common as a sequence of rheumatism, the hypertrophied heart causes bulging of the chest wall. The area of cardiac impulse is increased and may sometimes be seen from the third to the sixth interspace and beyond the nipple line. The strongest impulse may be to the right of the apex. The wavy character of the pulsation in the third, fourth, and fifth interspaces is not peculiar to adherent pericardium. Not much stress can be laid upon the fixed position of the impulse, which in great enlargement of the heart is not much influenced either by posture or respiration. A more important point is systolic retraction of the apex region. Whether this occurs without adhesion of the pericardium to the chest wall is doubtful. It is often marked, and is sometimes best appreciated by the application of the hand over the apex region, which is felt to be drawn in at the moment of systole. The retraction may be most noticeable in the lower sternal region or even at the xiphoid cartilage. Following this there is sometimes a rapid rebound—the diastolic shock—which has been regarded by some as the most reliable of all signs of pericardial adhesion. Associated with this diastolic rebound is the so-called *Friedrich's sign*—diastolic collapse of the cervical veins.

(2) *Percussion* reveals an increase in the area of cardiac dulness, particularly upward as high as the second interspace. In a majority of the cases there are adhesions as well between the pleura and pericardium—in ten of thirteen cases analyzed by Ord. In some instances the dulness may reach as high as the first interspace. A sign of value is the fixed limit above and to the left of cardiac dulness, as pointed out by C. J. B. Williams. When the outer layer of the pericardium is adherent to the pleura this is a sign of very definite value, and the limit of dulness varies very slightly on deep inspiration.

(3) On *auscultation* the phenomena vary extremely with the condition of the chambers. There may be no murmurs. When extreme dilatation is present the gallop or fœtal rhythm occurs. A loud regurgitant murmur is not uncommon at the apex region, and the cases are frequently mistaken for mitral insufficiency.

(4) The *pulsus paradoxus* in which during inspiration the pulse-wave is small and feeble, is sometimes present, but it is not a diagnostic sign of either simple pericardial adhesion or of the cicatricial mediastino-pericarditis.

Adherent pericardium with extreme dilatation of the heart may raise the suspicion of pericarditis with effusion, as the outline of dulness in both is somewhat alike. As a rule, however, the basic dulness is broader in adhesion, and has not the pear-shaped outline. The extent and wavy character of the impulse is never so marked in large effusions, and the heart-sounds are muffled.

II. OTHER AFFECTIONS OF THE PERICARDIUM.

1. **Hydropericardium.**—Naturally there are in the pericardial sac a few cubic centimetres of clear, citron-colored fluid, which probably represents a post-mortem transudate. In certain conditions during life there may be large secretions of serum forming what is known as dropsy of the pericardium. It occurs usually in connection with general dropsy, due to kidney or heart disease; more commonly the former. It rarely of itself proves fatal, though when the effusion is excessive it adds to the embarrassment of the heart and the lungs, particularly when the pleural cavities are the seat of similar exudation. There are rare instances in which effusion into the pericardium occurs after scarlet fever with few, if any, other dropsical symptoms. The physical signs are those already referred to in connection with pericarditis with effusion. It is frequently overlooked.

In rare cases the serum has a milky character—chylo-pericardium.

2. **Hæmo-pericardium.**—This condition, by no means uncommon, is met with in aneurism of the first part of the aorta, of the cardiac wall, or of the coronary arteries, and in rupture and wounds of the heart. Death usually follows before there is time for the production of symptoms other than those of rapid heart-failure due to compression. Particularly is this the case in aneurism. In rupture of the heart the patient may live for many hours or even days with symptoms of progressive heart-failure, dyspnœa, and the physical signs of effusion.

As already mentioned, the inflammatory exudate of tubercle or cancer is often blood-stained. The same is true of the effusion in the pericarditis of Bright's disease and of old people.

3. **Pneumo-pericardium.**—Gas is rarely found in the pericardial sac, and is due, as a rule, to perforation from without, as in the case of stab wounds, or the result of perforation from the lungs, œsophagus, or stomach. Possibly, too, it may result from the decomposition of a purulent exudate. As a result of perforation, acute pericarditis is always excited, and the effusion rapidly becomes purulent. The physical signs are remarkable. When the effusion is copious the fluid and gas together give a movable area of percussion dulness with marked tympany in the region of the gas. On auscultation, remarkable splashing, churning, metallic phenomena are heard with friction and possibly feeble, distant heart-sounds. Death follows rapidly, even in thirty-six hours, as in a case (the only one which I have seen) of perforation of the pericardium in cancer of the stomach. Except as a result of injury, the condition is not one for which treatment is available. In a case of perforation from without with signs of effusion, to enlarge the wound by free incision would be justifiable.