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# Italian Diluvianism and antidiluvianism within the international arena: the great debate that lasted more than six centuries

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ABSTRACT

As early as the thirteenth century naturalists of the Italian panorama began to look for a possible explanation for fossils found on emerged land. From the beginning, they tended quite naturally to resort to a catastrophic phenomenon, which found a direct 'confirmation' in the Holy Scriptures: the Great Flood. As an element found in numerous peoples, from the Babylonians, to ancient Egypt and the Chinese culture, the Flood became for a long time the only process able to explain the presence of marine fossils on the highest mountains, in a period dominated by a static concept of planet Earth. On the Italian scene, the supporters of the Flood were quite numerous, but equally numerous were the authors who brought evidence against the Deluge hypothesis, preferring a long stationing of the sea in places where the fossils are found today. An influential part of the second group is represented by the glorious Tuscan school that, starting from Boccaccio, includes prominent figures as Leonardo da Vinci, Baldassarri, Bastiani, Giovanni Targioni Tozzetti, Caluri, and Matani. In any case, the aspect that characterizes the majority of Italian authors from both the two interpretative factions, is a predilection to the study of deposits and fossils directly in the field, rather than the construction of 'big systems' simply based on the authority of sacred texts or other ancient authors.



" . . . *chi tutto il Fenomeno non spiega, non ne spiega nulla*"

(" . . . who does not explain the whole phenomenon, does not explain anything")
(Anton Lazzaro Moro, 1740)

## 1. Introduction

Once the organic nature of fossils as *ex-vivi* was recognized, following a winding trail of evidence with extreme fatigue, dialectical duels and counterdemonstrations (see Rudwick, 1972; Accordi, 1978; Morello, 1979, 2003; Romano, 2014, 2015a, 2016a, 2016b), the fundamental problem to be solved became how to explain these marine remains, scattered on hills and high mountains. The most obvious key, which found a literary response in the Holy Scriptures, was the Great Flood: a widespread myth, common to most of the ancient middle-eastern and circum-Mediterranean civilizations. A single and large catastrophic process able, according to a large group of supporters, to explain all fossils (terrestrial or marine, vertebrates or invertebrates) found and dug up on the planet's surface.

Traces and narrations of a gigantic flood are also found in the Epic of Gilgamesh, in ancient texts written in Sanskrit (the *Rigveda* of the Hindu tradition) and in the cuneiform tablets of the Babylonians. In the famous archeological excavations of Nineveh (conducted between 1842 and 1932), among the many Assyrian and Babylonian artifacts recovered, 24,000 cuneiform tablets were found of the legendary library of King Ashurbanipal. In the tablets, a detailed and sensational description of a Universal Flood is provided, with many points in contact with the biblical narrative. Hasis-Adra is warned by the God of the Sea (Ea) about an imminent coming flood and he is ordered to build an ark to save himself and his family. The great catastrophe invades the Euphrates area, with waters flowing from underground in large quantities. Once the impetuosity of the waters calmed, the ark comes to rest on top of Mount Nizir, from where Hasis-Adra sends a dove, a raven and a swallow, to be sure that the Earth was again habitable for the human race and for other organisms (see Sarti, 1988).

According to the ancient Egyptians the Earth was affected cyclically by large floods characterized by variable cycles between

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120,000 and 360,000 years able, given their enormous power, to shape the mountains and kill all the living beings (Sarti, 1988). In ancient Chinese traditions, we have traces of a great inundation caused by flooding of the Yellow River, followed by the construction of nine channels to allow the water to flow out (Sarti, 1988). Also in the ancient Greek tradition, the narrative of the Deluge, or Universal Flood, largely comparable to that of the Babylonian-Assyrians, is found at least in Ogige, Darden and Deucalion.

The amazing convergence of such a large number of myths in different cultures and regions has led scholars to seek, over time, a possible highly catastrophic geological phenomenon that happened in human memory; such an energetic and rapid event capable of also having a huge emotional impact on cultures and civilizations directly affected by the natural disaster. Among the several highly catastrophic phenomena proposed as a possible explanation of the Flood myth, have been, for example, the flooding and submergence of large coastal areas as a result of cyclical phases of deglaciation. According to some authors, the myth of the Great Flood could find a close match in the catastrophic flooding of the endorheic basin of the Black Sea, between ten and twelve thousand years ago (Ryan and Pitman, 1999).

The most literal interpretation of sacred texts did not question the universality of the Flood, with a maximum water level that must have exceeded the highest peaks of the mountains. However, on the basis of a theory formulated in the first century by Philo of Alexandria (c. 30 BC–45 AD), other authors including Isaac de La Peyrère (1596–1676), Isaac Vossius (1618–1689) and Edward Stilling (1635–1699), hypothesized that the extent of the flood was limited just to Middle East, i.e. the area thought as really inhabited at the time of the biblical catastrophe.

If on one hand the Flood seemed a convenient process to support organic origin of fossils, at the same time the fossils became a tangible proof of the biblical narrative itself. This reasoning, with tautological shades, could lead to a loss of the true meaning and explanatory power of fossils.

The debate between diluvianists and antidiluvianists has been widely covered in the literature with dedicated contributions (e.g. Sarti, 1988; Vai, 2003a; Luzzini, 2009). This paper moves the attention on to several mostly unknown Italian authors who, nevertheless, played an important role in the long and vexed dispute.

## 2. Diluvialist theories in the international arena

One of the most famous diluvialist schools is that of the English tradition characterizing the decades between the sixteenth and seventeenth centuries. The hypothesis, spread to most European academic circles, remained extremely popular and prevailed for about a century. Those are the years of the famous "Sacred Theories of Earth" and "Physico-theological systems" by Thomas Burnet (1681,Fig. 1), John Ray (Fig. 2), William Whinston and John Woodward (1695), genuine champions of the most literal diluvialism, totally faithful to the biblical account (see Vai, 2003a). The well-known work by Woodward (1665–1728, Fig. 3) entitled "*An Essay toward a Natural History of the Earth and Terrestrial Bodies, especially Minerals . . .* " represents the more irredeemably apologetic approach to the Scriptures. In the text, literary quotations of the Fathers of the Church are used not for the sole purpose of literary embellishment, but as real 'proof' to build possible systems and major models. An anti-scientific tendency was exaggerated to the point that genuine observations made in the field were changed or distorted, in the search for a reconciling correlation between biblical narrative and geological processes. Thus it was possible to avoid embarrassment raised by phenomenal evidence clearly at odds with biblical exegesis. Despite the metaphysical neutrality, i.e. the separation between religion, spirituality and the scientific world based on observations, experiments and demonstrations, that was an integral part of the Royal Society of London Statute, authoritative members such as Burnet, Ray and Woodward, often made use or 'abuse' of literal interpretation of the sacred texts.

Another apologetic tendency is found in William Whinston (1666–1753), disciple and heir of Newton in the prestigious chair of mathematics at Cambridge University. Whinston embraces the diluvial hypotheses adding, however, a possible astronomical phenomenon as an explanation of the catastrophe: the passage, very close to our planet, of a comet with a large mass. In general, the work of Whinston can be seen as a reading, in a purely Newtonian key, of the "*Telluris theoria sacra*" by Burnet. Flowing into metaphysics and supernaturalism, the passage of the devastating comet is made to correspond precisely with the degeneration of the human race, to be punished through the catastrophe. The ultimate aim then is of a moral nature, whereas the causes and effects are expertly made to fall in Newtonian physics.

The main flaw of the two major works by Burnet and Whinston was to totally leave out from the assumptions and reasoning, the problem of fossils and their possible interpretation; a problem that occupies a central role in the early debates on Earth Sciences. One who did consider fossils as an integral and central part of reasoning was another famous diluvialist of the English School, John Woodward.

Woodward addresses the issue in his work of 1695 "*An Essay toward a Natural History of the Earth*". Over time the author pulled together a great number of fossils collected directly in the field, becoming one of the biggest supporters of organic origin of these natural objects. He also strongly supported this hypothesis for those fossils defined as 'difficult', that is, of which there are no clear analogous living forms. Even the diluvialism by Woodward is among the most literary and orthodox. The narratives of sacred texts are interpreted literally, leaving no room for possible allegorical interpretations. This element is reflected in both the reading of processes, and universality of the catastrophe, both in the chronology and time elapsed between the 'creation', the Deluge and the current condition of the planet. As already found in Ray, the author does not accept a definitive extinction and disappearance of ammonites, but imagine their permanence to the present day in distant oceans and seas as yet completely unexplored.

Contrary to Burnet and Whinston, Woodward tried to include the fossils in his interpretive model, providing a possible explanation of lithified organisms. He argued that the Universal Flood catastrophe must have completely dissolved the preexisting mountains and hills, bringing in solution the enormous amount of material together with marine organisms that populated the sea and fresh water. Once the catastrophe ended, the material and the dead organisms were laid on the seabed following essentially the physical laws of gravity and decantation. In the theory of Woodward, this process at first led to the formation of tabular and regular strata extremely rich in fossils. However, subsequently, the action of subterranean fires caused a disruption of the same layers, leading to the chaotic structures in strata, observed directly in the field.

Another well-known diluvianist was the Swiss Johann Jacob Scheuchzer (1672–1733), physician and naturalist who embraced, fully and enthusiastically, the theories of Woodward. Initially in his work "*Specimen Lithographiae Helvetiae Curiosae*" of 1702, the Swiss author clearly supported the inorganic origin of fossils, natural objects 'just superficially similar to living organisms' but, in essence, interpretable as mere freaks of nature. However, the reading of Woodward had a great impact on Scheuchzer who

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