

Remarks about Gravitation

There is no phenomenon that occupies a more prominent place in world affairs than the force of gravity. Not only does it affect profoundly all animal and vegetable existence, but the so-called mineral kingdom as well. Think of the electrical power developed at Niagara as well as in other great rivers of the world because of the fall of great volumes of water toward the center of the earth. Think of the ebb and flow of the vast volumes of water in the oceans of the world, rising and falling twice a day, traceable to the effects of gravitation, largely that of the moon and in lesser degree of the sun.

Think of the child learning to walk. Trying to stand upon his feet, he is immediately brought face to face with a phenomenon he later learns to call unstable equilibrium, all because of gravitation. The writer has often wondered as to the choice of that apple story associated with the name of Sir Isaac Newton, when there are so many better illustrations. The list is long indeed.

Some of the larger effects have not even been mentioned. The contour of the earth's surface with its lofty mountains and deep valleys is accounted for by a balance reached between gravitation and the forces concerned with the upheaval, including effects of temperature and pressure that produce faults and cracks in the solid crust. The unruffled surface of the ocean takes the shape

of a beautiful solid known as an oblate spheroid, almost but not quite a sphere. The earth's radius at the equator is some thirteen miles more than its radius from center to pole. This shape is a result of the rotation of the earth combined with the action of gravity.

Gravitation is unique in some remarkable particulars that differentiate it from all other phenomena. It can be neither increased nor diminished by any operation that has been contrived. It persists unaffected as temperature and pressure are varied, even in the condition called the most stable steady states of atoms when all other radiations have ceased. Those radiations disappeared long since as the temperature was reduced, but gravitation persists.

This radiation emanates from the positive charges in atoms, and has been in existence as long as the charge has been. Surely it has endured for a very long time indeed, long enough for its effect to travel at the velocity of light to great distances. It would reach the sun from the earth in only eight minutes.

Another unique characteristic of gravitation is its ability to penetrate right through great amounts of solid matter. No screening effect has been discovered that will reduce the force in the slightest degree by interposing great bodies of matter between the two objects being tested.

Newton is credited with the discovery of the law of gravitation. In the popular mind that seems to have put an end to the search. But Newton did

