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Frank H. Meyer
University of Wisconsin, Superior

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FRANK H. MEYER*

ABSTRACT – "Non-implications" in Newton's Law of Gravitation are discussed to emphasize different approaches in two books treating the subject: Dewey Larson's **Beyond Newton**, and **Gravitation**, by Misner, Thorne and Wheeler. The author notes that the latter book ignores the possibility that gravitation may not be an interaction; while Larson accepts Newton's Law of Gravitation as a mathematically valid statement of Kepler's Laws of Planetary Motion, thus being applicable to the sun and planets even if they are not actually interacting.

Isaac Newton's Law of Gravitation does not imply that the sun actually pulls physically on a planet such as the earth. Similarly, the Law does not imply that the earth pulls on the sun. Newton's result does not even imply that the sun and the earth act on the space-time between them to produce a gravitational wave motion at the rate of 3×10^5 kilometers/second. While the sun and planets appear to be interacting in some way, the Law deduced by Newton applies to them even if they are NOT actually interacting, even if the planets and the sun have each been going its own separate way ALL THIS TIME and NOT in fact interacting AT ALL with each other either directly or indirectly.

The above reflections in accord with Dewey Larson's 160 page book, *Beyond Newton*, are prompted by the publication last year of a new 1,279 page textbook, *Gravitation*, by Charles W. Misner, Kip S. Thorne and John Archibald Wheeler. In this big book no room is found to examine the possibility that gravitation may not be an interaction, because from the beginning the authors take it for granted that gravitation must be an interaction. They are quite certain that the assumed interaction must involve a deformable, "curvable" space-time continuum, assumed by Einstein when he derived his general relativity theory of gravitation physics, also known as geometro dynamics.

Of course, if it is not true that space and time form a 4-dimensional self-unmoving continuum and not true that gravitation is any kind of interaction, then geometro dynamics, no matter how sophisticated its mathematical development, is bound eventually to fail from the errors of its assumptions. This has happened before, for example, to the Aristotelian-Ptolemaic physics, which rested on the conviction that God placed earth immovably at the center of the universe, because earth is humankind's home.

The mathematics of geocentric physics after awhile became so weird that one youth, obliged to learn it, said of it, according to legend: "If the Lord Almighty had consulted me before embarking on the creation, I should have recommended something simpler." This was the person who became Alfonso X, King of Leon and Castile, called Alfonso the Wise, who sponsored a famous set of astronomical tables in the thirteenth century, according to Professor I. B. Cohen. However, the mathematics of pre-Copernican European physics could not save it, once it became evident that its initial assumptions were not true, were incorrect.

Newton's Law of Gravitation is a mathematical statement of the physical truths implicit in Johann Kepler's laws of planetary motion. Kepler found that the planet Mars moved in elliptical paths and that during each cycle of planetary motion an elliptical focus was located near the sun's center. He inferred that the other planets known to him should behave the same way and they do. Kepler found also that the radius vector from the sun to Mars traversed equal sectorial areas in equal time intervals. This relation also holds for the other planets. Kepler furthermore found that the ratio of the cube of the elliptical semimajor axial length to the square of a planet's orbital period was the same constant for all the planets known to him and is the very same for planets unknown to him.

Thus, Kepler's laws affirm facts, physical truths, truths disregarded by Galileo, but confirmed and acknowledged by Newton. From the facts established by Kepler, Newton deduced a new mathematical statement, his law of Gravitation, a logically necessary conclusion from Kepler's facts. Newton's Law states that the mathematical cause of the apparent mutual attraction between sun and planet is directly proportional to the product of their masses and inversely proportional to the square of the distance between their centers of mass, since both are spherically symmetrical bodies.

Larson accepts Newton's Law of Gravitation as the mathematically valid statement of Kepler's Laws of Planetary Motion. However, Larson's theory implies rejection of all conceptual interpretations of the Law of Gravitation which regard gravitational motion as caused by some physical INTERACTION between physical systems, whether through a space-time continuum or by action at a distance. Instead the Law of Gravitation is regarded as the expression of an inherent physical motion of all material systems and particles toward ALL space-time locations, whether or not such locations are occupied by matter. The space-time locations in Larson's theory are not ultimately continuous and not stationary, but rather discrete aspects of an outward self-moving space-time progression at the uniform rate of 3×10^5 kilometers/second. The expansion of the physical universe of galaxies in all directions is attributed to this specified scalar increase of space with increasing three-dimensional time. According to Larson's theory, the entire physical universe is constituted from one component, motion, existing in three dimensions, in discrete units and in two reciprocal forms, space and time. Unity, that is, unit velocity, C, is the true physical zero. The scalar space-time progression is always away from unity; gravitational motion of matter always toward unity.

The Larson theory provides an interesting application of its premise that the space-time progression is always AWAY from unity, while gravitational motion is always TOWARD unity in the solid phase of matter. In a solid two atoms ordinarily approach each other within much less than the computed finite length of a natural unit of space, $\sim 0.45 \times 10^{-5}$ centimeter. The gravitational motion between the atoms in this situation is regarded as providing the REPULSIVE force that enables the solid to resist compression, while the space-time progression provides the ATTRACTIVE force that enables the solid to resist tensile stress.

*FRANK H. MEYER engaged in these studies at the University of Wisconsin at Superior, where he is a member of the Physics Department faculty. He reported this material at an annual meeting of the Minnesota Academy of Science.