greatest, and that, as I demonstrated in this Society at a previous meeting, the bronchi and arteries run in such a direction that they tend only to lengthen and shorten in respiration.

The veins pursue a different course from the arteries. They lie as far as possible from the bronchi, while the arteries accompany these tubes. Their course also is more tortuous. They are surrounded by elastic pulmonary tissue, attached loosely to their walls. The mechanical advantage of this arrangement has not, I think, been pointed out. It is evident that the veins are so placed as to tend to be held open during inspiration and expiration, by the tendency of the elastic tissue to contract toward the bronchi. They are so placed as to be practically uncompressed by the atmosphere. In fact, they may be said to run always through those parts of the chest in which there is a nearly perfect balance between the contractile power of the lung and the atmospheric pressure.

Ewart, in his remarkable monograph, "The Bronchi and Pulmonary Blood-vessels," describes the course of the veins with the same exactness and detail which characterize the rest of his work. He views the veins, however, as a part of the pulmonary framework. In this he is, I think, only partly correct. He is right, as far as he goes, in looking upon the veins as part of the pleural and pulmonary connective-tissue system; but the vein only lies in, and does not form a part of, the sustentacular system, running in the latter because it is necessarily best placed, as far as possible from the centres of expansion and contraction of the lung. I cannot speak too highly of this work of Ewart. It fills a practically unexplored field of pulmonary anatomy with a thoroughness which leaves nothing to be desired. It has vastly simplified my own work, and rendered the publication of much of it needless. To it I am indebted for the first correct idea of the pulmonary vein. My view of the subject is purely mechanical, and Ewart's anatomical, hence we interpret differently.

The Attachments of the Lungs.—The structures forming the roots of the lungs are not so much concerned in holding the organs in place as is usually assumed. Far more important are the pleural folds known as the *ligamenta lata.* These broad ligaments are arranged in such a way as to fasten the lungs, for a considerable part of their inner surfaces, firmly to the vertebral column, pericardium, and diaphragm. Their folds are so separated above as to leave free room for the bronchi, vessels, etc., and so protect them entirely from injury or pressure during respiration. Except these broad ligaments, the rest of the pleuræ of the lung and thorax are interesting for our purposes in so far as they glide over one another.

The Thorax and its Contents.—The thorax is an expansible cavity, partly enclosed by rather rigid walls, composed of bone, connective tissue, and muscles, partly by the very elastic diaphragm. The cavity is divided into two compartments for the lungs by the mediastina and the pericardium contents. These structures make a fairly rigid column, attached above to the deep neck fascia, below to the diaphragm. The central parts of the latter are thus held nearly motionless at all times.

The chest moves in respiration in such a way as to enlarge or diminish every diameter (roughly speaking) in proportion to the bulk of lung-tissue lying between every part of each half of its surface and the main bronchus of the corresponding lung. The movements of the thorax cause not only expansion of the lungs, but also gliding of the pulmonary over the parietal pleura.

Every structure within the thorax, save the lungs, is subjected to a varying negative pressure by the elasticity of these organs. During inspiration this pressure is of course most marked. It is this which causes the diaphragm to arch up and the intercostal spaces to curve inward. It is this which determines the position and shape of fluid masses in the pleural cavities, and the displacements of viscera in pneumo-thorax.

Fluid in the Pleural Cavities, as is beautifully demonstrated by Garland in his paper on "Pneumono-dynamics," does not assume a "hydrostatic," but a "hydrodynamic," level. That is: because of the negative pressure of the lungs, the surface of the fluid is made to take a peculiar shape. It is not level, as it would be under the influence of gravity alone, but is drawn up so as to apply itself to the surface of the contracting lung. The line of flatness at the fluid-level is not straight, but curved. Moreover, the same negative pressure may prevent any great change in the fluid-level with change of posture. Garland illustrates these facts by means of simple and ingenious apparatus. He also calls attention to the fact that active compression by fluid of an elastic body like the lung is impossible, until the elasticity of that body is overcome. The fluid allows the lung to contract, does not press upon it until the chest is very full and the contractile power of the lung exhausted. Of course, as far as the effect upon the blood circulation and air movement within the lung is concerned, it does not make any difference whether the elastic tissue contracts, or the fluid compresses it; but it is very important to remember that, until this negative pressure ceases, the intercostal spaces will continue to be depressed, and the abdominal viscera will not be much displaced. Not so with the heart, since the elasticity of the lung on the sound side produces a negative pressure which causes its displacement toward that side when fluid is present in too small quantity to do so.

All this is so obvious, when once stated, that it is needless to discuss it. The position assumed by the lung when actively compressed by fluid, or