is to depress ability to form ethyl alcohol. In turn this phase is followed by increased fermenting activity after some days and this increase in production of alcohol is maintained thereafter. Additional experiments showed that over-intense exposure weakened the yeast so that fermentation induced by it thereafter was depressed. Very short exposures on the other hand, produce no evident effect whatever.

This increase in production of ethyl alcohol is due to the influence of the ultra violet energy upon the yeast itself and is not brought about by treatment of the wort. This was demonstrated by irradiating the beer wort under conditions identical to those already outlined. When such wort then was inoculated with untreated yeast, there was no appreciable difference between the amount of alcohol produced here and that formed by similar amounts of normal yeast in untreated wort.

8846 P

Effects on Blood Pressure of Injection of Kidney Extracts of Dogs with Renal Hypertension.

T. R. HARRISON, A. BLALOCK AND M. F. MASON.

From the Departments of Medicine, Surgery and Biochemistry of Vanderbilt University, Nashville, Tenn.

A rise in blood pressure may be produced in dogs either by partial obstruction of the renal arteries[1] or by ligation of the ureters.[2] Since the latter procedure often causes a marked decline in the renal blood flow,[3] it seems likely that the hypertension is in both instances related in some way to ischemia of the kidneys. It was shown by Tigerstedt and Bergman[4] that saline extracts of the kidney of rabbits produced a sustained rise in blood pressure when injected into other rabbits. The object of our experiments was to determine whether extracts prepared from ischemic kidneys, removed from dogs with hypertension, had a greater pressor effect than similar extracts of normal kidneys.

The freshly removed kidneys were chopped up with scissors and

1 Goldblatt, H., Lynch, J., Hanzal, R. F., and Summerville, W. W., *J. Exp. Med.*, 1934, **59**, 347.

2 Harrison, T. R., Mason, M. F., Resnik, H., and Rainey, J., *Trans. Assn. Am. Phys.* In press.

3 Levy, S. E., Mason, M. F., Harrison, T. R., and Blalock, A. In press.

4 Tigerstedt, R., and Bergman, P. G., *Skand. Arch. Physiol.*, 1898, **8**, 223.

ground with carborundum and 0.9% salt solution. The suspension so obtained was centrifuged and the supernatant fluid was kept in the ice box until used. Amounts corresponding to 5 gm. of kidney tissue were administered intravenously to *normal unanesthetized dogs*. Changes in blood pressure were measured by the cuff described by Ferris and Hynes,[5] the passage of the pulse wave being determined by palpation of the dorsal artery of the foot.[6]

The results which have been obtained are summarized in Table I. Extracts of the normal kidneys frequently caused a marked preliminary decline in blood pressure, followed in a few minutes by a gradual rise which persisted for 30 minutes or longer. The degree of rise varied from zero to 60 mm. of mercury above the control values. Extracts of the kidneys of dogs with renal hypertension usually caused less preliminary decline and a more marked secondary rise in blood pressure. The time of onset of the peak of the blood pressure curve varied markedly in the different experiments, but tended to appear somewhat earlier when the extracts of the ischemic kidneys were injected.

In a number of experiments a comparison was made between the effects of extracts of the 2 kidneys of a dog made hypertensive either by partial obstruction of one renal artery or by unilateral ureteral ligation. Here again the extracts of the ischemic kidney caused less preliminary decline and more marked rise in blood pres-

TABLE I.
Effects on Blood Pressure of Unanesthetized Dogs of Injection of Extracts of the Kidneys of Normal Dogs and of Dogs with Renal Hypertension.

Injected Saline Extracts of Kidney of	No. of Exp.	Decline in Blood Pressure: No. Observations	Max. Rise in Blood Pressure, mm. of Hg			Aver. Time of Max. Effect: Min. after Injection
			Lowest	Highest	Aver.	
Normal dogs	12	6	0	75	*27*	29
Hypertensive Dogs: Partial obstruction of both renal arteries	7	2	32	100	*60*	19
Hypertensive Dogs: Both ureters ligated	4	0	0	132	*47*	8
Hypertensive Dog: Partial obstruction of one renal artery						
Normal kidney	4	1	0	30	*14*	26
Ischemic kidney	5	1	14	68	*42*	30
Hypertensive Dog: Ligation of one ureter						
Normal kidney	7	5	23	61	*36*	19
Ischemic kidney	8	0	34	71	*49*	14

[5] Ferris, H. W., and Hynes, J. F., *J. Lab. and Clin. Med.*, 1930-31, **16**, 597.

[6] Mason, M. F., Resnik, H., Minot, A., Rainey, J., Pilcher, C., and Harrison, T. R., *Arch. Int. Med.* In press.

sure than did the extracts of the opposite normal kidney of the same animal. (Table I.)

A few observations have been made on the effect of extracts of human kidney. It appears that the extracts of the kidney of certain patients with essential hypertension may have an increased pressor effect but this is not yet clearly established.

Our findings, which have been confirmed concurrently by Friedman and Prinzmetal,[7] indicate that a relationship exists between experimental renal hypertension and the production in ischemic renal tissue of an increased amount of some pressor substance. Whether the latter is actually the cause of the rise in blood pressure is not yet certain. The findings are also compatible with the idea of a diminution in the rate of formation of a depressor substance in the ischemic kidney as a factor in the production of renal hypertension. Definite conclusions cannot be drawn until more is known concerning the chemical nature of the pressor and depressor agents. Attempts at separation and purification of these substances are now being made.

8847 C

Metabolic Activities of *Escherichia coli* in a Synthetic Medium.

C. E. CLIFTON, S. F. CAHEN AND GRANT MORROW.

From the Department of Bacteriology and Experimental Pathology, Stanford University, California.

Recent studies by Martin,[1] Mooney and Winslow,[2] and Clifton[3, 4, 5] on the metabolic activities of bacteria indicate that the rate of metabolic activity per cell varies widely at various phases of the growth-cycle. The maximal oxygen-consumption, carbon dioxide-production or ferricyanide-reduction per cell per unit-time was noted near the end of the lag-period of growth and could be only in part explained by increased cellular size during the same period of growth. The metabolic activities per unit-volume of the cultures, as measured by the above indices, reached maximal values

7 Friedman, B., and Prinzmetal, M. Personal communication.

1 Martin, D. S., *J. Gen. Physiol.*, 1932, **13**, 691.

2 Mooney, G., and Winslow, C.-E. A., *J. Bact.*, 1935, **30**, 427.

3 Clifton, C. E., Cleary, J. P., and Beard, P. J., *J. Bact.*, 1934, **28**, 541.

4 Clifton, C. E., PROC. SOC. EXP. BIOL. AND MED., 1936, **34**, 291.

5 Clifton, C. E., *J. Bact.*, 1936. In press.