As most of the derangements are appreciated by the ear, the acoustical properties of the thorax are of much importance.

In this paper I regard the thorax and lungs purely from this mechanical stand-point. I venture to bring forward the subject not so much that what I have to say is new, but because I believe it to be true. Every sign mentioned has been observed by myself, and the anatomical statements are based upon dissections, corrosion preparations, or sections made by me. I do not know that any observation is original; I know that many are not. I have tried to study objectively—to see what *is* not what has been said to be. How far I have succeeded I do not know. I hope that, at least, I may present some of it in a new light. This is my only excuse for writing.

Much of the confusion regarding physical signs has been caused by the use of incorrect diagrams. The usual diagram of the air-vesicle and terminal bronchus, for instance, is preposterous. The average diagrams representing pleural effusions are absurdly incorrect. Both have had their influence in producing false ideas of physical diagnosis, since they gave false impressions of the mode of production of physical signs. This is no theoretical matter. A man who does not have a clear idea of physical conditions cannot progress in the study of physical signs. He who thinks that bronchial breathing necessarily indicates consolidated or compressed lungs, or cavernous breathing a cavity, as many diagrams would tend to show, is not a trustworthy interpreter of pulmonary signs. The same is true, in lesser degree, of one who supposes that the level of pleural effusions is always horizontal when the patient stands, or that it usually shifts when the patient lies down, or that absence of evidences of change of level with the patient's change of position indicates pleural adhesions, or that the lung is under actual pressure from fluid save when the quantity is very great, or, finally, that the lung is compressed or contracts directly and symmetrically toward its root when fluid is present.

The air-vesicles do not in the least resemble the usual diagrams. Active pressure upon the elastic lung, until fluid is very abundant, is, as Garland has shown, impossible. The same author has demonstrated why the fluid level does not always change with change of posture. That the lung cannot contract toward its root is evident when one looks at the *ligamentum latum*. Yet all the ideas mentioned are common.

The Air-vesicles.—In regard to the anatomy of the lungs, for the present purpose we are mainly concerned with the bronchial and vesicular portions. The former is better understood than the latter. The description which follows is the result of much study of corrosion preparations. It corresponds with that of Delafield, in his "Studies in Pathological Anatomy." This description (of Delafield's) had been generally discredited. Among others who doubted its accuracy was the writer of this paper. A good deal of work has convinced me that Delafield's view is correct. It may be said that there are two different ideas in vogue regarding the anatomy of the pulmonary lobule; some regard the air-vesicles as attached to the terminal bronchi like a raspberry with its interior hollow. Hence many time-honored diagrams representing fine *râles*. Others give a more elaborate description of infundibula, etc. When one looks at perfectly injected cast of ultimate bronchus and air-vesicles (which looks like a berry), and breaks it up (observing it with a low-power lens), it becomes evident that the interior of the berry is made up of spheroidal bodies which are attached to one another at two or more points. These are the true air-vesicles, and the important point for us in Delafield's account is that these vesicles communicate freely with one another. This they do, since it is possible to break off a number together, and then, by further breaking, to show that there are many which present corresponding rough surfaces at the line of fracture. Delafield further points out that the bronchi enter the lobules in an irregular manner, sometimes from the side, sometimes from the distal end, etc. It is perfectly easy to reconcile the two other descriptions if this view be adopted. Kolliker, Klein, and others describe imperfect injections. Those who are responsible for the usual diagrams, probably studied well-injected specimens imperfectly broken up, and also sections of lungs which seem to bear them out. Delafield describes "air-passages" which, he says, "seems to be made up of a succussion of large vesicles opening into each other, or of an irregular, large canal, made up of vesicles into which other vesicles open from all sides. These air-passages branch and anastomose. . . . They are given off from the ends of terminal bronchioles, or from the sides of small bronchi" ("Studies in Pathological Anatomy," vol. i., p. 102). In Delafield's "air-passages" we have, "the infundibula," the "respiratory bronchioles," and the terminal bronchi with vesicles opening into them. The main fact which Delafield demonstrates is the communication between air-passages.

The Bronchi and Blood-vessels.—The bronchi divide and subdivide, until finally the ultimate bronchioles terminate in the branching and freely communicating air-passages and vesicles. This arrangement exposes a very large surface to the air in the lobules; it also makes room for much elastic tissue, and it must cause a very great amount of motion in the air within the lobules and bronchioles with the respiratory movements. It is interesting to note that the bulk of the air-vesicles is always greatest where the chest motion is