

## 12042 P

## A Comparison of Antigens by Interfacial and Nephelometric Methods.

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The results obtained by Boyden<sup>1</sup> with the Libby photronreflectometer<sup>2</sup> indicate clearly the value of this instrument in studies of precipitin. The instrument affords an accurate measurement of the precipitate formed by antigen and antibody. Light rays passing through the turbid system are reflected by the suspended particles, and falling upon a photronic cell generate a current of electricity which is recorded by a galvanometer. The galvanometric readings, obtained with doubling dilutions of antigen and a constant amount of antiserum, furnish the points for a curve, the area under which is used to indicate the total reaction between the antigen and antiserum. A comparison of the areas of the homologous and heterologous reaction-curves is used herein to indicate the chemical similarity. In the interfacial tests, relationship-values were determined in the manner described by Boyden,<sup>3</sup> the end-point being the all-important factor.

The graphs show the results obtained when several antigens were tested with a diluted (1+2) anti-leghorn serum. Each antigen represents the pooled sera of from 4 to 95 birds, with the exception of turkey-buzzard which is the serum of one individual. In a similar

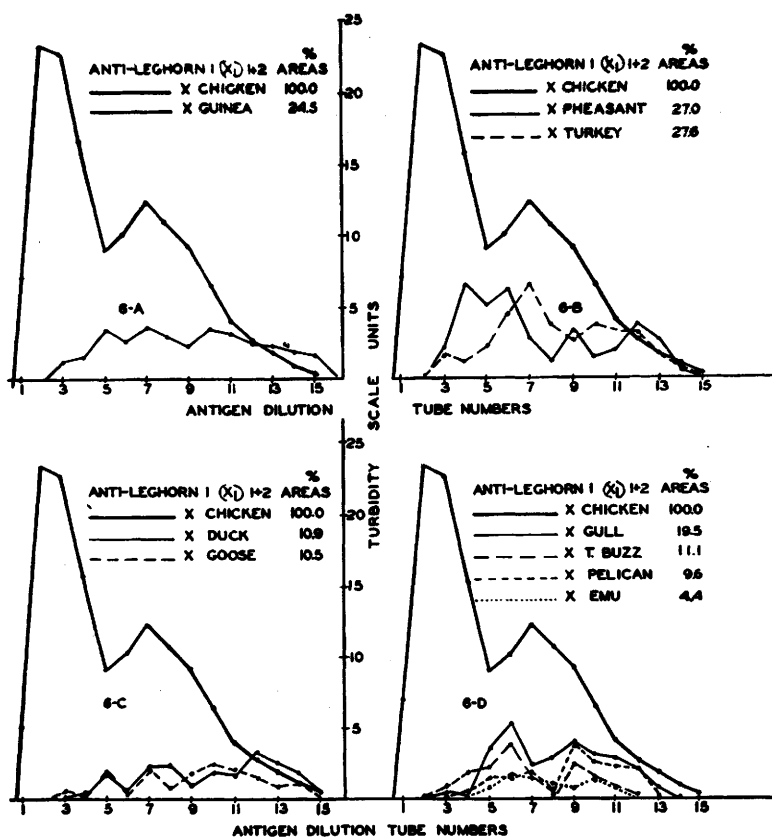
TABLE I.  
A Comparison of Interfacial (I) and Nephelometric Values (N) Using the Same Antiserum for Both Tests.

Antigens	Anti-leghorn serum (X <sub>1</sub> )		Anti-guinea hen serum (X <sub>1</sub> )		Anti-turkey serum (X <sub>1</sub> )		Anti-duck serum (X <sub>3</sub> )		Anti-pelican serum (X <sub>2</sub> )	
	I	N	I	N	I	N	I	N	I	N
Leghorn	100.0	100.0	25.0	32.5	25.0	53.2	0.8	28.7	0.8	30.9
Guinea hen	1.6	24.5	100.0	100.0	25.0	18.2	0.8	—	1.6	19.7
Turkey	50.0	27.6	12.5	22.0	100.0	100.0	0.8	—	0.8	—
Pheasant	50.0	27.0	50.0	34.7	12.2	37.8	0.4	20.7	0.4	—
Goose	3.1	10.5	25.0	9.8	6.3	7.2	50.0	70.0	0.8	—
Duck	3.1	10.9	12.5	6.8	3.1	—	100.0	100.0	3.1	3.7
Turkey buzzard	3.1	11.1	12.5	5.1	0.4	7.8	6.3	—	6.3	18.3
Pelican	3.1	9.6	12.5	2.4	0.0	13.6	1.6	10.3	100.0	100.0
Gull	0.0	19.5	25.0	5.8	1.6	—	0.4	—	1.6	26.5
Emu	0.4	4.4	12.5	0.1	0.0	—	0.4	—	1.6	—

<sup>1</sup> Boyden, A. A., *Carnegie Inst. Wash. Year Book*, 1938-1939, 219.

<sup>2</sup> Libby, R. L., *J. Immunol.*, 1938, **34**, 71.

<sup>3</sup> Boyden, A. A., and Noble, G. K., *American Museum Novitates*, 1933, No. 606.



manner the same antigens were tested with the precipitating antiserum to the serum-proteins of turkey, guinea hen, duck, and pelican. The table shows the values obtained by the interfacial (ring) and nephelometric methods.

The injection of a mixture of antigens, such as serum, may result in the production of: (a) antibodies to one fraction alone; (b) antibodies to several or all fractions, with more to one fraction than to another. The fractions are rarely present in equal amounts, so the interfacial endpoints may, in some cases, be the result of one fraction and its antibodies, and in other cases the result of another fraction with its antibodies. Since in relationship-studies the antiserum is kept constant, a small but strongly antigenic fraction spends the greater part of its reaction within the first few tubes, whereas, a larger but less antigenic fraction yields a wider prezone and positive reactions occur in the higher dilutions of antigen. Thus, while the interfacial test is a good test of the sensitivity of the antibodies, it measures only one point at the end of a curve. The

nephelometric test is a better indication of the similarity of the antigenic substances, for it registers the total reaction, involving all antigens and all antibodies in the reacting systems.

12043

### An Attempt to Produce Hepatic Cirrhosis by a Diet Deficient in Vitamin B Complex.

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Interest in the possible rôle of a vitamin deficiency in the production of cirrhosis of the liver has resulted from (1) the clinical observation that patients with that disease have improved following the administration of a high vitamin diet (Patek<sup>1</sup>), and from (2) the experimental observations that hepatic necrosis developed in rats offered a vitamin deficient diet (György and Goldblatt<sup>2</sup>) and more recently that cirrhosis without necrosis occurred in rabbits on a diet deficient in some factor that is contained in yeast (Rich and Hamilton<sup>3</sup>). The latter investigators believed that a lack of thiamin, riboflavin, or nicotinic acid could be eliminated as the responsible factor. In order to investigate this matter in another species of animal we have administered to the rat one of the diets that Rich and Hamilton found effective for the production of hepatic cirrhosis, but have failed in that animal to secure comparable results.

*Procedure.* Eighteen apparently normal, male, adult, albino rats of an inbred Wistar strain were selected. The mean body weight was  $300 \pm 80$  g. Twelve of these animals were placed on a diet deficient in the vitamin B complex, while the remaining 6 received B complex in the form of brewers' yeast and served as controls. All animals in groups of three received daily a food bolus consisting of

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<sup>1</sup> Patek, A. J., *Proc. Soc. Exp. Biol. and Med.*, 1937, **37**, 329.

<sup>2</sup> György, P., and Goldblatt, H., *J. Exp. Med.*, 1939, **70**, 185.

<sup>3</sup> Rich, A. R., and Hamilton, J. D., *Bull. J. H. Hosp.*, 1940, **66**, 185.