cercariae obtained from specimens of *Blanfordia nosophora* from Japan. In both cases serial microscopic sections of snails so exposed showed the successful penetration of the snail by the miracidia. The biological similarity of the Japanese and Chinese forms of *Schistosoma japonicum* is therefore demonstrated.

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Factors controlling the electrolyte and water distribution in the blood.

By D. D. VAN SLYKE, HSIEN WU, and FRANKLIN C. McLEAN.

[*From the Laboratory of Physiological Chemistry and the Chemical Laboratory of the Department of Medicine, Peking Union Medical College, Peking, China.*]

In combining the known facts to form an inclusive quantitative expression of the phenomena of electrolyte and water distribution we have assumed for the blood the validity of the following physico-chemical laws:

I. At and near the neutral point all strong alkalies are in the form of salts. At blood reaction therefore the total base may be represented as BP + BA, when BP represents the alkali protein salts, BA the salts bound by the alkali with other negative radicles, chiefly Cl' and HCO_3'.

II. The law of Donnan governing the influence of non-permeating ions on the distribution of permeating ions on the two sides of a membrane holds for the membranes of the blood cells. Donnan's theory has been provided with a sound basis of experimental proof by Donnan, by Proctor and Wilson, and especially by Loeb's recent study on the osomotic and electrical behaviors of protein solutions.

III. The osmotic activity of each solute is proportional to the ratio $n : N$, of gram molecules of solute to gram molecules of water. The presence of the serum proteins, according to the vapor tension determinations of Neuhausen, does not affect the

validity of this ratio as the governing factor of osmotic activity.

On the basis of the assumption that the above laws are valid for blood, mathematical expressions have been derived which indicate the distribution of electrolytes and water between cells and serum, and the manner in which the distribution is affected by changes in P_H (CO_2 tension) and oxygen content. The effect of varying CO_2 tensions has been investigated, and the results have been found to accord with those calculated on the basis of the above assumption.

107 (2067)

Leishmania donovani in the peripheral blood.

By CHARLES W. YOUNG and HELEN M. VAN SANT.

[*From the Department of Medicine, Peking Union Medical College, Peking, China.*]

Donovan[1] who found *Leishmania donovani* first in the living patient also discovered the parasite in smears from the peripheral blood. Many have advocated the examination stained blood smears for diagnosis of the disease (Patton,[2] Marshall,[3] Cannata,[4] Knowles[5]) but all agree that the organism is present in small numbers and that many slides must be carefully studied. Spleen smears obtained by aspiration has been the usual method for diagnosis. As the bleeding time is prolonged in all advanced cases this procedure is not devoid of danger (Donovan,[1] Wylie,[6] Knowles,[7] Rogers,[8] Bramachari[9]). Blood culture has been suggested as a substitute but results have been inconstant (Mayer and Werner,[10] Wenyon,[11] Row,[12] Korke,[13] Knowles[5]). The last named author made 128 cultures from 34 patients with two posi-

1 Donovan, *Lancet*, 1904, ii, 744.

2 Patton, W. S., *Indian Jour. Med. Res.*, 1914, ii, 492.

3 Marshall, W. E., Fourth Report, Wellcome Trop. Res. Labs., Khartoum, 1911, 157.

4 Cannata, S., quoted by Wenyon, *Trop. Dis. Bull.*, 1922, xix, 1.

5 Knowles, R., *Indian Jour. Med. Res.*, 1920, viii, 162.