these signs of pain were aroused, was found by experiments in which partial cross-sections of the cord were made, to run not in the posterior, but in the lateral columns. The pain pathway from either side of the body runs up both halves of the cord, but more largely up the opposite half.

31. "An experimental study of the cause of shock": WILLIAM H. HOWELL. [Presented by **S. J. MELTZER.**]

Professor Howell's experiments were made upon dogs anæsthetized with morphin and ether, and brought into a condition of shock by operations of various kinds. Blood-pressure records were obtained in the usual way during the experiment. The following general conclusions were reached:

1. The most important and dangerous feature of severe shock is a long continued, practically permanent fall in blood-pressure to about 20 mm. to 40 mm. of Hg. This condition is designated as vascular shock and is due to a long lasting loss of activity of the vasoconstrictor center.

2. A second important result of shock is a very rapid and feeble heart-beat. This condition is designated as cardiac shock; since, although it may result secondarily from the permanent fall in blood-pressure, it may also occur quite independently of the vascular shock as a primary result of the operations. Cardiac shock, so far at least as the rate of beat is concerned, is due to a more or less permanent loss of activity of the cardioinhibitory center.

3. Intravenous infusions of alkaline salt solutions (NaCl, 0.6% — Na_2CO_3, 0.5%) cause a rise of pressure by increasing the force of the heat-beat. The effect is more durable than with salt solution alone and may be renewed by repeating the injection.

4. The fundamental cause of vascular and cardiac shock is not exhaustion of the vasomotor and cardioinhibitory centers from over activity, but a more or less permanent inhibition of these centers from excessive stimulation of the inhibitory paths.

Sixth meeting.[1]

Bacteriological Laboratory of the Department of Pathology of Columbia University, at the College of Physicians and Surgeons. April 20, 1904.

[1] Reprinted from *Science*, 1904, xix, p. 828; *American Medicine*, 1904, vii, p. 789; *Medical News*, 1904, lxxxiv, p. 1101.