the "postsecretory zone." The latter is in part characterized by the presence of numerous degenerating and senescent cells.

A complete account of the methods used and a correlation of the histochemical findings with histological and cytological data will appear in the *American Journal of Anatomy.*

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Determination of Prothrombin.

ARMAND J. QUICK.

From the Department of Pharmacology, Marquette University School of Medicine, Milwaukee, Wisconsin.

The author[1] developed a quantitative method for the determination of prothrombin based on the principle that the clotting time of blood or plasma is a quantitative measure of the prothrombin concentration provided an excess of thrombin and a constant concentration of calcium are present. For convenience and accuracy, the blood is oxalated and the test done on the plasma. It was demonstrated, however, that the test can be applied to whole blood.[2] In this determina-

TABLE I.
Comparison of Clotting Times of Unoxalated Plasma and of Recalcified Oxalated Plasma in Presence of Excess Thromboplastin.

	cc		cc
Chicken plasma unoxalated	0.1	Chicken plasma oxalated	0.1
Saline (0.85%)	0.1	Calcium chloride 0.025 M	0.1
Thromboplastin*	0.1	Thromboplastin*	0.1
Clotting time in seconds, 10 to 12		Clotting time in seconds, 10 to 11	
Goose plasma unoxalated	0.1	Goose plasma oxalated	0.1
Saline (0.85%)	0.1	Calcium chloride 0.025 M	0.1
Thromboplastin*	0.1	Thromboplastin*	0.1
Clotting time in seconds, 12		Clotting time in seconds, 11	
Human blood	0.9	Human plasma oxalated	0.1
Thromboplastin†	0.1	Calcium chloride 0.025 M	0.1
		Thromboplastin†	0.01
Clotting time in seconds, 12		Clotting time in seconds, 12½	

* From chicken brain.
† From rabbit brain.

[1] Quick, A. J., *J. Biol. Chem.*, 1935, **109**, lxxiii.

[2] Quick, A. J., Stanley-Brown, M., and Bancroft, F. W., *Am. J. Med. Sci.*, 1935, **190**, 501.

tion 0.1 cc of thromboplastin emulsion was added to 1 cc of blood obtained by venipuncture.

Theoretically there should be essentially no difference between the clotting time of recalcified oxalated plasma and unoxalated plasma or blood provided an excess of thromboplastin is present. This can be demonstrated experimentally as shown by the results of Table I.

Recently Smith and his associates[3] have adopted the author's method of determining the clotting time of 1 cc of blood containing 0.1 cc of thromboplastin as a "Bedside Test" for the determination of prothrombin. They employ the formula:

$$\text{Prothrombin activity (in \% of normal)} \quad \frac{\text{clotting time of normal blood}}{\text{clotting time of patient's blood}} \times 100$$

This formula is based on the assumption that the clotting time is a linear function of the concentration of prothrombin. The writer's quantitative studies of prothrombin in man,[4] in the rabbit, in the chicken[5] and other animals have shown that the relationship between the clotting time and the concentration of prothrombin is not linear. If the values are plotted, a hyperbolic curve is obtained which can be satisfactorily expressed by the equation:

$$\text{c.t.} = a + \frac{k}{c}$$

(c.t. = clotting time; c = concentration of prothrombin; a and k = constants.)[6]

For the exact quantitative determination of prothrombin, the author's test employing oxalated plasma has proved satisfactory in all experimental and clinical conditions, including the hemorrhagic disease of the newborn.[7] The difficulty of obtaining venous blood from young infants, however, has necessitated the development of a simple, roughly quantitative method for purely clinical purposes which is carried out as follows: A drop of blood obtained by a heel or ear lobe puncture is put on a glass slide, and mixed with a drop of equal size of thromboplastin. (Prepared according to the author's directions.)[4] The mixture is slowly stirred with a fine pointed stirring rod. By holding the glass slide over a light, the exact clotting time can readily be determined. Normal blood will clot in 15 to 20 seconds.

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3 Smith, H. P., Ziffren, S. E., Owen, C. A., Hoffman, G. R., and Flynn, J. E., *J. Iowa Med. Soc.*, 1939, **29**, 377.

4 Quick, A. J., *J. A. M. A.*, 1938, **110**, 1658.

5 Quick, A. J., *Am. J. Physiol.*, 1936, **118**, 260.

6 Quick, A. J., and Leu, M., *J. Biol. Chem.*, 1937, **119**, lxxxi.

7 Quick, A. J., and Grossman, A. M., PROC. SOC. EXP. BIOL. AND MED., 1939, **40**, 647; **41**, 227.