globin by means of the acid hematin color, somewhat according to the plan of Elvehjem[5] and Arnow.[6]

The hemoglobin powder is prepared from blood by precipitating the hemoglobin and other proteins with NaCl at saturation after acidification with hydrochloric acid. The precipitate is washed with strong NaCl solution, dried and pulverized. In use a weighed quantity of the powder is dissolved in N/10 NaOH and transferred to a volumetric flask. In another flask the test sample of blood is treated similarly with NaOH. After a few minutes the contents of both flasks are diluted to the mark with water and sufficient HCl to make the final concentration N/10.

TABLE I.
Hemoglobin by Protein Fe and O_2 Capacity.

Subject	Basis of Protein Fe		Basis of O_2 Capacity
	Direct as Prussian blue	Indirect as acid hematin	
B. P.	17.35	17.10	17.00
W. L. N.	17.09	16.70	16.58
J. G.	18.11	18.05	18.00
Pernicious Anemia	5.28	5.32	4.56*
Leukemia	9.82	9.72	9.72
Malaria	9.37	9.26	9.68
Pneumonia	13.41	13.32	13.85
Jaundice	14.15	14.26	14.13
Nutritional Edema	12.00	11.82	12.15

* Low result due to poor quality saponin.

In the accompanying table are data on three normal individuals and a few patients, showing close agreement between hemoglobin values calculated from oxygen capacity and from protein iron. Figures represent gm. percent.

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Effect of Theelin Injections upon the Castrated Woman.

AUGUST A. WERNER. (Histological Study by W. D. Collier.)

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These experiments were an attempt to determine the effect of various dosages of theelin upon human female castrates of different ages and for varying periods of castration with particular interest

[5] Elvehjem, C. A., *J. Biol. Chem.*, 1931, **93**, 203.

[6] Arnow, L. Earl, PROC. SOC. EXP. BIOL. AND MED., 1932, **29**, 569.

in the effect upon the subjective symptoms of castration and the involuntary changes of the breasts and genital tract.

Five white women who had complete bilateral ovariectomy performed and whose uteri were intact were used in these experiments. The ages ranged from 22 to 40 years. The age at castration ranged from 21 to 38 years and the time elapsing since castration ranged from 6½ months to 6 years. All had amenorrhea and the subjective symptoms of castration and all showed atrophic breasts and genital tracts upon physical examination. Curretage of the endometrium showed extensive atrophy of the endometrium in all cases. All other physical and laboratory tests were normal.

All patients received daily a dose of 200 rat units of theelin intramuscularly in the upper genital region during the first 28 days, 300 rat units during the second 28 days, and 400 rat units during the third 28 day period. After the third period, injections were stopped to determine if uterine bleeding would occur as claimed by some writers. The total period of daily observation of each patient was over 5 months.

All patients showed relief from subjective symptoms of castration in from 6 to 20 days. All showed an increased congestion of the cervix and a mucous discharge from the cervix within the first two weeks. All patients showed enlargement of the breasts, erection of the nipples and sometimes even complained of the tingling and sense of fullness of the breasts. The oldest patient, 40 years of age, alone failed to show a relatively marked hyperplasia of the endometrium and alone failed to show bleeding from the uterus accompanied by all the usual subjective symptoms of menstruation. Uterine bleeding occurred in 4 patients during the administration of theelin and 3 showed bleeding during the first week after the hormone was discontinued. The endometrium was not only increased in thickness in all except the one patient mentioned but it also became much more differentiated. The mucoid type of stroma found at the beginning eventually differentiated out normal hyperchromatic stroma cells and the epithelium differentiated out more fully, sending down longer and more tortuous tubules.

Obviously excessive doses of theelin were given over a period of at least 84 days without discomfort until 6 to 8 cc. were given, and then there was only local and transitory discomfort.