

Brief History of Motion

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Since antiquity, people have tried to understand the behavior of matter: why unsupported objects drop to the ground, why different materials have different properties, and so forth. Also a mystery was the character of the universe, such as the form of the Earth and the behavior of celestial objects such as the Sun and the Moon. Several theories were proposed, most of them were wrong, but this is part of the nature of the scientific enterprise, and even modern theories of quantum mechanics are considered as theories that have not been finalized. Physical theories in antiquity were largely written in philosophical terms, and rarely verified by systematic experimental testing.

Typically the behavior and nature of the world were explained by invoking the actions of gods. Around 200 BC, many Greek philosophers began to propose that the world could be understood as the result of natural processes. Many also challenged traditional ideas presented in mythology, such as the origin of the human species (anticipating the ideas of Charles Darwin), although this falls into the history of biology, not physics. The atomists attempted to characterize the nature of matter, which anticipated work in our present day.

Due to the absence of advanced experimental equipment such as telescopes and accurate time-keeping devices, experimental testing of many such ideas was impossible or impractical. Modern knowledge of these early ideas in physics, and the extent to which they were experimentally tested, is sketchy. Almost all direct record of these ideas was lost when the Library of Alexandria was destroyed. What has been left is amazing, and makes us wonder how great this civilization really was.

Perhaps the most remarkable idea we know of from this era was the deduction by Aristarchus of Samos that the Earth was a planet that travelled around the Sun once a year, and rotated on its axis once a day, accounting for the seasons and the cycle of day and night, and that the stars were other, very distant suns which also had their own accompanying planets

The discovery of the Antikythera mechanism points to the fact the Greeks had a detailed understanding of movements of these astronomical objects, as well as a use of gear-trains that pre-dates any other known civilization's use of gears. It is this study of motion that was a driving force between the Greeks to learn ways to predict the future positions of the planets and the stars.

Regrettably, this period of inquiry into the nature of the world was eventually stifled by a tendency to accept the ideas of eminent philosophers, rather than to question and test those ideas. Pythagoras himself is said to have tried to suppress knowledge of the existence of irrational numbers, discovered by his own school, because they did not fit his number mysticism. For one thousand years following the destruction of the Library of Alexandria, Ptolemy's (not to be confused with the Egyptian Ptolemies) model of an Earth-centered universe with planets moving in perfect circular orbits was accepted as absolute truth.

Additional References:

http://en.wikipedia.org/wiki/History_of_physics#Early_history