

the diaphragm, as seen in paralysis due to lesions of the phrenic nerve or of its spinal centres, and it very often is due to mechanical obstruction to the proper action of the diaphragm, as may occur in abdominal distension from any of the causes named above, or from the pressure of a large pericardial effusion.

(b) **Movements due to the Circulation.**—Pulsation in the abdomen is rarely seen except in the **epigastrium**, where it is a fairly common symptom. Here the time of the pulsation is of importance. Systolic epigastric pulse is due to the contraction of the right ventricle in most cases. It may be observed in health at times when the heart is acting forcibly, as in emotional states, and as a result of exercise. It is found in cases where the right ventricle is dilated and hypertrophied, in consequence of mitral disease. A systolic pulsation in the epigastrium may be due to displacement of the apex-beat to the right from the various causes of this dislocation mentioned at p. 472; or, lastly, the movements of the heart may be transmitted to the surface through the liver or a tumour in the epigastrium. A pulsation occurring a fraction of a second (about one-tenth) after the ventricular systole is frequently observed in the epigastrium of dyspeptic patients, and especially of those who are neurotic. It is merely an exaggerated pulsation of the abdominal aorta—the so-called **irritable aorta**—and is without serious diagnostic significance. The pulsations from a normal or from an irritable aorta may be transmitted to the surface through a solid **tumour** in the epigastrium. In this case the pulsation may disappear from the tumour when the patient is placed in the knee-elbow position. In rare instances the epigastric pulsation may be due to **aneurism** of the abdominal aorta (which is much rarer than those of the thoracic aorta). Here the pulsation is ample, and the tumour is laterally expansile. The pulse in the lower limbs is weakened, and the patient suffers pain in the back and in the region of the tumour.

Pulsation of the liver may be the cause in rare cases of epigastric pulsation. In order to demonstrate it the edge of the liver should, if possible, be grasped by the fingers and thumb of one hand, or, what is usually more practicable, it may be pressed between two hands, one placed behind supporting the last two or three ribs, and the other in front, placed over the right hypochondrium. If the liver is pulsating, a general expansion of the organ may be felt with each systole, but this must be carefully distinguished from