Inertia

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The resistance of mass to acceleration is called inertia. An understanding of inertia then requires an examination of the structural response of mass particles, or more specifically of atoms, to acceleration. First of all, the size and shape of atoms are a function of the orbits of the electrons around the atomic nuclei. The orbits of electrons are precisely confined to very specific spherical shells that are determined by the relationship of electrons’ vibrations to their orbit. Each orbit must be such that the electron arrives, after orbiting, at exactly the same position in its cycle of vibration as it had at the start of the orbit. That is to say, the orbit and the vibration are synchronized. The various shells represent different (small) numbers of vibrations called de Broglie waves. Electrons can jump from one shell to another (involving a loss or gain of energy) but cannot reside anywhere in an atom except in the specified shells. The speed of an orbiting electron is approximately the speed of light and the electron cannot go any faster.

Acceleration involves motion and atomic motion has an effect on orbiting electrons. Because an electron cannot go any faster, any part of an electron orbit in the direction of motion will therefore take more time to complete. Conversely any part of an electron orbit in the opposite direction of motion will take less time. As is well known, the two do not quite cancel out because they start from a different base of motion. Given this situation, the electron in a moving atom would arrive a bit late after an orbit which would put the orbiting electron out of synchrony, an untenable condition. The only solution and therefore the inevitable result, is that the orbit (shell) be flattened in the direction of motion so that the orbit is shortened and synchrony is maintained. Matter traveling close to the speed of light is characterized as crushed in this way. Matter traveling at ordinary speeds is flattened ever so slightly. Such flattening has been called, without specifying its origin, the Laurentz - Fitzgerald contraction. Apparently a similar contraction occurs inside the atomic nucleus. In order that contraction be accomplished, an input of energy must occur. All of the above reasoning has been published in 1992 (de Laubenfels: It’s Hard to Believe in Infinity).

Experimental confirmation of the Laurentz - Fitzgerald contraction has been provided by the famous Michelson – Morley experiments of a century ago. These experiments were designed to determine the absolute motion of the earth through space by sending light to equidistant mirrors in perpendicular directions and back on a rigid apparatus. The object was to take advantage of the lag in the direction of motion that was described above, in this case for the trajectory of the light rays. Obviously measurements had to be made in various directions until a maximum reading was obtained. Because of the atomic contraction described above being experienced by the apparatus, however, the lag will be exactly eliminated and no difference whatsoever should be predicted for the measurements. No difference was, in fact, found; even though that was not what was expected by the experimenters, who were not anticipating a contraction.

At the time of the Michelson – Morley experiments the role of orbiting electrons was not appreciated and no mechanism to bring about a possible contraction could be identified. The effect of an “ether”, considered a possibility, simply could not be confirmed and was abandoned. Inasmuch as speed is the ratio of distance and time, the lack of an identifiable distance contraction caused attention to turn to the alternative of a time expansion. In those days Einstein was advocating exactly that, the special theory of relativity, which then was embraced by default. This theory purports that time slows down for a moving observer. Because movement is one dimensional, that means that time should slow down in the direction of movement but not in perpendicular directions where no movement is taking place and do not even ask what happens in the reverse direction. Such reasoning is absurd and unnecessary. It can absolutely be confirmed that there is a contraction of matter with motion.

The energy needed to cause the indicated contraction during acceleration is the well-known phenomenon of inertia, the opposite of which is momentum. A continued belief in the warping of time interferes with the ability to understand inertia, among other things.

The internal structure of atomic nuclei is not fully known but appears to involve some kind of orbiting elements. This is the basis for the observation above that contraction apparently occurs in accelerating nuclei. The likelihood exists that this accounts for the major part of inertial energy. If there were such orbiting, certain elements of moving nuclei would spend more time on one side of their orbit than the other. The suggestion can be made that, in the decay of a moving neutron, the longer side is associated with decay into matter and the shorter side decay into anti-matter. This represents an explanation for the observed small bias toward matter in neutron decay. Such asymmetry is due to the asymmetry of time which only moves forward. If time were also to move backward, neutron decay would alternately favor anti-matter and there would be symmetry. A corollary of this reasoning is that whereas neutron decay when moving at ordinary speeds is only slightly biased, neutron decay at elevated speeds will be greatly biased. The bias of neutron decay ultimately explains the lack of anti-matter in the universe. Article Keywords: Laurentz-Fitzgerald contraction, Special theory of relativity, Momentum, Time warp, Neutron decay