

The Common-Man's Cosmology

John A. T. Bye*

School of Geography, Earth and Atmospheric Sciences, The University of Melbourne, Australia

*Corresponding author: John A. T. Bye, School of Geography, Earth and Atmospheric Sciences, The University of Melbourne, Australia

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Abstract

Cosmology is of course a focus of modern science, which for the non-specialist is reduced to the interpretation of the latest images from the ever finer observation of distant galaxies. This perspective of the universe, at first glance, takes us away from mundane experience. In this article however, it is pointed out that there is a unifying concept implicit in Newton's gravitational model, which acts on all space scales, but appears to have been previously neglected.

Introduction

Archaeology (in its widest sense) is the daughter of the cosmology of the universe. The physical evidence lies in abundance around all of us. The mission of archaeology is to order this evidence into a connected narrative. The successful achievement of this goal follows directly from an interpretation of the work of Isaac Newton, which appears to have been neglected. Gravity is the most basic of all forces as the image of an apple falling on Isaac's head demonstrates. The perception of a normal force directed towards a central massy object appears unassailable, however, look a little closer, there may also be a tangential force, which happened to be of negligible magnitude for Newton [1]. This adjunct force of gravity, which arises from the frictional forces of the orbiting bodies, was neglected in the classical gravitational model.

The adjunct force of gravity

In reality, the adjunct force is very significant in cosmology It also plays an important role in the common experience. A prime example is at the sea surface where water and air interact. Here the individual waves are a time-dependent response to the vertical force of gravity, however their turbulent interaction produces a locally intense shear stress in the horizontal. In fluid mechanics, the mean shear stress is often referred to as the wind stress. In our context, the wind stress is a response to the adjunct force of gravity. Depending on the time-scale of averaging and the formation materials, fossilized adjunct forces are present throughout the

world, and may be quite properly regarded as the building blocks of archaeology [2]. More generally, the universe is comprised of a mix generated throughout by the interaction of the normal and adjunct forces of gravity.

The stress-free universe

On a personal level, this is the common man's cosmology. An important question is which of the two forces dominates. Fortunately, fluid mechanics provides an answer to this question. Consider a small ocean contained in a tank. The wind stress drives a circulation in the tank, but the strength of the circulation is limited by the friction on the walls of the tank. Within the tank there is a continual interaction of the two forces, which are representative by the atmospheric and oceanographic circulations. This is a basic model applicable on all space scales. On the scale of the universe, the internal dynamics are limited by the velocity of light as proposed by Einstein, and the energy source which drives the motion is the annihilation of antimatter by matter, as also proposed by Einstein, and the frictional forces occur at the boundaries, in the manner of the shear stress at the sea surface [3]. In the stress-free universe, the motive and frictional forces are balanced, and give rise to its observed expansion.

Newton's principle of action and reaction, applied at the boundary of the universe, is the link with outer space beyond our universe

Conclusion

This article follows the lead of Julian of Norwich, who explored common experience 700 years ago as the constant guide to a knowledge of the universe. This remains true today.

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