

AGAINST CATASTROPHIC RATIONALISM: GRAVITATIONAL ATTITUDE DEFLECTIONS OF THE EARTH'S AXIS†

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The postulated very large angular deflections of the earth's axis due to gravitational encounters, say with Venus or Mars, as espoused by many rationalistic catastrophism, most eminently by Velikovsky, are analyzed and found wanting. Useful analytic expressions are derived and are also applied against the alleged accuracy of astronomical dating and Copernicanism. Large Angular deflections seem to be possible only if a large body were to be captured for a considerable period of time.

It will be understood that this article is concerned only with possible changes in the direction of the earth's axis. Possible changes in the orbit, as some catastrophists have proposed for the earth or for other bodies, are not investigated here.

Problem and Procedure

The Euler rigid body equations for the angular displacement of the earth due to (1) an interstellar of cometary flyby, (2) asteroidal or planetary encounters, and (3) Keplerian capture of a massive body, are solved to yield simple analytical approximations. In order to obtain simple solutions the notion of an equivalent dumbbell for the earth is derived. Analytical error analysis as well as numerical integration of the exact equations is performed in order to demonstrate the accuracy, at least for the purposes of this paper, of the approximate solutions. The equivalent dumbbell approximate model is a planar one which errs in the favor of rationalistic catastrophism.

In order to estimate this error, the interstellar flyby case is solved in three dimensions. This three-dimensional solution then, also provides a theoretical model for questioning the alleged accuracy of astronomical dating in that the singular or accumulated effect of asteroidal encounters could have produced very large errors in the geographical position and time of ancient eclipses. Lastly, some consequences against Copernicanism are conjectured, especially concerning Joshua's long day.

Plan of this Article

The problem is discussed qualitatively in the Introduction, and then in the light of conclusions which have been reached, in the sections: Consequences on Astronomical Dating, Note on Geocentricity, Joshua's Long Day and Geocentricity, and the Conclusion. These parts may be read first, and will show what has been accomplished. The mathematical details are mostly contained in the sections: The Equivalent Dumbbell, The Equation of Motion of a Dumbbell, Dumbbell Rotation Due to a Mass Moving Rectilinearly from Infinity to Infinity, Numerical Evaluation of Rectilinear Case, Dumbbell Rotation Due to a Mass Moving in a Circular Orbit About the Sun, Dumbbell Rotation Due to a Mass Moving in a Keplerian Orbit, Numerical Evaluation of

the Keplerian Case, Verification by Numerical Integration, and The Orientation of a Rotating Ellipsoid Due to Arbitrary Rectilinear Motion.

Introduction

Rationalistic catastrophism is not indigenous to this time. Many ancients held such views, for example see Johnson's chapter on the pre-Copernical conceptions of the universe.¹ In more recent times "Wicked Will" Whiston (1667-1752), known for his translation of Josephus's "Antiquities," was tried for blasphemy by the Anglican Church for his enthusiastic use of the New Newtonian Cosmology in rationalizing the Noahic Flood by a near cometary collision.² Peterson³ ingeniously has a double-nucleus comet staying electromagnetically suspended above the earth in order to explain Joshua's long day, the two luminous nuclei being the sun and the moon. And even more fanciful theories are promoted by Patten^{4,5} who requires and earth ice canopy and planetary encounter.

Whiston, Petersen, and Patten have many interesting things to say, and they argue from the Bible, and correctly on some points; however they have hopelessly rationalized Scriptural catastrophic miracles to such an extent that God's intervention is not recognized. In fact it is not clear that He is even needed. It is indeed, hard to reconcile the Bible as the Book that makes the simple wise (Ps. 119:130) and the "wise" simple (Ps. 19:7) in the light of these arbitrary scientological interpolations. A fine expression is, "just because you can say it is so does not make it so." So it is with the afore-mentioned and with Velikovsky and his followers. I have not seen the slightest mathematical substantiation that these things (planetary encounters with the earth, etc.) have taken place or could take place. The best work defending rationalistic catastrophism seems to be the defense of Velikovsky in the defunct journal *Penseé*⁶ and its successor journal, *Kronos*.⁷

It will be shown in this paper, that if a planet, say Venus, could become captured into a Keplerian orbit by the earth for a sufficiently long per of time (i.e., a sizeable fraction of the captured body's orbital period, a large angular displacement of the earth's axis would occur (only capture will give this result for the other cases analyzed give quite small displacements). Hence the central question facing Velikovsky and his allies is, *was Venus ever captured by the earth (as will be seen, even a close encounter will not help Velikovsky). We may even weaken the question by asking, could Venus*

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PANORAMA OF SCIENCE

Missing Meteorites?

It has recently been remarked on that, while there are many meteorites buried in the upper few feet or so of soil, there are few or none lower down, and in particular in the alleged geological column.¹ Surely this is a strange situation, from the uniformitarian viewpoint. A Creationist, on the other hand, will have no trouble in seeing why this is so. For the materials of the column were not lying there for ages to accumulate meteorites; they were deposited very quickly. Creationists, had they become interested in the matter, might have predicted before hand that few meteorites would be found in the column.

Creation Admitted to be Reasonable

In a recent article, the author made the following remark: "The hypothesis of special creation by divine intervention is completely logical and tenable but it is one which science, by its nature, must try to do without. That is not to say that it is wrong".²

One may agree fully with the author that Creation is a reasonable explanation of the world. But, then, why must science try to do without it? Surely it is most unscientific to refuse to consider an explanation which has been admitted to be a possible one.

It is Hard to Make Planets

In a letter to the *New Scientist*, it has been maintained that a planet like the Earth would not form, according to the current notions, around a double star.³ For the companion would disrupt the process of formation. In-

deed, even the presence of Jupiter might well disrupt the formation of a planet like the Earth.

Two things may be drawn from this. First, all of the proposed ways in which the Solar System might have originated, other than by Creation, involve difficulties. Moreover, many of the stars are double (or more); thus they may be out of the running, as for having inhabited planets. Indeed, Barnard's star, often said to have planets, might have rather a small companion. In that case planets, inhabited or not, would be unlikely.

The Tungus Explosion Again

The great explosion, which happened in Siberia in 1908, is in the news again. Two independent articles have suggested that it was a large meteorite, or small comet, composed loosely, largely of ice.^{4, 5} It would mostly have disintegrated before it hit the ground; but the heating would cause a shock in front of it, and that, in turn, a great explosion.

These suggestions are useful for three reasons. They may serve as an antidote to some of the nonsense which has been written about that explosion. The information may be useful to Creationists who believe that extraterrestrial ice has affected the Earth before, maybe at the time of the Flood. Also, the article in *Nature* has some thoughts about the possible production of carbon 14 in the shock, which may throw some light into possible vagaries of carbon 14 in general.

Young Comets and Asteroids

Creationists have often pointed out that the comets can not be very old. Now that fact seems to be more