Apparently there was no permanent deleterious effect on the reproductive system following the injections because 3 of the 5 birds were mated and have built nests and laid eggs.

In summary, it is seen that female canaries can be made to sing the typical male song by injections of male hormone. The most striking difference between the singing in normal males and stimulated females was in the greater sound volume produced by the males. Whether or not the tone quality was as good as that of the males must be left for experts to decide but certainly the range of tones, variations, trills and duration of song were similar to those of the males of this strain of birds. The temperamental nature of the time and frequency of singing, so characteristic of the males, also occurred in females. The best results were obtained when the females were isolated.

Several canary owners have informed me that female canaries normally will sing under certain conditions. This was not observed in the females used in these experiments nor has it been observed by Mr. Frederichs. The stimulation of the female birds to sing by male hormone injections under the above conditions of the experiments indicates that singing is a secondary sexual characteristic of male canaries.

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A Method for Concentrating Serum in Cellophane Bags and Simultaneously Removing Salts and Other Constituents.

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A report was made about a year ago describing a simple, inexpensive method for concentrating serum under sterile conditions in sterile, cellophane sausage casings.[1] Subsequently, Dr. P. A. Kober[2] informed me that he had described this process in 1917 and 1918 under the name "Pervaporation".

The casing filled with serum is suspended by the tied end from a hook either at room temperature or in a large mechanical refrigerator

1 Thalhimer, William, PROC. SOC. EXP. BIOL. AND MED., 1938, **37**, 639.

2 Kober, P. A., *J. Am. Chem. Soc.*, 1917, **39**, 941; 1918, **40**, 1226; PROC. SOC. EXP. BIOL. AND MED., 1917, **15**, 1233.

kept at 5°C, the bag being placed in front of an electric fan. The serum can be concentrated to one-third its volume in about 48 hours at room temperature, and after a somewhat longer interval in a refrigerator. We have also concentrated ascites fluid by this method to as much as one-tenth its original volume. The concentrated serum or ascites fluid is then passed through a Buchner paper pulp filter, and subsequently, a Berkefeld filter. It is then put into sterile vials, and tested for its sterility.

By this method of concentration only moisture and gases are removed; all other substances, including salts, and non-protein nitrogenous materials are concentrated to the same degree as the protein.

It seemed advisable to have available, if possible, a simple method whereby protein constituents could be concentrated with most of the salts and non-protein nitrogenous materials removed, since in conditions such as nephrosis it is manifestly undesirable to inject large amounts of salts or non-protein nitrogenous substances.

The problem of concentrating serum and at the same time dialyzing out most of the salts was solved by immersing the bag of serum in a very pure, inexpensive, colorless commercial corn syrup.* It was found that the serum concentrated more rapidly by this technic than by the air method, and that, at the same time, a great deal of sodium chloride and non-protein nitrogenous materials dialyzed out. Some of the results are given in Table I.

In has been found that only from 5% to 8% of dextrose dialyzes into the bag, and either no dextrin at all or only a trace. The dextrose which dialyzes into the serum might have the advantage of acting as a diuretic.

To determine whether a solution of dextrin could be injected intravenously with safety very small amounts of 50% solution of corn syrup were injected intravenously at first into some patients with hypertension and increased intracranial pressure and later larger amounts. Dr. Francis Murphy of Milwaukee undertook to compare the effect of this solution under these conditions with 50% sucrose solutions. He reports no harmful results or reactions after the intra-

* The corn syrup used is Three Star Corn Syrup, and was generously furnished by the Corn Products Refining Company. The formula given for the corn syrup is as follows:

Moisture		19.5 %
	On Dry Basis	
Reducing Sugars—Dextrose		40 %
	Maltose	2 %
Dextrins		57.75%
Ash		.25%

TABLE I.

Ascites Fluid, Pool II	Unconcentrated %	Concentrated 5.5 times in air %	Concentrated 9.5 times in corn syrup %
Total Protein	2.4	14. (13.2)*	25. (22.8)
Albumin	1.5	8.5 (8.25)	16. (14.25)
Globulin	0.9	5.5 (4.95)	9. (8.55)
Sodium Chloride	—	3.50	1.31 (6.04)
Non-Protein N	0.034	0.144 (0.187)	0.117 (0.323)
Dextrose	—	—	—

Ascites Fluid 3	Unconcentrated %	Concentrated 6.5 times in corn syrup %
Total Protein	3.04	17.9 (19.76)
Sodium Chloride	1.05	0.795 (6.82)

Human Serum No. 206	Unconcentrated %	Concentrated 3 times in air %	Concentrated 3 times in corn syrup %
Total Protein	7.3	22.53 (21.9)	22.77 (21.9)
Sodium Chloride	0.573	1.632 (1.719)	0.771 (1.719)
Non-Protein N	0.032	0.108 (0.096)	0.048 (0.096)

*Figures in parenthesis show the percentage calculated on the basis of concentration. The sodium chloride and non-protein nitrogen actually present in the materials concentrated in corn syrup are much less than the expected amounts because of dialysis out into the corn syrup.

venous injection of large amounts of 50% corn syrup solution.†

Ascites fluid is concentrated just as easily as serum by this technic.

Clinical conditions in which the intravenous injection of serum or ascites fluid concentrated by this technic might be of therapeutic value are nephrosis, surgical shock, conditions of increased intracranial pressure caused by injury, brain tumors, etc.

Reactions have not been caused by the intravenous injection of human serum concentrated by the corn syrup technic.‡

† The 50% corn syrup solution was kindly prepared by Dr. Haldane Gee, of the Sterisol Ampoule Corp.

‡ I am indebted to Sophronia A. Myron and Thelma Schwartz for their valuable technical assistance.