ESSAY 51: DOGMA AND DYNAMICS

Dogma has pervaded physics for over three hundred years, a prime example being Newtonian dynamics. The inverse square law was discovered by Robert Hooke, and this was known in the seventeenth century. John Aubrey relates this in “Brief Lives”, a literary classic. Hooke sent Newton a letter containing a problem to which Hooke already had the answer. In contemporary terms it asked Newton to give Hooke the force law that produces an ellipse. Newton answered incorrectly - he thought it was an inverse r law where r is the distance from the sun to a planet. The orbit was thought at that time to be an ellipse from the work of Kepler. Hooke pointed out to Newton that he knew the answer, an inverse square law. Therefore the discoverer of the inverse square law is Robert Hooke. The dogma of the physicists attributes the discovery to Newton and this is not historical fact. Of the three laws of motion attributed to Newton, only one was actually inferred by him, the third law. The first law is an unproven assertion, that objects move in straight lines unless acted upon by a force, and the second law is a definition, force is mass multiplied by linear acceleration. The third law is action and reaction are equal and opposite, but in the Principia Newton does not state it in that way. These are still known in the dogma as the three laws of Newton.

Hooke and Newton were much influenced by Kepler’s planetary laws, so they were interested in explaining orbits. It is almost always claimed dogmatically that Newton explained orbits with his inverse square law. As a matter of fact he did not. His inverse square law is due to Robert Hooke. As a by product of UFT 196 (www.aias.us) its section three shows that the idea of an orbit being a balance of the inverse square law and a centrifugal force of repulsion is incorrect. In Section 3 of that paper the elliptical orbit is expressed in terms of cylindrical polar coordinates and simply by differentiation, the force law is found to be purely an inverse square law of attraction only, meaning that the force acts only in a line joining the planet to the sun. The centrifugal term appears, but as a sum of two terms, one positive and one negative. They cancel out exactly, leaving only a force of attraction. In the dogma that passes for Newtonian dynamics the actual method used is to construct a hamiltonian for motion in a plane. The hamiltonian is the sum of the kinetic energy T and a potential energy U. The angular part of the kinetic energy is the labelled by the dogmatists the “centrifugal potential energy”. This is despite the fact that it is not a potential energy. It is a kinetic energy.

This angular kinetic term is incorrectly described by the dogmatists as a potential energy that is added to the gravitational potential energy of attraction, U. The result is claimed by the dogmatists to be the effective potential V. When differentiated with respect to r the negative of the result gives two forces, one is the real force of attraction, which is negative valued, and the other is the false force of repulsion, known as the centrifugal force. This is pure nonsense, but it has been repeated endlessly and dogmatically. There is only one real force in Newtonian dynamics. This can be derived directly from the orbit as in Section 3 of UFT 196. The orbit exists by astronomy, and the object m remains in orbit around the attracting object M. Therefore the force as defined by Newton, mass multiplied by acceleration cannot be an orbital force of attraction, it is merely a mathematical re expression of the function that describes the orbit, the analytical dependence of r on the angle theta of the cylindrical polar system. The force of attraction does not explain why the object remains in orbit.

Furthermore, there is no universal force of attraction, the same analysis for a precessing ellipse gives the sum of an inverse square and inverse cube term, and the same analysis for a circular orbit gives an inverse cube term. There is no univesal law of gravitation, and it was not discovered by Newton. Historians and scholars must reject the

dogma of the physicists. The explanation of the repulsive force that tends to throw an object outward must be sought elsewhere, and I tis given by ECE dynamics in paper such as UFT 55. The origin of the Coriolis analysis is given in that paper, which extends general relativity to rotational motion.