

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/332710803>

# Fires from Heaven. Comets and diseases in circum-Mediterranean Disaster Myths

Article · April 2011

CITATIONS

0

READS

656

1 author:



Amanda Laoupi

28 PUBLICATIONS 8 CITATIONS

[SEE PROFILE](#)

Some of the authors of this publication are also working on these related projects:



NOE - DISMA [View project](#)



DISASTERS AND HUMAN PSYCHE [View project](#)

## **Fires from Heaven. Comets and diseases in circum-Mediterranean Disaster Myths.**

Dr. Amanda Laoupi

Centre for the Assessment of Natural Hazards & Proactive Planning – NTUA

[alaoupi@gmail.com](mailto:alaoupi@gmail.com)

### **ABSTRACT**

The present work follows the two previous steps of disaster myths' analysis and interpretation (Homeric Hephaistos as comet/meteor god / Aristaïos and the Sirius' cult in Bronze Age Mediterranean). The aim of this work is to: a) assess contemporary and future trends concerning the interrelations between astrobiological phenomena (comets, impacts, plasma emissions, Super Novae explosions, solar cycles, Venus transits as biohazards) and past epidemics (Justinian plague, the Black Death, the AD 1918 flu pandemic spread, other more recent cases), and b) provide new evidence through famous circum-Mediterranean 'myths' (Venus as a comet, Apollo's wrath in Homeric Iliad, Tantalides / Niobe, Deucalion's flood, the Ten Plagues of Egypt, the Late Bronze Age Pestilence that destroyed mighty empires).

Especially, the dual role of comets & asteroids as bringers of destruction, as well as bringers of building blocks of life or even life, has given shape to the idea of "panspermia", meaning that life arrived fully developed in the form of micro-organisms (i.e. William Thomson -Lord Kelvin, Svante Arrhenius, Otto Struve). In fact, recent suggestions that meteorites, possibly of Martian origin, include exotic biotic materials has refocused attention on the possible extraterrestrial origins of life.

On the other hand, a growing number of scientists assert that catastrophic collisions with asteroids & comets have played a major role on Earth in shaping geology and climate. In recent years, physicists Fred Hoyle & Chandra Wickramasinghe have proposed not only that life originated from outer space in the distant past, but also that terrestrial evolution continues to be driven by the input of extraterrestrial genetic material. They also suggest that various historical pandemics were caused by bacteria or virii delivered by comets.

In addition, many other scientists examine seriously the likelihood that various plagues of the past times have been started when bacteria & viruses from outer space invaders (plasma, comets, meteors) reached the earthen atmosphere (i.e. Mike Baillie, Gunnar Karlsson, John Lewis, Graham Twigg).

Furthermore, inspired researchers such as Immanuel Velikovsky, Alfred de Grazia & Paul La Violette have already pointed out the interrelation of similar past events with the formation of myths in ancient societies. A cometary or planetary near-encounter results in falling of gases, hydrocarbons, burning pitch & stones. Such events are unknown to modern experience but are indicated by ancient legends from many places worldwide and by various geological & biological phenomena detected via geoaerological and bioarchaeological studies.

Consequently, the author: a) suggests that the main structural order and functions of space phenomena once happened, were strongly correlated to bioclimatic and geotectonic events on Earth, events 'hidden' in disaster myths all over the world.

Some specific circum-Mediterranean legends are examined, analyzed and interpreted through the new perspective of Disaster Archaeology's methodology, and b) highlights the role – often neglected by modern scientists - of biohazards in the evolution of ancient cultures and the fall of past socio-economic systems.

## **Keywords**

Biohazards, astrobiology, aerobiology, astromythology, disaster mythology

## **1. INTRODUCTION**

The earliest recorded advocate of 'Panspermia' ("life arrived in Earth fully developed in the form of micro-organisms") was the Greek philosopher Anaxagoras, who influenced Socrates. However, Aristotle's theory of spontaneous generation came to be preferred by science for more than two thousand years. Then on April 9, 1864, French chemist Louis Pasteur announced his great experiment disproving spontaneous generation as it was then held to occur. In the 1870s, British physicist Lord Kelvin & German physicist Hermann von Helmholtz reinforced Pasteur and argued that life could come from space.

In 1907, Swedish chemist and Nobel laureate Svante Arrhenius (1859-1927) argued that microbes could have been hurled into near-planet space by storms, then propelled by radiation pressure, directly propagating life between planets. In fact, no comets or meteorites were required. Arrhenius became active in the fields of astronomy and cosmic physics, and he proposed a new theory of the birth of the solar system by the collision of stars. He used the ability of radiation pressure to transport cosmic material to explain comets, the corona, the aurora borealis & zodiacal light. He developed a theory to explain the ice ages and other profound climatic changes undergone by the earth's surface (See: Possibility of Arrival of Living Organisms from Space, 1996).

The astronomers Sir Fred Hoyle and Chandra Wickramasinghe (1977, 1978, 1979, 1981, 1985, 1987) discuss the idea of a comet tail's delivery systems for extraterrestrial biological visitors. This would be consistent with the idea of panspermia. These researchers found evidence which suggests that influenza (at least in the beginning of a given flu season) breaks out in a sporadic manner, but doesn't spread easily (see also: Chyba et al., 1990; Yoemans, 1991; Thomas et al., 1997). Furthermore, 'Cosmic Ancestry' (Brig Klyce, 2001) is a new theory pertaining to evolution and the origin of life on Earth. It holds that life on Earth was seeded from space, and that life's evolution to higher forms depends on genetic programs that come from space (OSETI III Conference, 2001).

Meanwhile, inspired researchers such as Immanuel Velikovsky (1950), Alfred de Grazia (1983) & Paul La Violette (1997) have already pointed out the interrelation of similar past events with the formation of myths in ancient societies. A cometary or planetary near-encounter results in falling of gases, hydrocarbons, burning pitch & stones. Such events are unknown to modern experience but are indicated by ancient legends from many places worldwide and by various geological & biological phenomena detected via geoarchaeological and bioarchaeological studies.



Figure 1: Meteorite entering the atmosphere of Earth

Graham Twigg (1985) argued that the climate & ecology of Europe and particularly England made it nearly impossible for rats & fleas to have transmitted the bubonic plague of the AD 14<sup>th</sup> cent. and that it would have been nearly impossible for *Yersinia pestis* to have been the causative agent of the plague. He also demolishes the common theory of entirely pneumonic spread, proposing, based on his examination of the evidence & symptoms, that the Black Death may actually have been an epidemic of pulmonary anthrax caused by *Bacillus anthracis*. Additionally, Gunnar Karlsson (2001) pointed out that the Black Death killed between half and two-thirds of the population of Iceland, although there were no rats in Iceland at this time.

On the other hand, the dendrochronologist Mike Baillie of Queen's University, Belfast, Ireland, had just noticed some strange tree ring patterns that happened to coincide with this historical catastrophe (2007). In addition, there was some sort of environmental downturn that weakened the human population, making humanity susceptible to bacterial or viral death on a large scale. More specifically, he compared these tree rings to dated ice-core samples that had been analyzed and discovered a very strange thing: ammonium. There are, as it happens, at least four occasions in the last 1500 years where scientists can confidently link dated layers of ammonium in Greenland ice to high-energy atmospheric interactions with objects coming from space: AD 539, 626, 1014, and 1908 (the Tunguska event). In short, there is a connection between ammonium in the ice cores and extra-terrestrial bombardment of the surface of the Earth, forming high-energy interactions. This ammonium signal in the ice-cores is directly connected to an earthquake that occurred on January 25th, 1348. Surprisingly, a 14th century writer had wrote that the plague was a "corruption of the atmosphere" that came from this earthquake!

All these environmental coincidences, have also been related to the frequency of fireball activity in the Taurid meteor streams recorded in Chinese archives, during the AD 400-600 timeframe, and supported in work by British cometary astrophysicists. Baillie also points out that a series of such impacts/overhead explosions, would more adequately explain the longstanding problem of the end of the Bronze Age in the Eastern Mediterranean in the 12th century BC. During that malefic period of time, many major sites were destroyed and totally burned by the notorious "Sea Peoples". But, if that was the case, there ought to at least be some evidence for that, like dead warriors or signs of warfare.. There were almost no bodies found, and no precious objects except those that were hidden away as though someone expected to return for them, or didn't have time to retrieve them. The people who fled were probably also killed in the act of fleeing and the result was total abandonment and total destruction of the cities in question. So, in his book, *Exodus to Arthur: Catastrophic Encounters with Comets* (1999), relates the findings of his tree-ring studies to a series of global environmental traumas over the past 4400 years that may mark events such as the biblical Exodus, the disasters which befell Egypt, collapses of Chinese dynasties & the onset of the European Dark Ages.

In another work of him, co-authored with Patrick McCafferty (2005) , he focuses on the AD 540 event as recorded in the historical records & myths of Ireland,

showing that the imagery in the myths and the times between events are consistent with a comet with an earth-crossing orbit similar to P/Encke, as described by the British astronomers Victor Clube & Bill Napier (1990). His latest book (2006), shows how the tree-ring & Greenland ice core evidence along with descriptions in annals, myths & metaphors adduced in support of the global environmental downturn at AD 540, (including the Justinian plague), also applies to conditions extant at the time of the Black Death in AD 1348.

## 2. PLAGUES IN PREHISTORY

The idea of spreading diseases via travellers & settlers around the world, seems to be as old, as history meets local legends (Hays, 2005; Sherman, 2006). For instance, in Ireland, around 6000 BC the first people settled, following the receding of European glaciers. Historians & archaeologists call these the Middle Stone Age or Mesolithic people. They were hunters & gatherers who lived by lakes and rivers. Circa 3000 BC, Neolithic people arrived. These were farmers and flint masters who constructed axes to cut down forests for pastures and farmland. The Bronze Age peoples arrived around 2000 BC and introduced a culture with high artistic form. The Irish mythic legends tell of those successive waves of invasion.

In Irish mythology, Partholón was the leader of the second group of people to settle in Ireland, the first to arrive after the biblical Flood. They arrived in 2680 BC according to the chronology of the Annals of the Four Masters, 2061 BC according to *Seathrún Céitinn's* chronology, and the time of Abraham according to Irish synchronic historians. The earliest surviving reference to Partholón's settlement is in the *Historia Brittonum*, a 9th century British Latin compilation attributed to one Nennius. Here, "Partolomus" is said to have come to Ireland with a thousand followers, who multiplied until there were four thousand, and then all died of plague in a single week, in their third century in Ireland. Over 9,000 Partholonians died then. The survivors lived on another 30 years and then the group is lost to history. *Seathrún Céitinn's* 17th century compilation *Foras Feasa ar Éirinn*, gives Partholón the following background story. He was the son of Sera, the king of Greece, and fled his homeland after murdering his father & mother. He lost his left eye in the attack on his parents. He & his followers set off from Greece (Greek Scythia?), sailed via Sicily, around Spain, and arrived in Ireland from the west, having traveled for seven years (O'Donovan, 1848-1851; Joyce, 1909; Morris, 1980; Killeen, 1994; Smyth, 1996; Duffy, 1997).

Nowadays, scientists can detect the appearance of an epidemic disease in the distant past, along with its spatio-temporal distribution, via accurate biomolecular methods & techniques. When mapping of the human genome was completed in 2003, researchers discovered a shocking fact: our bodies are littered with the shards of retroviruses, fragments of the chemical code from which all genetic material is made. This discovery has created a new discipline, Paleovirology, which seeks to better understand the impact of modern diseases by studying the genetic history of ancient viruses. DNA sequences from up to 2900-year-old skeletal remains from different burial sites in Europe have proven that a mutant allele of the chemokine receptor CCR5 gene (CCR5-Delta32), which confers resistance to HIV-1 infection (this allele provides almost complete resistance to HIV-1 in the homozygous state & partial resistance with slower disease progression in the heterozygous state), is probably originated from a single mutation event in historic times, and rapidly expanded in Caucasian populations, owing to an unknown selective advantage. Among other candidates, the plague bacillus *Yersinia pestis* was implicated as a potential source of

strong selective pressure on European populations during medieval times. The paleopathological findings indicate that this mutation was prevalent already among prehistoric Europeans, while it is virtually absent in African, Asian, Middle Eastern & American Indian populations (Hummel et al., 2005). Nevertheless, by using a population genetic framework that takes into account the temporal pattern & age-dependent nature of specific diseases, biochemists find that smallpox (*Variola major* virus) is more consistent with this historical role (Galvani & Slatkin, 2003). And we should point out that the cumulative number of deaths during the last 700 years from smallpox was greater than that from plague (Giblin, 1995; Hopkins, 2002).

### 3. THE WRATH OF THE GREEK GODS

First comes the story of the Tantalides. Pausanias, when describing the catastrophe of Helike in 373 B.C. (7.24.5 ff.), knew an analogy from his homeland (de Grazia, 2005). It was the mythical city of Tantalus on mount Sipylus (N.W. of Ermos river), 48 km. east of Smyrna, which disappeared into a chasm (? the city of Zippasla in the Hittite texts).. From the fissure in the mountain water gushed forth this chasm named Lake Saloe. The ruins remained visible in the waters of the lake until the deposits of the local torrent covered them up with mud. Homer (*Iliad*, II.575, VIII.203 & XXIV.614 - 617) & Diodorus (14.80.1) speak of it, too. P. James (1991) located the legendary city in the area of Magnesia, in ancient S.W. Anatolia.

The tragic place is also related to the heroine Niobe, daughter of Tantalus and wife of Amphion, king of Thebes - Central Greece (Homer, *Iliad* XXIV.602; Plato *Cratylus*, 395D - E: devastation of Tantalus due to an earthquake and flood; Demokles in Strabo, 1.3.17; Apollodorus, *The Library* 3.46; Antoninus Liberalis *Metamorphoses*, 36; Plinius Junior, 5.31; Ovid, *Metamorphoses* VI.145-310; Diodorus, 4.74; Quintus Smyrnaeus, *Fall of Troy* 1.390), whose 14 children, after being killed by Apollo (boys) & Artemis (girls) respectively, they had being staying unburied for nine days, because Zeus had turned people into stones. A devastated Niobe fled to Mount Sipylus (Spil Mount) of Lydia in Anatolia, and was turned into a stone waterfall as she wept unceasingly.



Figure 2: "The Weeping Rock" (Ağlayan Kaya in Turkish) on the slopes of Mount Sipylus and overlooking Manisa is associated with Niobe

Euripides in *Orestes* ties the much-abused Tantalos to a 'bolos' swinging in orbit around Olympos! The whole sequence of events (Tantalus & her daughter Niobe) reveal a space-related disaster that brought disease & death.

Plato in *Timaeus* tells us about the event of Niobe, mentioning it before the Deucalion's Deluge: "Solon (addressing to Egyptian Priests of Neith/Athena) began to tell about the most ancient things in our part of the world-about Phoroneus, who is called "the first man," and about Niobe; and after the Deluge, of the survival of Deucalion and Pyrrha.. Thereupon one of the priests, who was of a very great age, said: O Solon, Solon, you Hellenes are never anything but children, and there is not an old man among you. Solon in return asked him what he meant. I mean to say, he replied, that in mind you are all young; there is no old opinion handed down among

you by ancient tradition, nor any science which is hoary with age. And I will tell you why. There have been, and will be again, many destructions of mankind arising out of many causes; the greatest have been brought about by the agencies of fire and water, and other lesser ones by innumerable other causes..”.

Deucalion & Pyrrha, according to the ancient Greek tradition, were the first king and queen of Northern Greece--the regions of Opountian Lokris, Malis, Phthiotis & the Thessalian lands. Deucalion was the son of Prometheus, the creator of mankind, while Pyrrha was the daughter of Pandora, the first woman. The mythographer Apollodorus writes that "Deucalion was the son of Prometheus. He reigned as king in the country about Phthia and married Pyrrha, the daughter of Epimetheus and Pandora, the first woman fashioned by the gods. But when Zeus wished to destroy the men of the Bronze Age, Deucalion by the advice of Prometheus constructed a chest or ark, and having stored in it what was needful he entered into it with his wife. But Zeus poured a great rain from the sky upon the earth and washed down the greater part of Greece, so that all men perished except a few, who flocked to the high mountains near. Then the mountains in Thessaly were parted, and all the world beyond the Isthmus and Peloponnesus was overwhelmed. But Deucalion in the ark, floating over the sea for nine days and as many nights, grounded on Parnassus, and there, when the rains ceased, he disembarked and sacrificed to Zeus, the God of Escape. And Zeus sent Hermes to him and allowed him to choose what he would, and he chose men. And at the bidding of Zeus he picked up stones and threw them over his head ; and the stones which Deucalion threw became men, and the stones which Pyrrha threw became women. That is why in Greek people are called laoi from laas, 'a stone' (Hesiod, Catalogue of Women fragments 1-3, 5, 68, 82; Hecataeus of Miletus, fr. 341; Pindar, Olympian Odes 9; Apollonius of Rhodes, Argonautica 3.1086; Virgil, Georgics 1.62; Hyginus, Fabulae 153; Poeticon astronomicon 2.29; Dionysius of Halicarnassus, Roman Antiquities 1.17.3; Ovid, Metamorphoses, 1.318ff.; 7.356; Strabo, Geographica, 9.4; Apollodorus, Library 1.7.2; Plutarch, Life of Pyrrhus, 1; Lucian, De Dea Syria 12, 13, 28, 33; Pausanias, Description of Greece 10.38.1; Nonnus, Dionysiaca 3.211; 6.367). The Parian Chronicler, who drew up his chronological table in the year 265 B.C., dated Deucalion's flood 1265 years before his own time.

Artemis, symbolizing the unseen forces of disease & sudden death, was also connected to other legendary plagues as a result of her wrath against local inhabitants of Bronze Age Greece. She was the goddess who brought sudden death to infants, girls & women, for she was not only the protector of girls, but also by contrast their destroyer. Apollo, possessed the complimentary role, bringing sudden death, illness & disease to boys & men. Ancient philological evidence is clear on this: “Zeus has made you [Artemis] a lion among women, and given you leave to kill any at your pleasure” (Homer, Iliad XXI.470). “[Odysseus to the ghost of his mother Antikleia] 'What doom of distressful death subdued you? Was it some long-continued sickness, or did the Artemis Iokheaira (archeress) visit you with her gentle shafts and slay you?’” (Homer, Odyssey xi.172). “And Artemis has her name from the fact that she makes people 'Artemeas' (Safe and Sound) ... And both pestilential diseases and sudden deaths are imputed to these gods [Artemis and her brother Apollo]” (Strabo, Geography 14.1.6). “They say [the people of Phokis] that whatever cattle they consecrate to Artemis grow up immune to disease” (Pausanias, Guide to Greece 10.35.7).

Apart from the afore-said legend of the Niobids, there were other evidence for the existence of plagues during the prehistoric & historic times in Greece. Koronis

was the daughter of the king Phlegyas (Thessaly), later got pregnant from Apollo to Asclepius. “[Artemis] smote her [Koronis] down [with her arrows of plague]: and many a neighbour, too, suffered alike and was destroyed beside her; as when on the mountain from one small spark a raging fire leaps up, and lays in ruin all the widespread forest” (Pindar, Odes Pythian 3 str1-ant3). Furthermore, the wrath of Artemis began to destroy the inhabitants [of Patrai in Achaia]; the earth yielded no harvest, and strange diseases occurred of an unusually fatal character. When they appealed to the oracle at Delphi the Pythian priestess ... [ordered] that every year a sacrifice should be made to the goddess of the fairest youth and the fairest maiden” (Pausanias, Guide to Greece 7.19.1). Similarly, “The people of Aigialeia were smitten by a plague. The seers bade them propitiate Apollo and Artemis, they sent seven boys and seven maidens as suppliants to the river Sythas” (Pausanias, Guide to Greece 2.7.6). The “[Spartans] Astrabakos and Alopekos ... when they found the image [of Artemis Orthia] straightway became insane. Secondly, the Spartan Limnatiens, the Kynosourians, and the people of Mesoa and Pitane, while sacrificing to Artemis, fell to quarrelling, which led also to bloodshed; many were killed at the altar and the rest died of disease. Whereat an oracle was delivered to them, that they should stain the altar with human blood” (Pausanias, Guide to Greece 3.16.7). In addition, “after a female bear appeared in it [the shrine of Artemis at Mounykhia in Attika] and was done away with by the Athenians a famine ensued, and the god prophesied the means of relieving the famine: someone had to sacrifice his daughter to the goddess [to compensate her for the death of her sacred bear]” (Suidas s.v. Embaros eimi). “A wild she-bear [sacred to Artemis] used to come to the deme of Phlaidoi [Brauron] and spend time there ... [until some men] speared the she-bear, and because of this a pestilential sickness fell upon the Athenians. When the Athenians consulted the oracle [the god] said that there would be a release from the evils if, as blood price for the she-bear that died, they compelled their virgins to play the bear” (Suidas s.v. Arktos e Brauronioi).

Respectively, the famous opening of Homeric Iliad (I, 9-11) tells us that "Zeus' son and Leto's, Apollo, who in anger at the king drove the foul pestilence along the host, and the people perished, since Atreus' son had dishonoured Chryses, priest of Apollo....". Perhaps, the information derived from the very first verses of Homer's Iliad about the plague which hit the Achaeans as a mark of divine presence, could be used as a chronological tool of the events during the period of the last one of the three cities of Troy described in the Epics (Laoupi, 2006a).

Another Bronze Age plague probably occurred in mainland Greece, during the reign of Oedipus at Thebes. Oedipus, after killing his father Laius without knowing his crime, he married to his mother Jocasta. They were happily married and over the years Thebes prospered under Oedipus' reign. Oedipus was known as a wise and just king. After two decades, the land began suffered from the drought and famine or plague (Sophocles, Oedipus the King 1316). Oedipus was determined to learn the truth of what was causing the woes to his kingdom. He learned that plague was caused by the murder of Laius, and his killer went unpunished.

The symbolic language of ancient myths correlates the heavenly bodies / phenomena (gods & goddesses) to the leit motif of deadly arrows that bring havoc & plagues among people. Those arrows are also correlated with falling 'stones', 'fires', and other objects from the sky. In many races (de Grazia, 1983c), people believed that the stone axes fell from the heavens. In Japan, the stone arrow-heads are rained from heaven by the flying spirits, who shoot them. Similar beliefs are found in Brittany, in

Madagascar, Ireland, Brazil, China, the Shetlands, Scotland, Portugal etc. Also from the Aztec prayer to Tezcatlipoca, and from the Bible (Deuteronomy xxviii).

#### 4. THE LATE BRONZE AGE PLAGUE

It is difficult to say what is the earliest recorded outbreak of the bubonic plague. Some scholars believe that the first two outbreaks are reported in the Bible. In one, reported in the book of 1st Samuel and dated approximately 1320 B.C., the Philistine army attacks the Hebrews and seizes the Ark of the Covenant. They take it to the city of Ashdod, then to Gath & Ekron. Each city is stricken with devastating illness which is only cured through the return of the Ark to the Hebrews and the gift of five golden “emerods” & five golden mice. What these “emerods” were is unclear, but they are believed to be either hemorrhoids or the buboes of plague victims.

The second biblical account of plague is chronicled in the books of 2nd Kings, 2nd Chronicles, Isaiah, and in the writings of Herodotus, a Greek historian. Here, the city of Jerusalem, was under siege by the army of the Assyrians, led by Sennacherib. It is written that one morning the Hebrews awoke to find all of the armies dead, and, according to Herodotus, “multitudes of field mice.” The presence of rodents among the dead could indicate an outbreak of plague, and plague has been known to kill in as quickly as 24 hours (de Grazia, 1983c).

Besides the geotectonic upsetting and the celestial events (Sallares, 1991: 391, refers to many scientists who examined various natural forces as possible triggers of the societal collapse during the end of the Bronze Age, i.e. Carpenter, 1966; Parry, 1978; Weiss, 1982; Longo, 1984; Shrimpton, 1987), there was another, generally neglected, parameter of that turbulent period, the epidemic diseases (i.e. Walløe, 1999), which seemed to play a crucial role in the collapse of the Hittite empire and the problems of Pharaonic Egypt.

Smallpox (*Variola major* & *minor*) is an epidemic disease caused by a virus that plagued humanity for millennia. In fact, it was the first and only disease ever intentionally eradicated from the face of our planet. Historians speculate that it appeared around 10,000 BC in the agricultural settlements of NE Africa. From there, it probably spread to India via Egyptian merchants. It was known in China as early as 1.122 B.C. and it is also mentioned in ancient Sanskrit texts of India. In the 1500s, the Spanish & Portuguese transported it to the New World, where it decimated the Aztec & Inca populations in Central and South America.

The first known smallpox epidemic was recorded in 1350 B.C. During the Egyptian / Hittite war Egyptian prisoners spread the disease to their enemies. Even the Hittite king Suppiluliumas I and his heir, Aruwandas, fell victim to the virus in 1340 B.C. (Beckman, 1999; Singer, 2002). Later on, the pharaoh Ramesses V died of smallpox in 1157 B.C. at the age of 35.

Ramzes V - Usermaatresekhperenre - 1147-1143 B.C



Figure 3: The mummy of Ramesses V

The scars of the disease have been found on his mummy, as well as on other mummies of the 18<sup>th</sup> 7 20<sup>th</sup> dynasties (New Kingdom= ca 1570 – 1085 BC).. There are two clinical forms of smallpox. Variola major is the severe and most common form of smallpox, with a more extensive rash & higher fever. There are four types of variola major smallpox based on the Rao classification: ordinary, modified, flat & hemorrhagic. Historically, variola major has an overall fatality rate of about 30%; however, flat and hemorrhagic smallpox are usually fatal. In addition, a form called *variola sine eruptione* (smallpox without rash) is seen generally in vaccinated persons. Variola minor is a less common presentation of smallpox, and a much less severe disease, with historical death rates of 1% or less. Subclinical (asymptomatic) infections with variola virus have also been noted, but are not believed to be common. Generally speaking, this disease was highly contagious with high fatality rates (up to 40%) and severe social side effects (Ruffer & Ferguson, 1911; Ruffer 1921; Cerny 1975; Hopkins, 1983; Fenner et al., 1988; Barquet & Domingo, 1997; Christopher et al., 1997; Alibek & Handelman, 1999). Meteorological and other fluctuating environmental conditions make the spread of any contagious disease an unpredictable agent in human history.

## 5. THE JUSTINIANIC PLAGUE

Throughout history, humans have been faced with disastrous catastrophes which must be endured in order to survive. One of the most deathly disasters for humanity has been the plague. This term in Greek can refer to any kind of sickness; in Latin, the terms are *plaga & pestis*. In antiquity, two of the most devastating plagues were the Athenian plague of 430 B.C. and the Justinianic plague of A.D. 542.

Although many disastrous epidemics probably occurred between the Athenian and Justinianic plagues, few sources detailing these plagues have survived. One such disease, known as the Antonine plague, occurred during the reign of Marcus Aurelius (161-180 A.D.). It was brought back by soldiers returning from Seleucia, and before it abated, it had affected Asia Minor, Egypt, Greece, and Italy. The plague destroyed as much as one-third of the population in some areas, and decimated the Roman army. Another plague occurred during the reigns of Decius (249-251 A.D.) & Gallus (251-253 A.D.). This pestilence broke out in Egypt in 251, and from there infected the entire empire. Its mortality rate severely depleted the ranks of the army, and caused massive labour shortages. The plague was still raging in 270, when it caused the death of the emperor Claudius Gothicus (268-270).

Even if many writers documented the Justinianic period, there are three main sources for that plague: John of Ephesus (*Historia Ecclesiastica*), Evagrius Scholasticus (*Historia Ecclesiastica*), and especially Procopius. Another source for the Justinianic plague is the *Historia* of Agathias. A lawyer and poet, he continued the history of Procopius. A further account is the *Chronicle* of John Malalas; however, this work may have copied Procopius (Mc Neil, 1976; Cartwright & Biddiss, 1991; Orent, 2004; Little, 2006; Rosen, 2007).

The plague of Justinian (a pandemic), during which ca 100 million people died, ravaged the city of Constantinople and was named after the Byzantine emperor of the time, Justinian I who ruled between AD 527-565. The epidemic started in May, 542, during the festival of the founding of the city. It began in the waterfront districts and spread throughout the entire city. Black rats, presumably from either India or Africa, carried infectious fleas to the capital of the empire. The fleas were the true source of the epidemic, a fact of which the people remained ignorant. Byzantine physicians could not find a treatment for, or a prevention against, the plague.

Nevertheless, the people did not flee the city. Some shut themselves inside their homes, thinking the self-imposed quarantine would spare them from the disease. Others took refuge in churches, thinking the sanctuaries would provide them with an immunity.

According to R. Sallares (“Ecology, Evolution, and Epidemiology of Plague” in Little ed., 2006), a cool enough time period in the Middle East promoted the beginning of a pneumonic plague. Once the plague becomes pneumonic, then it only needs a constant supply of vulnerable hosts and the right temperature & humidity to promote respiratory spread. At the beginning of the Justinianic plague, it was recorded as an unusually cool and wet year as far north as Ireland. The plague seems to have been incubating in local epidemics in normally hot and dry Egypt and nearby areas, possibly waiting for the right climate conditions to go pneumonic. Sallares (p. 240) also made the important connection between neck buboes & pneumonic plague. Neck buboes are not a sign of fleas biting the head but of pneumonic transmission.

Baillie proposes the great Antioch earthquake of AD 526, due to which up to 250,000 people perished according to the description of John Malalas, as one triggering mechanism. Later on, scientists detected more intriguing coincidences: Analysis of tree rings shows that at in AD 540, in different parts of the world, the climate changed. Temperatures dropped enough to hinder the growth of trees as widely dispersed as N. Europe, Siberia, western North America & southern South America. A search of historical records & mythical stories pointed to a disastrous visitation from the sky during the same period. There was one reference to a "comet in Gaul so vast that the whole sky seemed on fire". According to a legend, King Arthur died around this time, and Celtic myths associated with him hinted at bright sky Gods & bolts of fire. Moreover, in the 530s, both Mediterranean & Chinese observers recorded an unusual meteor shower. Famine followed the crop failures and bubonic plague swept across Europe in the mid-6th century.

David Keys, in a 1999 British television documentary based on his book suggested that an eruption of Krakatoa in AD 535, was the primary cause of a global climatic catastrophe that caused widespread famine, pestilence & extinction of many civilizations around the globe. Keys reasons that a huge volcanic eruption, somewhere near the equator sent volcanic emissions high into the stratosphere where air currents distributed them around the globe, creating a veil through which sunlight could not penetrate. As a result, the Earth sustained flooding & cooling over the next century, which caused the failure of crops. People & animals scattered and either starved to death or died from a pandemic that swept the civilized world in the sixth century (see also: Lewis, 2002; Winchester, 2003). Keys provides many lines of evidence, five of which are: tree rings, building of crannogs (wooden forts built over water in Ireland), writings from people living at the time, volcanic sulphates in 1,000-meter-deep columns of ice from Greenland in the north and from the Antarctic in the south, and carbon-dated charcoal in layers surrounding a buried layer of Krakatoa lava. But researchers argue that similar environmental calamities occurred around 3200 B.C., 2300 B.C., 1628 B.C. and 1159 B.C. Each led to the collapse of urban societies in widely scattered portions of the globe. Destructive as they were, the natural disasters that have plagued Earth since the dawn of human civilization are but popguns compared with the truly titanic catastrophes of prehistoric eras.

## 6. THE PLAGUE OF THE AD 14<sup>th</sup> CENT.

The 14<sup>th</sup> century marks the start of some serious climatic changes that caused widespread disturbances in seasons & crops. The result was widespread storms, rain,

flood, droughts and of course serious crop failures. The worst, but far from the only one, was the "universal famine" AD 1315-1317, which caused conditions almost too cruel to mention. It is reported through contemporary chroniclers that parents ate their children, that people dug up bodies from churchyards for food, and that it even was common for people to kill others for food. In Europe north of the Alps and the Pyrenees 10% of the population perished according to some estimates. Right before the Black Death another serious famine devastated nations, having affected 1/5<sup>th</sup> of mankind.

The Black Death came in three forms, the bubonic, pneumonic & septicemic. Each different form of plague killed people in a vicious way. All forms were caused by a bacterium called *Yersinia pestis*.



Figure 4: Plague bacillus. *Yersinia pestis*

The bubonic plague was the most commonly seen form of the Black Death. The mortality rate was 30-75%. The symptoms were enlarged & inflamed lymph nodes (around arm pits, neck & groin). The term 'bubonic' refers to the characteristic bubo or enlarged lymphatic gland. Victims were subject to headaches, nausea, aching joints, fever of 38° - 41° C degrees, vomiting, and a general feeling of illness.

Symptoms took from 1-7 days to appear. The pneumonic plague was the second most commonly seen form of the Black Death. The pneumonic & the septicemic plague were probably seen less than the bubonic plague because the victims often died before they could reach other places. The mortality rate for the pneumonic plague was 90-95% (if treated today the mortality rate would be 5-10%). The pneumonic plague infected the lungs. Symptoms included slimy sputum tinted with blood. Sputum is saliva mixed with mucus excreted from the respiratory system. As the disease progressed, the sputum became free flowing and bright red. Symptoms took 1-7 days to appear. The septicemic plague was the most rare form of all. The mortality was close to 100% (even today there is no treatment). Symptoms were a high fever and skin turning deep shades of purple due to DIC (disseminated intravascular coagulation). Victims usually died the same day symptoms appeared.

The Black Death killed at least 75 000 000 people in Eurasia alone from 1347 to 1351. This is the worst pestilence ever in sheer numbers, but neither its mortality nor its global nature was unique. Around 1/3<sup>rd</sup> of Europe's population perished (25 000 000 people). China, where the Black Death is said to have originated, lost around half of its entire population (going from around 123 million to around 65 million). In Mediterranean Europe, where the plague ran for about four years consecutively, it was probably closer to 70% to 75% of the total population. Africa lost approximately 1/8th of its population (from around 80 million to 70 million).

The plague is supposed to have originated in Central Asia, or somewhere in Africa, where plague is endemic in some rodent populations. It is assumed that some environmental stimulus caused infected rodents to leave their normal habitats and infect rat populations, and ultimately human populations, in areas where there was no natural immunity. The mechanism of transfer is believed to have been infected fleas leaving the bodies of dead rats and moving to human hosts who were in turn infected by the feeding fleas (Marks, 1971; Nohls, 1971; Gottfried, 1983; Gregg, 1985; Geary,

1994; Horrox, 1994; Herlihy, 1995; Benedictow, 2004; Byrne, 2004; Kelly, 2005; Bennett & Hollister, 2006).

During that period, more than 100 plague epidemics swept across Europe (in 1603, the Italian Plague of 1629-1631, the Great Plague of Seville of 1647-1652, the Great Plague of London of 1665-1666, the Great Plague of Vienna in 1679, the Great Plague of Marseille in 1720-1722, the Great Plague of 1738 and the 1771 plague in Moscow).

The epidemiologists Susan Scott & Christopher Duncan (2001 & 2004) from Liverpool University proposed the theory that the Black Death might have been caused by an Ebola-like virus, not a bacterium. Their research and findings are thoroughly documented in *Biology of Plagues*. More recently the researchers have published computer modelling demonstrating how the Black Death has made around 10% of Europeans resistant to HIV.

The historian Norman F. Cantor (2001), suggests the Black Death might have been a combination of pandemics including a form of anthrax & a cattle murrain. He cited many forms of evidence including the fact that meat from infected cattle was known to have been sold in many rural English areas prior to the onset of the plague.

But let us return to the triggering mechanisms of that pandemic.

“... a dragon at Jerusalem like that of Saint George that devoured all that crossed its path .... A city of 40,000 ... totally demolished by the fall from heaven of a great quantity of worms, big as a fist with eight legs, which killed all by their stench and poisonous vapours”. A story by the Dominican friar Bartolomeo is enlightening: “... massive rains of worms and serpents in parts of China, which devoured large numbers of people. Also in those parts fire rained from Heaven in the form of snow (ash), which burnt mountains, the land, and men. And from this fire arose a pestilential smoke that killed all who smelt it within twelve hours, as well as those who only saw the poison of that pestilential smoke”. ... Petrarch's close friend, Louis Sanctus, before embarking on his careful reporting of the plague... claimed that in September floods of frogs and serpents throughout India had presaged the coming to Europe in January of the three pestilential Genoese galleys. Numerous chroniclers reported earthquakes around the world, which prefigured the unprecedented plague. Most narrowed the event to Vespers, 25 January 1348. Of these earthquakes that "destroyed many cities, towns, churches, monasteries, towers, along with their people and beasts of burden", the worst hit was Villach in southern Austria. Chroniclers in Italy, Germany, Austria, Slavonia, and Poland said it was totally submerged by the quake with one in 10 surviving.

Baillie quotes the contemporary work of Philip Ziegler (1969): “Droughts, floods, earthquakes, locusts, subterranean thunder, unheard of tempests, lightning, sheets of fire, hail stones of marvellous size, fire from heaven, stinking smoke, corrupted atmosphere, a vast rain of fire, masses of smoke..”. Ziegler discounts entirely reports of a black comet seen before the arrival of the epidemic but records: heavy mists and clouds, falling stars, blasts of hot wind, a column of fire, a ball of fire, a violent earth tremor, in Italy a crescendo of calamity involving earthquakes, following which, the plague arrived.

Jon Arrizabalaga (1998) compiled a selection of writings in an attempt to comprehend what educated people were saying about the Black Death while it was happening. Regarding the terms used by doctors and other medical people in 1348 to describe the plague, he writes: “One... Jacme d'Agramaont, discussed it in terms of an "epidemic or pestilence and mortalities of people" which threatened Lerida from "some parts and regions neighbouring to us" ... Agramont said nothing concerning the

term epidemic, but he extensively developed what he meant by pestilencia. He gave this latter term a very peculiar etymology, in accordance with a form of knowledge established by Isidore of Seville (570=636) in his *Etymologiae*, which came to be widely accepted throughout Europe during the Middle Ages. He split the term pestilencia up into three syllables, each having a particular meaning: pes = tempesta: 'storm, tempest'; te = 'temps, time', lencia = clardat: 'brightness, light'; hence, he concluded, the pestilencia was 'the time of tempest caused by light from the stars'. If Florence was in the grip of an epidemic of colds, coughs and fevers, astrologers . . . declared that it was caused by the *influence* of an unusual conjunction of planets. This sickness . . . came gradually to be known as "influenza" (Di Camugliano, 1933).

## 7. WHEN VENUS & MARS BROUGHT DESTRUCTION

"Of the morning star, the great star, it was said that when it first emerged and came forth, four times it vanished and disappeared quickly. And afterwards it burst forth completely, took its place in full light, became brilliant, and shone white. Like the moon's rays, so did it shine. And when it newly emerged, much fear came over them; all were frightened. Everywhere the outlets and openings [of houses] were closed up. It was said that perchance [the light] might bring a cause of sickness, something evil, when it came to emerge. But sometimes it was regarded as benevolent" (ancient Mesoamerican recollections of Venus. de Sahagun, 1952).

I. Velikovsky, after studying a plethora of evidence, had suggested that Venus came into our solar system within the last 4 to 5000 years; it came flying past our Sun and was caught by the gravitational field. Venus spins in the opposite direction that it orbits the Sun, which no other planet does. In addition, it's spinning tremendously fast, and also it could well have been the thing which caused the strange happenings on our own planet as it flew by, recorded in the Bible: fired-up things in the sky (chariots of fire), weird tides in the oceans (parting of the Red Sea) & an unbalanced earthen biology (the plagues of frogs & stuff). The Babylonians were the first to chart Venus, and looking at their records Venus appears very suddenly ca 4 - 5000 ya. The Vedas said that the star Venus looks like fire with smoke. The star had a tail, dark in the daytime & luminous at night. This luminous tail, which Venus had in earlier centuries, is mentioned in the Talmud `Fire as hanging down from the planet Venus. Described by the Chaldeans the planet Venus `was said to have a beard. "Beard" is used in modern astronomy in the description of comets. As for the Mexicans, they called her a comet, `a star that smoked'. Moreover, the peoples of the Mexican Gulf Coast were lamenting the destruction of their previous civilization by the jaguar-god (a Venus symbol) & storm-god Huracan. In China, the time of Emperor Yehou belongs around the time of Exodus; and there the waters "over-topped the great heights, threatening the heavens with their floods".

Venus is a sister planet to Earth. It is nearly the same size and density yet it has a surface temperature of 720° K, an atmosphere dominated by carbon dioxide and no evidence of oceans or ridges. It has been described as "Earth's evil twin". In fact, Dr. Velikovsky has produced numerous citations from ancient sources to show how falls of a blood-like substance occurred when a "new" comet (later to become the planet Venus) came into catastrophic contact with the Earth: the Manuscript Quiche of the Maya, the so-called Papyrus Ipuwer from Egypt & the Book of Exodus all record the fact that the water in the rivers was turned into "blood". In addition he refers, also, to the Greek myth of the Sky-god Ouranos, the first ruler of the universe, who was castrated by his son Kronos and his blood fell to the Earth, impregnating it

with a number of dreadful deities, along with ethereal Aphrodite. A more exhaustive survey of such legends would include the Sumerian myth of Inanna (a Venus goddess) who filled the wells of Sumer with "blood", the Egyptians story of the goddess Hathor (also Venus) whose visits to Earth were associated with the covering of the land with a blood-like "beer", and the Norse legends of the "raining of blood" associated with the Valkyries.

More specifically, the accounts of Exodus (7:24) and of Ipuwer lamentations agree that this bloody coloured water was unpleasant and maybe poisonous. It is recorded of the Nile that "the river stank" (Exodus 7:21). There was disease among the cattle which, Dr. Velikovsky claimed, was due to dust of an irritant nature (de Grazia, 1983c, ch. 9). In the Biblical account (Joshua x) "the Lord cast down great stones from heaven upon them unto Azekah, and they died: There were more which died with hailstones than they whom the children of Israel slew with the sword". This event may be happened the day when the Sun "stood still" (a swing-back of cometary Venus?), according to Velikovsky, 52 years after Exodus, showing that this hail was not ice but of stone (1950: 42-3, 51-3).

On the other hand, modern researchers (i.e. de Grazia) have examined the ancient literary & geoaerchaeological evidence suggesting that there were close flybys of the planet Mars in the past. Those flybys could create on the Earth the following phenomena: immense subcrustal tides of magma (of 6 hour duration), immense oceanic tides, flooding continents, Earth spin axis "precessions" causing spin axis shifts, recharges of the Earth's geomagnetic field strength, paleomagnetic polarity reversals, orbit perturbations or "warps" for both Earth & Mars, meteor-type impacts on Earth (since Mars had a rocky ring system, of which only Deimos & Phobos survive). Close Mars flybys alternated between the ascending intersection (October 24) & the descending (March 20-21) crossroads. Close flybys rocked back and forth in 108-year cycles, like a rocking chair. Saturn, another planet in strong implication with ancient legends concerning floods & disasters, if in a 30:1 resonance with Earth's orbit, would have been found in one or the other of only five zodiacal zones during ancient flyby years (Scorpio, Pisces, Leo, Gemini, Capricorn), and no others. In the October flybys the giant Jupiter, in 12:1 resonance, was always in Cancer. When Saturn was 180 degrees opposite from Jupiter, in Capricorn, the two giants caused the maximum warping of Mars' orbit. So, Saturn in Capricorn could warp the Mars orbit 45,000 km closer to the Earth than Mars' average pathway..

## 8. THE 1918 FLU PANDEMIC

Influenza, commonly known as flu, is an infectious disease of birds & mammals caused by an RNA virus of the family Orthomyxoviridae (the influenza viruses). In humans, common symptoms of influenza infection are fever, sore throat, muscle pains, severe headache, coughing, and weakness & fatigue. In more serious cases, influenza may cause pneumonia, which can be fatal, particularly in young children & the elderly. An influenza pandemic is an epidemic of the influenza virus that spreads on a worldwide scale and infects a large proportion of the human population. In contrast to the regular seasonal epidemics of influenza, these pandemics occur irregularly, with the 1918 Spanish flu the most serious pandemic in recent history, being responsible for the deaths of over 50 million people. There have been about three influenza pandemics in each century for the last 300 years. The most recent ones were the Asian Flu in 1957 & the Hong Kong Flu in 1968. The Spanish flu has been cited as the most devastating epidemic in recorded world history. More people died of influenza in a single year than in four-years of the Black Death

Bubonic Plague from 1347 to 1351. Known as "Spanish Flu" or "La Grippe" the influenza of 1918-1919 was a global disaster. The flu was most deadly for people ages 20 to 40. An estimated 675,000 Americans died of influenza during the pandemic, ten times as many as in the world war. The influenza pandemic circled the globe. Most of humanity felt the effects of this strain of the influenza virus. It spread following the path of its human carriers, along trade routes and shipping lines. Outbreaks swept through North America, Europe, Asia, Africa, Brazil & the South Pacific (Taubenberger, 1997).

How many mutations would make an avian virus capable of infecting humans efficiently, or how many mutations would render an influenza virus a pandemic strain, is difficult to predict. We have examined sequences from the 1918 strain, which is the only pandemic influenza virus that could be entirely derived from avian strains. Of the 52 species-associated positions, 16 have residues typical for human strains; the others remained as avian signatures. The result supports the hypothesis that the 1918 pandemic virus is more closely related to the avian influenza A virus (Subtype involved: H1N1, after Hilleman, 2002) than are other human influenza viruses (Chen, et al., 2006; Klenk et al., 2008; UMN CIDRAP, 2008).

Professor Louis Backman (1944) of Uppsala University, Stockholm, suggested that it was entirely possible that organisms causing recent flu epidemics had come from Venus, Jupiter or Mars. ... Laboratory workers know that that bacteria and other living cells can survive the near-absolute-zero temperature of interplanetary space. ... University of California professor Charles B. Lipman once claimed that he had found living bacteria locked in meteorites millions of years old. ... No one else has confirmed Lipman's finding, and scientists have remained skeptical. ... Backman believes it very unlikely that life originated on the Earth; he thinks it more properly started in the more favourable atmospheres containing methane and ammonia gases which surround planets such as Jupiter, Venus & Mars. From them, living organisms may have been transported to the Earth by meteorites or by the propulsive power of the sun's rays.

Recent articles describe a peculiar sequence of air-borne/rain-water-borne yeast-like bacterial attacks on astronomical photographic plate emulsions at a British observatory from 1937 to 1961. An underlying periodicity of these events appears to have had a significant positive correlation with the occurrences of inferior conjunctions of Venus with respect to Earth. Compared to Earth, Venus, has a negligible magnetic field. That means that the Solar Wind can disturb its atmosphere directly, and can blow away fractions of its upper atmosphere (including airborne particulate matter) in comet-like fashion. It was found that the onsets of six confirmed Lockyer major microbial invasions occurred, on average, 55 days following strong geomagnetic storms nearest to inferior conjunctions of Venus. The shortest interval between geomagnetic storm and outbreak was 35 days and the longest was 67 days. Seasonal effects also appeared to play an auxiliary role also as to whether or not an invasion occurred. Invasion onsets occurred only during the months May thru July. The Lockyer events (Barber, 1963 & 1997) were bacterial in nature but, in 1918 an inferior conjunction of Venus occurred on about February 9th. The first reported case of the 1918-1919 influenza outbreak in the United States (at Camp Funston) was 30 days later.

Furthermore, Gina Kolata (1999) calls attention to the often repeated phenomenon of how epidemics can move quickly through a country, "hopscoching over some towns while felling others" (p. 63). She reports that "After an influenza pandemic of 1789, a young American doctor named Robert Johnson puzzled over how the infection could spread so far and wide, and so quickly" (p. 63), discussing the

rapid outbreaks in Great Britain and on ships at sea. Kolata reports that the 1918 "flu's mortality rates peaked in Boston and Bombay in the same week. But New York, just a few hours from Boston, had its peak three weeks later" (p. 62). Doctor finally decided that "influenza must arise from some sort of changes in the atmosphere (Aerobiology) but that, once it got started, it could spread from person to person" (pp. 63-64).

And another intriguing question.. Could SARS and the 1918 Influenza Pandemic be caused by the Same Virus? - James A. Marusek (online article on May 11<sup>th</sup>, 2003) says that the SARS virus contains a neuramidase, which is normally found in influenza viruses, and that SARS and the virus that caused the 1918 pandemic share the same initial gene sequence "MNPNQKIITIGS" implying that they are distant cousins.

SARS is a most unusual coronavirus. That is because it contains neuramidase, which is normally found in influenza viruses. It is better described as an orthomyxovirus-coronavirus hybrid. Both coronaviruses & orthomyxoviruses are known to infect animals, birds & humans. Both viruses have the ability to cross over from animals to humans. Those infected in the 1918 Influenza Pandemic shared similar symptoms with those infected today with SARS. As a result it may be fruitful to study the 1918 Pandemic in greater detail (The gene sequencing of the 1918 Influenza virus is provided in <http://www.pnas.org/cgi/content/full/97/12/6785>. The gene sequencing of SARS is provided in <http://www.rense.com/general37/knjown.htm>).

## 9. THE CYCLADIC ASTROMYTH OF SIRIUS/ ARISTAIOS AND THE SPACE / EARTH WEATHER TELECONNECTIONS

Hearing of the death of his son Androgeos, in Attica, during the festival of Panathenaia, Minos mustered a large army and navy against Athens. Minos captured many islands as he approached Attica, becoming the Lord of the Aegean. In his campaign on the mainland Greece, he had captured the kingdom of Megara, ruled by Nisus. From there, he moved his army and navy against Athens. The siege in Athens, however, was long, frustrating Minos for revenge against Aegeus. So Minos prayed to his father, Zeus, the mightiest of the gods, for aid. So Zeus caused Athens to suffer from famine & the pestilence. The Athenians suffering from war & plagues, asked the oracle how they might survive. The oracle informed them that only sacrifices can be made to end the war, plague & famine. Since Minos had lost a son, Aegeus must give him seven youths and seven maidens every nine years, as tributes. These young Athenians would be confined in the Labyrinth, as food to the monster Minotaur. Aegeus had no choice but to comply with Minos' demands.

Later on, the prehistoric population of Keos was a witness to a severe environmental change. In the remote past, deadly heat, drought & severe plague caused much suffering around the 'islands of Minos'. Delphic prophecy counselled Aristaeus to sail to Keos, where he would be greatly honoured. The hero came to the island and sacrificed to Sirius & Zeus Ikmaios (Lord of Moisture) on the highest peak (its modern name is Prophetis Helias), on behalf of all the Greeks. Zeus listened to his prayers and sent the etesian winds blowing for forty (40) days after the heliacal rising of Sirius during summer (Aristotle fr. 511; Theophrastos On Winds, 14; Diodorus, 4.81.1; Hyginus, Astronomica 2.4; Nonnos 13.253). Since that time, the priesthood of the island(Callimachus, Aitia Fr. 3.1 -from Oxyrhynchus Papyri 7) established an annual celebration to honour Sirius the day of its heliacal rising, during which they used to invoke for help and protection (Apollonius, 2.498 - 527)..

The Eastern Mediterranean's cultural centres of the Bronze Age had repeatedly suffered from severe environmental upheaval, convincingly testified by

modern interdisciplinary scientific works. Those primordial Aegean ceremonies that honoured Sirius echo the recollection of these past catastrophic events. The triptych of fire / light - winds - rainfall / dew is recognised in the structure of Aristaios' myth. Aristaios was one of the prime hierophants in Sirius' cult. The Keian astromyth of Aristaios (Laoupi, 2006) as pivotal figure in Sirius' cult among insular populations of Eastern Mediterranean, is a LBA myth of Pelasgian origin, created in - or transmitted via - the Cycladic island of Keos, that seems to have been an prominent religious centre for the maritime civilization of that time. The myth echoes : a) the importance of the 'wind symbolic system' within the ideological & socio-political framework of the Aegean maritime societies, b) disturbances in wind patterns as a broader impact of climatic oscillations (NAO, Indian monsoons, Sahel rainfall) repeatedly occurred during the Bronze Age, c) the recollection of a deadly pestilence enhanced by subsequent the environmental and social upheaval and d) movements of groups across the Mediterranean triggered by various catastrophic events. Those groups transferred with them useful knowledge (viticulture, apiculture, pastoralism, cheese and oil-making, art of weaving, astronomical observations, use of successful metrical systems such as sothic / solar/lunar calendars).

Consequently, the invocation of LBA priesthood to Sirius on peak sanctuaries just before its heliacal rising, seems to reflect, wisely, the knowledge of these teleconnections of the Etesian winds with monsoonal behaviour, rates of Sahel rainfall & Nile's flooding, solar activity and summer climatic patterns across Eastern Mediterranean.

#### 10. THE SOLAR CYCLE & THE GAMMA-RAY BURST INTER CONNECTION

The first case of West Nile virus in the Western hemisphere has been reported to have occurred in New York City (two dead crows) on June 29, 1999. The *onset* may have been about two weeks earlier. According to a U.S. Government Accounting Office report, a veterinarian at Bayside Veterinary Clinic found crows with signs of nervous system disorders in the mid-June to late July 1999 time frame. The birds were treated. Those that survived were released. If one chooses to think in terms of extraterrestrial pathogens entering Earth's upper atmosphere one to two months prior to their expression at the Earth's surface, then the upper atmosphere drop-in time frame would have been roughly April 29 to May 29. In the middle of that period, the angle between Venus and Earth, with respect to the sun, would have been on the order of 70 degrees. At that angle the solar wind should have blown Venusian particles, biological or otherwise, well clear of the Earth.. This looks like trouble for the Venusian pathogen hypothesis.

Moreover, an unprecedented solar wind disruption took place on May 10, 1999, causing an intense Gamma-Ray Burst (GRB 990510), which may have some bearing on the interplanetary particle delivery problem. From late May 10, 1999 to early May 12, 1999, NASA's ACE and Wind spacecraft observed that the density of the solar wind dropped by more than 98 percent. This disappearance was the most drastic & longest-lasting decrease ever observed.

Dropping to a fraction of its normal density and to half its normal speed, the solar wind died down enough to allow physicists to observe particles flowing directly from the Sun's corona to Earth. This severe change in the solar wind also changed the shape of Earth's magnetic field and produced an unusual auroral display at the North Pole. Because of the decrease, energetic electrons from the Sun were able to flow to Earth in narrow beams, known as the 'strahl'. In parallel with the polar rain event, Earth's magnetosphere swelled to five to six times its normal size. NASA's Wind, IMP-

8, and Lunar Prospector spacecraft, the Russian INTERBALL satellite & the Japanese Geotail satellite observed the most distant bow shock ever recorded by satellites. Earth's bow shock is the shock front where the solar wind slams into the sunward edge of the magnetosphere (See NASA's article: The Day the Solar Wind Disappeared). The GRB radiation flashed through the solar system from a point near the South Celestial Pole, and that most of the material density associated with the solar wind is concentrated near the solar system's equatorial plane (Briggs et al., 1999).

And there's more.. New supporting evidence of extraterrestrial correlations of the origins of diseases is growing steadily. First there's the sun-flu connection: "Influenza epidemics are more likely to sweep the globe when the sun develops spots and sends its excess energy barrelling toward Earth, according to Canadian researchers. "Epidemics are four times as likely during solar maxima," said Kenneth Tapping (online information) -solar researcher & project director for Canada's National Research Council-, pointing to the striking correlation between flu pandemics and the peaks of the 11-year sunspot cycle, also known as the solar maximum". A similar lack of increased solar activity could signal the beginning of what is known as a Maunder Minimum, an event which occurs every couple of centuries and can last as long as a century. This solar hibernation corresponded with a period of bitter cold that began around 1650 and lasted, with intermittent spikes of warming, until 1715. Frigid winters & cold summers during that period led to massive crop failures, famine & death in N. Europe.

## 11. A RAIN OF FIRE FROM HEAVEN

The author has already studied 'Hephaistos' case' (Laoupi, 2006 in press), some interesting thoughts extracted from which, are presented here. The 'flame of Hephaistos' or his 'red breath' (characterized as purest flame) was a leit motif among ancients (Orphic Hymn 66 to Hephaestus; Homer Iliad, II.426, IX.467, XVII.88 & XXIII.33 and Odyssey xiv.71; Hesiod Theogony, 864; Aristophanes Birds, 436; Quintus Smyrnaeus, 13.170,13. 367 & 4.160; Suidas, s.v. 'Hephaistos').

The god was also related to the Lemnian Earth. Although ancient writers mention it together with Keian, Cappadocian & Sinopic earths, all four being identified as red earths, Pliny's comment makes the difference. This earth (terra lemnia, rubricata or sigillata) resembles cinnabar ( 35.14), it had a pleasant taste, too, while Galen (13.246b) adds that "it differs from miltos because it doesn't leave a stain when handled". The ritual of its extraction highlights its peculiarity. On the other hand, the god was reknown as an ' aithaloeis theos', meaning the sooty god (Suidas , s.v. 'Aithaloeis theos'), and in Lemnos, Hephaestus was worshipped as a god of healing, his priests possessing antidotes to poisons. Later on, the priestesses of Artemis had the right to use this earth.

Destruction layers with hydrocarbon presence & other characteristics mentioned above (like cinnabar, with sweet taste, loosing its power with the time passing over or being periodically recharged) may be another evidence of past celestial events (combustion residues, chemical fusion). The geoarchaeological evidence is recorded in the above-mentioned paper, we insist, though in mentioning ancient testimonies. A cometary or planetary near-encounter results in falling of gases, hydrocarbons, burning pitch & stones. Such events are indicated by ancient legends from many places and by various geological & biological phenomena (Velikovsky, 1950 & 1955; Clube & Napier, 1982; Iyengar, 2004).

The Mexican Annals of Cuauhtitlan speaks of an "age which ended in the rain of fire". The Popul-Vuh, the sacred book of the Mayas, narrates about an endless fiery

rain from the sky. The Manuscript Quiche from the people of Mexico is more detailed as it speaks about a rain of bitumen & a sticky substance (Tedlock, 1992; Taube, 1993; Tedlock, 1996). The Papyrus Ipuwer notes that the fire almost 'exterminated mankind', 'naphtha, together with hot stones, poured down upon Egypt'. Naphtha means petroleum in Aramaic and Hebrew (<http://philologos.org/bpr/files/h001.htm>). The afore-mentioned clues intrigue us to think that the famous Deluge of Noah describes a period of fiery rain and not a merely water flood.

In addition, the Exodus from Egypt contains evidence of celestial. Biblical references indicate radiation and radiance of various types: a complex chemically-loaded dew, red phosphorus; hydrocarbons (naphtha), unidentified poisons; sulphur, mercury, ammonia, cinnabar (cinnamon), formaldehyde, manna & perfumes (Velikovsky, 1950 & 1955; de Grazia, 1984a; Peiser et al., 1998).

The biblical plagues of Egypt (Ginzberg, 1909; de Grazia, 1983a) - independently of their interpretations, and they are many of them- present a coherent sequence of plagues that are interconnected in a 'natural' order (turning of rivers into blood, invasion of frogs, lice, mixed hordes of wild beasts, grievous pestilence, rain of naphtha, hail, locusts, dungeon darkness, death of the first born children). If we observe the sequence of events, the pestilence preceded the naphtha, hail & darkness, but came after the bloody waters & the upheaval in the fauna. One could assume that the space-induced disaster came by degrees, first as a contamination in the atmosphere and the waters, causing massive migrations of insects & animals. Later on, heavier particles entered the earthen atmosphere causing more 'tangible' events.

Many ancient writers known to us, who had something to say of the period of Exodus, mentioned a great sky-connected disturbance of the world. Among them are such well-known figures as Eusebius, Pliny, Plutarch, Ovid, Seneca, Varro & Augustine (these and others are collected and quoted in Velikovsky, 1950). The researcher's attention is called also to a book by two British Astronomers, V. Clube & W. Napier, 1982, who assign a comet to the Exodus days). In 1602, Abraham Rockenbach, a German Professor at Frankfurt University, published a "Treatise on Comets according to a New Method," there offering the following conclusion: In the year 1495 B.C. - as many trustworthy authors, on the basis of many conjectures, have determined - a comet appeared which Pliny also mentioned in his second book. It was fiery, of irregular circular form, with a wrapped head; it was in the shape of a globe and was of terrible aspect. It is said that King Typhoon ruled at that time in Egypt. Certain (authorities) assert that the comet was seen in Syria, Babylonia, India, in the sign of Capricorn, in the form of a disc, at the time when the children of Israel advanced from Egypt toward the Promised Land, led on their way by the pillar of cloud during the day and by the pillar of fire at night (Bimson, 1977).

The famous papyrus of Ipuwer, an Egyptian writing shortly after the Exodus, laments for the plagues that devastated the fertile lands of Egypt: "Years of noise. There is no end to noise. The land turns round as does a potter's wheel. The towns are destroyed. Upper Egypt has become dry. All is ruin.. Gates, columns and walls are consumed by fire. The fire has mounted up on high. Plague is throughout the land. Blood is everywhere. The river is blood. Men shrink from tasting and thirst after water. Hair has fallen out for everybody. Women are barren; none can conceive. Trees are destroyed. No fruit nor herbs are found.. The Desert is throughout the land A foreign tribe from abroad has come to Egypt Woe is me because of the misery of this time" (Gardiner, 1909; Velikovsky, 1950; Greenberg, 1973 & 1975; Lowery, 1977 - 1978).

## 12. RAIN FROM SPACE

### 12.1 *The Carancas case*

Another intriguing case is the Carancas event. In the Andean Altiplano, the Carancas crater has posed a profound scientific riddle. On September 15 of 2007, at 11:45 in the morning, a massive fireball streaked across the sky above SE Peru and slammed into a dry stream bed in Carancas, located in the high Andes department of Puno in the Desaguadero region, near the border with Bolivia.. The resulting explosion shook the earth and threw a mushroom cloud of corkscrewing smoke and scorched rock hundreds of metres into the air. Hundreds of Aymaran villagers, who had otherwise been enjoying a restful Saturday, flocked to the site to see what had happened. 600 villagers were rushed to the hospital; Police confiscated fragments of the extraterrestrial object and sold them to rabid American space-junk collectors; the Russian tabloid Pravda said the impact was caused by a downed American spy satellite and the mass sickness was the result of hydrazine leakage from its fuel tank - a claim that seemed laughable at the time, but now seems frighteningly within the realm of possibility.. Scientists confirmed that the object that landed in Carancas was a meteorite; that roughly 30 villagers had developed nausea & headaches - likely symptoms of mild psychological trauma.

### 12.2 *The Red rains of Kerala*

From 25 July to 23 September 2001, red rain sporadically fell on the S. Indian state of Kerala. Heavy downpours occurred in which the rain was colored red, staining clothes with an appearance similar to that of blood, Yellow, green, and black rain was also reported. Colored rain had been reported in Kerala in as early as 1896 and several times since then. It was initially announced that the rains were colored by fallout from a hypothetical meteor burst, but a study commissioned by the Government of India found that the rains had been colored by airborne spores from a locally prolific terrestrial alga. According to locals, the first colored rain was preceded by a loud thunderclap & flash of light, and followed by groves of trees shedding shrivelled grey "burnt" leaves. Shrivelled leaves and the disappearance & sudden formation of wells were also reported around the same time in the area. Red rainfalls typically lasted less than 20 minutes.



Figure 5: Red rain collected in buckets. Wikipedia online, 2008

Several groups of researchers analyzed the chemical elements in the solid particles and different techniques gave similar results. The particles were mostly carbon & oxygen with lesser amounts of hydrogen, nitrogen, silicon, chlorine & metals. Sediment (red particles plus debris) from the red rain was collected and analyzed by the Centre for Earth Science Studies (CESS) using a combination of ion-coupled plasma mass spectrometry, atomic absorption spectrometry and wet chemical methods. The CESS analysis also showed significant amounts of heavy metals in the

red rain dust, including nickel, manganese, titanium, chromium & copper. In 2003 Godfrey Louis & Santhosh Kumar, physicists at Mahatma Gandhi University in Kottayam, Kerala, posted an article entitled “Cometary panspermia explains the red rain of Kerala” in the on-line, non-peer reviewed archive web site. While the CESS report (2001) said there was no apparent relationship between the loud sound (possibly a sonic boom) & flash of light which preceded the red rain, to Louis & Kumar it was a key piece of evidence. They proposed that a meteor (from a comet containing the red particles) caused the sound & flash and when it disintegrated over Kerala it released the red particles which slowly fell to the ground. Their work indicated that the particles were of biological origin (consistent with the CESS report), not inorganic material and they invoked the panspermia hypothesis to explain the presence of cells in a supposed fall of meteoric material. Additionally, using ethidium bromide they were unable to detect DNA or RNA in the particles. Two months later they posted another paper on the same site entitled “New biology of red rain extremophiles prove cometary panspermia” in which they reported that the microorganism isolated from the red rain of Kerala shows very extraordinary characteristics like ability to grow optimally at 300°C and the capacity to metabolize a wide range of organic & inorganic materials. In 2006, they published a paper in *Astrophysics and Space Science* entitled “The red rain phenomenon of Kerala and its possible extraterrestrial origin”. One of their conclusions was: If the red rain particles are biological cells and are of cometary origin, then this phenomena can be a case of cometary panspermia. In addition, a study has been published showing a correlation between historic reports of colored rains and of meteors. In an interview The author of the paper, Patrick McCafferty (2008), said: Sixty of these events (colored rain), or 36%, “were linked to meteoritic or cometary activity”. But not always strongly. Sometimes, “the fall of red rain seems to have occurred after an airburst,” as from a meteor exploding in air; other times the odd rainfall “is merely recorded in the same year as a stone-fall or the appearance of a comet”.

### 13. CONCLUSIONS

The ancient disaster myths include the evidence for past celestial events that resulted in various interconnected hydrometeorological, geological and bioclimatic phenomena (i.e. changes in the geomagnetic field of the Earth, earthquakes, volcanic explosions, spread of contagious diseases, changes in the atmospheric balance & the biochemical equilibrium of soil, air & water) on Earth. Those interconnections had been also mentioned by the ancient and medieval authors long before the 19<sup>th</sup> & 20<sup>th</sup> centuries, when Science started to explain them with strict interdisciplinary methods & techniques.

This paper, after evaluating the existing afore-said interconnections in the cases of the Justinianic Plague & the Black Death, examines similar cases in the Prehistory of circum-Mediterranean areas & the way they had been transformed into symbolic features of myths, as well as it presents modern parallels of ‘complex’ cases (i.e. the Spanish Flu, the recent solar cycles, the Gamma-Ray Burst, the red Rains of Kerala, the Crarancas case).

Hephaistos with his flame, Mars, Venus & rare planetary conjunctions, the wrath of celestial gods (i.e. Apollo & Artemis), falling stones, arrows that bring devastation, malignant signs & disturbance of the hydroclimatic balance (i.e. patterns of the Etesian Winds), deathly epidemics along with other natural phenomena, elimination of humans and new generations arisen, all these symbolic features disclose the powerful truths behind the legendary narrations and local traditions of the

past. Furthermore, the symbolic language that reveals plagues, upheaval & natural bio-disasters reminds modern scientists of neglected or hidden parameters of environmental, socio-economic and cultural changes.

## ACKNOWLEDGEMENTS

Thanks are due to professors Alfred de Grazia, Stavros Papamarinopoulos & George Pararas for their constant support and collaboration in disaster topics.

## REFERENCES

- Alibek, K. & Handelman, St. (1999). *Biohazard*. New York: Random House.
- Arrizabalaga, J., French, R., Cunningham, A. & García-Ballester, L. (eds) (1998). *Medicine from the Black Death to the French Disease*. UK: Ashgate Publishing.
- Backman, L. (1944). Flu from Venus? *Time*, 21 Feb, p. 90.
- Bailey, M.E., Clube, S. V. M. & Napier, W.M. (1990). *The Origin of Comets*. Oxford: Pergamon Press.
- Baillie, M.E. (1999). *Exodus to Arthur: Catastrophic Encounters with Comets* UK: Batsford.
- Baillie, M., & Patrick McCafferty (2005). *The Celtic Gods: Comets in Irish Mythology*. Tempus.
- Baillie, M.E. (2006). *New Light on the Black Death: The Cosmic Connection*. Tempus.
- Baillie, M. (2007). Tree-Rings Indicate Global Environmental Downturns that could have been Caused by Comet Debris, in Bobrowsky, Peter T. & Hans Rickman (eds.), *Comet/Asteroid Impacts and Human Society: An Interdisciplinary Approach*, Springer-Verlag, Ch. 5, pp. 105-122.
- Barber, D.R. (1963). *Invasion By Washing Water in Barber, Donald, Perspective*, Focal Press, London, Vol. 5, pp. 201- 208. As director of the Norman Lockyer Observatory in England, Barber noticed that outbreaks of unknown photo-emulsion liquefying bacteria, coincided with inferior conjunctions of Venus during magnetic storms. Venus was also in inferior conjunction at the start of the 1918 influenza pandemic. Barber renewed his suggestion in a 1997 article in the *Norman Lockyer Observatory News*, and Robert Fritzius has a webpage devoted to the topic.
- Barquet, N. & Domingo, P. (1997). Smallpox: the triumph over the most terrible of the ministers of death. *Ann Intern Med.* 127(8 Pt 1), 635 - 642.
- Beckman, G. (1999). *Hittite Diplomatic Texts*. 2nd ed. Atlanta: Scholars Press.
- Benedictow, O. J. (2004). *The Black Death 1346-1353: The Complete History*. The Boydell press.
- Bimson, J.J. (Spring 1977). "Rockenbach's De Cometis' and the Identity of Typhon," *I SISR*, 4, pp. 9-10.
- Briggs, M.S., Preece, R.D., van Paradijs, J., Zand, J., Heise, J., Kuulkers, E. & Kouveliotou, C. (1999). "Wide-Band Spectroscopy of GRB 990510," *Gamma-Ray Bursts - 5th Huntsville Symposium AID Conference Proceedings*, 526, pp. 125-129.
- Byrne, J.P. (2004). *The Black Death*. London: Greenwood Press.
- Cantor, N.F. (2001). *In the Wake of the Plague. The Black Death and the World It Made*. New York: Perennial.
- Cartwright FF. & Biddiss MD (1991). *Disease and History*. New York: Dorset Press.
- Chen, G-W, Chang, S-C, Mok, C-K, Lo, Y-L, Kung, Y-N, Huang, J-H, et al (September 2006). "Genomic Signatures of Human versus Avian Influenza A Viruses". *Emerging Infectious Diseases Journal* vol. 12, Number 9, online article.
- Cerny, J. (1975). Egypt: From the Death of Ramesses II to the End of the Twenty-first Dynasty, In I.E. Edwards (ed.) *The Cambridge Ancient History*. vol. 2. Cambridge University Press, pp. 606 - 657.
- Christopher, G.W., Cieslak, T.J., Pavlin, J.A. & Eitzen, .EM. Jr. (1997). Biological warfare. A historical perspective. *JAMA* 278, pp. 412 - 417.
- Chyba, Ch.F., Thomas, P.J., Brookshala, L. & Sagan, C. (27 July 1990). "Cometary Delivery of Organic Molecules to the Early Earth". *Science* vol. 249, pp. 366-373.
- Clube, S.V. M. & Napier B. (1982). *The Cosmic Serpent*. U.K.: Universe Books.
- de Grazia, Al. (1981). *Chaos and Creation*. Princeton, London and Bombay: Metron Publications.
- de Grazia, Al. (1983). *Homo Schizo I & II*. Princeton: Metron Publications.

- de Grazia, Al. (1983). *God's fire*. New Jersey: Metron Publications.
- de Grazia, Al. (1983). *The Lately Tortured Earth*. New Jersey: Metron Publications.
- de Grazia, Al. (1984). *The Burning of Troy*. New Jersey: Metron Publications.
- de Grazia, Al. (1984). *The Disastrous love Affair of Moon and Mars*. Princeton: Metron Publications.
- de Grazia, Al. (2005). *The Iron Age of Mars. Speculations on a Quantavolution*. Naxos, Greece: Metron Publications / Eumetron.
- De Sahagun, B. (1925). *The Florentine Codex, General History of the Things of New Spain*. Book 7, Salt Lake City, Utah: University of Utah, 1952, p. 11.
- Di Camugliano, Ginevra Niccolina (1933/1957). *The Chronicles of a Florentine Family 1200-1470*. GB: Jonathan Cape, 1st Edition & Time, June 24, p. 80.
- Duffy, S. (ed.) (1997). *Atlas of Irish History*. Dublin: Gill & Macmillan.
- Fenner, F., Henderson, D.A., Arita, I., Jezek, Z. & Ladnyi, I.D. (1988). *Smallpox and Its Eradication*. Geneva: World Health Organization.
- Galvani, Alison, P. & Slatkin, M. (2003). Evaluating plague and smallpox as historical selective pressures for the CCR5-<sub>32</sub> HIV-resistance allele. 15276–15279 PNAS December 9, vol. 100 no. 25, online article.
- Gardiner, A.H. (transl.) (1909). *The Admonitions of an Egyptian Sage from a Hieratic Papyrus in Leiden*. Leipzig.
- Geary, P.J. (1994). *Living with the Dead in the Middle Ages*. Ithaca, NY: Cornell University Press.
- Giblin, J. C. (1995). *When Plague Strikes: The Black Death, Smallpox, AIDS*. New York: Harper Trophy.
- Ginzberg, L. (1909). *Legends of the Jews*, Philadelphia, vol. II, 3423.
- Gottfried, R. S. (1983). *The Black Death*. New York: Free Press.
- Greenberg, L. (Winter 1973). "The Papyrus Ipuwer". III *Pensée*, pp.36-37; Anon., (1975). "A Concordance of Disaster" I *Kronos* 2, pp. 16-22.
- Gregg, Ch. T. (1985). *Plague : an ancient disease in the 20th century*. Albuquerque : University of New Mexico Press.
- Hays, J.N. (2005). *Epidemics and Pandemics: their impacts on human history* Denver, CO: ABC CLIO.
- Herlihy, D. (1995). *The Black Death and the Transformation of the West*. Cambridge, MA: Harvard University Press.
- Hilleman, M (Aug 19, 2002). "Realities and enigmas of human viral influenza: pathogenesis, epidemiology and control". *Vaccine* 20 (25-26), pp. 3068–87.
- Hopkins, DR. (1983). *Princes and Peasants: Smallpox in History*. Chicago: University of Chicago Press.
- Hopkins, D. R. (2002). *The Greatest Killer in History: Smallpox*. Chicago: University of Chicago Press.
- Horrox, Rosemary (trans. & ed.), (1994). *The Black Death (Manchester Medieval Sources): Natural and Human Disaster in Medieval Europe*. UK: Manchester University Press.
- Hoyle, F. & Wickramasinghe, C. (1977). 'Does Epidemic Disease Come From Space? *New Scientist*' 76, pp. 402-404.
- Hoyle, F. & Wickramasinghe, C. (1978). *Lifecolour: The Origin of Life in the Universe*. New York: Harper and Row.
- Hoyle, F & Wickramasinghe, C. (1979). *Diseases from Space*. London: Dent and Sons.
- Hoyle, F. & Wickramasinghe, C. (1981). *Space Travelers*. UK: University College, Cardiff.
- Hoyle, F. & Wickramasinghe, C. (1985). *Living Comets*. UK: University College Cardiff Press, Cardiff.
- Hoyle, F. & Wickramasinghe, C. (1987). 'Influenza viruses and comets'. *Nature* 327, p. 664.
- Hummel, S, Schmidt, D, Kremeyer, B, Herrmann, B. & Spearman, M. (June 2005). Detection of the CCR5-Delta32 HIV resistance gene in Bronze Age skeletons. *Genes Immun.* 6(4), pp. 371- 4.
- Iyengar, R.N. (2004). Profile of a Natural Disaster in Ancient Sanskrit Literature. *Indian Journal of History of Science*, INSA 39 (1), pp. 11 - 49.
- James, P. (1991). *The Sunken Kingdom*. London: Jonathan Cape.
- Joyce, P.W., (1909). *Outlines of the History of Ireland from the Earliest Times to 1905*. M. Hill & Son Dublin.

- Karlsson, Gunnar (2001). *Iceland's 1100 Years: The History of a Marginal Society*, London: Hurst.
- Kelly, J. (2005). *The Great Mortality*. New York: Harper-Collins.
- Killeen, R (1994). *A Short History of Ireland*. Gill & Macmillan: Dublin.
- Klenk, H.D., Matrosovich, M. & Stech, J. (2008). "Avian Influenza: Molecular Mechanisms of Pathogenesis and Host Range", In : Th. C. Mettenleiter and Francisco Sobrino (eds) *Animal Viruses: Molecular Biology*, ch. 6, UK: Caister Academic Press.
- Kolata, Gina (1999). *Flu, The Story of the Great Influenza Pandemic of 1918 and the Search for the Virus That Caused It*, Simon & New York: Schuster, Touchstone.
- La Violette, P. A. (1997). *Earth Under Fire. Humanity's Survival of the Apocalypse*, New York, Alexandria, VA: Niskayuna.
- Laoupi, Amanda, (June 2006). *The Greek Myth of Pleiades in the Archaeology of Natural Disasters. Decoding, Dating and Environmental Interpretation. Mediterranean Archaeology and Archaeometry* 6(1), pp. 33 - 41.
- Laoupi, Amanda, (2006). *The Divine Fires of Creation. Homeric Hephaistos as a Comet / Meteor God. International Symposium on 'SCIENCE AND TECHNOLOGY IN HOMERIC EPICS', 27-30 August 2006, Ancient Olympia, Greece. In press by Springer Verlag.*
- Laoupi, Amanda, (2006/special issue). *The Sirius' Cult in Ancient Greece. Aristaios and the Formation of the Attico- cycladic Substratum. MAA* 6(3), pp. 129 - 142.
- Little, Lester K. (ed.), (2006). *Plague and the End of Antiquity: The Pandemic of 541-750*, Cambridge: Cambridge University Press.
- Louis, G. & Kumar, A.S. (2006). "The red rain phenomenon of Kerala and its possible extraterrestrial origin". *Astrophysics and Space Science*. Available online on 2008-06-06 (full paper at journal website).
- Louis, G. & Kumar, A.S. (5 October 2003). "Cometary panspermia explains the red rain of Kerala". Available online on 2008-06-01.
- Louis, G. & Kumar, A.S. (29 December 2003). "New biology of red rain extremophiles prove cometary panspermia". Available online on 2008-06-01.
- Lowery, M. (1977-8). "Dating the 'Admonitions': Advance Report". *II S.I.S.R.* 3, pp. 54-57.
- McCafferty, P. (2008). "Bloody rain again! Red rain and meteors in history and myth". *International Journal of Astrobiology*. Available online on 2008-05-31.
- McNeill, W. H. (1976). *"Plagues and Peoples"*. New York: Bantam Doubleday Dell Publishing Group, Inc.
- Marks, G. (1971). *The medieval plague : the Black Death of the Middle Ages*. Garden City, NJ : Doubleday & Company, Inc.
- Morris, J. (transl. & ed), (1980). *Nennius: British History and the Welsh Annals*. Chichester: Phillimore.
- O'Donovan, J. (ed) (1848-1851). *Annals of the Kingdom of Ireland by the Four Masters vol 1*. Dublin: Hodges, Smith, and Co.
- NASA/GSFC (2008): *The Day the Solar Wind Disappeared*. Based on a NASA/GSFC Press Release. Available online.
- Nohls, J. (1971). *The Black Death : a chronicle of the plague compiled from contemporary sources*. London : Unwin Books.
- Orent, Wendy (2004). *Plague, The Mysterious Past and Terrifying Future of the World's Most Dangerous Disease*. New York: Simon & Schuster, Inc.
- OSETI III (22 January 2001). Conference in San Jose, California. Published in *SPIE Proceedings - 4273*, DOI: 10.1117/ 12.435366.
- Peiser, B.J., Palmer, Tr. & Baily M.E. (eds) (1998.) *Natural Catastrophes During Bronze Age Civilizations. Archaeological, geological, astronomical and cultural perspectives*. Oxford : BAR International Series 728.
- Net Advance of Physics: Annotated Bibliographies (1996): Possibility of Arrival of Living Organisms from Space. No. 1: Panspermia, Theories Section III.*
- Rosen, W. (2007). *Justinian's Flea: Plague, Empire, and the Birth of Europe*. USA: Penguin Press.
- Ruffer, M.A. (1921). *Pathological note on the royal mummies of the Cairo Museum*. In: R.L. Moodie (ed.), *Studies in the Palaeopathology of Egypt*. Chicago: University of Chicago Press.
- Ruffer, M.A. & Ferguson, A.R. (1911). *Note on an eruption resembling that of variola in the skin of a mummy of the Twentieth Dynasty (1200-1100 BC)*. *Journal of Pathology and Bacteriology*, vol. 15, pp. 1-4.

- Sallares, R. (1991). *The Ecology of the Ancient Greek World*. Ithaca, New York: Cornell University Press.
- Sampath, S., Abraham, T. K., Sasi Kumar, V., & Mohanan, C.N. (2001). *Colored Rain: A Report on the Phenomenon*. CESS- PR-114-2001, Center for Earth Science Studies and Tropical Botanic Garden & Research Institute. Available online.
- Sherman, Irwin W. (2006). *The Power of Plagues*. Washington D.C.: ASM Press.
- Scott, Susan & Duncan, Chr. (2001). *Biology of Plagues: Evidence from Historical Populations*. UK: Cambridge University Press.
- Scott, Susan & Duncan, Chr. (2004). *Return of the Black Death: The World's Greatest Serial Killer*. UK: Wiley.
- Singer, I. (2002). *Hittite Prayers*. Atlanta: Scholars Press.
- Smyth, D., A. (1996). *Guide to Irish Mythology*. 2nd ed. Dublin: Irish Academic Press.
- Taube, K. (1993). *The Legendary Past. Aztec and Maya Myths*. Austin: University of Texas Press.
- Taubenberger, J. et al. (1997). "Initial Genetic Characterization of the 1918 "Spanish" Influenza Virus," *Science* vol. 275, pp. 1793-96.
- Tedlock, D. (1992). *The Popol Vuh as a Hieroglyphic Book*. In: E. C. Danien and R. J. Sharer (eds), *New Theories on the Ancient Maya*, University of Pennsylvania : University Museum Monograph 77. Philadelphia, pp. 229-240.
- Tedlock, D. (1996). *Popol Vuh. The Definitive Edition of the Mayan Book of the Dawn of Life and the Glories of Gods and Kings*. Trans. by Dennis Tedlock. New York: Simon and Schuster.
- Thomas, P.J., Chyba, Chr. F. & McKay, Ch.P. (eds), (1997). *Comets and the Origin and Evolution of Life*. New York: Springer-Verlag, Inc.
- Twigg, Gr. (1985). *The Black Death: A Biological Reappraisal*. New York: Schocken Books.
- UMN CIDRAP (Center for Infectious Disease Research And Policy) (2008). *Avian Influenza (Bird Flu): Implications for Human Disease*. Physical characteristics of influenza A viruses. Available online.
- Velikovsky, I. (1950). *Worlds in Collision*. USA: The Macmillan Company.
- Velikovsky, I. (1955). *Earth in Upheaval*. New York: Doubleday Books.
- Walløe, L. (1999). "Was the disruption of the Mycenaean World caused by repeated epidemics of Bubonic Plague?" *Opuscula Atheniensia* 24, pp. 121 – 126.
- Woodbridge, Judith, Bennet, M. & Hollister, C.W. (2006). *Medieval Europe: A Short History*. New York: McGraw-Hill.
- Yoemans, D.K. (1991). *Comets*. New York: Wiley Science Editions.
- Ziegler, Ph. (1969). *The Black Death*. USA: Collins.