

## Were sixth-century natural catastrophes factors in the transfer of relics from Palestine?

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**Abstract.** *The suggestion that the Shroud now in Turin is the same cloth as the Image of Edessa, known there from the mid-sixth century, is generally accepted by sindonologists. But no credible reason has been adduced for removal of the imaged cloth at that time from its place of origin, Roman Palestine. The mid-sixth century was marked by numerous natural catastrophic events which resulted in profound social upheaval as terrified multitudes moved from town to countryside, countryside to town, city to city, seeking safety and food. These events correlate with the timeline of the emergence of the Shroud in Edessa and appearance of the Sudarium in North Africa, and may be considered among possible factors in the peregrinations of the cloths.*

**Keywords:** desertification, plague, volcanic eruption

### 1. INTRODUCTION

Several years ago, Professor Zvi Ben-Avraham, the Israeli geophysicist, pointed out that much of the Judean Desert had been a thriving agricultural area until it was transformed rather suddenly into an arid desert in the mid-sixth century [1]. Both the Shroud of Turin and the Sudarium of Oviedo reappeared in the historical record about this time, after a hiatus of several centuries [2]. Also during the mid-sixth century, the earth was devastated by numerous natural disasters – famine, plague, earthquakes, a volcanic eruption with global consequences. These concomitant events combined to produce massive societal dislocation. For the people who lived then, these catastrophes were of unparalleled proportions, Procopius wrote, “From the time this happened, men were not free from war, nor pestilence nor anything leading to death.” [3]

The mid-sixth century is critical to provenance of the Shroud. Iconography considered as reflecting the facial image on the Shroud has been dated to precisely that time. This includes the Homs Vase of hammered silver, ca. 570, now in Musée du Louvre, Paris, and the encaustic Pantocrator of the Monastery of Saint Catherine at Mount Sinai, ca. 560. Towards the end of the sixth century, reference to the “Image of Edessa” (adduced as the same cloth now known as the Turin Shroud) [4] appeared in the historical record [5]. The Sudarium is said to have been removed from Palestine to North Africa early in the seventh century, The drastic environmental changes of the sixth century, with resulting societal upheaval, coincide with historical evidence for these timelines for the transfers of both the Shroud and the Sudarium.

These cloths, whose origin is associated with Jesus at

Golgotha in Jerusalem in the first century, may very well have been moved to the Dead Sea area during the Jewish revolt of 65 – 71 C.E. Just as many Jewish insurgents fled to that area from the Roman troops, so we may expect that the keepers of the Shroud would likewise have fled there.

We suggest that social dislocation induced by natural catastrophic events beginning in the mid-sixth century may be considered among possible factors in the peregrinations of the cloths.

### 2. AGRICULTURE AND VERDANCY

Numerous paleoclimatic studies involving geology, hydrology, palynology, seismology, meteorology, archaeology remains and historical evidence indicate that the Dead Sea region, verdant from about the first century B.C., became desert rather abruptly in the sixth century [6, 7, 8].

In view of the extremely arid climate of the Dead Sea region today, one may wonder if this really could have been a thriving agricultural area 2,000 years ago. In fact, archaeological and palynological evidence confirms that it was [9, 10, 11]. Further, it has been shown that even minor climatic changes in certain areas can result in dramatic environmental changes [12].

In the period we are discussing, approximately two thousand to fourteen hundred years ago, rain-fed agriculture was the general method of food production in the Near East. Apart from areas such as Egypt or Mesopotamia, which contain great rivers, agriculture dependent on rainfall was the economic basis in Palestine and elsewhere -- cities of the Levant, for example, which flourished during the Roman and Byzantine periods [13].

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Rainfall, evaporation and humidity work together to affect the natural flora of the region and its suitability for cultivation. Rainfall, with its periodic fluctuations, affects long-term fluctuations of the Dead Sea water level. The water level and the associative areal surface of the Dead Sea not surprisingly rise following seasons of abundant rainfall and decline during drought years. [14] Evaporation rate based on greater or lesser areal surface of the lake in turn affects humidity of the region, and in this manner intensifies climatic change caused by fluctuating rainfall, closing the circular effect.

The year-to-year water level would be steady if the volume of water leaving the Dead Sea by evaporation were equal to the volume flowing in from perennial streams, flash floods in the wadis, and draining groundwater [15]. But historically, the consistency of the exchanges has fluctuated over time.

In various studies, historic water-level records were reconstructed using evidence from rainfall and tree ring widths, sedimentology, history, archeology, botany, and morphology. The largest change in estimated water level of the Dead Sea occurred between about 100 B.C. and A.D. 40. [16] Within this period, the water level of the Dead Sea rose some 70 meters, from about 400 meters below sea level to about 330 meters below sea level. [17]

The evidence shows that agriculture flourished during this humid period of greater rainfall, and was sustained for several hundred years. Palynological analyses of cores retrieved from Dead Sea sediment layers confirm increasing percentages of cultivated plants from the first century to about 600 A.D. [18] Radiocarbon dating of embedded plant fragments to around 2000 years BP support this conclusion. [19]

Analysis of core extractions of Dead Sea pollen indicates an increasing cultivated agricultural overprint on the arid vegetation background during this time, which indicates increasing rainfall and humidity. [20] The occurrence of abundant pollens of *Cerealia* (cereals), *Olea* (olive), *Juglans* (walnut), and *Vitis* (grape) reflects climate conditions supporting intensive cultivation of these Mediterranean plants. The latter two were grown, in particular, during the Roman and Byzantine periods (ca. 70 B.C. – 600 A.D.) [21].

### 3. DESERTIFICATION

This period of agricultural fecundity was followed by an abrupt drop in rainfall, a lowering of the water level of the Dead Sea and an increased rate of evaporation, with consequent desertification and inability of the land to sustain agriculture: “Interpreting the lake level changes as monitors of precipitation in the Dead Sea drainage area and the regional eastern Mediterranean palaeoclimate, we document... multiple abrupt arid events during the Holocene.” [22] Repeated episodes of desertification in this area, including the cycle which began in the sixth

century, have been shown to be related to these climatically induced environmental changes.

Palynological studies show widespread abandonment of agriculture. This is indicated by reduced percentages of *Olea* (olive) pollen and increased pollens of vegetation natural to arid and semi-arid plains and desert. [23] This decline of agriculture triggered a process of forest regeneration starting with pine trees (*Pinus*), followed by evergreen oaks (*Quercus ilex*) and other Mediterranean plants replacing *Olea* in the hills around the Dead Sea [24].

Moreover, the increasingly drier climate, with the continuing demise of agriculture, favored the transition from sedentary life of cultivators to nomadism, also coinciding with the rapid spread of Islam [25].

### 4. VOLCANIC ERUPTION

In 535 – 536, mankind suffered one of the greatest natural disasters ever to occur. It blotted out much of the light and heat of the sun for eighteen months, and the climate of the entire planet began to spin out of control. The result, direct and indirect, was climatic chaos, famine, massive migration, war and political change, not only in the Byzantine Empire, but on virtually every continent. The contemporary Roman historian Procopius wrote of the climate changes as “a most dread portent... The sun gave forth its light without brightness like the moon during this whole year, and it seemed exceedingly like the sun in eclipse, for the beams it shed were not clear.” [26] John of Ephesus, also a sixth-century contemporary of these events, wrote, “The sun became dark and its darkness lasted eighteen months. Each day it shone for about four hours, and still this light was only a feeble shadow” [27].

Not only the light, but also the heat of the sun was diminished. Unseasonable frosts disrupted agriculture where it had not been disrupted by the process of desertification, and famines afflicted some parts of the Empire. We have other accounts of the darkened sun from Zacharias of Mytilene, [28] John the Lydian [29] and the Roman Senator Cassiodorus [30].

Scientists have determined that a massive volcanic explosion took place in the year 535. Mile-deep ice core samples from both Greenland and Antarctica show that acid snow was falling on both ice caps at relatively the same time during the sixth century. This acid precipitation had to be delivered by the two totally separate high altitude wind systems that operate in the Northern and Southern hemispheres. Only an eruption from a tropical zone could have achieved this to any substantial extent [31].

The location of this volcano was the Sunda Straits between Java and Sumatra near present-day Krakatoa, which erupted massively in 1893. The sixth-century eruption was enormously greater than that of the

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nineteenth century, however, and probably caused the separation of Sumatra and Java into two islands. [32] A vast cloud of ash would have billowed forth, followed by a column of red-hot magma that would have shot out of the mountain like a fountain. A huge mushroom cloud of ash and debris would have penetrated far into the stratosphere, carried round the world at hurricane-force speeds.

It is clear how this eruption would bring about the drastic climate changes of the sixth century. But the volcano also indirectly brought about the devastating bubonic plague that followed. Modern research has concluded that most plague outbreaks are caused by sudden and severe climate change. [33]

## 5. THE "JUSTINIAN" PLAGUE

In the year 640, bubonic plague broke out in the port city of Pelusium, Egypt, where it had been carried by rats originally from ports on the eastern coast of Africa, at that time a great source of ivory for the Empire. After devastating Pelusium, it spread quickly to Alexandria, then to Constantinople, then throughout the whole empire and eventually to the Far East, where it was recorded by Chinese historians. [34] Up to a third of the empire's population died in the first massive outbreak, and in the capital city of Constantinople, more than 50 percent of the population is thought to have died. [35]

John of Ephesus, who tried in vain to flee from the pandemic, wrote of its devastation in the countryside as much as in the cities. "We saw desolate and groaning villages and corpses spread out on the earth,, and cattle abandoned and roaming scattered... with nobody to gather them." In Constantinople, John recorded in considerable detail the scale of the catastrophe, noting that when the dead had reached 230,000, officials gave up counting the corpses, which, when burial space ran out, were thrown into the sea from barges. Finally, Justinian ordered the digging of vast mass graves. [36] The church historian Evagrius survived the plague when just a youth and lived through four great plague epidemics. In the year 593, he wrote: "I believe no part of the human race to have been unafflicted by the disease," as it occurred in some cities "to such an extent that they were rendered empty of almost all their inhabitants." "During the course of the various visitations [of the plague] I lost to the disease many of my children and my wife and many of the rest of my relatives, Now, as I write this, I am 58 years old and it is not quite two years since the fourth outbreak of plague struck Antioch and I lost my daughter and the son born to her in addition to those [lost] earlier." [37]

After a century of repeated plague epidemics, population levels in Europe declined dramatically. Constantinople shrank from a city of over half a million inhabitants to one of fewer than a hundred thousand. [38] Meanwhile, the mid-sixth century climactic crisis and its consequences

had been generating further mechanisms through which the Empire and Europe were transformed. The ongoing invasions of "barbarians," so-called, were greatly accelerated by migrating peoples from the north and east attempting to find pastures and arable land. The reduced population and destabilization of the Empire left it in a weakened condition militarily and opened the way for the precipitous ascent of Islam. In less than sixty years, the empire shrank to less than a quarter of its former extent under Justinian. [39]

## 6. SEISMIC EVENTS

Historical records reveal a cluster of devastating earthquakes in the early Byzantine period from the fourth to the sixth centuries. In 551, a strong earthquake occurred in the Levant and caused extensive damage in the Galilee and in the cities of Jerusalem, Gerasa and Petra. [40] While earthquakes are generally not an adequate reason to explain the abandonment of settlements and the collapse of economic systems, as residents tend to remain and rebuild, the coincidental occurrence of recurrent earthquakes with drought, famine, and virulent pestilence may well have combined to exacerbate the plight of inhabitants and reduce them to refugees fleeing from one city to another in a vain search to escape these terrors.

## 7. SOCIETAL DISLOCATION

The various crises discussed above – desertification and resulting famine, devastating earthquakes, chaotic climatic change, terrifying pestilence resulting in sharp population decline – combined to bring about societal dislocation and decline of urbanism throughout the Empire.

In the Judean Desert, this same process of societal upheaval has been traced directly through water levels and rainfall patterns. Arid events during this time appear to have coincided with major breaks in cultural development. Wetter periods were marked by the enlargement of smaller settlements and growth of farming communities in desert regions, revealing a parallelism between climate and Near East cultural development. [41]

Archaeological evidence reveals recurrent periods of habitation and abandonment of many sites along the western shore of the Dead Sea. These have been dated through concurrent historical records, coins, pottery, and archaeological ruins. These sites were plotted according to their chronology and elevation and found to match various points on the historical hydrograph of water levels and rainfall. [42] In other words, higher population levels match with higher water levels and rainfall, and abandonment matches with lower water levels and minimal or absent rainfall.

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The economic prosperity of this area during the Byzantine period came to a halt in the mid-sixth century. In the second half of the sixth century and continuing through the seventh century, a sharp decline in both urban and rural settlement is evident. For example, at Mampsis in the northeastern part of the Negev Desert, the north gate was destroyed by fire and the entire site was abandoned in the mid-sixth century. The entire village of En Gedi on the western shore of the Dead Sea was abandoned and destroyed around 600 A.D. A sharp urban deterioration also was found in cities of the Decapolis such as Gerasa. At Scythopolis (Bet Shean), excavations point to the mid-sixth century as the beginning of degeneration and decline in the life of the city. [43]

At this time also, numerous springs in this area dried up and were covered by sand dunes, leading to the abandonment of communities that had depended on them. For example, at 'En Hatzeva, the spring which supplied abundant water to the nearby bathhouse in the Late Roman and Byzantine periods dried up completely; the bathhouse ceased to exist and the nearby village was abandoned. A monastic farm near 'En 'Aneva in the Judean Desert, founded during the early Byzantine period, was abandoned at the end of the period, again because of the drying up of the local spring. Near Yavneh-Yam in the Mediterranean coastal plain, a Byzantine well was abandoned in the mid-sixth century because it had entirely dried up and was blocked by sand. All of this accords with the testimony of Procopius of Gaza, who wrote Jerome of Elusa a letter describing how the roots of the vines had been exposed by a combination of drought and relentless winds [44].

## 8. THE RELIC CLOTHS OF GOLGOTHA

**The Sudarium of Oviedo** -- Pollen studies conducted by the late Dr. Max Frei [45,46] confirm the historical route of the Sudarium from Jerusalem and the Dead Sea area through North Africa and into Spain as well as the location of the Shroud in Jerusalem, the Dead Sea region, France and Italy. [47] While the presence of pollens can locate the cloth geographically, this evidence can contribute nothing to the problem of dates.

The fact is, we do not have a compelling timeline for the travels of the Sudarium. It generally is asserted that the cloth was removed from Palestine for safekeeping shortly before the city was conquered by the Persian Chosroes II in 614. [48,49] This tradition relies entirely on the twelfth-century *Liber Testamentorum*, a book commissioned by Pelayo (Pelagius), Bishop of Oviedo 1101–1129, to record ostensible donations made to the Cathedral of San Salvador. The documents comprising the *Liber Testamentorum*, however, are widely acknowledged as fabrications [50]. The fabulous claims of the book earned Pelayo the sobriquet "historiador-fabulador." [51]. Pelayo's "manipulation, interpolation,

and outright creation of documents" [52] are seen as an effort to commemorate Oviedo's prestigious past, enhance the city's recently diminished Episcopal status, and restore the city's place of honor, which faded after King Ordone II transferred his residence to Leon in the early tenth century. [53] We may conclude that the connection of the cloth's removal from Palestine to the arrival of Chosroes remains an unsubstantiated hypothesis.

The history of the Sudarium after it arrived in Spain, especially its odyssey north to Oviedo, is mentioned in a number of other documents and is not disputed here. Yet the date when it was taken from Palestine remains uncertain.

We suggest its removal may have been instigated by catastrophic events of the mid-sixth century.

**The Shroud of Turin** -- The "Image of Edessa," which circumstantial evidence strongly suggests may be identified with the Shroud of Turin, came into the historical record at just the time we have been discussing -- the mid-sixth century. Its earlier provenance remains a mystery. The earliest mention of an image is in the *Doctrine of Addai* where initially it is described as a painting by Abgar's envoy, Hanan [54]. Eusebius's tale of letters exchanged between Abgar V Ukkama and Jesus is not credited as historically valid. The account is not merely suspect: The *Catholic Encyclopedia* refers to the exchange, both as recounted by Eusebius and as found in the later *Addai*, (which professes to be of the apostolic age), as a "legend," and as "imaginary," and notes: that the "correspondence has long since ceased to be of any historical value. The text is borrowed in two places from that of the Gospel, which of itself is sufficient to disprove the authenticity of the letter" [55]. In a detailed examination of the material related to Abgar, the respected historian Walter Bauer concluded: "Thus we find the Abgar saga to be a pure fabrication, without any connection with reality." Bauer "resolutely" rejects "any thought of a 'historical kernel'" [56]. However, Professor Ilaria Ramelli of the Catholic University of Milan has undertaken an extremely thorough investigation of possible historicity of the *Doctrina Addai* and has found: "In conclusion, I suppose that the *Doctrina* might contain some historical traces, especially in the correspondence between Abgar and Tiberius, even though wrapped in a legendary dress" [57]. Nevertheless, she refers to the material as a whole as "absolutely unhistorical." [58], and as "a fiction," [59] particularly with regard to the supposed exchange of letters between Abgar and Jesus.

Ian Wilson's identification of the folded "Image of Edessa," aka the "Acheiropoietos," with the cloth that arrived in Constantinople in 944 is fully credible, but the notion that this cloth might have been hidden for centuries, actually forgotten, in the damp city walls of Edessa, [60] is not.

In any case, we have no credible information pertaining to the removal of this cloth, the record of Jesus's passion at Golgotha, prior to the sixth century.

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## 9. CONCLUSION

The Roman world suffered significant crises during the sixth century, as a result of the cataclysmic changes we have described. In contrast to the age of Justinian, the later sixth century was characterized by political, economic, and military collapse. Just three years after Justinian's death in 568, the Lombards began their conquest of Italy. During the latter part of the reign of Justin II (d. 578) large numbers of Slavs, forced west and south by loss of agricultural fertility, began to cross the border of the Empire. Migrations of the Avars from central Asia followed during the last quarter of the sixth century. Moreover, the Arabian peninsula as well was progressively drying up during this period, forcing Arab populations to move into surrounding territories. The long wars between Persia and Byzantium, which exhausted both sides, also may have been exacerbated by social dislocations resulting from plague, famine, etc.

We suggest that the basis of social upheaval during this time may be found in the natural catastrophes dating from the mid-sixth century, and that these disasters may thus be considered among several possible factors in the appearance of the Shroud of Turin in Edessa as the "Acheiropoietos" and the appearance of the Sudarium of Oviedo in North Africa shortly thereafter.

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