ment examined after centrifugation at 30,000 RPM for 30 minutes in the Spinco preparative centrifuge.§ Large numbers of typically coiled threads and uncoiled filaments were observed (Fig. 2). Examination of similar sediments prepared within 15 minutes of solution of the trypsinogen in buffer revealed a rare coiled thread or filament. Incubation of trypsinogen at 5°C in 0.4 borate buffer at pH 5.2 failed to produce any fibrous structures. This experiment was then repeated under sterile conditions. The "Tryptar"-seeded trypsinogen solution buffered at pH 8.0 was passed through an ultra-fine, sterilized, sintered glass filter and checked by thioglycollate and blood plate cultures for bacterial contamination immediately following filtration and after five days of incubation at 5°C. The solution proved to be sterile throughout the experiment. No coiled threads or filaments were found in the fresh filtrate. After incubation for 5 days the solutions were centrifuged and the sediments examined. Large numbers of long, typically coiled threads and filaments were observed in all fields.

Thus, it would appear that the characteristically coiled threads, described as components of elastic tissue by this author and as components of bacterial flagellae by Franchi and DeRobertis, are in fact fibrous structures arising from solutions of purified, crystallized trypsinogen during incubation under certain conditions. There exists the interesting possibility that this phenomenon may represent a fibrous transformation of trypsinogen or a component or contaminant thereof. Such transformations are known to occur in solutions of insulin(4), actin(5), and tropomysin(6). Further studies on the characterization of these fibrous units and the conditions for their production will be reported in detail elsewhere.

Summary. The coiled threads and filaments described by Gross as essential components of elastin, liberated from the tissue by tryptic digestion, and later described by Franchi and DeRobertis as products of tryptically digested bacterial flagellae have been demonstrated to be present in Armour's crystalline trypsin, but not in the more highly purified product "Tryptar," and can be produced by incubation from clear, sterile solutions of crystalline trypsinogen. This process probably represents a fibrous transformation of trypsinogen, a component or contaminant thereof.

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§ Because of the very small (oft-times invisible) sediment, the walls of the centrifuge tube had to be scrubbed thoroughly in 1 cc distilled water. Higher trypsinogen concentrations produced visible sediments.

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Evidence for a Sodium Retaining Factor in Toxemia of Pregnancy.* (19035)

JEROME J. CHART, ELVA G. SHIPLEY, AND EDGAR S. GORDON.
(Introduced by R. K. Meyer.)
From the Department of Zoology and the Department of Medicine, University of Wisconsin, Madison, Wis.

Toxemia of late pregnancy is a clinical problem which still remains to be defined in terms of etiology and pathological physiology. Practical management has taken diverse forms and has evolved from one plan to another, but

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TABLE I. Excretion of a Sodium Retaining Factor in Late Pregnancy.

Patient	Type of pregnancy	Date	17-keto-steroid, mg/24 hr	11-oxy-steroid, mg/24 hr	Sodium factor in μg equiv. DCA/24 hr	Remarks
VF	Toxemic	11/16-18/50	7.7	1.193	228	LMP: 4/20/50 EDC: 1/27/51
		12/1-3	4	.591	604	Toxemia began 10/20/50
		12/10-12	5.3	.393	60	Caesarean section 12/8/50
EB	"	11/11-13	8.1	.416	1008	LMP: 2/22/50 EDC: 11/29/50
		11/17-19	7.2	.902	463	Toxemia began 9/15/50; induction of labor 11/16/50; stillborn infant
EJ	Toxemic-diabetic	5/29	11.6		756	LMP: 10/6/50 EDC: 7/13/51
		7/4	12		48	Toxemia began 5/20/51; caesarean section 7/1/51
LM	"	1/14/51	7.2	.900	21	LMP: 6/15/50 EDC: 3/25/51
		2/22	12.6	.631	32	Toxemia began 2/20/51
		3/2	13.5	.977	322	Caesarean section 3/2/51
		3/3	8.8	1.453	72	Postpartum eclampsia
		3/4	7.6	1.428	43	
NR	"	3/28	9.8	.806	278	LMP: 12/6/50 EDC: 9/13/51
		7/1	21		653	Toxemia began 5/20/51
		8/10			106	Caesarean section 8/8/51
EO	Toxemic	5/27	20.6		490	LMP: 8/15/50 EDC: 5/22/51
		5/30			226	Toxemia began 12/20/50
		6/4	10		48	Caesarean section 5/28/51
ML	Toxemic-diabetic	6/22	15.8		202	LMP: 11/15/50 EDC: 8/22/51
		7/29			422	Toxemia began 6/30/51
		7/30	16.4			Caesarean section 7/30/51
		8/4			106	
NN	Normal		5.4		36	In middle of last trimester
NM	"		18.4		61	" " " " "
SS	"				100	Beginning of " "
NS	"				104	In middle " " "

all have as their ultimate goal, the control of edema, reduction of blood pressure, maintenance of adequate nutrition, especially of proteins, and prevention of eclampsia. In this complex of clinical manifestations there exists strong suggestive evidence of the presence of pathological factors exerting abnormal control over electrolyte and fluid balance. It is quite logical, therefore, that the function of the adrenal cortex should be investigated in this connection.

In the present study an attempt has been made to measure the quantitative urinary excretion of various steroid fractions thought to be of adrenal origin, in toxemic as well as normal pregnancies, with special attention to the sodium retaining function of these urinary compounds. 17-Ketosteroids have been measured by a standard chemical method after extraction with chloroform(1). 11-Oxysteroids or "glucocorticoids" have been measured chemically by Mason's modification(2) of the method of Daughaday and Williams (3). Sodium retention has been measured by means of a biological assay procedure developed by Kagawa, Shipley and Meyer(4), using adrenalectomized rats. The rats are used for the test 24 hours after adrenalectomy. The test period of 6 hours is initiated by the subcutaneous injection of desoxycorticosterone acetate or urinary extract, followed 1 hour later by the subcutaneous injection of 8.29

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mg of sodium in the form of sodium chloride. Immediately following the sodium chloride injection, the urethra is ligated and four hours later the animal is sacrificed, the urinary bladder is removed, and its contents and washings analyzed for sodium. The procedure is standardized against pure desoxycorticosterone acetate and results are reported in microgram equivalents of desoxycorticosterone acetate per 24 hours. The method has been found to be sensitive to variations as small as 2 μg of desoxycorticosterone acetate.

Urine collections covering 24- or 48-hour-periods have been made on patients exhibiting the clinical manifestations of toxemia as well as on women with normal pregnancy. Because of the well recognized tendency for diabetic pregnancies to become toxemic, several diabetic pregnant patients have been studied with the advantage that they have been observed before and during their transition into the toxemic state. In one instance it has been possible to predict from the urinary assay figures, the appearance of toxemia before the usual manifestations have appeared. The results are to be seen in Table I.

It is evident that the usual assays of the common steroidal fractions performed by chemical methods have given no consistent indication of abnormality in toxemic as compared to normal pregnancies(5,6). In the few instances in the present study in which formaldehydogenic steroids and the sodium retaining factor have been measured in the same specimens, no significant rise in the former has been noted. The sodium retaining factor, however, has shown a sharp and striking rise in every instance, and has often preceded the appearance of edema and hypertension. The identity of the compound, or compounds, involved in this phenomenon is unknown but it is chloroform soluble, presumably steroidal in nature, and possibly of adrenal origin. A placental source has not been excluded, however, and studies on this point are being conducted at present and will be included in a later publication. The action of the chloroform extracted fraction on sodium balance studies suggests that the active material is a desoxycorticosterone-like substance. No clue is provided in these studies as to the nature of the physiological mechanism which might lead to an adrenal stimulation of this type in some pregnancies and especially in diabetic pregnancies, but it does seem probable that all of the clinical manifestations of the toxemia complex may be explainable on this basis.

Summary. A marked rise in excretion of a sodium retaining factor has been observed in toxemic pregnancies in both diabetic and nondiabetic patients. The increase has been observed in one patient before other toxemic symptoms have become evident. No parallel increases in 11-oxysteroid excretions were found in these patients.

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