3. Coronary insufficiency. Myocardial infarction does occur in the absence of coronary occlusion. Yater and associates [9] found absence of occlusion in less than 10 per cent in their series of cases of myocardial infarct. They reviewed 866 fatalities due to disease of the coronary arteries in men of the ages from 18 to 39 years. Some of their findings are listed in table 3.

From these statistics it is apparent that fatal coronary insufficiency is represented in a definite but small percentage of coronary deaths. Severe coronary insufficiency with infarction, as a rule, is due to unusual exertion beyond the cardiac reserve. It is probable that unusual exertion on the part of the patient at the time of his attack is the precipitating cause of his coronary insufficiency and subsequent myocardial infarction. This is usually associated with a subendocardial infarct. Subendocardial infarction usually shows inversion of the T waves and does not show prominent Q waves in the electrocardiogram. There are other clinical and, of course, pathological characteristics to distinguish this type of infarction.

4. Contusion of the heart muscle. Direct trauma to the heart muscle may occur as the result of a blow on the chest and may produce abnormal electrocardiographic changes suggestive of coronary occlusion. The electrocardiographic

TABLE 3.—*Statistics on Myocardial Infarction (Based on Autopsy Observations in 866 Cases of Coronary Artery Disease of Men of Ages 18 to 39)* *

	Number	Percentage
Patients with gross myocardial infarction	114	100
Without occlusion of coronary artery	8	7
With sclerotic occlusion only	27	23.7
With thrombotic occlusion only	55	48.2
With both sclerotic and thrombotic occlusion	24	21.1

* This table is an adaptation of table XXXIV, page 690, of the third article of Yater and associates cited in footnote 9.

changes are due to the injury of the heart muscle. However, the injury is not due to circulatory failure but is due to the contusion. This type of heart lesion is industrial in origin if the injury of the chest was sustained in the course of the man's occupation, and should not be confused with myocardial infarction.

5. Rare conditions of the myocardium. Myocarditis, acute dilatation of the heart (cor pulmonale), severe electrolytic disturbances and other rare conditions of the myocardium can be differentiated on clinical grounds.

COMMENT

If it is agreed (*a*) that angina pectoris is a transient symptom of arteriosclerosis without residual and is therefore not important in an industrial sense, (*b*) that coronary occlusion is due to arteriosclerosis and is not related to strain, and consequently is not industrial in origin, and (*c*) that acute coronary insufficiency with myocardial infarction may be due to severe muscular or nervous strain, then most cases of myocardial infarction can be classified definitely as to their cause and consequently their industrial relationship. I realize that not all physicians will agree to the above stipulation, but there are available at this time sufficient data to uphold

9. Yater, W.; Traum, A. H.; Brown, W. G.; Fitzgerald, R. P.; Geisler, M. A., and Wilcox, B. B.: Coronary Artery Disease in Men 18 to 39 Years of Age, Am. Heart J. **36**:334 (Sept.); 481 (Oct.); 683 (Nov.) 1948.