with a slight hypoglycemia similar to that found in the unexcited control group. Obviously, the insulin concentration of the blood was increased sufficiently to offset completely the effects of adrenalin on the blood sugar of the test animal.

With respect to the reactivity of the vago-insulin and the sympathetico-adrenal systems our experiments can be divided into 3 groups. The first consists of excited controls showing sympathetico-adrenal effects but no signs of vago-insulin excitation; the second group consists of the majority of psychotic patients showing absence of sympathetico-adrenal effects (blood sugar unchanged) and greatly increased insulin content of the blood. Finally, the third group comprises excited patients in a somewhat intermediate group in which the reactivity of the sympathetico-adrenal system is adequate to cause a rise in the blood sugar of the patient but the test on the hypophysectomized-adreno-demedullated rat reveals that insulin is present in increased amounts enough to offset the effect of adrenalin on the blood sugar of the test animal.

12068 P

Heart Sounds in Myocardial Infarction Due to Acute Coronary Occlusion.

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In 80 cases of acute coronary occlusion a phonocardiographic study was made of the effect of myocardial infarction on the character of the heart sounds. Using the Sanborn Stetho-cardiette, phonocardiograms were recorded daily during the first 2 or 3 weeks following the attack and 3 times weekly thereafter until discharge. The apical heart sounds were recorded with the patient in the semi-recumbent position and holding his breath in expiration. For proper timing, an electrocardiogram and venous pulse curve were recorded simultaneously.

The first and second heart sounds were analyzed for intensity (amplitude), pitch (frequency) and duration, and the presence of normal or accentuated auricular and third heart sounds was noted. The analysis was aided by the use of 2 microphones, one amplifying all sound frequencies equally, including those of very low pitch which are usually inaudible, and the other selectively amplifying the

TABLE I.
The Heart Sounds in Acute Coronary Occlusion: Comparison with Normal Subjects of the Same Age Group.

	Coronary occlusion %	Normal subjects
No. of cases	78	100
First sound		
S_1 low	19 (33)	6
S_1 lower than S_2	41 (57)	6
Auricular sound		
Total No.	65 (83)	38
Normal	38 (50)	38
Accentuated (presystolic gallop)	26 (33)	0
Third sound		
Total No.	37 (47)	12
Normal	30 (38)	12
Accentuated (protodiastolic gallop)	7 (8)	0
Summation gallop	5 (6)	0

sounds of higher frequency, thus corresponding to auscultation by the human ear. For comparison, phonocardiograms were also recorded in a control series of 100 normal subjects, 93% of whom were over 40 years of age.

The results are tabulated in Table I. The significant findings are related to the first sound, the auricular and the third sounds.

1. *First Heart Sound.* a. *Intensity:* A distinct diminution of the amplitude of this sound occurred in 33% of cases. In 57% the first sound showed a relative diminution as compared to the second. This is the reverse of the normal relationship, being present in only 6% of the normal control group. The diminished first sound in normal individuals is related to various extra cardiac factors affecting sound conduction, such as thickness of the chest well, form of the thoracic cage and overlying lung tissue.

b. Frequency: The diminution in amplitude involved exclusively the high frequency component, resulting in a first sound of low pitch and decreased audibility. The main high frequency component of the normal first sound originates during the isometric phase of ventricular systole. Its disappearance following myocardial infarction is probably related to lowered intraventricular pressure and diminished force of ventricular contraction.

c. Duration: This was not affected in any of the cases, unless intraventricular block was present.

2. *Auricular Sound.* An auricular sound immediately preceding the first sound and which is related to auricular contraction, occurred in 83% of cases of infarction as compared to 38% of the normal control group. It was of normal amplitude in 50% and distinctly accentuated in 33%. (It was never accentuated in the normal group.)

The accentuated sound usually became audible as a presystolic gallop rhythm. It is related to the increased intraäuricular pressure following ventricular infarction and heart failure.

3. *Third Heart Sound.* A third sound, occurring in early diastole, was present in 47% of cases of infarction and in only 12% of normal subjects. It was definitely accentuated in 8%, forming an audible protodiastolic gallop rhythm. The third sound is related to the early diastolic filling of the ventricles when the inrushing blood from the auricles impinges on the ventricular wall. A decreased ventricular tonus and increased intraäuricular pressure which occur in infarction favor the production of a third sound of increased intensity.

In 6% of the cases there was a superimposition of the normal or accentuated auricular and third sound forming a clinically audible summation gallop rhythm.

Summary. In myocardial infarction due to acute coronary occlusion the first sound is usually diminished in amplitude both absolutely and relatively to the second sound, and is of low pitch owing to the small amplitude of the high frequency component. There is an increased incidence of auricular and third sounds. The accentuation of these sounds by increased intraäuricular pressure and decreased ventricular tonus often results in gallop rhythm.

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Liver Histamine During Peptone Shock in Dogs.

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Dragstedt and Mead[1] reported that the vascular shock produced by the intravenous injection of proteose solutions into dogs is accompanied by the appearance in the blood and thoracic duct lymph of a vasodepressor substance which was tentatively identified as histamine. Dragstedt, Mead and Eyer[2] presented additional evidence that the vasodepressor substance was histamine. They likewise presented indirect evidence that the amount of histamine liberated from the fixed tissues is adequate to account for the degree of shock

[1] Dragstedt and Mead, *J. Pharm. and Exp. Ther.*, 1937, **59**, 429.

[2] Dragstedt, Mead and Eyer, *J. Pharm. and Exp. Ther.*, 1938, **63**, 400.