RE – EQUIVALENCE PRINCIPLE

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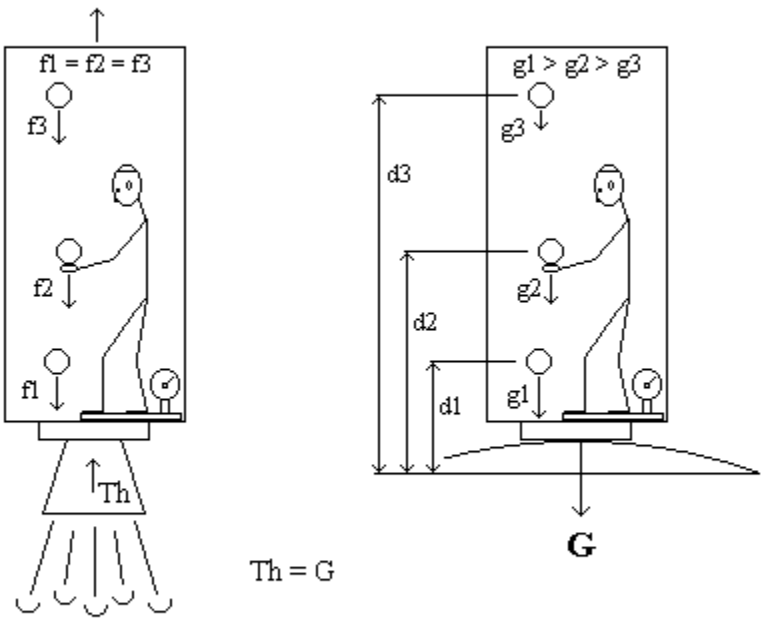
Einstein formulating his General Theory of Relativity described its fundamental postulate - the principle of equivalence, using as an example a physicist closed in a box (size not relevant). He insisted that a physicist inside could not tell the difference between gravity and acceleration.
This author felt free to analyze this prediction and the equivalence principle by review of the Einstein's thought experiment.
First pair of pictures (see EQUIVALENCE? 1) has an identical interior of the box with "physicist" standing on scales, dropping an apple toward the floor. Exterior of the box differs, one showing the box standing on the ground (Earth's surface), the other having ignited rocket engines installed under the floor and surrounded by free space.

EQUIVALENCE? (1)

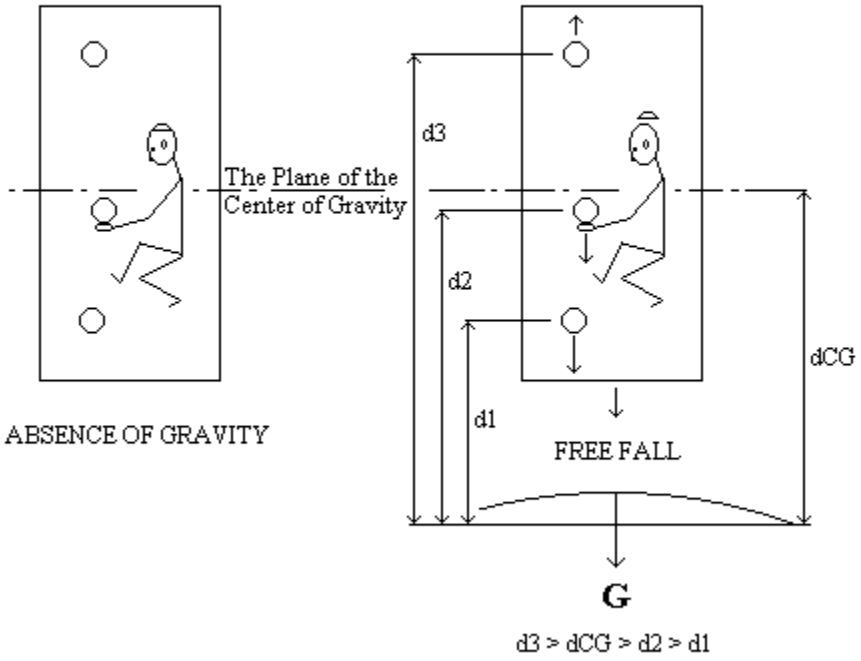


Textbooks claim that "it is not possible, by doing experiments within the box, with the physicist to tell which box he is in".[1]

[1] FUNDAMENTALS OF PHYSICS, David Halliday, Robert Resnick, John Wiley & Sons 1988 P.349, 352

We argue that gravity in *reality* **changes with distance d^2**, therefore, near ceiling the gravity is smaller than at the floor. We can also argue that the gravity is recognizable, since we don't have an elevator height limit, so it can be, let's say 10 or 15 meters high.
Physicist in the box resting on the Earth's surface would be able to indicate and to calculate difference between gravity value near the ceiling and near the floor.
In the box propelled by the rocket engines, all objects in all positions will have the same acceleration due to the force applied only on the box.
The next pair of pictures, (EQUIVALENCE? 2) also with the identical interiors, shows physicist weightless in elevator drifting in space in one picture and falling toward the earth in the other.

EQUIVALENCE? (2)



Textbook claims: "it is not possible, by doing experiments within the cab, for the physicist to tell which box he is in".
In the box ***drifting*** in space, objects inside boxes will keep their relative positions being influenced only by mutual gravity of the mass of the box and other objects in proximity.
In the case of ***free fall*** all objects are subjected to gravity, it also means **with respect to the distance.** Therefore object(s) situated **above** the elevator's weight-point plane (which determines the box gravitational acceleration), will move **toward the ceiling**, objects placed **below** the **elevator's center of gravity** plane will tend to move **toward the floor** reacting to the distance factor $\mathbf{d^2}$. Thus a high school educated observer would be well aware of presence of the gravity.

Some argue that the difference is so small anyway, that it can't be detected.
To invalidate this argument we just need to mention, that at the bottom of the third-next page of the *same textbook* is the sample problem involving gravity force between two dancers at the **10 meters distance**.(!?!)