At the 90ieth Anniversary of General Relativity: A Brief Note on the Gravitational Deflection of Light.

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Einstein's 1915 General Theory of Relativity (ART) was confirmed by measurement in 1919. It proved able to correctly calculate the then for the first time measured deflection angle α of light passing the sun: $\alpha = 4GM/rc^2$ [1]. (α = deflection angle, G = gravitational constant, M = mass of the sun, r = distance from the centre of the sun, c = vacuum velocity of light). A comparative calculation of this effect according to the gravitational theory of classical mechanics produced *just one half* of the measured value: $\alpha = 2GM/rc^2$. Since then Einstein is generally believed to have dethroned Newton's theory of gravitation.

A difference of just "one half". On the basis of the result of calculation "according to Newton", the measured value, and Einstein's corresponding calculation amount to differ from that basis by 100 %. Most remarkably, this difference amounts *always* to exactly 100 %, no matter what conditions else determine the result, e.g. if the deflection angle is measured and calculated at the sun or at some other object. Physicists should have been suspicious of this outcome, since it evidently contradicts the general claim of Einstein's ART to yield only slightly differing results from those of the classical theory, depending on the respective mass of the central body and growing to considerable values only when this mass should be far greater than that of the sun.

Investigating the "classical" comparative calculation one finds the "Newtonian" result to depend on the presupposed measure of kinetic energy $E = mv^2/2$ (with $v = c$ one obtains $E = mc^2/2$), since this quantity determines the measure of the determining gravitational potential.

Einstein's calculation, however, is based and depends on his equation $E = mc^2$. The difference between both concepts of energy is just "1/2". Evidently the shortcoming of the classical theory by exactly "one half" is due to its concept of kinetic energy, i.e. to the factor "1/2" only, independently of the respective gravitational potential.

Historians of science know that this factor had not been part of the concept of energy before Gustave Gaspard Coriolis [2] introduced it into classical mechanics in 1829 "for the sake of mathematical convenience" (Max Jammer [3]). So one must infer that *before* Coriolis, the *authentic Newtonian theory of gravitation* would have produced exactly *double the value* which today is presented in textbooks as the "inadequate-by-1/2" result of a calculation according to "Newton". In other words: The *uncorrupted theory* of Newtonian mechanics *yields the same value as Einstein's ART.* Modern textbooks do not tell the truth.

History (not only that of science) would have gone differently, had only scientists in 1919 calculated the Newtonian comparative result *correctly*. To consider what further follows from the easy demonstration of α to depend from E is left to the reader.

References:

[1] B. Schutz, Gravity from the Ground up, Cambridge 2003.

[2] Gustave Gaspard Coriolis, Calcul de l'effet de machines, ou considerations sur l'emploi des moteurs et sur leur évaluation, Paris 1829.

[3] Max Jammer, Concepts of Force, Cambridge/Mass. 1957, p. 166 fn. 12.

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