be used as normal control subjects. We agree with the New Haven workers that mouse brain emulsions will often produce strong reactions in allergic persons, but these reactions will be equally as severe following the injection of normal mouse brain emulsion as following the injection of specific mouse brain antigen. Therefore, we use normal mouse brain emulsions as control instead of sterile saline solutions, as first advocated by Frei.[4] A comparison of both reactions will then insure the correct diagnosis in persons with slight allergic reactions. This has also been advocated by Grace and Suskind.

Summary. On the basis of 217 Frei tests performed in persons suffering from acute lymphogranuloma inguinale and healthy medical students, with mouse brain antigen of varying age, we conclude that neither its specificity nor its sensitivity is altered by preservation in the ice-box or at room temperature, for as long as 14 months. In order to exclude false positive reactions in persons hypersensitive to mouse brain emulsions, the use of normal mouse brain emulsions as control is recommended.

9196 P

Effect of Posture on Cardiac Output.

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Most of the evidence obtained by various investigators employing different methods shows that cardiac output is decreased progressively in the sitting and standing as contrasted to the recumbent position. Recent investigations[1-5] in which the generally accepted more accurate acetylene method was used have given results in the same direction. Grollman,[6] however, using a nitrous oxide method which in his hands gave values agreeing with the acetylene method, found no change with posture. Beilschowsky,[7] using the acetylene method,

4 Frei, W., *Klin. Wchnschr.*, 1925, **4**, 2148.

1 Fisher, I. L., *Arbeitsphysiologie*, 1932-3, **6**, 111.

2 Bock, H., *Zeit. f. d. ges. exper. Med.*, 1934, **92**, 782.

3 Nylin, G., *Skand. Arch. f. Physiol.*, 1934, **69**, 237.

4 Schneider, E. C., and Crampton, C. B., *Am. J. Physiol.*, 1934, **110**, 14.

5 Scott, J. C., *Am. J. Physiol.*, 1936, **115**, 268.

6 Grollman, A., *Am. J. Physiol.*, 1928, **86**, 285.

7 Beilschowsky, P., *Klin. Woch.*, 1932, **2**, 1252.

also found no change. This discrepancy in the findings, augmented by Gladstone's criticism and modification of the acetylene method[8] prompted this reinvestigation of the problem.

Five experienced healthy adult males, ranging in age from 21 to 36 years, served as subjects for determinations made at intervals over periods of 4 to 6 months each. All determinations were made in the morning after the fasting subject arrived at the laboratory and had rested on a comfortable cot for at least 30 minutes. The recumbent determinations were made with the subject supine on the cot, the sitting in a straight-backed chair and the standing with the subject leaning lightly against the wall to prevent swaying. Changes in position were made with as little expenditure of energy as possible. Cardiac outputs were determined about 20 minutes after the assumption of the desired position.

All subjects show a smaller cardiac output in the standing as contrasted to the recumbent position (Table). This difference is further accentuated when only paired determinations (recumbent and standing done on the same day) are compared, the mean difference of 28 such determinations being 21%. The change is apparent regardless of whether the original Grollman[9] or the modified Gladstone method[8] is used. Values for the sitting approximate those for the standing position. A comparison of the results obtained by the 2 methods shows excellent agreement for outputs determined in the recumbent position but lower outputs due to higher A-V O_2 differences in the sitting and standing positions when the Grollman method is used.

Sampling at short intervals during the rebreathing (6 samples at intervals of 2 seconds or more) indicates an abrupt decrease in the rate of acetylene diffusion in the sitting and standing positions but

TABLE I.
Average of All Determinations, Gladstone Method.

	Recumbent				Standing			
Subject	No. of det'm.	O_2 cons. cc. per min.	C.O. liters per min.	Stroke vol., cc.	No. of det'm.	O_2 cons. cc. per min.	C.O. liters per min.	Stroke vol., cc.
F.	9	205.3	3.53	57.7	12	227.1	3.07	37.3
H.	9	197.4	5.31	91.9	16	223.5	3.91	41.3
M.	17	227.8	4.82	79.9	10	232.0	3.71	44.0
T.	12	236.8	5.65	109.1	12	289.8	5.16	61.9
M.	13	229.5	4.44	67.7	8	242.2	4.22	47.5
Average		219.4	4.75	81.3		243.0	4.01	48.0
% change						+10.8	—15.8	—40.9

[8] Gladstone, S. A., *Am. J. Physiol.*, 1935, **112**, 705.

[9] Grollman, A., *Am. J. Physiol.*, 1929, **88**, 432.

not in the recumbent position. This change occurs at 10.5 seconds (average 3 determinations) in the sitting and at 10.2 seconds (average 13 determinations) in the standing position and is obviously due to recirculation[8] although the factors involved in the more rapid recirculation in these positions have not yet been determined. These experiments account for the falsely high A-V O_2 differences and low outputs obtained with the Grollman procedure in the sitting and standing positions, since under these conditions the acetylene difference is erroneously low.

The adequacy of the short Gladstone rebreathing procedure for attaining homogeneity of gases in the lung-bag system prior to drawing the first sample has been substantiated. Two first samples were drawn simultaneously from the proximal and distal ends of the bag respectively. The resulting A-V O_2 differences calculated by pairing each of these first samples with the one second sample agreed closely. A-V O_2 differences calculated from any 2 samples in the 6-sample experiments also show good agreement from the end of the first expiration until recirculation takes place.

9197 P

Effect of Metabolites on Growth, and Differentiation in the Colon-Group.*

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The subdivision of the colon-group of bacteria into distinct subgroups is still a problem despite many studies. The genera *Escherichia* and *Aërobacter* can be differentiated from each other by nearly a dozen correlated characters. The genus *Aërobacter* can be further subdivided on correlated characters into at least 2 distinct subgroups represented by *Aërobacter aërogenes* and *Aërobacter cloacæ*. Aside from these divisions, however, considerable confusion still exists.

There are many strains whose characters are such that they cannot be allocated to either of the genera. In this paper these bacteria will be referred to collectively as "Intermediates".

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