tissues in rodents[8, 9, 10] and monkeys[11, 12] following injections of estrogenic substances, and some of the female organs, rudimentary in the male, have been induced to hypertrophy by injections of oestrin.[13]

The present study reports uniformly negative results from assays of hypertrophied prostatic tissues removed at operation from patients 60 to 80 years of age. Seven hypertrophied prostates, histologically hyperplastic but without evidence of malignancy, ranging from 9 to 28 gm., and also 23 samples of urine from 12 patients before and after prostatectomy, ranging in quantity from 1 to 15 liters, have given uniformly negative results in more than 100 tests. The methods used for extraction and assay of oestrin from tissue and from urine were those in current use for the detection of small amounts of this active substance.

These results indicate that oestrogenic substances were not present in significant quantities in either the urine or hypertrophied prostatic tissue examined.

8555 C

Enzymic Digestion of Lactalbumin Versus Casein *in Vitro*.*

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Since the experimental evidence concerning the nutritive value of lactalbumin is conflicting, an intensive study has been initiated in this laboratory to investigate the biological value of this protein from the standpoint of digestion, metabolism, and growth. Casein (being a protein of indisputable excellent biological value) was used as a standard of comparison.

In this report a summary is given of the results of tryptic-ereptic digestion of lactalbumin versus casein *in vitro*. The casein was

8 Lacassagne, A., *C. R. Soc. Biol.*, 1933, **113**, 590.

9 Burrows, H., *Brit. J. Surg.*, 1934, **21**, 507.

10 Burrows, H., and Kennaway, N. M., *Am. J. Cancer*, 1934, **20**, 48.

11 Van Wagenen, G., *Anat. Rec.*, 1935, **63**, 387.

12 Parkes, A. S., and Zuckerman, S., *Proc. Physiol. Soc., J. Physiol.*, 1935, **84**.

13 Willier, B. H., *Anat. Rec.* (Suppl.), 1935, **61**, 50.

* Research paper No. 383, Journal Series, University of Arkansas, Fayetteville.

furnished by Merck and prepared according to the method of Hammersten. The lactalbumin was obtained from Harris Laboratories which is the purest product obtainable with a minimal ash content.

The technique employed has been described.[1] The proteins were studied in 3 concentrations, 120, 180, and 210 mg. As a source of trypsin and erepsin pancreatic and intestinal extracts were taken from rats of our colony stock diet, on which ration excellent growth is obtained.

A 6% protein solution (pH. 7.8), using approximately .08 N NaOH as a solvent, was prepared. An aliquot of this solution (1 cc. corresponding to 60 mg. protein); 20 cc. of boric acid buffer (pH 7.8); 1 cc. of pancreatic extract equivalent to 25 mg. pancreas; 2 cc. of intestinal extract equivalent to 100 mg. intestines, were made up in a 60 cc. Erlenmeyer flask to a final volume of 50 cc. with distilled water, alkaline to cresol red. The incubation

TABLE I.
Summary of Tryptic-ereptic Digestion of Casein and Lactalbumin.
1 cc. pancreatic extract. 2 cc. intestinal extract.

Hrs. of Incubation	Amt. and type of proteins	No. of samples	Mean hydrolysis in % total amino N	Difference between means of casein and lactalbumin in % total amino N	Significant Ratio
1	A	11	22.1 ± .80		
1	B	11	14.0 ± .93	7.1 ± 1.23	5.7
4	A	11	33.9 ± 1.14		
4	B	11	30.5 ± 1.79	3.4 ± 2.12	1.65
24	A	11	52.4 ± 1.32		
24	B	11	50.5 ± .87	1.90 ± 1.59	1.20
1	C	14	23.4 ± .84		
1	D	14	18.0 ± .82	5.4 ± 1.17	4.60
4	C	14	34.6 ± .72		
4	D	14	29.2 ± 1.15	5.4 ± 1.36	4.0
24	C	14	52.4 ± .95		
24	D	14	50.2 ± .94	2.2 ± 1.33	1.65
1	E	12	14.5 ± .69		
1	F	12	11.7 ± .41	2.8 ± .81	3.4
4	E	12	23.3 ± .79		
4	F	12	17.8 ± .85	5.5 ± 1.16	4.7
24	E	12	47.7 ± 1.23		
24	F	12	41.6 ± 1.09	6.1 ± 1.23	4.9

A = 120 mg. casein.
B = 120 " lactalbumin.
C = 180 " casein.
D = 180 " lactalbumin.
E = 210 " casein.
F = 210 " lactalbumin.

Significant Ratio:
2.5 to 2.8 approaching significance.
2.8 to 3.0 significance.
above 3.0 is high significance.

[1] Sure, B., Kik, M. C., and Buchanan, K. S., *J. Biol. Chem.*, 1935, **108**, 11.

was allowed to proceed at 37.5°C for a maximum period of 24 hours. After an interval of one, 4, and 24 hours the amino nitrogen was determined in aliquots by means of the Van Slyke amino nitrogen apparatus. A blank contained the same as the sample, except that the tissue extracts were used after boiling for 10 minutes which destroyed trypsin and erepsin.

The results were expressed in percentage of total amino nitrogen, which was determined by acid hydrolysis. The total amino nitrogen for casein was 9.75% and for lactalbumin 10.7%.

A summary of the final average results is submitted in Table I. It will be noted from the speed of liberation of amino nitrogen that a significantly better digestion was observed with casein than with lactalbumin after the first hour incubation with all 3 concentrations of protein. There is also a noteworthy increase of digestion of casein after the fourth hour with 180 mg. protein. In the case of 210 mg. protein, there is a constant increase of amino nitrogen liberation in casein versus lactalbumin throughout the 24 hours of digestion.

It is, therefore, concluded that lactalbumin is less readily digested than casein *in vitro* by trypsin and erepsin when the incubation of these proteins is carried out under standard and comparable conditions.

8556 P

Segmental Differentiation in the Proximal Convoluted Tubule of the Mammalian Nephron.

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Edwards,[1] in discussing the proximal convoluted tubule of the mammalian nephron, refers to "its functional differentiation as manifest segmentally unaccompanied by obvious cytological change." Edwards and Schnitter[2] state that the proximal convoluted tubule of the mammal "is cytologically uniform throughout its length." In his most recent publication, Edwards[3] mentions the "unisegmental appearance" of the mammalian proximal

1 Edwards, J. G., *Anat. Rec.*, 1933, **55**, 343.
2 Edwards, J. G., assisted by C. Schnitter, *Am. J. Anat.*, 1933, **53**, 55.
3 Edwards, J. G., *Anat. Rec.*, 1935, **63**, 263.