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**THE CAUSE OF THE FIRST SOUND OF THE HEART.**

Up to the present day this subject has been in an unsettled condition. While there has been perfect agreement that the second sound was caused by the tension of the semilunar valves and by this only, some have denied that the auriculo-ventricular valves took any part in the causation of the first sound, and, as in the case of other theories, a so-called convincing demonstration was furnished. Others thought they had proved equally conclusively that the valves were at all events the principal factor; while still others explained the sound by eddies of the blood.

Recently Professor Haycraft has undertaken the investigation of this vexed subject, and has taken broader ground than his predecessors generally. Haycraft and others have extended Helmholtz's view that the sound heard when a skeletal muscle contracts is a resonance note of the auditory meatus. Haycraft emphasizes what must be clear upon a little consideration, that the heart-sounds as heard when listened to over the chest-wall are not the same as when the stethoscope is placed upon the heart itself; nor should this be expected, for what is really heard is the heart-sound greatly modified by the resonance of the chest-walls, the stethoscope, and the auditory meatus of the observer.

It is shown that the first heart-sound as heard with the stethoscope when placed over the organ itself or against the thoracic wall differs in pitch from any muscular sound known; but it does answer pretty well to what might be expected from a valvular sound modified by the resonance of other parts. In fact, Dr. Haycraft thinks he has demonstrated that "the first heart-sound