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The Story of the Universe: Metaphors for Time in Astrophysical Cosmology

_There is fire in everything, shining and hidden –_  
Or so the saint believed. And I believe the saint...  
Edward Hirsch, ‘Incandescence at Dusk’

2.1 Introduction

We human beings are aware of all sorts of time: the rising and setting of the sun, the regular phases of the moon, the seasons of the year and agricultural cycles, beating hearts, and flowing tides. Each marks the complexity of our ordinary day-to-day life. We are probably most conscious of the kinds of time that intimately affect us like our pulse, menstrual cycles, and sleeping patterns, but these rhythms are also traceable within, and often to, the larger cosmic cycles of recurrence. The succession of moments; patterns of repetition; and the accumulation, growth, and disintegration or death of people, objects, and institutions are built into the very structure of the world as we know it. ‘As soon as man comes to life, he is at once old enough to die.’

Beginnings and endings, with intermediate flourishing and waning, structure non-human as well as human existence.

Since human beings inhabit a middle ground in time scales – between the microworld of quarks, electrons, and atoms and the macro-environment of the universe – our sense of time is limited in scope. We are familiar with brief times, like our reaction time (about a tenth of a second) to a possible age (let us say) of a century (3,000 million seconds). Most of our life is developed within a few hours or a few days and weeks. Rarely do we think of times like a millennium, let alone the pre-human world four million years ago, when our
particular branch of evolution started. Reflecting upon the time of the earth (about 4,500 million years) or the time of the universe (15–18 billion years) seems incomprehensible to us. Can we even conceive of a story for that amount of time? Does the earth have a narrative structure before human beings emerged? Is there a succession of ‘events’ that marks the passage of the earth and the universe? Are the stories we tell meaningfully related to the data available to us?

Until relatively recently (by the standards of earth’s time), this question was answered only by the founding stories and rituals within cultures. These stories were always religious. So Haida peoples of the Pacific Northwest describe the original human beings as having been created by a raven whose curiosity pried open a clamshell, releasing men and women onto the seashore. The book of Genesis proclaims ‘light overcoming chaos’ by the Word of the Lord; the Babylonians described the struggle of Marduk and Tiamat, one of whom dismembers the other to produce the heavens and the earth.

In an extraordinary fifteenth-century tapestry made in Flanders, the cosmos is imagined as an astrolabe, the medieval astronomical instrument by which sailors measured the altitude of the stars, moon, and sun. The polar star is at the center, surrounded by the *rete* (net; in Arabic, spider) the moveable wheel, on which is projected the celestial sphere with the constellations of the northern sky. The extra-zodiacal constellations such as Orion, Andromeda, and Pegasus, are woven into the outer circle or *mater*. On the right of the cosmos is Lady Philosophy enthroned with Geometry and Arithmetic at her feet. By her left side Abraham and Virgil converse, while at her right shoulder Astrology points to the celestial spheres. Atlas supports the cosmic astrolabe on the left of the tapestry while a wind-driven angel adjusts the *rete* with a very large crank. God the prime mover radiates from a sunburst above the angelic steersman, directing planetary movements like an orchestra conductor by his hands – genuine action at a distance. The universe is organized around the stars and their configurations; it is comprehended through arithmetic, geometry, astrology, philosophy – and Abrahamic faith; it is run by the warmth of divine love working through the force of Atlas and the guidance of angelic servants. A Latin inscription states: ‘The poets say when the angel acts under the power of the prime mover, the world is made fit for this by its own agility; the sky revolves controlling its motion.’

At one of those nodes in human history during the initial age of European colonial exploration, philosophy of nature, theology, and art combined to produce a complete image of the known universe. At