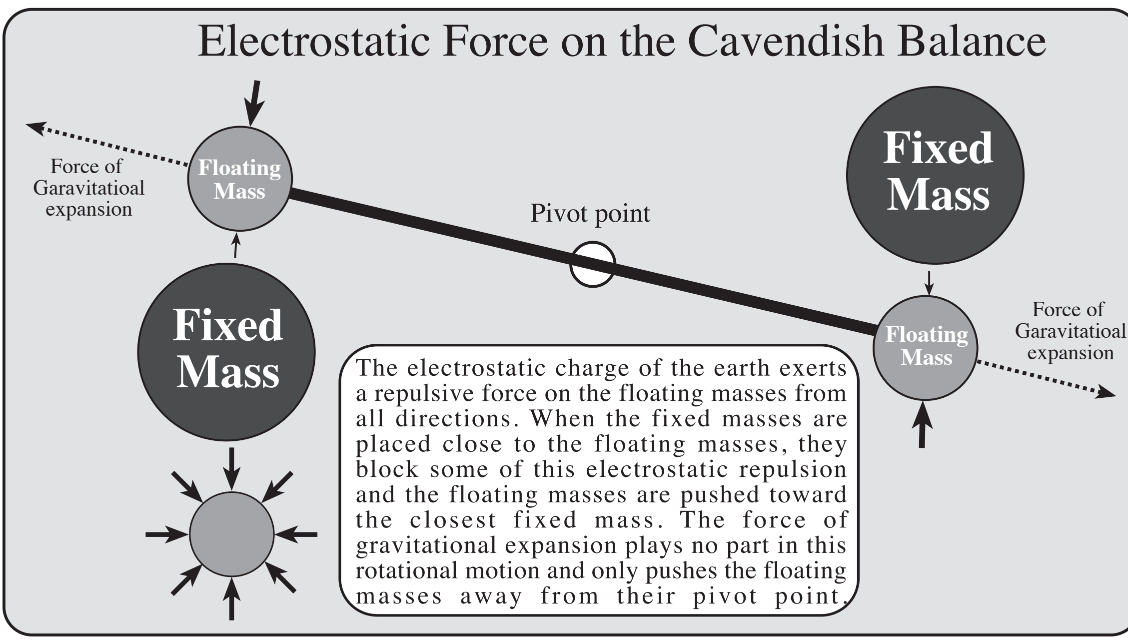
The Cavendish Balance

by James Carter

Certain observations that have long been considered to be gravitational in nature may well be electromagnetic interactions. An example of this is the experimental measurement of the gravitational constant. Based on gravitational logic, the forces produced by a Cavendish balance have been used to measure the gravitational constant (G). This result is then used to determine the mass of the Earth in terms of kilograms. The Cavendish balance measures mass by the amount of long range electric force that it can block.

Prior to this, Newton was able to weigh Earth relative to other bodies in the solar system. According to this method, where the mass of Earth = 1.0, orbital mechanics can be used to calculate the masses of the other bodies such as the sun and moon to be multiples or fractions of Earth's mass. What could not be calculated, however, was Earth's mass in kilograms.



By assuming that gravitational force causes the measured force and motion of a Cavendish balance, it was possible to "weigh" Earth, as well as the rest of the solar system, by comparing Earth's gravity with the force between two known masses. However, if the action of the Cavendish balance is not gravitational but instead demonstrates an electrostatic effect, then Earth's mass can not be accurately measured in this way.

A variable in the mechanism of Cavendish balance type inventions prevents the accurate measurements of Newton's gravitational constant G. When we measure the other constants and basic parameters of matter such as M_E, a_o, α, and C, we get answers that are accurate to many decimal places; however the gravitational constant can only be consistently measured to about one or possibly two decimal places. The reason for this may be that the Cavendish balance measures long range electrostatic force and not gravitational force. What is measured is not the total force of gravity between the weights but the way in which the weights block a tiny portion of Earth's total electric charge.

The Cavendish balance was long thought to demonstrate the non-local nature of gravitational force. Gravitational theorists believed that their proposed gravitational force was able to reach across any void such as the small distance between the two balanced masses. This connection of force then constantly pulled the masses together. The observed movement and tension of the floating masses was calculated to determine the force of gravitation in units of mass times acceleration.

If we consider the dynamics of the gravitational force produced by the expansion of matter, then gravity could not be the cause of the force measured with a Cavendish balance. All the force from the expansion of the floating masses would be directed away from their inertial center. Thus, the floating masses are directed away from the stationary masses at the same rate as they are expanding into one another. The only way that the force of gravitational expansion could draw floating masses together would be if they were floating near one another in outer space. In this case, their inertial centers would not move together but rather their outer surfaces would expand toward one another with a measurable acceleration. This apparent drawing together of floating bodies would not happen to bodies floating in water on Earth's surface because the different upward acceleration vectors of each body with the center of Earth would push them apart at the same rate that their expansion brought them together.

I admit that my calculations for the gravitational velocity constant G_v are based on a density of Earth derived from Cavendish balance measurements. In reality, I do not know what the true density of Earth is relative to the measured density of the hydrogen molecule. I can only know the density of the Earth relative to the density of the sun and moon. The exact expansion velocity at the Bohr radius (G_v) could best be measured by observing the measured bodies of mass floating near one another in deep space. Even then, it might not be possible to determine the amount of long range electromagnetic contamination in these measurements. However, calculations for the dynamics of expanding matter do not require a specific value for the constant G_V. All that is required is that this velocity constant be the same for all matter throughout the universe.

The way I measure the mass and density of Earth is by simply extrapolating from the measurements of the proton and the Bohr radius. I just use the mass and volume of the Hydrogen molecule at the Bohr radius to represent a density of one = 1.000. When I fill the volume of Earth with these density one molecules I find a mass and density for Earth of 1.005 which is very close to the Cavendish measurement of 1.000.