip was replaced by a Leuer adapter and a hypodermic needle (chromium plated or non-rusting steel) of such size as to give a freely falling drop of no more than 0.01 cc. Then, by opening the stopcock very slightly a small fraction of a drop was released, which could be taken off quantitatively with a stirring rod. However, the time and energy consumed by this procedure were so great as to cause an appreciable reduction in the efficiency of the worker engaged in these titrations. Therefore, a mechanical drop-control became imperative.

Such a device has been described by Müller[1] for use in potentiometric titrations where drops of uniform size are required. On attempting to employ his contrivance, two difficulties were encountered. Occasionally, the stopcock opened accidentally, due to a falling of the heavier end of the drop-control handle attached to the stopcock plug. Also, since it was necessary to add fractions of a freely falling drop, it was important that the rate of drop formation be readily controllable—which was not true in this case. Consequently, the requisite changes in the principle of Müller's device were made, and as the resulting instrument has proved very satisfactory for more than a year, it is described herewith.

It consists of two parts as indicated in the figure. The stationary part (EGJH), which carries the stop

[1] Erich Müller, "Elektrometrische (Potentiometrische) Massanalyse," 4th ed., 1926, p. 67.



(H), is attached to the sleeve of the stopcock; the movable handle (A), which strikes against the stop, is attached to the glass plug. Both parts are made of brass. To insure rigidity of the handle, the rod (C′) can be screwed tight against the handle of the plug (B) and can be clamped there by means of the nut (D).

The stationary part of the drop-control is clamped to the wider end of the glass sleeve by means of the semi-circular bands (E′ and E″), which are fastened together by two screws (F). One of these bands (E′) is an extension of the body (G); the other band is separate from it. The rod (H) serves as a stop to the rotating rod (C′ or C″) when it is desired to release a drop of reagent. This stop is set perpendicularly into the arm (J) which in turn is supported by (G). Support is effected by means of the projection (M) which passes through a hole in (G) and is held there by a pin, thus permitting a slight rotation of the arm (J) about the pin as fulcrum. The rotation is controlled by the screw (K) which passes through (J) and rests against (G). Movements of the arm, imparted by the screw, are opposed by the spring (L), which is held in a second hole in (G) by means of a pin. The free end of the spring is extended in such a way as to press against the lower end of (J).

The chief precaution to be taken in attaching the movable part to the plug is to have the glass handle fairly well centered with respect to (A). In attaching the stationary part, the body (G) is set at such an angle to the vertical that when the rod (C″) touches the stop (H), drops will flow from the burette tip at a slow but steady rate. Then, by means of the adjusting screw (K), the stop can be set at such a position as to permit the formation of freely falling drops at either a rapid rate or else so slowly as to enable the operator to remove small fractions of a drop at his convenience. On the other hand, it is always possible to get a steady flow of reagent from the burette by reversing the direction of rotation of (A) so that (C′–C″) is vertical. A strip of heavy rubber sheeting interposed between the semi-circular bands and the stopcock will prevent the latter from cracking.

The writer wishes to express his obligations to the departmental machinist, Willy Appledorn, for his assistance in constructing this instrument.

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SPECIAL ARTICLES

THE RELATIONSHIP BETWEEN ELECTRICAL DIFFERENCES OF POTENTIAL IN THE SKIN AND NORMAL BASAL METABOLISM

IN 1919 and 1920 Waller published the results of his researches on emotive phenomena and their correlation with variation of conductance of the palm of the hand. In general, Waller's experimental observations substantiated his view that there is "a close association between nutrition and what we may call emotion" and that there is reason for placing the "special class of emotive effects in the general category of trophic phenomena."[1] The experiments of Waller evidenced, therefore, a correlation between the electric resistance (or conductance) of the skin and nutritional changes and indicated that the emotive effect varied considerably in magnitude depending on whether the subject was rested or fatigued. No correlation between electrical conductance and general metabolic activity was attempted.

Waller was of the opinion that emotive effect is to be regarded as due to diminished resistance (increased conductance) rather than to increased electromotive force. However, Lund[2] and his colleagues

[1] A. D. Waller, "Concerning Emotive Phenomena. Part II. Periodic Variations of Conductance of the Palm of the Human Hand," *Proc. Roy. Soc. London*, Series B, 91: 17–31, 1920.

[2] E. J. Lund and W. A. Kenyon, "Relation between Continuous Bioelectric Currents and Cell Respiration. I.