6. If a small hole be made in the top of a diving bell, will the water flow in or the air flow out?

7. If a cylindrical diving bell, height 5 feet, be let down till the depth of its top is 55 feet, find (1) the space occupied by the air, and (2) the volume of air that must be forced in to expel the water completely, the water barometer standing at 33 feet.

Ans. (1) 1.8 nearly; (2) $\frac{2}{11}$ths of the volume of the bell.

8. The weight of a diving bell is 1120 lbs., and the weight of the water it would contain is 672 lbs. Find the tension of the rope when the level of the water inside the bell is 17 feet below the surface ($h = 33$ feet).

Ans. 676.48 lbs.

9. A cylindrical diving bell of height a is sunk in water till it becomes half full. Show that the depth from the surface of the water to the top of the bell is $h - \frac{a}{2}$.

10. A cylindrical diving bell, of which the height inside is 8 ft., is sunk till its top is 70 feet below the surface of the water. Find the depth of the air space inside the bell ($h = 33$ feet). *Ans.* $2\frac{1}{2}$ feet.

11. (1) Describe the action of a common pump; (2) distinguish between a lifting pump and a forcing pump; (3) to what height could mercury be raised by a pump?

12. The length of the lower pipe of a common pump above the surface of the water is 10 feet, and the area of the upper pipe is 4 times that of the lower; prove that if at the end of the first stroke the water just rises into the upper pipe, the length of the stroke must be 3 feet 7 inches very nearly ($h = 33$ feet).

13. If the diameter of the piston be 3 inches, and if the height of the water in the pump be 20 feet above the well, what is the pressure on the piston? *Ans.* 61.2 lbs.