(phage type 44A/80/81) produced both hemolysins.

It is of some interest that 50% of Group d (non-typable) strains exhibit fibrinolytic activity. This value is considerably higher than the 14% reported by Neter(6). While Fusillo and Jaffurs(7) defined a relationship between activity of coagulase and inactivity of urease among strains of staphylococci, our observations showed some urease activity in strains of Group a (44A) and Group d (non-typable).

Summary. Free coagulase can be measured adequately by either the tube-plasma method or the tellurite-glycine method. We were unable to establish any direct relationship between certain groups of phage-typable staphylococci and production of alpha, beta or delta hemolysins. Fibrinolytic activity was variable but 50% of Group d (non-typable) exhibited some activity.

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Lowered Glucose Utilization, Phosphate Uptake and Reduced Glutathione of Erythrocytes Following Uretero-Caval Anastomosis.* (25244)

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Following bilateral nephrectomy of the dog, glucose utilization, phosphate uptake and reduced glutathione content of erythrocytes are significantly lowered(1). Bilateral nephrectomy is also associated with a prominent shortening of the life span of erythrocytes(2). Anastomosis of one ureter into the inferior vena cava followed by contralateral nephrectomy is attended by the same degree of retention uremia as after bilateral nephrectomy, yet the life span of erythrocytes is significantly improved toward normal during uretero-caval anastomosis(3). These findings have suggested protection against *in vivo* hemolysis by intact renal tissue(3). With this background it became of interest to determine the state of glucose utilization, phosphate uptake and reduced glutathione content of erythrocytes in the uremia of the dog following uretero-caval anastomosis.

Material and methods. Normal mongrel dogs were used. Under nembutal anesthesia one ureter was severed near the urinary bladder and connected to the inferior vena cava by means of a polyethylene tube. Through a purse string suture about a puncture of the vena cava the polyethylene tube was extended for 3 to 5 cm along the blood stream. Three to 4 days later the contralateral kidney was removed during ether anesthesia. Control blood samples were obtained prior to nephrectomy. The test samples were obtained 4 days following removal of the contralateral normal kidney. After the test sample was obtained the animal was sacrificed and the patency of the ureter and tube and state of the kidney were determined. In 5 of the 7 experiments the ureter and tube were open; there was no hydronephrosis and the kidney was of normal

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TABLE I. Changes in Glucose Utilization, P-32 Uptake and GSH Content of Erythrocytes following Uretero-Caval Anastomosis. Control value was taken prior to removal of normal kidney. Degree of azotemia is given in last column.

					GSH content (mg/100 ml R.B.C.)					
	Glucose utilization (mg/100 ml R.B.C.)		P-32 uptake (%)		Nitroprusside method		Alloxan method		Plasma urea (mg/100 ml)	
Wt, kg	Control	4 days	Control	4 days	Control	4 days	Control	4 days	Control	4 days
* 9.1	38.1	46.9	34.1	24.9	57.6	39.8	57.9	41.5	76	486
10.0	63.8	34.6	43.0	29.4	55.8	37.3	59.8	37.3	72	386
* 8.4	51.5	38.1	37.5	22.8	61.7	33.2	61.4	46.3	74	366
15.0	55.4	31.2	35.6	26.9	66.2	41.7	74.4	42.8	82	402
11.0	56.0	32.9	41.3	31.6	55.3	28.6	54.7	28.8	100	468
9.1	58.5	29.8	42.1	33.4	57.9	44.8	58.3	47.6	86	394
9.1	42.5	39.3	37.0	30.1	48.7	42.1	48.9	41.9	65	330
Mean diff.	−16.75		10.21		−19.4		−18.5			
p *vs* o	.02		.001		.001		.001			

* Obstructed ureters. All other examples had non-obstructed ureters.

configuration. In 2 instances the polyethylene tube was obstructed by blood clots. The anastomosed kidneys increased in weight over the contralateral kidney by an average of 48% over the 4 days. This marked hypertrophy has been shown to be associated with an increase in normal appearing cortical and medulla tissues(4). These observations indicated an adequate circulation through the kidney with the uretero-caval anastomosis. Duplicate analyses on each sample revealed minimal variations. The values were averaged. Ten ml of blood were obtained from the femoral artery into a syringe containing a drop of heparin. The samples were immediately chilled in ice and analyses were begun shortly thereafter. For the glucose utilization the Somogyi glucose method(5) and the general approach described by Hollingsworth(6), were used. The inorganic phosphate uptake was conducted by the method described by Prankerd(7). The reduced glutathione content was obtained by 2 methods, the nitroprusside method of Grunert and Phillips(8) and the alloxan method(9). The plasma urea concentration was determined by an urease method(10).

Results. The data and their statistical analyses are given in Table I. The Table contains paired data, that is the control values after uretero-caval anastomosis but before removal of the contralateral normal kidney and the values 4 days after the nephrectomy. During the 4 days the ureter was connected to the vena cava and there was no excretion of urine to the outside. A "t" test was used to determine whether or not the mean difference between the control and the 4 days values differed significantly from zero.

The results from all 3 measurements differed significantly from zero indicating a lowering of all 3 biochemical measurements. There was no significant difference in the reduced glutathione values as obtained by the alloxan and Grunert and Phillips methods. While these results were derived a pronounced azotemia accrued.

Comment. The 3 biochemical measurements of erythrocytes used (glucose utilization, phosphate uptake, reduced glutathione content) were lowered to the same extent in the presence of intact hypertrophying renal tissue without an excretory outlet as following renal ablation. Since uretero-caval anastomosis and bilateral nephrectomy are associated with a similar degree of retention uremia, the findings suggest that either hypertrophying renal tissue cannot prevent these red cell changes or that the changes are more related to the uremia *per se*. The resolution of these two possibilities was not possible by this study.

Bilateral nephrectomy of the dog is associated with a pronounced shortening of the life span of erythrocytes. Since the uretero-caval procedure as used herein changes the erythrocytic life span significantly toward normal(3), the present study does suggest that the biochemical measurements used are not as directly related to the shortened eryth-

rocytic life span as was previously considered (1).

Summary. 1. Glucose utilization, phosphate uptake and reduced glutathione content of erythrocytes are significantly lowered following uretero-caval anastomosis and contralateral nephrectomy of the dog. 2. Above biochemical changes are of the same magnitude as following bilateral nephrectomy. Thus presence of hypertrophying renal tissue without an excretory outlet is not protective toward these alterations.

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Influence of Vitamin A on Cholesterol Blood Levels. (25245)

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There is evidence that a relationship exists between elevated serum cholesterol levels and atherosclerosis(1,2). It therefore seemed worthwhile to investigate further substances which might be capable of reducing serum cholesterol levels. Vitamin A* was chosen because of favorable reports of its antihypercholesteremic properties in animals. Weitzel, Schon, and Gey(3) reported that Vit. A had a definite protective effect on experimental atherosclerosis in rats. Later, the same workers(4) gave large oral doses of the fat-soluble Vit. A, E, and K to old atherosclerotic hens, over a period of 75 to 100 days. With Vit. E, a slight antiatherosclerotic effect was observed in a few cases. With Vit. A, however, macroscopic examination showed marked regression of the atheromatosis in all the test groups and a decrease in total fat content of the aorta. However, Oppenheim and Bruger,(5) reported that oral doses of Vit. A did not alter the pattern of development of experimental atherosclerosis in rabbits. Wendt(6) reported that massive doses of Vit. A caused an increase in cholesterol content of human serum. Lasch (7) reported that Vit. A, given as "Vorgan" 3 times a day to human beings, in doses of 40.000 to 80,000 I.U. caused an increase in serum cholesterol within 5 to 10 days. This increase was due to an increase in serum cholesterol esters.

Method. Two types of patients were used in this investigation: first, normal individuals, aged 30 to 50; and second, individuals having experienced a myocardial infarction within the year, aged 40 to 55. The above groups were subdivided; those receiving Vit. A and those receiving no medication. Thus there were 4 different experimental groups. *Group A.* Each of these patients experienced at least one myocardial infarction within the year. All individuals showed elevated serum cholesterols, total, free, and ester levels. 100,000 I. U. of Vit. A acetate per day was administered orally to each patient. *Group B.* Each of these patients had suffered at least one myocardial infarction within the year. All had elevated cholesterol levels, total, free, and esters. No medication was administered to this group. *Group C.* All patients had normal cholesterol levels, total, free, and esters. No clinical history of coronary artery disease. 100,000 I. U. of Vit. A acetate per day was administered orally to

* Vit. A was furnished by Hoffman-La Roche, Nutley, N. J.