The True Scale of Atoms

Post by “Bryan” of December 24, 2023 at 1:05 AM

(excuse my slight swerve from the topic)

This is fun:

> Quote from Relativity: The Special and General Theory, 1916, Translated: Robert W. Lawson
>
> The purpose of mechanics is to describe how bodies change their position in space with "time." **I should load my conscience with grave sins against the sacred spirit of lucidity were I to formulate the aims of mechanics in this way**, without serious reflection and detailed explanations. Let us proceed to disclose these sins.
>
> **It is not clear what is to be understood here by "position" and "space."** I stand at the
>
> window of a railway carriage which is travelling uniformly, and drop a stone on the
>
> embankment, without throwing it. Then, disregarding the influence of the air resistance, I see the stone descend in a straight line. A pedestrian who observes the misdeed from the footpath notices that the stone falls to earth in a parabolic curve. I now ask: Do the "positions" traversed by the stone lie "in reality" on a straight line or on a parabola?
>
> Moreover, what is meant here by motion "in space" ? From the considerations of the
>
> previous section the answer is self-evident. **In the first place we entirely shun the vague word "space," of which, we must honestly acknowledge, we cannot form the slightest conception**, and we replace it by "motion relative to a practically rigid body of reference."
>
> The positions relative to the body of reference (railway carriage or embankment) have
>
> already been defined in detail in the preceding section. If instead of " body of reference" we insert "system of co-ordinates," **which is a useful idea for mathematical description**, we are in a position to say : The stone traverses a straight line relative to a system of coordinates rigidly attached to the carriage, but relative to a system of co-ordinates rigidly attached to the ground (embankment) it describes a parabola. **With the aid of this example it is clearly seen that there is no such thing as an independently existing trajectory**, but only a trajectory

> relative to a particular body of reference.
>
> Display More

When it is put so simply, it is easy to simply disagree with it.

Ultimately, Einstein throws away the void, and his "vacuum" is affected by gravity.