ity to obtain this sensitivity. The system is grounded at the galvanometer and requires no shielding; careful insulation is required only for the glass cell itself, the condenser and the lower key contact. These are mounted on paraffin. 2 mf. by-pass condensers from radio stocks can be selected, which have a resistance to direct current of over 10^{11} ohms, or over one thousand times that of average glass cells.

This arrangement is also satisfactory for reading micro-electrodes or potentials in any high-resistance circuit, the value of the condenser being chosen to give the required sensitivity.

4712

Plasma Protein, Erythrocyte Sedimentation and Serum Lability in Tuberculous Individuals.

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Sedimentation of the corpuscles of heparinized blood was determined by noting the extent of fall in glass tubes with an inside diameter of 4 mm. and height of 100 mm. during an interval of 1 hour. The tubes were centrifuged to insure complete sedimentation and the sedimentation-index computed as the ratio between the sedimentation observed in 1 hour and the possible maximum extent of sedimentation.

Precipitability of serum protein was determined by adding various amounts of aluminum sulphate, as contained in a unit volume of 1 cc. to 0.2 cc. of unheated blood serum in small tubes. Serum and reagent were mixed and set aside at room temperature for 1½ hours. A heavy flocculent precipitate that settled out leaving a clear supernatant fluid was recorded as a positive reaction.

Average values for these blood properties as observed in a group of 14 tuberculous and a group of 20 normal individuals are listed in the accompanying table with average values for total protein, fibrin, globulin and albumin as contained in the plasma.

In the presence of tuberculous infection the blood of man exhibits a quantitative shift in plasma protein toward the more labile globulin and fibrinogen fractions, also an increased sedimentability of the corpuscles and an increased precipitability of serum protein. The latter changes are coincident with but not necessarily related to changes in plasma protein. Apparently with the inception of a

Plasma—100 cc.

	20 Normal Male Individuals	14 Tuberculous Male Individuals
Total protein gm.	6.95	7.51
Fibrin gm.	0.26	0.43
Globulin gm.	2.05	2.94
Albumin gm.	4.64	4.11
Blood Sedimentation-Index	12.5	66.4
Incidence of minimal precipitation with alum. sulph. per cent		
0.01	0	0
0.02	0	2
0.03	0	4
0.04	0	6
0.05	0	2
0.06	6	all
0.07	7	all
0.08	2	all
0.09	5	all
0.10	all	all

general biologic reaction in the course of tuberculous disease, a decrease in blood stability (as measured by these properties) becomes apparent and is quantitatively without relationship to the extent of tuberculous involvement.

Clinical and experimental value of the aluminum sulphate flocculation test may be extended by the titration procedure outlined.

4713

Can Bacteriophage Be Detached From the Carrier-Particles?

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It has been found earlier that residue remaining on the membrane after ultrafiltration of bacteriophage through collodion retains a large proportion of the active agent and does not give it off freely into the filtrate on repeated washing with water. But, if broth is substituted for water in washing, the active agent reappears in the filtrate in high concentration.[1]

This finding suggested at first that passage of broth through the

[1] Bronfenbrenner, J., *J. Exp. Med.*, 1927, xlv, 873.