TABLE II. Bromsulphalein Value at Selected Time Intervals for Rabbits Fed CCl_4.

Specimen	% bromsulphalein retention				
	5 min.	10 min.	15 min.	30 min.	60 min.
Control	51.2	15.7	5.7	.7	0
After 2 doses	91.2	69.8	45.6	33.8	5.2
After 4 doses		110.6	92	50	22
Control	38	12.2	4.5	.5	.3

sections from rabbit 140 revealed greater liver damage than that of rabbit 142. Liver sections from rabbits 139 and 148 which were killed 14 days following the fourth dose of CCl_4 revealed milder liver damage (Table I). No tissue was obtained from rabbit 138 as death occurred on a weekend and the rabbit was disposed of by error.

Summary. 1) Fifteen minutes after administration of bromsulphalein at a dose of 10 mg/kg i.v. in rabbits, dye was present in the blood and a satisfactory determination of the dye concentration was possible. 2) Liver damage was reflected by an increased retention of bromsulphalein 15 minutes after injection of the dye.

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Excretion of Urinary "Epinephrines" in Psychiatric Disorders.* (23181)

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Physiologic changes which resemble those following injection of epinephrine and norepinephrine frequently occur in response to many types of noxious stimuli. The recent introduction of bio-assay and chemical procedures for estimation of epinephrine has made it possible to confirm physiologic evidence of increased sympathetic medullary activity under these circumstances. Since fear or anxiety is one of the most prominent symptoms in both neurotic and psychotic patients, such a study is of particular interest in these individuals. The purpose of this report is to present preliminary observations on excretion of urinary epinephrine in this group.

Materials and methods. Seventeen pyschiatric patients, none of whom was receiving a course of tranquillizing drugs, insulin treatment or electric shock therapy, were studied on one or more occasions. Diagnoses of the nature of the disorders were made by the psychiatric staff of McLean Hospital. In some cases, the illness was acute, while in others it was chronic. Some, but not all, patients complained of severe anxiety and often showed physiological evidence of increased epinephrine activity such as clammy hands and tachycardia. Their blood pressures, however, were within normal limits. The method used in determination of the urinary "epinephrines"‡ has been described elsewhere(1). Minor refinements in the chromatographic technics were made during the course of the investigation. In a control series comprising 45 patients, values ranged from 0 to 59.5 μg per 24 hours; average value was 20.0 and standard error was 2.9. Values in patients

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‡ "Epinephrines", as used in this paper, includes all compounds detected by the method employed. These substances include epinephrine, norepinephrine, certain other alpha-hydroxy catechol amines, trihydroxindoles, and 3,5 hydroxy-6-oxy indoles.

TABLE I. Value of Urinary "Epinephrines" in Psychiatric Patients.

Case	Age	Diagnosis	Urinary "epinephrines," μg/24 hr
45 controls			0-59.5, Avg 20 ± 2.9*
♀	40	Psychotic disorder, psychotic depressive reaction	773
♂	26	Schizophrenic reaction, catatonic type	0
"	30	*Idem*	631
			184
			639
			728
			203
			360
♀	26	Schizophrenic reaction, paranoid type	577
			270
"	42	*Idem*	730
♂	38	Schizophrenic reaction, schizoaffective type	800
♀	45	*Idem*	353
			339
"	46	"	710
♂	21	Psychoneurotic disorder, anxiety reaction	660
♀	36	*Idem*	364
"	34	Psychoneurotic disorder, dissociative reaction	1184
			1055
"	36	Psychoneurotic disorder, obsessive compulsive reaction	133
"	24	Psychoneurotic disorder, depressive reaction	237
"	"	*Idem*	233
"	51	"	119
♂	16	Personality disorder, passive aggressive disturbance	34
"	14	Transient situational personality disturbance, adjustment reaction of childhood, conduct disturbance, destructiveness	3

* S.E.

with pheochromocytomas are usually from 200 to 3000 μg, but on rare occasions normal findings may be present in patients with these tumors.

Results. The urinary "epinephrines" of most of the patients were from 200 to 500 μg per day (Table I), values well in excess of those found in normal individuals. However, three patients, one recently recovered from catatonic stupor, one with a personality disorder and the third an adjustment problem, showed normal values. The 2 latter subjects were the youngest in the series and could be more properly classified as suffering from personality disorders rather than from psychoneurosis or psychosis. The highest readings for neurotic patients and schizophrenic patients were 1184 and 800 μg respectively.

Comment. The literature on urinary epinephrine and norepinephrine concentration in both normal subjects under stress and in psychiatric patients is sparse(2-5). Some normal and some elevated values have been found in neurotic and psychotic patients. Increased urinary outputs have been reported on occasions in normal individuals subjected to stress.

For almost a half century, substantial physiological evidence(6,7) has accumulated which suggests increased secretion of epinephrine or norepinephrine in response to strong emotional stimuli. Although these data are based on acute experiments, there is little reason to doubt that the chronic anxiety of neurotic and psychotic patients might eventuate in such increased activity of the adrenal medulla and sympathetic nervous system.

The problem arose of whether urinary "epinephrines" could be correlated with subjective anxiety or with physiologic evidence of increased sympathetic activity. Since all current methods of measuring both anxiety and the status of the autonomic nervous system are crude, a systematic study was impossible. However, neurotic patients with high values seemed in general to be more anxious and more subject to excess perspiration and palpitations. Such a relation was not so evident in the psychotic group; for example, one patient showed normal values within 2 weeks after an episode of catatonic stupor. Although none of the subjects of Table I were hypertensive, 2 patients studied at another hospital, who exhibited both anxiety and hypertension while acutely ill, showed elevated urinary "epinephrines" (375 and 670 μg) during this period. With the diminution of anxiety, these values fell significantly to 107 and 92 μg respectively, and blood pressure readings fell to normal levels.

The finding of increased "epinephrines" in neurotic and psychotic patients raises, of course, the question why physiological and biochemical abnormalities are observed less frequently in this group than in patients with

pheochromocytomas. This question cannot be answered fully; however, one factor might be the increased rate of oxidation of epinephrine commonly found in schizophrenia(8).

Summary. Increased 24 hr excretion of urinary epinephrines was found in 14 of 17 patients with various psychiatric disorders. These increased outputs varied from about 200 to 500 μg/day; the largest was 1184. Such values are within the range of those found cases of pheochromocytoma and emphasize the fact that increased epinephrine excretion is not pathognomonic of adrenal medullary and chromaffin chain tumors.

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Effects of Aminopterin and Estrogen on Phosphoprotein Phosphatase of Rat Uterus.* (23182)

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In a previous investigation of the effects of estrogen and 4-aminopteroylglutamic acid (Aminopterin) on phosphate metabolism of rat uterus(1), it was observed that Aminopterin caused an almost complete inhibition of synthesis of phosphoprotein in response to estrogen. Aminopterin also inhibited uterine growth in response to estrogen which suggested that synthesis of phosphoprotein, might be a significant factor in growth of this organ. Therefore, it was felt that a study of the enzyme concerned in metabolism of uterine phosphoprotein would be of interest.

Methods. 45 female rats of the Holtzman strain, weighing 45-55 g, were used. The animals were 22 days old when spayed and were placed on experiment 1-2 days after spaying. They were grouped according to treatment as follows: Group AE contained 22 animals, receiving 10 μg Aminopterin/day for 4 days intraperitoneally and 0.1 μg 17-β-estradiol/day for 3 days subcutaneously. Estrogen was given simultaneously with the last 3 Aminopterin injections. Group E contained 6 animals which received estrogen injections only and Group C contained 17 animals serving as untreated controls. At necropsy uteri were removed, stripped free of mesometrium, weighed, pooled as described in Table I, and 10% water homogenates prepared. Assay procedure for phosphoprotein phosphatase activity was that described by Norberg(2) except that whole homogenates rather than extracts were used. The substrate was commercial casein dissolved in dilute NaOH solution and precipitated with HCl 3 times, then stored in frozen state. This procedure was necessary to prevent precipitation of proteoses after addition of molybdate in phosphate determinations. Inorganic phosphorus was determined according to Lepage(3).

Results. Activity of phosphoprotein phosphatase in the different groups (Table I) cannot be correlated with observations on phosphoprotein fraction of uterus studied under identical experimental conditions, as described previously(1). Values for this

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