sedimentation rate, agglutination with the Group A hemolytic streptococcus, or in the general course of the disease. After a week in most instances, the viscosity of the joint fluid had returned approximately to its original level. There was no change in the tendency of the fluid to reaccumulate in the joint.

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Electrophoretic Analysis of Human Semen.*

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The seminal proteins are of interest in that they are largely composed of proteoses (60%). By analytical methods globulins account for 21-40% of the total seminal proteins.[1] The present study was undertaken to investigate this nondialyzable portion.

Method. The electrophoretic patterns of normal and pathological semen were studied with the Longsworth[2] modification of the Tiselius[3] apparatus. Four pooled normal semen specimens and one specimen from a patient, whose semen contained a persistent thick coagulum, were studied. The semen was centrifuged in a high speed centrifuge at 12,000 revolutions per minute and was then diluted with 1 to 3 volumes of buffer depending on the turbidity of the solution. The solution was then dialyzed for 3 to 4 days at 0° against several liters of the same buffer consisting of 0.025 M veronal, 0.025 N hydrochloric acid and 0.025 N sodium chloride at pH 7.8. The protein solution was then centrifuged at 0° before being introduced into the electrophoretic cell.

The semen was introduced into the 2 lower compartments of the Tiselius cell. The 2 upper compartments of this cell were then disconnected, and buffer was added to the two upper cells. After equilibrium had been established in a constant temperature bath at 0° to 2° the 2 upper cells containing the buffer were made continuous with the 2 lower cells containing the protein and a direct current of 6 milliamperes was applied to the protein solution.

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1 Huggins, C., Scott, W. W., and Heinen, J. H., *Am. J. Physiol.*, 1942, **136**, 467.

2 Longsworth, L. G., Shedlovsky, T., and Mac Innes, D. A., *J. Exp. Med.*, 1939, **70**, 399.

3 Tiselius, A., *Tr. Faraday Soc.*, 1937, **33**, 524.

TABLE I.
Mobilities of Semen Proteins.

Patient	Mobilities, U × 10⁵			
	Albumin	Alpha	Beta	Gamma
WGZ	6.3	4.7	2.2	.6
W	6.0	4.1	2.4	.7
N	6.0	4.4	2.5	.6
LNS	6.0	4.2	2.3	.6
LZ	6.4	4.7	2.3	.6
Normal Serum	6.1	4.3	2.7	.8

All photographs and measurements were made of the protein boundaries descending into the protein solution at the negative pole of the cell.

Results. Four protein fractions are observed electrophoretically in normal and pathological human semen. These 4 proteins have the same mobility as albumin, alpha, beta, and gamma globulin observed in normal serum, and may be presumed to be identical with these protein fractions. (Table I.)

The beta globulin constituted 34.3 to 44.5% of the total protein and was present in largest amounts uniformly in all semen specimens studied. (Table II.) The alpha globulin was the second largest component in all but one semen, and formed 19.8 to 27.8% of the total protein. In the one exception (Table II, case W) the gamma globulin was larger than the alpha globulin, constituting 26.1% of the protein content.

The third largest protein fraction was the albumin which was present in 17.7 to 22.7%. This was observed in 4 of the 5 semen specimens, but in one (Table II, case N) the gamma globulin was larger than the albumin. The smallest protein component in 3 of the 5 cases was the gamma globulin which varied between 11.4 and 21%.

The pathological semen (Table II, case LZ) was identical in protein composition with the normal semens.

Conclusion. 1. Four protein fractions were observed in 4 normal

TABLE II.
Percentage Composition of Semen Proteins.

Patient	Albumin	Alpha	Beta	Gamma
WGZ	17.7	27.8	43.1	11.4
W	22.7	15.9	35.2	26.1
N	18.1	20.5	41.0	20.4
LNS	21.4	23.2	34.3	21.0
LZ (abnormal)	19.0	19.8	44.5	16.7
Normal Serum	64	7	14.5	14.4

and one pathological semen specimens subjected to electrophoretic analysis. 2. The electrophoretic mobilities of these protein fractions after dialysis are identical with those of the albumin, alpha, beta, and gamma globulins of normal serum. 3. Average values for these components as percentages of the total nondialyzable semen protein are: beta globulin, 39.6; alpha globulin, 21.3; albumin, 19.9; and gamma globulin, 19.1. 4. The protein composition of the one pathological semen studied did not differ from the 4 normal semens.

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Difference in Response of Certain Strains of Rats to Augmentative Gonadotropic Effect.

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The phenomenon of synergism between gonadotropic hormones first reported by Evans, Simpson and Austin[1] has been repeatedly confirmed and has since served as an aid in the estimation of the pituitary follicle-stimulating hormone. The most common synergistic combination is that of human chorionic gonadotropin with pituitary follicle-stimulating preparations. It was surprising, therefore, to find that some anterior pituitary preparations prepared in this laboratory and considered fairly certain to contain follicle-stimulating factor in a relatively pure state, gave no augmented response when combined with prolan. The combinations were tested by the ovarian weight increase in normal immature female rats of the Sherman strain obtained from the Rockland Farms. These rats have been used successfully in this laboratory for the assay of either chorionic gonadotropin (prolan) or the gonadotropin of pregnant mare serum alone. They have been found to give responses comparable to those given by Wistar rats from our own colony. However, the elimination of one factor after another finally led to the conclusion that the insensitivity of the strain of rats being used was the only remaining explanation for our failure to get augmentation in test animals when chorionic gonadotropin was combined with a highly purified follicle-stimulating fraction of the sheep pituitary.

When tested on Sprague-Dawley rats, a follicle-stimulating prepa-

[1] Evans, H. M., Simpson, M. E., and Austin, P. R., *J. Exp. Med.*, 1933, **57**, 545.