1. The breaking strength of wires — that is, the force required to pull them apart — should be proportional to the square of their diameters. One wire whose diameter was .412^{mm} broke with a weight of 7.08 lb. What should be the breaking strength of another whose diameter was .546^{mm}? The actual weight required was 12.92 lb. Find the difference between the actual and the computed results; also what per cent this difference is of the computed result.

2. A meter of wire weighs 2.66^{g}; its breaking strength is 8.1^{Kg}. How long must a piece of the wire be which, when suspended, will break by its own weight?

3. The times of vibration of different pendulums are as the square roots of their lengths. A pendulum 39.1 in. long swings once in a second. A meter equals 39.37 in. How many times per minute will a pendulum a meter long swing?

4. A pendulum is observed to swing 50 times in 55 sec. How long is it? How long is the pendulum of a clock which ticks twice per second?

5. An elevator well is 130 ft. deep. How long would it take the longest pendulum which could be hung in the well to swing?

6. A falling body falls 16.08 ft. in the first second, 48.24 ft. in the second, 80.40 ft. in the third second, or in each second of its fall 16.08 ft. multiplied by one less than twice the number of the second. A stone dropped from a balloon falls 15 seconds. How far will it fall in the 5th second? in the 10th? in the 15th?

7. The distance that a body falls in 1 second is 16.08 ft., in 2 seconds is 64.32 ft.; or, in general, 16.08 ft. multiplied by the square of the number of seconds that the body is falling. How high up was the balloon in the preceding question?

8. The velocity of the falling body at the end of the first second is 32.16 ft. per second, at the end of the second second 64.32 ft. per second; or, in general, 16.08 ft. multiplied by twice the number of the second. If a ball is dropped from the top of the Washington Monument, 555 ft. high, how fast will it be going when it reaches the ground?