

ADALYA



SUNA-İNAN KIRAÇ AKDENİZ MEDENİYETLERİ ARAŞTIRMA ENSTİTÜSÜ
SUNA & İNAN KIRAÇ RESEARCH INSTITUTE ON MEDITERRANEAN CIVILIZATIONS

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Supplementary Data to be Added to the Chronology of Plague and Earthquakes in Antalya Province and in Adjacent and Related Areas

T. M. P. DUGGAN*

This article is a supplement to the chronology of plagues and earthquakes that struck the region over the past 2,300 years that was published in 2004¹. It lists in chronological order more than 100 additional items, including additional recorded outbreaks of plague and of earthquakes in the area of Antalya Province that should be inserted into last year's chronology. It provides further detail concerning some of the events that are recorded in last year's chronology and also corrections to three dated events, 1167-70, 1931 and 1977 that are listed in last year's chronology. This supplement also lists some additional information on quarantine and outbreaks of smallpox, typhoid, malaria and other presently notifiable diseases in the region over the past 2,300 years.

Additions to the chronology 300 B.C. to 2004

1st century B.C. An inscription from the Lycian city of Oinoanda records an appeal to the God Apollo to lift the plague, although what this disease was, it is today impossible to say. This inscription, precedes by 200 years the 5 surviving appeals that were written from the 2nd century A.D. onwards, concerning the question, "How may we survive the plague?", with replies given by the oracle at the temple to Apollo at Claros in Caria². They include requests for advice from this oracle of Apollo from the cities of Pergamun, Hierapolis in Phrygia, Odessos, Callipolis and Cesarea Trochetta, on how to prevent or to escape a visitation from the plague. The advice from the oracle being: to erect a statue of Apollo, to carry out specific rites of purification and sacrifice and to feast³. The link between Apollo and plagues stretches back, at least to the time of composition of Homer's *Illiad*, if not before, where Apollo's ability to cause, and to advert the plague, is recognised⁴: "What god was it then that set them together in bitter collision? Zeus's son and Leto's, Apollo, who in anger at the king drove the foul pestilence along the host, and

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¹ Duggan 2004.

² Milnes 2000, 148.

³ R. L. Fox, *Pagans and Christians* (1986) 232.

⁴ *Illiad*, Book 1, l.8

the people perished”⁵. It is noteworthy that St. Sebastian, the Christian Saint appealed to in those places that suffered from the plague, to lift the plague, was martyred with arrows, and there may well be a real continuity between the cult of Apollo and the Christian St. Sebastian in their relationship to plague and to the arrows of plague. Asklepios, Apollo’s “most honoured son and helper”, was regarded as being concerned more with disease, than with epidemics such as plague, measles, smallpox etc⁶. Evidence of sites of the cult dedicated to Apollo, from inscriptions, coins and surviving structures in the region covered by this paper come for example from: Patara, Perge, Kyaneai, Soura (near Myra), Tyberissos, Limyra, at the Letoon by Xanthos, Oinoanda, Korba, Side, Aspendos, Termessos, Telmessos, Sagalassos, where a temple dedicated to Apollo Claros was erected and Perge, where the Pythian Games, dedicated to Apollo, were regularly held, which provide perhaps, some idea of the need the people of the region felt for some protection from epidemics, although not every temple dedicated to Apollo was concerned with only epidemics. Although Poseidon’s role concerning earthquakes and tidal waves seems to have been at an early date in this region transferred to the God Zeus, with temples dedicated to Zeus Solymos at Termessos and to Zeus at Selge, and the frequent use of the epithet “Zeus Soter”⁷, Apollo seems to have maintained his role, both as the cause of, and protector from plagues from Homeric times until into the 4th century A.D.

240 A.D. To be added to the chronology. The earthquake that struck Arycanda on August the 5th and damaged the stadium, the stage building of the theater and probably also destroyed the mausoleum of Hermaios, caused damage also at Phaselis⁸ and seems to have been a considerable seismic event.

542 To be added to the chronology. It is to be noted that this plague pandemic left the Cilician ports and settlements of Anemurium, Corycos, Kanlıdivane, Anavarza and Canbazlı totally or largely abandoned⁹ and it appears that this pandemic had similar consequences, resulting in the abandonment of settlements in Western Anatolia, in Lycia, such as Neapolis by Termessos, where recent survey work from 1997 to 2004 has provided no datable material evidence later than the 6th century A.D.¹⁰ Likewise, survey work conducted in the last few years at the important Lycian city of Phellos, by Kaş, suggests that it was also abandoned at this time and for this same reason¹¹. There was significant trade along the coast between Pamphylia, Pisidia and Cilicia, as the coins of the Hecht hoard confirm¹² and it seems sensible to suggest the plague pandemic spread along these coastal trade routes from Cilicia to Pamphylia and Lycia as well as along the inland trade and pilgrimage routes. The population loss through this plague pandemic clearly rendered some smaller settlements unsustainable and one can suspect that the production of olive oil from the terraces of Neapolis for example, stopped due to the loss of labourers

⁵ op.cit. Book. 1. l. 43-68; supra n. 3, 231-241.

⁶ supra n. 3, 119.

⁷ Duggan 2004, 124.

⁸ Bayburtluoğlu 2004, 73-4, 140, 145.

⁹ Keys 1999, 420 n. 6.

¹⁰ My thanks to Prof. Dr. N. Çevik and the Beydağ survey team from Akdeniz University for this information.

¹¹ My thanks to Prof. M. Zimmermann for this information.

¹² Gökyıldırım 2001, 374-92.

and the lack of any significant demand, due to widespread population loss from the plague. It is evident that the rural depopulation caused by the plague paved the way for the establishment of the Byzantine Theme system from the reign of the Emperor Heraclius (610-41) onwards¹³, of land use in exchange for military service, as the large scale resettlement of Slavs in Anatolia in the 7th century, and probably also the Mardanites along the Southern coastline of Anatolia in the late 7th century under Justinian IInd ¹⁴, all seem to have been resettled without significant dislocation of existing rural populations.

The situation in Lycia seems to have been a similar situation to that of Northern Syria in the same period, which became largely uninhabited, and resulted in the so-called "Dead Cities". The decline of the region of Northern Syria was likewise due to a combination of both earthquakes and plague. Earthquakes struck Antioch (Antakya) in 526 and 528 with the loss of more than 300,000 lives and led to the subsequent re-naming of the city as "Theopolis", in the attempt to provide it with some protection¹⁵, and the port cities of Tyre and Ptolemais (Akko) had been struck by an earthquake in 503 and an earthquake destroyed the port of Berytos (Beirut) in 551: and the plague pandemic reached Syria in 541, during a series of wars, which led to very serious depopulation and to the abandonment of many cities and settlements in northern Syria¹⁶.

The 13th century chronicler Gregory Abu'l-Farac in his chronicle written in the 13th century is quite explicit that this 542 plague pandemic struck Antalya and it seems probable that he had access to source material concerning this plague pandemic that has not survived the passage of the intervening centuries¹⁷.

1077-8 Gregory Abu'l-Farac records that there was widespread plague and famine in Byzantine territory in these years, although it is unclear if Antalya province was struck in the course of this plague outbreak¹⁸.

1143 Cilicia, Syria and Cyprus were struck by an earthquake. There may have been consequences from this quake on the Eastern coastline of Antalya Province¹⁹.

1156 - 1157 A series of earthquakes struck Northern Syria and Cyprus. In 1156 the fortifications of Aleppo, Kafr Tab and Hama were damaged and a bastion of the fortress of Apamea collapsed in two quakes of 27th of September and the 10th of October²⁰. Apamea is recorded as being in ruins in 1157, probably as a result of the quakes of 1156-7²¹. In November - December of 1156 Shaizar in Northern Syria was badly damaged in a quake and many people were crushed under fallen masonry²² and in the spring of 1157 a series of quakes, on the 3rd, 11th and 19th of April²³ struck and damaged the coastal cities of

¹³ Ostrogorsky 1969, 96.

¹⁴ op.cit. 131.

¹⁵ P. L. Gatier, *The Levant-History and Archaeology* (2000) 209.

¹⁶ Kaegi 1993, 27 and n. 3; W. Naphy - A. Spicer, *Plagues, Black Death and pestilence in Europe* (2004) 15.

¹⁷ Abu'l Farac 1999, 153, "Sonra Galatia, Kapadokya, Ermenistan ve Antalya'ya ilerledi".

¹⁸ op.cit. 328.

¹⁹ Keşik 2002, 39.

²⁰ Damascus 1932, 326.

²¹ Runciman 1990, 349.

²² Damascus 1932, 326.

²³ op.cit. 1932, 328-329.

Northern Syria and Cyprus. In August of the same year, a major quake struck the same area, called by chroniclers "the Hama earthquake" and which left many dead in Homs and Aleppo. The shock of the spring 1157 quakes must have been felt in Antalya Province in the areas adjacent to Cyprus²⁴. This is a correction concerning this series of quakes mentioned in the chronology under 1167-70, as it was incorrectly dated as occurring in 1158, and because, as it also struck Cyprus, it may well have had consequences in Antalya Province.

1203 A major outbreak of plague at St. Jean d'Acre (Acre, Akko) on the Syrian coast that lasted from April to September and was spread by Christian pilgrims and crusaders. It may have reached the ports of Antalya Province although there is no record of this²⁵.

1204 In reference to the entry for 1204 in the chronology, it is noteworthy that the destruction on Cyprus from this earthquake is mentioned by Gregory Abu'l-Farac²⁶.

1270 An earthquake struck Cyprus in this year that led to repairs being made to the Cathedral of Hagia Sophia in Nicosia²⁷ and doubtless resulted in significant damage to other buildings of lesser importance. This earthquake may have also caused damage to buildings on the Anatolian coastline, at Alanya and elsewhere, although I can find no dated evidence for this.

1361 A serious outbreak of plague was recorded in Famagusta, Cyprus in this year and the Latin rite clergyman, interpreting this as a punishment from God, formed a procession of the Christian sects to walk the street barefoot beseeching the mercy of God. At the end of this procession it is reported that 200 persons are said to have been healed and that the plague departed²⁸. This perhaps formed a part of a substantial plague outbreak also in Byzantine territory that is recorded in the *Chronica Byzantina Breviara*, with further plague outbreaks in Byzantine territory listed for 1375-6, 1381-2, 1390-1, 1398-9, 1409-10, 1417-18 and 1422-3, although if any of these outbreaks also reached Antalya Province it is impossible today to determine²⁹, but it does provide an idea of the frequency of plague outbreaks in Anatolia following the pandemic of 1347.

1392 A plague outbreak on Rhodes and several of the brethren of the Knights of St. John of Jerusalem died in this outbreak³⁰.

1438 A major outbreak of plague on Cyprus is described in the *Chronicle of Leontios Makhairas*: "And from the beginning of June 1438 after Christ, a great plague fell upon Lefkosia and the villages, and there were many deaths in all parts of Cyprus; and it lasted 17 months³¹.

²⁴ Runciman 343-4 n. 1, 344; see also, the restoration of Nurad-Din's Syrian fortresses following this major quake noted by M. O. Rousset; Rousset 2000, 278 which provides some idea of the magnitude of this series of seismic events.

²⁵ Queller et al. 1974, 462.

²⁶ Abu'l-Farac 1999, 486.

²⁷ Boase 1977b, 168.

²⁸ Keshishian 1970, 54-55.

²⁹ Nicol 1999, 217 n. 18.

³⁰ Luttrell 1995, 306.

³¹ Dawkins 1945, 9.

1456 Both famine and plague are recorded in Rhodes in this year³².

1481 A series of major earthquakes struck Rhodes in the year following the lifting of the Ottoman siege of Rhodes City by Mesih Paşa, which had lasted from May the 23rd to August 17th, 1480. This series of earthquakes in 1481, in March, May, October and December³³, “largely destroyed Rhodes city”³⁴, with villages also destroyed and the population, as a result, was left starving. These earthquakes were also associated with tsunami, which may well have struck the Anatolian coast, as was the case with the similar earthquakes at Rhodes and tsunami waves in 1609 and 1741. Amongst the recorded damage to Rhodes city in these quakes was the destruction of the Auberge of the Langue of France and the Auberge of the Langue of Provence, which were so badly damaged that they had to be entirely rebuilt, further damage to St. Nicholas’s tower which had already been damaged in the siege of the previous year, and damage to the tower by the West facing gateway to the Grand Master’s Palace³⁵. Sir C. T. Newton reports that the entire West Gateway to the Castello of Rhodes city was rebuilt after this quake, the rebuilding carried out under the reigns of Grand Masters D’Aubusson 1476 - 1503 and D’Amboise 1503 -1512, suggesting even greater destruction in this event³⁶. The combined damage to Rhodes City by the siege of 1480 and the quake of 1481 meant that, “The city of Rhodes as it is preserved today, with a perfection almost unique in Europe, reflects for the most part, the rebuilding of the convent after the siege of 1480”³⁷, although the whole city has undergone significant restoration and rebuilding in an “Italianita fascist” manner post 1912³⁸. There can be no doubt that this earthquake also caused significant damage to built structures in the Western half of Antalya Province, in addition to probable tsunami damage along the coastline.

1490 It is reported by McNeill³⁹, citing Hans Zinsser’s “Rats, lice and history”, of 1935, that typhus was brought to Spain by soldiers who had been fighting in Cyprus and that typhus was a disease new to Europe at this time. However, I have been unable to trace this reference to its source and it seems very odd that there are no accounts of outbreaks of typhus, a new disease to the area, recorded in the region in this period; further, there seems to have been no serious outbreaks of fighting on Cyprus since 1464, with the ending of the Venetian, Cypriot (Lusignan) and Genovese struggle for control, neither can I find any reference to Spanish troops on Cyprus at this time. The annexation of Cyprus by Venice on the 26th of February 1489 had passed off peacefully. One would expect an outbreak at Venice, rather than in Spain, if typhus was on Cyprus in 1489-90, but I can find no record of this, and in fact, typhus appears to have spread eastwards from Spain to Italy, causing the retreat of the French army besieging the Spanish ruled city of Naples in 1526. I can find no clear evidence that typhus, spread by lice, fleas and mites, was recorded on Cyprus or occurred anywhere else in the East Mediterranean region prior to the mid 16th century.

³² Rossi 1995, 321.

³³ op.cit. 321. See also Soysal et al. 1981 catalogue reference number No. 179. However, Vatin 2000, 141-2, says that these quakes occurred in March, May, October, and then in November rather than in December, 1481.

³⁴ Kollias 1999, 171.

³⁵ op.cit., 72, 134.

³⁶ Newton 1865, 151.

³⁷ Sire 1994, 38.

³⁸ Boase 1977a, 230.

³⁹ McNeill 1977, 209, 220.

1491 A major earthquake struck Cyprus and severely damaged the East end of the Cathedral of Hagia Sophia in Nicosia. The pilgrim Dietrich of Schachten describes how much of the choir fell in this earthquake and in falling, the masonry also destroyed the Chapel of the Sacraments⁴⁰. The consequences of this earthquake were probably significant in Antalya province as well as on Cyprus, although I have been unable to attribute any repair work in Alanya or Antalya to this quake.

1492 A major quake struck Cos (İstanköy) on the 17th of October and destroyed the city.⁴¹ The city had been refounded after earthquakes had destroyed it in 366 B.C. and in 141 A.D. it was again refounded after this event, and again after that of 1933.

This quake, like those of 1481, 1489 and 1491, should probably be related to extreme pressure and movement along the line of faults running south of the foot of the Tauros Mountains from the Gulf of İskenderun, through the island of Cyprus, the Bay of Antalya, Meis/Kaş, Fethiye/Rhodes, past Cos (İstanköy) and which marks the border between the African and Anatolian tectonic plates. This border was first recognised and mapped by the Irish, Dublin born engineer, Robert Maller (b.1810) and is clearly illustrated on Map D. of in his groundbreaking report to the Royal Society of London⁴², where the East Mediterranean earthquake belt off the Southern coastline of Anatolia is clearly shown. The significant pressure accumulated in this complex of faults is expressed periodically in a series of powerful earthquakes, also associated in some cases with tsunami, spread over a relatively short period of time, as for example in 1481 in Rhodes, 1489 in Antalya, 1491 in Cyprus and in 1492 at Cos. This pattern seems to have reoccurred again in the 18th century: 1741 Rhodes, 1743 Antalya, 1756 Rhodes and 1759 Antalya, and possibly again in the 20th century, although the mechanism of this particular series of events is not proven: 1926 Finike, 1926 Rhodes, 1931 Antalya, and 1933 Cos. It is to be noted that Dr. Ramazan Demirtaş, Director of the Seismology branch of the Disasters Directorate (Afet Müdürlüğü) of the Turkish Republic's Ministry of Public Works, and author of the report entitled "Türkiye'nin Sismotektoniği", of 2004, draws attention to this fault system, running along the southern coastline of Anatolia and termed, the Antalya Bay fault. Of the 16 potential major earthquakes listed in this report of a magnitude of 6 and above, four may impact upon Antalya Province, through the shock wave itself or, in two of these cases through possible tsunami. These faults are: the Antalya Bay fault that runs from the Gulf of İskenderun to the Island of Crete (Antalya Körfezi fayı), along which an earthquake measuring 7 to 7.5 on the Richter scale is possible, the Cyprus fault (Zafer Burnu fayı) where an earthquake of a magnitude of 7 is possible, the Gökova fault by Muğla where a 6.5 magnitude quake is possible and the Aksu fault, that runs North from Antalya to Isparta, along the line of the Aksu River, where an earthquake of magnitude 6-7 is possible⁴³. The rupturing of the Antalya Bay faults and faults on Cyprus have given rise to tsunami in the past.

⁴⁰ Boase 1977b, 167, 169 n. 4.

⁴¹ Soysal et al. 1981, No. 181, where this event is misdated to 1493; Çelikkol 1990, 12.

⁴² R. Maller, "The Great Neapolitan earthquake of 1857", 2 vols. (1862).

⁴³ Ö. Yılmaz, "Binlerce yıldır uyuyan bu faylara dikkat", Milliyet Gazetesi, 15th August 2004, 17; Demirtaş 2004, 20-26 and Şek. 4 for a general overview of the fault systems in the region; for the faults in the rock below Antalya's Bay see: op.cit. Özhan 2004, 27-36.

1503 Quarantine initiated and enforced at Rhodes by the Order of the Knights of St. John of Jerusalem under Grand Master Fra E. D'Amboyse (Grand Master from 1503-12) of a 40 days quarantine. Following their surrender and evacuation of Rhodes on January 1st 1523, on their arrival in Malta in 1530, the Knights of St. John of Jerusalem imposed the same quarantine regulations⁴⁴.

1540s The reconstruction of the re-named Süleymaniyya Mosque on the Alanya citadel seems to have been completed by 1548, as this date is inscribed on the wooden Koran kursu⁴⁵. The earthquake destruction on Alanya castle can therefore be more accurately dated to the early 1540s, rather than to 1556, as was suggested in last years' chronology.

1577 A large earthquake was recorded on Cyprus in this year⁴⁶.

1635 An earthquake struck Rhodes in this year⁴⁷.

1641 A terrible plague outbreak is reported in Cyprus⁴⁸. There is little doubt that this plague outbreak reached Alanya and Antalya, a result not only of the long established trade connections but also because from 1571 to 1670 the Paşalık on Cyprus, both administered and taxed the adjacent Anatolian Sanjaks of Alanya, İçel, Tarsus and Sis. The border between the Tekke Sancak (Antalya) and the Alanya Sancak, ran along the course of the Köprü Çayı by Aspendos (Belkis).

1660 A significant earthquake is recorded on Rhodes in this year⁴⁹.

1692 A great plague outbreak on Cyprus which is reported to have killed about two-thirds of the population of the island⁵⁰. It is possible that the plague outbreak that was reported by Lucas as occurring in Antalya at the end of the 17th century, mentioned in last year's chronology, was related to this outbreak in Cyprus.

1719 Plague was recorded on Cyprus in this year⁵¹.

1740 Plague led to an Ottoman enforced quarantine of Rhodes City in 1740 at the time of Dr. Pococke's visit, recorded in his "A description of the East and some other countries" published in London in 1745.

1743 Add to the chronology of the March 6th to 20th Antalya earthquake. It seems clear that the tsunami damage recorded in detail by D. Kelletat and G. Schellmann, with dated evidence to c. 1700 to 1750 on the coastline of Cyprus was, in all probability, a consequence of this major Antalya earthquake, with its epicenter to the west of Raşat (Sıçan - Fare) Island in the complex of 4 parallel faults running along the foot of the Tauros mountains. This tsunami reached 100-200m. inland and had a maximum height of 30-50 m. above sea level and moved boulders inland that weighed in excess of 20 tons⁵².

⁴⁴ Savona – Ventura 1997, 46.

⁴⁵ A. Yardım, Alanya Kitabeleri (2002) 141.

⁴⁶ Ambraseys-Finkel 1995, 54.

⁴⁷ Soysal et al. 1981, No 203.

⁴⁸ Luke 1989, 30.

⁴⁹ Soysal et al. 1981, No. 214.

⁵⁰ Luke 1989, 36.

⁵¹ Panzac 1997, 73.

⁵² D. Kelletat - G. Schellmann, "Tsunamis on Cyprus: field evidences and C14 dating results", in Geomorph. N.F. 46, 1. Marz 2002, 19-34; Özhan 2004, 27-36.

1759 A significant earthquake struck Antalya in this year⁵³.

1760 A plague outbreak on Cyprus killed 22,000 people in this year⁵⁴.

1761 September, The Danish Royal Expedition to the Yemen took passage in an Ottoman ship from Rhodes to Alexandria and in the course of this brief voyage 8 of the passengers died of plague⁵⁵. It is possible that this occurrence of plague amongst the passengers that embarked at Rhodes was related to the outbreak of plague on Cyprus of 1760.

1778-87 An outbreak of plague on Rhodes is recorded from March 1778, and this outbreak continued for the next nine years until 1787⁵⁶.

1785-6 A plague outbreak recorded on Cyprus⁵⁷.

Prior to 1808-9 The Süleymaniye Mosque on Rhodes, which seems to have been completed in 1530⁵⁸ was rebuilt in 1808-9⁵⁹. The reason for the destruction of this mosque, one of the most important in Rhodes City, is not given, but may have been due to earthquake damage, perhaps to the quake that severely damaged the Cos castle in the same period and which was repaired in 1821. For this earthquake that severely damaged the castle at Cos, probably prior to 1808, no firm date could be established. This earthquake seems to have occurred in the last decade of the 18th or the first decade of the 19th century prior to 1808 (see below).

1790's During the Napoleonic wars H. M. S Tigre, Captained by Sir Sidney Smith, put into the port of Fethiye and 100 members of the crew then fell sick of fever. The Tigre's medical doctor, E. D. Clarke describes this fever (almost certainly malaria) as caused by, "memphitic exhalations of carburetted hydrogen arising from improperly drained land", This fever also attacked the doctor and with such severity that it prevented his use of his limbs until after the Tigre had put out to sea⁶⁰.

1800 Col. W. M. Leake had to cut short his intended exploration of Lycia and sail for home from the port of Antalya, due to fever, probably malaria, perhaps caught during his stay at Larnaka in Cyprus or more probably on his journey along the coastline from Anamur Westwards to Antalya, although he remarks that Larnaka was known for its unhealthiness⁶¹. Given that a week to 10 days is the amount of time needed for the symptoms of malaria to exhibit themselves, it seems probable that the Anamur-Alanya coastline was where he was infected, leaving Gen. Koehler's party to proceed inland from Antalya, with Lycia, an objective of Leake's journey, remaining largely unexplored.

1800-1820? There was major damage to the castle of Cos city and Sultan Mahmut IInd restored this castle in 1821⁶², as was also the case for the fortifications of Antalya, repaired

⁵³ Soysal et al. 1981, No. 262.

⁵⁴ Panzac 1997, 169.

⁵⁵ T. Hansen, *Arabia Felix* (Det Lykkelige Arabien) (1964) 90.

⁵⁶ Panzac 1997, 26-7, 36, 75.

⁵⁷ op.cit., 34, 36.

⁵⁸ Çelikkol 1992, 67.

⁵⁹ Balducci 1987, 133 "yeniden yapılmış olduğunu"; Çelikkol 1992, 67; Bastıyalı, 1999, 98.

⁶⁰ Kinross 1956, 55, for quoting Dr. Clarke's own account; E. D. Clarke, *Travels in Europe, Asia and Africa* Vol. III (1817).

⁶¹ Leake 1824, 122.

⁶² Çelikkol 1990, 1 "çok büyük hasar görmüş".

in 1820-21⁶³, after having been repaired in 1815-1817/18⁶⁴, and the Ahi Kızı Türbe in Antalya was also repaired between 1819 and 1820⁶⁵. I have been unable to find a reference to a dated earthquake that could have damaged either Cos castle or Antalya's fortifications between 1800-1820, or one that damaged the Süleymaniye Mosque on Rhodes⁶⁶. Both the repair work carried out to the fortifications of Cos and Antalya seems to have taken place within Sultan Mahmut IInd's program of repairing and strengthening forts on the borders and supplying new garrison troops for them⁶⁷, with the repairs to Cos castle occurring the same year as the outbreak of the Greek nationalist revolt. However, the damage to the castle at Cos would suggest earthquake damage, that perhaps also resulted in the destruction of the Süleymaniye Mosque on Rhodes before 1808-9, and which may together suggest the possibility of a significant earthquake in the last decade of the 18th or the first decade of the 19th century, perhaps also resulting in some of the repair work carried out to Antalya's walls from 1815 to 1817-18. F. Beaufort's account of the attempted violent overthrow of the governor of Antalya in 1811⁶⁸ does not suggest any significant damage to the fortifications from this event.

However, Antalya's citadel, a most significant and substantial structure overlooking the port was at times used in the 13th century as the Seljuck Sultans' treasury⁶⁹. Clearly, as it served as the Sultans' treasury for decades, the Antalya citadel was both a substantial and secure structure, probably built or strengthened by the Seljucks after the revolt in Antalya ended in 1216, and this citadel was noted by many later travelers such as Evliya Çelebi in his 17th century "Seyahatname" who describes it as 7 stories tall, and Micheal Herberer in his record of travels as a slave between 1585-88, who describes this citadel-fortress as being on a raised area "dominating both the port and the city"⁷⁰, by Piri Reis in his "Kitab-ı Bahriye": where the port of Antalya is described, "Kalenin burç ve barusu görünür. Kale önünde bir liman vardır", "That you can see the citadel and the walls. Before the citadel, (that is, in front of the citadel) is the port", and, this citadel was described as late as 1800 by W. M. Leake, who described it thus: "The town is situated around a circular port, behind it on a height is a castle built with battlements"⁷¹. This citadel seems to have stood behind the "Tophane", in the area which is today called the "Cumhuriyet Meydanı". This massive citadel vanished in the period 1800-1812 and later references to repairs made to the "kale", refer in fact, to repair to the city walls, also unfortunately termed "kale", rather than to any repairs made to the citadel itself, which no longer stood. This citadel-fortress is not noted by Beaufort, nor is this citadel-fortress drawn by him in his drawing of the port of Antalya made in 1812, and so

⁶³ Moğol 1997, 127.

⁶⁴ op.cit. Ek 14, 127.

⁶⁵ Yılmaz 2002, 44.

⁶⁶ See above Prior to 1808-9.

⁶⁷ Shaw 1997, 7.

⁶⁸ Beaufort 1818, 66-74 and 79-83.

⁶⁹ Cahen 2001, 137, 153 and 186, Sultan Izzed-Din Keykavas IInd removed the treasure that had been stored in the Antalya citadel since the reign of Sultan Alaeddin Keykubat Ist, consisting of, "Cash, letters of credit and precious objects". Also see, Cahen 1968, 276 and İbn Bibi, "El Evamirü'l-Alai'ye Fi'l-Umuri'l-Alai'ye (Selçukname). M. Öztürk (çev.) (1996) Cilt 2 149.

⁷⁰ M. Herberer, Anılar, Osmanlı'da bir Köle. T. Noyan (çev.) (2003) 126 "yüksekçe bir yerde bulunan kale hem şehre, hem de limana egemen durumda".

⁷¹ Leake 1824, 133.

its destruction or demolition must have occurred prior to his visit to Antalya in 1812, but happened subsequent to Leake's visit in 1800. The reason for this is unclear, was it a deliberate demolition, perhaps due to its partial destruction during the Teke rebellion, which was a sustained revolt against central authority that included the siege by the rebels of Antalya castle from 1802 (h. 1217) for 29 months⁷². This revolt may have led to the castle's demolition, or was it perhaps demolished, having been damaged in an earthquake or from an accidental explosion in a powder magazine, as was the case with the destruction of Rhodes' Ulu Mosque, the former cathedral, in 1856? All remain possibilities, although its deliberate demolition seems to be the most probable, as the Antalya citadel had survived numerous major earthquakes over the previous 600 years and any earthquake or explosion that was able to destroy this massive citadel, would surely have also destroyed the city and city walls.

1811 Francis Beaufort draws attention to the largely deserted nature of the entire coastline of southern Anatolia, south of the Tauros Mountains, in his introduction: "Her former cities are deserted, - her fertile valleys untilld, - and her rivers and harbors idle"⁷³. This seems to have been a consequence not only of political instability, to which he draws attention, but was also due to plague outbreaks and to the prevalence of malaria in this marshy coastal region, including the vast freshwater lake by Manavgat, the swamps and marshland of Patara, Demre-Myra, Antalya etc. He also records that Meis Island (Castel Rosso), opposite Kaş, was in 1811 dependant upon the Bey of Rhodes⁷⁴. In part, the spread of plague can be related to the administrative and tax collecting system, in addition to plague traveling along the trade routes by land and sea, and thus a plague outbreak on Rhodes, like an outbreak on Cyprus, linked to the Anatolian coastline administratively, may well have spread to the Anatolian coastline through the visits of parties of tax and administrative officials, as well as through cabotage and through long distance trade through the ports. Attention was drawn to this point by Dr. W. Wilde in 1838 (see below 1838).

1814 An outbreak of plague on Cos is recorded on the gravestones of the Germe village cemetery⁷⁵. It is to be noted that the key works on Islamic tradition record that to be struck down by plague or to die in an earthquake, was to die as a martyr. For example in the *Al-Sahih* of Bukhari, 7.169, it is recorded that Abu Hurayra related that the Prophet of Islam had said, "To be struck down by an intestinal ailment or by the plague is to die a martyr"; and both *Al-Bukhari* and Muslim record in their authoritative collections that Abu Hurayra related that the Holy Prophet said: "There are five who are martyrs: he who dies of plague, he who dies of a disease of the stomach (in some later copies cholera is substituted for diseases of the stomach, the first cholera outbreak occurring in 1817), he who dies of drowning, he who is killed by a falling wall (as in an earthquake) and he who becomes a martyr by fighting in the cause of Allah".

1815-1819 Eğirdir's Hızırbey Mosque was completely rebuilt from 1815-1819 (repaired again in 1885) and was probably rebuilt because of earthquake damage, perhaps from the powerful 1795 Afeon quake⁷⁶, or to its destruction from a subsequent tremor.

⁷² Erten 1922-4, 61.

⁷³ Beaufort 1818, V.

⁷⁴ *op.cit.* 10.

⁷⁵ Bastıyalı 1999, 167.

⁷⁶ Soysal et al. 1981, No. 292

1816 The plague outbreak that is recorded on Cyprus in this year was of little violence⁷⁷.

1817 Two boats were quarantined at Larnaka in Cyprus, as they were infected with plague brought from Egypt⁷⁸.

1824-5? The repairs carried out to the Köprülü Mosque in Limasol, Cyprus of 1825, together with the repairs to the 17th century Arap Ahmet Paşa Mosque, completed in 1827 (also repaired in 1845) and to the Laleli Mosque in Lefkoşa, Cyprus, paid for by Ali Ruhi Efendi, and completed in 1828⁷⁹, may lead one to suspect possible earthquake damage on Cyprus within the 2nd decade of the 19th century, to which the repairs to Antalya's fortifications in 1825-7⁸⁰ might also in part be related. This damage may possibly have been due to the Antakya earthquake of 1822⁸¹, or to some closer seismic event in this period.

1831 Mehmet Ali, Paşa of Egypt, instituted a quarantine in 1831 upon on all boats coming from the port of Antalya, due to an outbreak of plague in the Antalya area⁸².

1833 Texier⁸³ records that in the space of 10 years, from 1833 to 1842, Anatolia experienced 30 outbreaks of plague, some outbreaks killing very many people, and also that smallpox was rife at Demre in the 1830's⁸⁴.

1835 Add to the chronology. For additional examples of Western travelers, setting Ottoman quarantine regulations at naught: William John Hamilton records in his diary entry for the 26th of January 1837, "We had some difficulty in getting ashore (at Rhodes Harbour) in the dark, having landed on the quarantine ground, but finding ourselves locked in, we discovered our mistake, before we were perceived and got safely off"⁸⁵. There is also for example, the account recorded by the American Fogg of his parties' deliberate breaking of the Ottoman quarantine regulations guarding the riverine entrance to Iraq in 1874⁸⁶ by concealing the party of foreigners in the boat from vital inspection and quarantine.

It is worth noting in this respect, that quarantine regulations were only applied to British Ceylon after the serious outbreak of the plague on the island in 1897, as prior to this late date, the British Imperial authorities regarded the unrestricted movement of largely seasonal Indian Tamil workers to work on the tea plantations, moving from British India to British Ceylon, as of far greater importance than the regular outbreaks of plague⁸⁷. This is considerably later than the imposition of quarantine regulations by the Ottoman Sultanate.

⁷⁷ Luke 1989, 151.

⁷⁸ Panzac 1997, 191.

⁷⁹ Aslanapa 1975, 5, 6, 37.

⁸⁰ Moğol 1997, 127.

⁸¹ Neale 1851, Vol. 2, 11; Jacquot 1931, 92; Soysal et al. 1981, No. 301.

⁸² Panzac 1997, 206.

⁸³ C. Texier, *Asie Mineure - description chersonnese d'Asie* (1862) 5.

⁸⁴ Texier 2002, Cilt 3, 411.

⁸⁵ Hamilton 1847, Vol 2, 51.

⁸⁶ Fogg 1875, 185.

⁸⁷ Moxham 2003, 176.

1835 A plague outbreak on Cyprus killed one third of the population of the island⁸⁸. It is probable that this outbreak led to the plague outbreak in Antalya that lasted from 1835-40, and this outbreak seems to have had a similar toll on human life in the region of Antalya as it had on Cyprus.

1835-6 The repair work carried out to Antalya's fortifications in this year may possibly be related to earthquake damage⁸⁹.

1836 A first hand account of plague in Antalya and adjacent regions from August of this year was provided by Willam John Hamilton writing in his "Researches in Asia Minor, Pontus and Armenia with some account of their antiquities and geology", published in 1847, in volume 2: "In Asia Minor, among the impediments to a travelers success may be especially recorded the deserted state of the countryside, which often puts the common necessities and conveniences of travelling out of his reach"⁹⁰, and it seems plague was a major factor in this depopulation of the Anatolian countryside, as well as causing great loss of life in towns and cities. On June 27th 1836 at Ilgın he records that the inhabitants were almost all dead of the plague⁹¹, and that, "the 6 weeks of plague to November 1st, in 1836 at Constantinople (İstanbul) had killed between 6,000, 7,000 and 8,000 men per day, not counting women, children and slaves, and that, in total, more than 100,000 inhabitants had died within 6 weeks"⁹². Further, he observed that, "It is a remarkable fact that plague is never very destructive at Smyrna (İzmir) when brought thither direct from Constantinople, whereas that of Egypt spreads immediately, and is of the worst character"⁹³.

Hamilton⁹⁴ provides a picture of the devastation caused by the plague in the area from Lake Beyşehir southwards to Antalya in 1836, which clearly calls to mind John of Ephesus's comments concerning the consequences of the pandemic of 542. He also relates that due to the severity of the plague raging at Antalya and along the coast he was unable to visit this area. At Kereli (on the East side of Lake Beyşehir in Konya province) on August 17th he wrote: "I had already heard that the plague was raging here, nothing could exceed the wretched appearance of the place; not a living being was to be seen in the streets, every house and shop was shut up, and the bazaars were abandoned; the whole population, with scarcely an exception, seemed to be dead or gone. Nothing impressed me more strongly with the almost total abandonment of the place than the fact of Hafız (Hamilton's guide) himself coming out to meet us at the entrance to the town, and conducting us without saying a word to the garden of the deserted Medresseh (Medrese), where my tent was silently pitched beneath a weeping willow, in the midst of desolation.

In the course of the afternoon we were visited by a few individuals whom the tatar had discovered, and who stated that the malady was daily becoming less severe, that there were not above two or three deaths a day, and that many of the inhabitants had escaped to the fields, or were employed in getting in their harvest! In the burial ground

⁸⁸ Panzac 1997, 187.

⁸⁹ Moğol 1997, 127.

⁹⁰ Hamilton 1847, Vol 2, iv.

⁹¹ op.cit. Vol 2, 188.

⁹² Hamilton 1847, Vol 2, 1.

⁹³ op.cit. Vol 2, 1.

⁹⁴ Hamilton 1847, Vol. 2, 351 to 355.

by the side of the fresh-made graves, were large marble blocks and columns.....We learnt that the plague was still raging at Smyrna (İzmir), and that seventy persons belonging to a small village near Beyşehir, the inhabitants of which resort to Smyrna as porters, had already perished. At Aidin (Aydın) Ghieuzel Hissar (Güzel Hisar) it had been so bad, that much of the corn was still left in the fields uncut for want of reapers; and cases had even occurred where a second person, who had bought up a standing crop, had died the next day, before he was able to reap it.

Friday, August 18th. Soon after seven we left Kereli for Kara Agatch (today's Şarkikaraağaç), four hours, and, passing through the burial ground, saw the funerals of two victims of the plague during the preceding night. For nearly two miles we crossed an undulating plain sloping on our left to the lake (Lake Beyşehir), which we soon lost sight of on entering a valley, well watered, and therefore well cultivated, which we ascended for several miles in a N.N.W. direction, where many fields of wheat and barley, long since ripe, were still uncut for want of hands (due to the great loss of life from plague).....

After following this valley for some miles we emerged into an open plain, intersected by a few streams and low hills. Here also large fields of corn, belonging to Kara Agatch, were still standing. As all accounts coincided in stating that the plague was still raging there with great violence, I determined to avoid entering the town, and reached the opposite side by a long detour, here we halted in a garden, until Hafiz, who could not be prevailed upon to take any precautions, had procured horses to proceed. More than half the population was said to have perished, and many large tracts of corn were left without an owner. Some large fields were pointed out to me, of which all heirs or claimants, direct or collateral, had died, except one helpless old woman, who could neither do anything herself nor obtain assistance from others. One of the surijis (sürücü: man in charge of the post-horses) from Kereli stated that he had been over to Ilghun twelve days before, where the mortality had been so great that 670 houses were completely shut up and closed, every person belonging to or connected with them being dead, according to the official accounts of the Mekhemeh (Mahkeme - Law Court), to which all the keys of such ownerless houses are given up.

The accounts which I received of the state of the country towards the sea coast and at Adalia (Antalya) were not more satisfactory: the plague was raging violently throughout the whole district; and the necessity of taking precautions to avoid contact with people, with the certainty that, however much we might keep from them, their horses must carry our luggage upon their own pack-saddles, rendered any further travelling in this part of the country not only disagreeable, but even useless, as it was impossible to pay attention to surrounding objects, while the mind was harassed with anxiety for personal safety. However insignificant these difficulties and dangers may now appear, at a distance of a few years and some thousand miles, they were then sufficient to induce me to give up my plan of visiting the southern coast of Adalia, and Pisidia, and to return without loss of time to Smyrna by the most expeditious road; for I could not help fearing that, if the plague were really raging at Smyrna as was represented, I might find some difficulty, in consequence of interrupted communications, in getting to England before winter.

We were detained some hours at Kara Agatch while the horses of the Menzil (post-station) were being shod, during which time I rested in a shady garden full of excellent grapes and various kinds of plums. At half-past two I started, under a most oppressive heat,

for Olou Borlu (Uluborlu), a road which I adopted as the shortest, and in order to fix the position of Apollonia, and the North end of Lake Eğirdir. It was indeed melancholy, in passing through this rich and well cultivated country, to see such tracts of corn left without an owner to reap them, or to carry the crops, or to thresh them out, abandoned as it were κύνεσσιν ὀϊωνοῖσί τε πᾶσι⁹⁵. Outside the town, as well as in the neighbouring village of Moudourah, great heaps of corn had been collected on the different threshing floors (Harman) around the place, but with scarcely a soul to work at them; many, indeed, were quite deserted; at others perhaps a single boy, or an infirm old man (it was a rare occurrence to see two together), was plodding through all the various operations of husbandry by himself. In many cases I heard that even the beasts had perished in the stables of hunger and thirst, because, the owners being dead, there was no one to let them loose to shift for themselves”⁹⁶.

1838 On the 1st of March, Dr. W. R. Wilde (father of the playwright and poet Oscar Wilde) writes of Fethiye: “For many years past, this place has been the southern point of communication between the Porte and her colonies, Egypt and Syria, couriers are always in readiness to transport dispatches, and camels and horses can always be procured for traveling. Owing to this constant intercourse with Constantinople (İstanbul), the village (Macri-Fethiye) has been seldom free from disease for 6 months at a time. Plague generally lurks within it, or in its neighbourhood, and it suffers periodically from intermittent fever (malaria), which generally breaks out in the month of May.... A few months ago, plague was introduced by some Turkish soldiers, and, although no case has occurred lately in the town itself, a small village, about 4 hours journey from it, had been nearly depopulated (from the plague)”⁹⁷. He also records that a quarantine of 3 days was in effect when he arrived at Limassol, Cyprus from Macri (Fethiye) in 1838 and that there was a 14 day quarantine following his arrival at Beirut from Limasol in the same year⁹⁸. The dispatch and arrival of government officials and travellers at the port of Macry (Fethiye) from Egypt is remarked upon by Beaufort⁹⁹, but the link of these travellers to the spread of plague was not mentioned by Beaufort.

Charles Fellows recorded in his diary on the 23rd of April at Fethiye, in the same year: “I must mention, as perhaps connected with this peculiarity (of the air at Fethiye), that the village of Kiacoee (Kaya Köy), 6 miles south (of Macri, of today’s Fethiye) where the governor of this district lives, and whence post horses are usually obtained, is suffering so much from the plague that it (Kaya Köy) is now placed under quarantine”¹⁰⁰. He records at Miletus, on the 30th of April that: “Unfortunately at all the post villages the plague was

⁹⁵ Gk.: Quoting from Book 1 of Homer’s *Illiad*, line 5, when plague struck the besiegers of Troy, from the arrows of the plague god Apollo, and consequently: “they gave their bodies to be the delicate feasting of wild dogs and vultures”. My thanks to Burak Takmer, epigraphical research assistant at Akdeniz University, for his assistance in this matter.

⁹⁶ Hamilton 1847, Vol 2, 351-355.

⁹⁷ Wilde 1840, Vol. 2, 70.

⁹⁸ *op.cit.* 100.

⁹⁹ Beaufort 1817, 74.

¹⁰⁰ Fellows 1852, 181.

raging severely. The system of each village isolating itself by local quarantine is now generally adopted even by the Turks, though they do it in a careless way"¹⁰¹.

Fellows's own remark, made in 1838, on local quarantine as being, "now generally adopted EVEN by the Turks" (my caps.), is quite incorrect, but is unfortunately typical of remarks often made by Western travellers to the Ottoman Sultanate in the 19th century. A form of local quarantine had been practiced by Moslems throughout the Islamic world for centuries before 1838, and in fact, dates back to the 7th century A.D. This form of local quarantine was based upon the hadith recorded by Abu 'Abd Allah Muhammad b. Ismail Al-Bukhari in his *Al-Sahih* (7.169), and also by Muslim b. Hajjaj in his *Al - Sahih*, both being authoritative and widely read collections of hadith. This hadith, transmitted by 'Abd ar-Rahman b. 'Awf, reads: "Do not go to a country where you know there is plague. However, if it breaks out in the country where you are, don't leave in order to flee from it". Exactly the same hadith is also transmitted by Usama ibn Zaid, and likewise is repeated in the hadith collections by Bukhari, by Muslim and Tirmizi¹⁰². These fundamental hadith collections, that were vital for the practice of Islamic law, were written and widely circulated from the 9th century to the present day. This same hadith also reappears in many later hadith collections including that by Muhyiad-Din Abu Zakariyya 'Yahya b. Sharaf an-Nawawi in his *Riyad as-Salihin* of the 13th century¹⁰³. This hadith is also cited within another hadith, also reported in Bukhari and Muslim, which relates that when plague broke out in Syria during the rule of the Caliph Umar (Omar) b. al-Khattab (634-44), called the plague of Amwas, from 638-9 (which also, in some sources seems to have been called the plague of Yezdigird), which wiped out an entire Moslem Arab army that included a number of the Companions of the Prophet of Islam, it was on the basis of this selfsame hadith alone, that the Caliph Umar decided not to visit his troops fighting the Byzantine forces in plague stricken Syria¹⁰⁴.

Likewise, when the Hapsburg Imperial Ambassador to the Ottoman Sultanate in the middle of the 16th century, Ogier Ghislen de Busbecq's dwelling in Istanbul was infected with plague, the reply made by the Ottoman Caliph-Sultan Süleyman to the Ambassador's request to move elsewhere, to evade the plague, that is recorded in the fourth of Busbecq's letters, was: "What did I mean and whither did I think of flying? Did I not know that pestilence is God's arrow, which does not miss its appointed mark? Where could I hide to be outside its range? If He (God) wished me to be smitten, no flight or hiding place could avail me; it was useless to avoid inevitable fate. His own house (the Topkapı Palace) at the moment was not free from plague; yet he remained there. I, likewise should do better to remain where I was. Thus I (Busbecq) was obliged to remain in that

¹⁰¹ Fellows 1852, 196-7; It is somewhat hard in this context, to understand Enid Slatter's comment, recorded in the most recent book on Fellows's travels: "Fortunately precisely the years of Fellows's journeys, 1839 to 1844, plague vanished from the Levant", as, for example, Charles Texier records 30 outbreaks of the plague in Anatolia in the period from 1833 to 1842. It seems quite illogical that she also writes on the same page, "To add to the prevailing feeling of death, Fellows had frequently to skirt round sad villages, isolated by the scourge of plague" which is recorded in his diary entry for the 27th of March 1838, while on the same page stating that plague had vanished from the Levant.

¹⁰² Bukhari, *Tibb* 30, *Enbiya* 50, *Hiyel* 13; Muslim, *Selam* 92 (2218) and Tirmizi, *Cenaiz* 66, 1065.

¹⁰³ Khan 1975, 234.

¹⁰⁴ *op.cit.* 300-301, in the chapter entitled: "On the undesirability of leaving or coming to a plague stricken town".

plague stricken house"¹⁰⁵. Further, Busbecq reports; "The Turks (a word at this time employed by European Christian writers, to mean all Moslems, not just members of the Turkish ethnic group) hold an opinion which makes them indifferent to, though not safe from, the plague. They are persuaded that the time and manner of each man's death is inscribed by God on his forehead; if therefore, he is destined to die, it is useless to try to avert fate, if he is not so destined, he is foolish to be afraid¹⁰⁶". This practice of the Moslem population remaining in a place when plague broke out, rather than fleeing, was due to both the example provided by the educated and powerful members of Moslem society, through the example recorded in the Prophetic tradition and religious law of the community and this knowledge was transferred into the realm of folklore and stories. Such as the well known story concerning the impossibility of avoiding ones fate, however fast or far one flees from it, a story that is situated by various storytellers in varied cities in the Islamic world. The story, in brief, is that a man in the main mosque in Cairo, turned around and saw the figure of death standing behind him, and so he fled from Cairo to Damascus, travelling as fast as the post horses could carry him. In Damascus, he went straight to the main mosque, where death was waiting for him, and Death said that he had been surprised to have just seen him in Cairo, as his recorded appointment with death was here, at Damascus, in the main mosque. This story, amongst other traditional stories on this same theme, may well be related to the hadiths relating to plague and it clearly served to act as a restraint upon panic and directly against fleeing from any plague outbreaks. These traditions and examples together formed a habit of mind and action amongst the Moslem populations of plague infected settlements and cities. The Moslem population's reaction to an outbreak of plague, of not fleeing the area, nor entering it, was one that figures such as Busbecq in the 16th century remarked upon and Western travellers and orientalis of the 19th century mistakenly termed "oriental fatalism" or "Islamic fatalism", when in fact, it was the practice of a local quarantine, implemented by the Moslem community.

It seems clear that the spread of plague and other epidemics amongst Islamic populations was in part, related to contacts made in trade over the caravan - transport network from town to town, through the ports, from contacts through maritime commerce with infected areas and through pilgrims and other travellers, as well as from people fleeing knowingly from a plague struck area. It must be pointed out that the transmitters of plague through overland trade to Moslem populations may well, in some cases, have been from Jewish and Christian merchants and traders, as at various times much of the maritime trade to Islamic states was in the hands of Christians, both from Europe or resident within Islamic lands. For example, much of the maritime cabotage trade of the central Ottoman lands was, from perhaps as early as the 17th century, if not before, in the hands of Greek Christians, living within the Sultanate's domains¹⁰⁷, while documentary evidence shows for example, that 66% of the French flagged ships and 23% of the Venetian flagged ships that arrived at the port of İzmir (Smyrna) between 1721 and 1796

¹⁰⁵ Busbecq 2001, 124.

¹⁰⁶ *op.cit.* 128.

¹⁰⁷ Quartaert 1997, 759-934; S. Faroghi, B. McGowan, D. Quartaert, Ş. Pamuk (1997) 799 for the Ottoman Greek merchant marine; for the Red Sea trade remaining in Moslem hands until 1840 799-80; also, for the 19th century; Kasaba (1988) 18-20 re the grain transport and smuggling trade and 28-30

were infected with plague¹⁰⁸. In addition, the fear and panic caused by reports of an outbreak, led to the escape from a plague infected area by both Christians and Jews including doctors¹⁰⁹, in the attempt to evade the contagion, actions which led inevitably to the spreading of plague to other places. Travellers frequently record that Moslem populations remained within plague struck areas and are reported to have behaved in an everyday manner, so far as this was possible in the circumstances¹¹⁰. They did not flee the city, but instead, provided an example of steadfastness in the face of adversity, rather than behaving like many Christians and Jews, fleeing elsewhere and thus spreading the epidemic. Consequently, the spread of plague was in part, it seems, not a result of a lack of local quarantine amongst the Moslem population, a system which had in fact been practiced since the 7th century, but rather, was in part, due to the multi-faith nature of the societies, cities and settlements in lands under Islamic rule, with the different responses made by the members of the different religious communities to the report of, or actual outbreak of an epidemic disease.

1840 Charles Fellows records that in summer the low-lying land, and marshy areas around Demre-Myra were deserted. In his journal entry for April 28th he reports: "The old priest (at Demre) tells us he alone is left upon the plain after the middle of May, as every hut in this village and on the plain is deserted for the mountains, on account of the heat and the appearance of an overwhelming number of mosquitoes or gnats"¹¹¹. It seems clear that the inhabitants had drawn, if only by inference, the connection between malarial fevers and the clouds of mosquitoes in the summer in the area, and the fact that it was much healthier to live in the mountains in summer, where it was cooler and where there were far fewer, if any, mosquitoes, only to return to the low-lying areas in the late autumn. This practice of transhumance is still practiced in Antalya province today by the semi-nomadic population, who for example, migrate with their flocks from around Manavgat up to the high pastures above Akseki, for the summer months. This practice is also echoed in the purchase of new summer villas and flats in Korkuteli by the wealthier residents of Antalya for use in the summer months or at weekends to avoid the heat and humidity of the coast, although the malaria problem has vastly diminished. It is noteworthy that many of the residents of Antalya in the past, left the city in the late spring or early summer and moved to Korkuteli, where the Ottoman Governor of the Sanjak also often conducted the administration, thus escaping the torrid heat, humidity and fevers of the summer months in Antalya.

1842 In this year, the Rev. E. T. Daniell, the epigraphist and draughtsman attached to Spratt and Forbes exploration of Lycia died in Antalya from malarial fever that he seems to have contracted in his last journey from Antalya past the marshy lowlands of the Aksu and Köprü Çayı (Eurymedon), including circumventing the great marsh (called in antiquity, Lake Capria and "Capru" by the Turkish inhabitants, beside the Köprü Çayı), and he traveled

¹⁰⁸ Panzac 1997, 68-70.

¹⁰⁹ see for example: "Eothen", Kinglake 1844, 164, 179 and for the different reactions of Moslems and Christians to the plague 166-7, 175, in Cairo in 1835.

¹¹⁰ See for example ibn Battutah's account, T. Mactintosh-Smith (ed.), *The travels of ibn Battutah* (2002) 275 where he relates that all the leading theological-legal figures he had met in his previous visits to Cairo were all dead from the plague.

¹¹¹ Fellows 1840, 200.

inland to the antique city of Selge and then to Side and back again to Antalya, where he died. In his account he records that he overnighted close to this malarial swamp in late July, suffered fever when he reached Side and he died of a recurrence of this fever in Antalya. In their book, Spratt and Forbes dedicate their work to the deceased and relate that the Rev. Daniell, “fell a victim to the malignant malarial fever of the country, contracted by lingering too long among the unhealthy marshes of the Pamphylian coast, when too anxious to complete his researches¹¹²”. Earlier in their travels, Spratt and Forbes had stayed at possibly the earliest Seljuck Sultanhan to be built in Turkey, the caravanserai of Evdir Han by Yukarıkaraman Köyü, Antalya, built before 1219, and their account vividly reveals the link between the caravanserai network for merchants and travelers and the flea population, vector of the plague bacillus amongst other parasitic diseases: “The lodging (Evdir Han) was snug enough, but had the disadvantage of having been the camp of a mighty army of fleas, who went forth, regarding us as natural enemies, proceeding to the attack; and although each of the party literally slew hundreds, did not seem in the least diminished by the morning. During the night they made incessant efforts to destroy us, and we arose in a very uncomfortable state and much wounded¹¹³”.

1842 12 members of the crew, including 3 officers, of H. M. S. Monarch died of Walcheren fever¹¹⁴ off Patara, in the course of May, while waiting to transport some of the Lycian marbles from Xanthos to England¹¹⁵.

1842 Isparta - Burdur earthquake on the 12th of July¹¹⁶.

1843 An earthquake struck Rhodes¹¹⁷. It maybe that the repairs carried out to the Arab Ahmet Paşa Mosque in Cyprus in 1845 were related to this event¹¹⁸ W. J. Hamilton who visited Rhodes in 1837 recorded that many of the houses in Rhodes city were then in ruins¹¹⁹, prior to this earthquake. These ruined houses seem to have been the result of past earthquake damage and also due to the consequence of depopulation from plague outbreaks.

1843 From the 2nd British Xanthos Expedition, conducted in November of this year, only one member of the crew of H. M. S. Queen died of malaria (Samuel Sutton), doubtless contracted from the mosquitoes of the swamps of Patara, and, that the Italian specialist plaster cast maker Antonio, also attached to the Xanthos expedition of this year, had a life threatening attack of malaria at Pinare, lying further up the Esen River from Patara¹²⁰. The difference in the death toll from malaria between the 1st. Xanthos expedition of May

¹¹² Spratt - Forbes 1847, Vol. 1, XV; Vol II, 32-35.

¹¹³ op.cit. Vol. I, 227. 228.

¹¹⁴ Like “intermittant fever”, this was another name given to malaria as a result of an incident in the Napoleonic wars, when 40,000 troops were dispatched to the Island of Walcheren off the Dutch coast and 7,900 died and 15,000 were disabled by the indiginous malarial fever in the space of a few months. Other names for malaria include: swamp fever, marsh fever, ague and swamp miasma. Malaria, from the Italian for “bad air”, came into general use in the first half of the 19th century.

¹¹⁵ Slatter 1994, 233-4.

¹¹⁶ Soysal et al. 1981, No 325. My thanks to Sayın Turhan Yavaş for drawing my attention to the published results of the Istanbul University Earthquake Research Center at Maslak and to Prof. Dr. Haluk Eyidoğan of İTÜ Jeofizik Mühendisliği Bölümü for his kind assistance.

¹¹⁷ Soysal et al. 1981, No 326.

¹¹⁸ Gazioğlu 1990, 271-2; Aslanapa 1975, 6.

¹¹⁹ Hamilton 1847, Vol 2. 49.

¹²⁰ Slatter 1994, 249, 272.

1842 and the 2nd expedition of November 1843, to the same area is noteworthy and confirms Dr. Wilde's remarks concerning the outbreak of malaria in Fethiye in May each year.

1844 A 15 days quarantine was in operation at the port of Izmir¹²¹. Charles Fellows records in his advice to travellers which was published in his 1852 volume, that in leaving Turkey, a quarantine of 3 weeks was enforced at the port of Syra and, a further quarantine of 2 weeks was enforced at the border of Greece before entry into Europe. However, it was possible to reduce this 5 weeks spent in quarantine if the traveler passed directly from Turkey to Malta, where a quarantine of 3 weeks sufficed for the traveler to pass direct into any port of Europe, thus saving 2 weeks of being cooped up in a quarantine station¹²².

1849 Earthquakes at both Antalya and Rhodes¹²³. It seems most probable that the restoration of the Tekeli Mehmet Paşa Mosque in Antalya in 1850¹²⁴, that was paid for by İbrahim Ağa and also for the restoration work carried out at the Bali Bey Mosque in Antalya in 1849-50¹²⁵, were both the result of damage from this Antalya earthquake of 1849.

1850 In April the quarantine facilities at Gaza, Palestine, were completed by the Ottoman Government as part of the Ottoman response to plague and cholera spread at the time of the annual haj by the pilgrims to Mecca and Medina, which of course included pilgrims from Antalya and elsewhere in the province¹²⁶. For a photograph of an example of a 19th century quarantine station built in the harbour at Antalya see (Fig. 5).

1851 Fethiye - Rhodes earthquakes on the 28th of February and the 3rd of April¹²⁷. This earthquake caused damage to the de Naillac tower (Arap Kulesi) that guarded the entrance to the harbour at Rhodes and it was repaired in the same year by order of Sultan Abdul Mecit¹²⁸. Only for this tower, described by Charles Fellows in his diary entry of the 13th of May 1840 as, "The beautiful tower, which is the striking feature of the city, commands the entrance (to the harbour)"¹²⁹ to be destroyed in the quake of 1863.

1852 On the 19th of October an earthquake struck Fethiye¹³⁰.

1853 C. T. Newton, H. M. Consul at Rhodes (1853-4) and archaeologist, writing from Rhodes on October 10th, records, "Smallpox is very prevalent in this part of Turkey, particularly in Asia Minor, where whole villages are swept away by it, and where children covered with pustules may be seen playing about the streets uncared for. The native population, both Turks and Greeks, has prejudice against vaccination, though doctors attached to the quarantine establishment take every means to introduce it"¹³¹. The first account of the difference between the killer diseases smallpox and measles was provided

¹²¹ Durbin 1845, Vol 2, 108-9.

¹²² Fellows 1852, 486.

¹²³ Soysal et al. 1981, No 340.

¹²⁴ Antalya 2000, 304 n. 246.

¹²⁵ Yılmaz 2002, 27, 131 No 4 n. 247.

¹²⁶ Neale 1851, Vol. 1, 12-20; Peters 1994, 301-315.

¹²⁷ Soysal et al. 1981, No. 344; Çelikkol 1992, 22.

¹²⁸ Balducci 1987, 12.

¹²⁹ Fellows 1841, 243.

¹³⁰ Soysal et al. 1981, No 347.

¹³¹ Newton 1865, Vol. 1, 250.

by the Sabian from Harran by Şanlıurfa, Thabit ibn Qurrah (836-901) in his "Tadhkirah" (The Treasury)¹³², however, a detailed clinical account of both smallpox and measles and how to distinguish between them was given in the work entitled "al-Judari w-al-Hasbah" which became famous, not only in the Islamic world but also in Western Europe. This was written by Abu Bakr Muhammad ibn Zakaraya al-Razi, born at Rayy, near Tehran, in Persia (865-925), known as Rhazes in the Latin West, and this was translated into Latin in 1498 as "Liber de Pestilentia", and this groundbreaking medical work was repeatedly translated and reprinted, at least 40 times between 1498 and 1866 in Europe, with the 1766 edition, printed in London by J. Channing entitled, "Rhazes de Variolis et Morbillis"¹³³. Likewise, the Cordoban physician and philosopher Abu al Walid Muhammad ibn Rushd (1126-1198), known in the Latin West as Averroes, in his "al Kulliyat fi al-Tibb", was the first physician to record that nobody was infected twice with smallpox, implying that the body gained immunity from further infection after the first infection¹³⁴.

Although Lady Mary Wortley Montagu, who was herself disfigured by an attack of smallpox in early adulthood, had introduced and popularised amongst the upper reaches of society in England, the Ottoman method of vaccination against smallpox, as a result of the successful vaccinations against smallpox that she had observed in İstanbul; it seems the practice of vaccination against smallpox had not spread into the mass of the Sultanate's population, although vaccination for smallpox between the thumb and index finger was common for Ottoman caravan leaders. Likewise, vaccination did not begin amongst the bulk of the urban populations in Britain until the 1840's, when vaccination began amongst the mass of urban poor, over a century after vaccination had been introduced into England from Ottoman territory. However, vaccination against smallpox had been introduced into China about 1100 from Moslem Northern India (Pakistan) where this technique seems to have originated¹³⁵.

Lady Montague had had her son, Edward W. Montague, vaccinated in İstanbul on the 18th of March 1718¹³⁶ and records in her letter dated 23rd March, 1718 that, "The boy (her son) was engrafted (vaccinated) last Tuesday. I cannot engraft the girl (her daughter), her nurse has not had the smallpox.". In a letter dated 1st April, 1718 to her husband she writes, "Your son is as well as can be expected and I hope past all manner of dangers". In England, in front of witnesses, Lady Montague had her daughter inoculated against smallpox and Princess Caroline then followed her example and had her two children vaccinated against smallpox in 1722, making inoculation against smallpox acceptable to many in England, doctors included¹³⁷.

1855 An earthquake struck Fethiye in this year¹³⁸.

¹³² Nasr 1976, 176 n. 40.

¹³³ Hitti 1991, 366.

¹³⁴ op.cit., 582.

¹³⁵ Macneill 1977, 250-3.

¹³⁶ Montagu 1994, 123, n. 235.

¹³⁷ op.cit. xviii.

¹³⁸ Soysal et al. 1981, No. 351.

1856 An earthquake struck Rhodes and Cos (İstanköy) on the 12th of October¹³⁹. Sir C. T. Newton, archaeologist and later Keeper of Greek and Roman antiquities at the British Museum, and sometime British Consul at Rhodes, reported the consequences of this earthquake in the following passage, a “dreadful catastrophe has just befallen the town of Rhodes. The inhabitants had hardly recovered from the shock of an earthquake, which threw down many private houses and greatly injured the fortifications...”¹⁴⁰. One can suspect significant damage from this quake along the Anatolia coastline facing Rhodes, as this earthquake was also recorded at Fethiye by C. Texier¹⁴¹.

1857 There was an earthquake at Marmaris¹⁴².

1858 Antalya earthquake¹⁴³.

1859 Rhodes earthquake¹⁴⁴.

1862 Marmaris earthquake¹⁴⁵.

In the same year, the Dali Mosque on Cyprus, built in 1839, also known as the Ziya Paşa Mosque, was restored, only 22 years after its construction¹⁴⁶. This restoration may have been related to earthquake damage on Cyprus, perhaps from the Antalya quake of 1858 or from the Rhodes quake of 1859.

1863 Isparta earthquake, killed 800 people and totally destroyed the Kubbeli Mescit, in the Şuhut ilçesi of Afyon, which was built in 1374. The shock from this major destructive earthquake being strongly felt in Dinar, Afyon and Konya¹⁴⁷, and it may have caused some damage to buildings in the northern areas of Antalya province.

1863 A major earthquake struck Rhodes - Fethiye¹⁴⁸ and largely destroyed the stone bastion tower of de Naillac built to guard the entrance to Rhodes harbour and which stood 46 meters high¹⁴⁹. This massive stone tower, essentially an artillery platform guarding the harbour entrance, was constructed by order of the Grand Master of the Knights of Saint John of Jerusalem, Fileberto de Naillac, Grand Master from 1396 - 1421 and, in the 19th century, was drawn and painted by many European artists including W. Clarkson-Stanfield (1793-1867), with many paintings based on William Bartlett's print of this tower, drawn in 1836¹⁵⁰. Grand Master De Naillac also began construction of the Knights' Castle of Petronium (St. Peter, San Pietro) at Halik, todays Bodrum, on the S.W. tip of Anatolia

¹³⁹ op.cit. No. 355.

¹⁴⁰ Newton 1865, Vol. 2, 73 where he goes on to describe the accidental explosion of a gunpowder magazine that demolished the Grand Mosque, the former Cathedral of St. John, and adjacent structures.

¹⁴¹ Texier 1862, 669.

¹⁴² Soysal et al. 1981, No 356.

¹⁴³ op.cit., No 358.

¹⁴⁴ op.cit., No 365.

¹⁴⁵ op.cit., No. 373.

¹⁴⁶ Gazioğlu 1990, 273-4.

¹⁴⁷ Vakıf 1983, 144; Soysal et al. 1981 No. 379 where this earthquake is broadly dated in the catalogue 1861-3.

¹⁴⁸ Soysal et al. 1981, No. 377.

¹⁴⁹ Sire 1994, 37; Boase a 1977, 232; Kollias 1999, 48, 170; Paradissos 1999, 179.

¹⁵⁰ This tower is also illustrated in Sir C. T. Newton's "Travels and discoveries in the Levant" (1865) Vol. 1 Pl. 5, with a description of the tower, pages 160-161 and an engraving of this tower, dating from 1483, is illustrated in Zeki Çelikkol's, "Rodostaki Türk Eserleri ve Tarihçe" (1992) Gravür IV.

opposite Cos in 1402. The remains of de Naillac's tower were leveled following this earthquake. The damage from this quake must have had a significant impact on the western parts of Antalya Province. It is possible that the restoration of the Church of St. George in Kaleiçi, Antalya in 1863, may have been caused by this quake or it may have been the consequence of damage to the church caused by the Antalya quake of 1858.

1864 A major destructive earthquake struck the island of Meis opposite Kaş and Fethiye on the 2nd of October¹⁵¹.

1865 Rhodes was struck by a series of earthquakes on the 2nd of February, the 1st of March, the 2nd of April and the 1st of December of this year¹⁵².

1866 Rhodes was struck by earthquakes on the 11th and the 16th of January¹⁵³.

1869 Kerme Bay-Marmaris earthquake of December 1st ¹⁵⁴.

1870 A quake struck Rhodes-Fethiye on the 22nd of November¹⁵⁵ and it seems probable that the repairs carried out to the Borazani Babba Mosque in Rhodes, built in 1808, that were carried out in 1870-71 were related to damage from this earthquake¹⁵⁶.

1872 On the 9th of April a major earthquake struck Antakya that badly damaged two-thirds of all buildings in Antakya and killed 1,800 people, only 150 houses remained intact in Antakya. This event may have had an impact on buildings in the Eastern parts of Antalya province¹⁵⁷.

1883 On the 5th of March an earthquake struck Cyprus, with houses, buildings and stone walls thrown down and extensive damage at Limassol. It was the most serious shock experienced on the island for many years, and was reported in "Nature" of the 22nd of March, 1883¹⁵⁸.

1885 A significant earthquake struck Rhodes¹⁵⁹.

1885 Prof. Niemann, archaeologist and draughtsman, suffered badly from recurring bouts of malarial fever, as did other members of the Austrian team, who also contracted malaria, while exploring the region of Perge and Side, which hampered the completion of their studies¹⁶⁰.

1887 In September, Muğla, Köyceğiz, Cine and Denizli were shaken by a major earthquake that may have led to damage in the western parts of Antalya Province¹⁶¹.

¹⁵¹ Soysal et al. 1981, No. 382.

¹⁵² op.cit. No. 383.

¹⁵³ op.cit. No. 386.

¹⁵⁴ op.cit. No. 405.

¹⁵⁵ op.cit. No. 407.

¹⁵⁶ Çelikkol 1992, 77; Balducci 1987, 128 and n. XXI.

¹⁵⁷ Jacquot 1931, 92 and 149; Soysal et al. 1981 gives a date of the 3rd of April, No. 424.

¹⁵⁸ Haining 1991, 43-44.

¹⁵⁹ Soysal et al. 1981, No. 493.

¹⁶⁰ Lanckoronski 1890, III, "Auch von Perge und Side wurde das wichtigste erledigt und so trotz einiger erkrankungen, insbesondere mehrerer hartnäckiger fieberanfalle, von denen Prof. Niemann heimgesucht wurde, bis zur heimkehr der herren im November ein grosses stück arbeit vollendet".

¹⁶¹ Soysal et al. 1981, No. 517.

1890 Isparta was struck with a series of quakes from the 2nd to the 14th of May¹⁶². It may be that the result of this series of quakes led to the repairs made to the Ulu Mosque at Akseki in 1894¹⁶³.

1890 On the 26th of May an earthquake struck Rhodes, Sakız and Psara¹⁶⁴ which may have caused some damage to buildings in the Western parts of Antalya province.

1890 In this year, 138 households comprising 550 refugees from the Caucasus arrived in Antalya by boat and were resettled in Serik's Boğaz district, where most of them then died of malaria¹⁶⁵.

1896 On the 26th of June, Marmaris, Kerme Bay, was struck by a powerful earthquake¹⁶⁶.

1896 Add to the chronology, it seems probable that this earthquake on the 27th of October at Rhodes destroyed the minaret of the Süleyman Paşa Mosque¹⁶⁷.

1898 An earthquake struck Rhodes which totally destroyed the Suleymaniyya Medrese - school, that had been built in 1876, and which was rebuilt in 1898-9¹⁶⁸.

1900 At the start of the 20th century plague was still present in Antalya¹⁶⁹.

1905 On the 14th of December, Dr. Adjutant Major Rifat Bey was recommended for promotion in connection with his work in Antalya combating the plague¹⁷⁰.

1910 A document dated 16th of January records the issuing of regulations that need to be taken in Antalya, "in order to prevent the every year recurring outbreaks of plague in Antalya¹⁷¹". This document shows the sheer frequency of plague outbreaks in Antalya. These regulations were re-issued again on the 16th of August, when there was a further outbreak of plague in Antalya¹⁷².

1911 A document from the Başbakanlık Osmanlı Arşivi, dated 17 January, records that the plague serum has been sent from the Ottoman Embassy in Paris to the Governor of the Sancak of Antalya¹⁷³. The serum against plague had been developed in Paris by Alexandre Yersin, the discoverer of the plague bacillus in 1894, through injecting plague bacillus into horses. This serum was first tested in Hong Kong, in the plague outbreak of 1896, and produced the first medically assisted cures from bubonic plague in human history¹⁷⁴.

¹⁶² op.cit. No. 533.

¹⁶³ Vakıf 1983, 594.

¹⁶⁴ Soysal et al. 1981, No. 534

¹⁶⁵ Selekler 1960, 135.

¹⁶⁶ Soysal et al. 1981, No. 577.

¹⁶⁷ Duggan 2004, 150; Çelikkol 1992, 68 where the minaret is reported to have fallen between 1890 and 1895; Soysal et al. 1981, No. 578.

¹⁶⁸ Çelikkol 1992, 97.

¹⁶⁹ Güçlü 1997, 80.

¹⁷⁰ Üstün 2004, 37.

¹⁷¹ op.cit., 37 citing B.O.A. Dosya No: 55 Gömlek No: 15 Fon Kodu: DH.İD.

¹⁷² Çimrin 2005.

¹⁷³ Üstün 2004, 37.

¹⁷⁴ Wills 1997, 74.

Within less than five years of the successful use of the plague serum, the Ottoman administration had this serum sent to Antalya for use as a vaccine, which was quite a remarkable achievement at this date.

1911 Insert in the chronology the date of the Antalya earthquake of this year, the 30th of April¹⁷⁵.

Also on the 30th of April, 1911, there was a suspected case of plague in Antalya and the reminder of measures to be taken against plague was re-issued, but it was reported on the 19th of May that the patient in fact suffered from pneumonia rather than from the plague¹⁷⁶.

1912 In Antalya on the 18th of February there was an outbreak of plague and the plague regulations were re-issued¹⁷⁷.

1913 Some Balkan Moslems who had been displaced by the nationalist wars in the Balkans and were refugees, (like those from the Caucasus of 1890, see above), were settled in Antalya Province but within the space of 2 years were entirely wiped out by malaria¹⁷⁸. This is but one example amongst many, of a tragic pattern in the resettlement of sometimes large numbers of Moslem refugees from the Balkans, the Crimea and the Caucasus along the malarial coastline of southern Anatolia, in the Adana and Antalya regions, from the 1870's to the 1930's. In the period from 1783 to 1913 as many as 7 million refugees, including, 3.8 former Russian subjects (of which 2 million came from the Caucasus), with the rest coming from the Balkans, were resettled within the contracting borders of the Sultanate which had a reported population in 1914 of 14,000,000 inhabitants living within the borders of the present Turkish Republic. As D. Quartaert records: "Malaria, for its part, carried off large numbers, reducing and sometimes completely wiping out entire colonies (rather, in fact, settlements) of Tartars and Circassian immigrants settled in the Adana region"¹⁷⁹. The same applied to those refugees that were resettled in the adjacent Antalya region. Although the malarial plasmodium was discovered by Alphonse Laveran working in Algeria in 1880 and, the connection between malarial fever and the bite of the mosquito was proved conclusively by Ronald Ross, working in India in 1898, for which he received the Nobel prize in 1902, a sustained campaign to eradicate the mosquito vector of malarial fever in Antalya province was not begun until 1929. Malaria can lead not only to fever, but also to anemia, melanosis, enlargement of the spleen and liver damage, that often includes liver cancer.

1918 An earthquake of 6.5 struck Cyprus on the 28th of September¹⁸⁰.

1920 Of the 200,000 people to inhabit the Province in this year, 172,000 had suffered from malaria¹⁸¹.

175 30th April, Duggan 2004 n. 258; Erten 1922-4, 78.

176 Çimrin 2005.

177 op.cit.

178 Çimrin 2002, 143 and the story "Bizim de temmuzumuz var" on the same page, from Selekler 1960, which relates a related encounter of the people of Serik district of Antalya with refugees from the Caucasus that had been recently settled by Serik, and the reply, that the malarial mosquitoes of July would sort out the problem of these refugees, which it did.

179 Quartaert 1997, 788-9 and n. 35; Quartaert 2000, 115.

180 Deprem 1983, No. 433.

181 Güçlü 1997, 80.

1922 It was reported on the 17th of August that the Turkish troops that came from Konya to Antalya with the evacuation of the Italian occupation forces from Antalya, who were billeted in houses in Antalya, suffered badly from malaria, typhus and other diseases¹⁸².

1923 From this date quinine to suppress the symptoms of malaria was distributed free of charge to the poor in Antalya from the Antalya Health Directorate, headed by Dr. Murat Dinçer, which was paid for from a special account, and, that increasingly, quinine was distributed to the poor in the surrounding villages by health service personnel¹⁸³.

1923 A contemporary account of the health situation in the Serik-Manavgat area is provide by Macit Selekler. An outbreak of smallpox in the villages of Alacami, Dikmen and Boztepe of Serik district of Antalya occured in this year, and other cases of contagious diseases were recorded; while the villages of: Boğazak, Azaplar, Aralık, Göncünü, Asaraltı, Kayaburnu, Üçtepe, Eminceler, Kürüş, Karadayı, Taşlık, Çağıllı and the related areas of Serik were ravaged by malaria. Of the 8 to 10 children born to families living in this swampy coastal plain, barely one or two survived, while in the villages many adults also died from malaria. In the villages, not a single child was left alive and there was no possibility of any increase in the population given the malarial and health problems of the area¹⁸⁴.

1924 An earthquake of 5.8 struck the area south of Cyprus on the 18th of February¹⁸⁵.

1926 An earthquake struck Finike on the 18th of March, with its epicenter at Meis Island opposite Kaş, with aftershocks from this earthquake felt until June. The shock from this earthquake was felt at Dinar, Konya, on the island of Santorini and on Crete¹⁸⁶, and the shock from this earthquake must have caused significant damage to structures in Antalya Province.

1926 An earthquake measuring 7.7 on the Richter scale struck Rhodes on the 26th of June at 19.46 pm. The depth of this earthquake was 100 km. and the shock from this earthquake was felt in Cairo, Libya and Italy¹⁸⁷. There can be no doubt that this second major earthquake of 1926 in the region, also caused substantial damage in Antalya Province, with its epicenter at Meis-Kaş. It is reported that 3,000 homes were damaged in Kaş, Fethiye, Köyceğiz, Marmaris and Datça¹⁸⁸.

1929 In Muratpaşa (Osmaniye) district of Antalya city, on Dutlu Street, there was a case of plague and as a result, the following "Talimatname", "Plague Regulations", were issued by the Province's court; which can be translated as follows: 1. Everybody is ordered to report to the city medical officer every case of fever. 2. Everyone is to be of assistance to the officials who will come to vaccinate everybody; whoever gives trouble

¹⁸² Çimrin 2005, forthcoming.

¹⁸³ Sıtma 1938, 69; Çimrin, op.cit.

¹⁸⁴ Selekler 1960, 163.

¹⁸⁵ Deprem 1983, No 531.

¹⁸⁶ Eyidoğan et al. 1991, 42.

¹⁸⁷ Deprem 1983 No 611 and www.Kluweronline.com. This earthquake is dated to the 26th of May rather than the 26th of June Eyidoğan et al. 1991, 43-4 Şekil 3.5, and is reported to have consisted of 2 consecutive shocks.

¹⁸⁸ Demirtaş 2004, 23.

or makes difficulties will be prosecuted by law. 3. It has been made public that all bakeries, mills, restaurants, shops, hotels and han-like establishments in the district are to close up any rat holes¹⁸⁹.

1931 add to the chronology: The repairs that were made to the Yivli Minaret Mosque in 1935 (not 1953 as given in the chronology) were most probably the result of damage from this quake of 1931¹⁹⁰.

1933 On the 23rd of April a major destructive earthquake struck the area of Kostańk  y, Dat  a and Bodrum destroying many houses¹⁹¹ and this quake may also have caused damage to buildings in the westernmost parts of Antalya Province.

1935 A quake of 6.1 is recorded west of Rhodes on the 18th of March¹⁹².

1937 A report on the fight against malaria in Antalya Province, published in 1938, covering the period from 1923 to 1937, provides official information on the scale of this endemic problem in the region¹⁹³. In 1929, six years after the Turkish Republic was established, the Organisation to fight against Malaria, (Sıtma M  cadele Te  kilatı) opened its campaign in Antalya Province. It was led by Dr. Nazmi   ke and its headquarters were in Antalya, with branches in Serik, Manavgat, Finike, Ka  , Korkuteli and Elmalı. Both winter and summer examinations were carried every year of the village populations, to identify and treat cases of malaria. As a result of this campaign, over the 9 years, from 1929 to 1937, 1, 166, 763 examinations were carried out and 208,384 cases of swollen spleen from malaria were detected (Fig. 1 & 3) and in total, 352,740 cases of malaria were detected and treated with quinine. During these 9 years, 379,946 blood tests were conducted and 38,743 cases of malaria were detected through these blood tests. In 1937 in Antalya Province there were: 37,574 chronic malaria cases, 42,157 cases of reinfection with malaria and 1,133 new cases of malaria, giving at total of 80,864 cases of malaria identified in this year. This occurred within Antalya province which had a population in 1926 of 226,704 people and a total of 232,345 inhabitants in 1935¹⁹⁴; that is, in terms of the number of malaria cases, over one third of the population of Antalya Province in 1937 had malaria and one-sixth of the population suffered from chronic malaria. The gravity of this endemic problem was such that the life expectancy of the inhabitants of Antalya Province could not be increased, nor could the high rate of infant mortality be reduced in the province, until malaria was brought under control, if not eradicated.

To reduce the breeding grounds of mosquitoes in the province, the campaign against malaria included in its program: the drainage of swampland, with an area of 156,986 sq.m. drained between 1930 and 1937; 112,049 m of new drainage canals were dug between 1929 and 1937; 64,476 m. of canal were cleaned from 1935 to 1937 (Fig. 2); 457,380 m. of

189   st  n 2004, 36. "Talimatnameye: 1. Hummalı olan her hastayı herkes belediye hekimliđine ihbar etmeye mecburdur. 2. Umumi veba a  sı tatbik edileceđinden a  ı i  in gelecek memurlara herkesin yardım etmesi gerektiđi, zorluk   ıkarımlar ve engel olanlar hakkında kanuni takibat yapılacađı. 3. Fırın, deđirmen, lokanta, bakkal, otel ve han gibi umumi mahallerde farelerin girip   ıkmasına m  sait deliklerin kapatılması l  zumu ilan olunur". My thanks to both M.   st  n and Dr. M. L. Champagne for their assistance in this matter.

190 supra n. 38, Yılmaz 2002, 10.

191 Eyidođan et al. 1991, 47.

192 Deprem 1983, No. 899.

193 Sıtma 1938, 69-71. My thanks to Kayhan D  rtl  k of AKMED for drawing this article to my attention.

194 G   l   1997, 44-5, where these census figures are given.

dykes were dug between 1935 and 1937, and 37,270 m. of dyke cleaned between 1935-7; 54 vacant areas were cleared and 58,042 sq. m. of hollows where water lay, that provided breeding areas for mosquitoes, were filled in, in the province between 1930 and 1937, as well as spreading Paris Green (copper acetoacetate & copper arsenite) and fuel oil in areas where mosquitoes were breeding around villages. This was a significant point on the path to eradicating malaria, but was then counterbalanced by the rapid spread of rice cultivation in the province, including on the newly drained land (see below); consequently, malaria in the region remained a health threat into the 1960's, and malaria will inevitably return to the region, given its climate and topography, if the program combating malaria is at any time in the future reduced¹⁹⁵.

Extraordinarily, as the drainage of areas of swampland increased in Antalya province, to reduce the scale of breeding grounds available to mosquitoes, there was a rapid increase in land in the province of Antalya which was placed under rice cultivation¹⁹⁶. From the incomplete agricultural statistics it can be seen that from 1909 to 1913 there was no rice grown in the province, in 1924 500 hectare was sown with rice, in 1925 50 h., in 1928, 100 h., in both 1929 and 1930 no rice was sown. In 1931 800 h. was sown with rice, in 1932 600 h., in 1933 1,625 h. was sown with rice and 2,455 tons of rice were processed in this year in specially built rice processing factories in Antalya; in 1934 1,125 h. was sown with rice, in 1935 4,000 h. was sown, in 1936 3,340 h. was sown and 7,035 tons of rice was locally processed, in 1937 2,597 h. was sown and, in 1938 2,703 hectares of rice paddies were sown in the province and in 1944 4,573 tons of rice was processed locally. The stagnant water of the flooded rice fields provided a perfect breeding ground for swarms mosquitoes. After official pressure and fines on rice growing in the province in the 1940's and a significant protest by the people of Serik to prevent nearby land being converted into rice fields, by 1946 rice production in Antalya Province had been halted, and cotton production was substituted for rice. However, a cotton crop also requires significant irrigation, and leaves pools of standing stagnant water, but the change from rice to cotton cultivation has doubtless considerably reduced the scale of mosquito breeding and infestation in the province. One rather wonders how in the 1930's and 40's, given the seriousness of the malaria problem for the population of the province, with one in three of the population infected with malaria and one in six, a chronic malarial sufferer, it was possible to carry out a drainage campaign to prevent malaria and, at exactly the same time, to rapidly increase the scale of rice paddy fields, and in some cases import paddy field workers from Egypt, to profit from rice production, disregarding the creation of vast new breeding grounds for mosquitoes at Kırkgöz, Arapsu, Serik, Manavgat and elsewhere in the province.

¹⁹⁵ Wills 1996, 152 where it is recorded that: two in five of the world's population were in 1996 at risk from malaria, with 110,000,000 new cases every year and between 1 and 2 million deaths per year. It is important to note that malaria is not the only dangerous parasitic disease spread by the mosquito vector, in Antalya Province as elsewhere. The Turkish Health Ministry statistics show that in 1994 there were 84,345 cases of malaria reported in Turkey, in 1995 82,096 cases, in 1996 60,884 cases, in 1997 35,456 cases, in 1998 36,842 cases, in 1999 20,963 cases were reported, in 2000 11,432 cases were reported, with 245 patients hospitalised and 3 died; in 2001 10,812 cases were reported, 227 patients were hospitalised and one patient died; in 2002 10,224 cases were reported, 170 patients were hospitalised and one died: T.C. Sağlık Bakanlığı, Sağlık İstatistikleri (1999) 70; 2000, 56, 70; 2001, 54, 70; 2002, 60, 77. The mosquito is also a vector of: Filariasis, Dengue, Rift Valley Fever, various types of Encephalitis, Yellow Fever and West Nile Fever and both Encephalitis and Filariasis (Elephantiasis) has also been recorded in the province.

¹⁹⁶ Güçlü 1997, 55, 61.

1940 The marshy area that is today covered by the Karaalioğlu Parkı, by Yenikapı, Antalya was drained, filled and converted into a park, eradicating this longstanding malarial swamp just beyond the city walls¹⁹⁷.

1941 A quake struck Cyprus, measuring 6.5 on the Richter Scale, on the 20th of January. Damage was severe at Enkomi, St. Barnabus's monastery was badly damaged. Agios Napa and Paralimni were totally destroyed and buildings and structures at Nicosia, Kyrenia Castle and Bellapais were damaged, with the shock from this earthquake felt along the Southern coast of Anatolia and in Israel¹⁹⁸.

1943 Uluç reported that malaria was rife in the undrained marshy area in and around Side in Antalya province¹⁹⁹.

1945 Most of the swamps in Antalya Province had been drained by this year, greatly reducing the occurrence of malaria in the population²⁰⁰ and, by 1960, it is reported malaria in the province was rare²⁰¹ although, see below the following entries concerning malaria.

1948 A major campaign launched by the government of the Republic of Turkey, as part of the newly formed W. H. O.'s initiative to eradicate malaria, using D.D.T. (dichlordi-phenyl-trichlorethane). Also, in the same decade, in 1943, as a result of the development of antibiotics, plague became treatable, if it was identified early enough, and mortality dropped from 60% in the 1908-9 plague outbreak in San Francisco, for example, to 15% in 1996²⁰². However, for the airborne, pneumonic form of plague, which has been unrecorded for a century, since the plague outbreak in China in 1894²⁰³, vaccination remains essential²⁰⁴. In consequence, the two greatest killers of Antalya's population over the past 1500 years began to come under control, and this resulted from the 1960's onwards in a rapid increase in Antalya's population, mainly of immigrants from outside the province.

1953 A quake struck Paphos in Cyprus, of a magnitude of 6.3 on the 10th of September and 160 villages in Cyprus were damaged and some deaths and injuries occurred. The shock from this earthquake was felt along the Southern coast of Anatolia, in Israel and Egypt and this event was also associated with a small tsunami²⁰⁵. This event was described by Lawrence Durrell: as the area was, "Still dotted with the smashed remains of the great earthquake that had so mercifully missed the Kyrenia range - though it had passed through Bellapaix (Bellapais) with a roar like an express train, shaking even the abbey"²⁰⁶. The "roar like an express train" mentioned, being the P Wave (the primary shock-wave) from this earthquake coming into contact with the air, to produce the often reported roar of an earthquake.

197 Antalya 1944, 13.

198 Demirtaş 2004, 24, 25; Deprem 1983, No. 1036.

199 Uluç 1945, 135-145. "Bu yöredeki bataklıkların kurutulması sonunda bir zamanlar büyük tahribat yapan malarianın hemen hemen tümüyle ortadan kalkmış olması..."

200 Güçlü 1997, 82.

201 Çimrin 2002, 143.

202 Willis 1997, 89.

203 op.cit. 72.

204 McNeill 1977, 168.

205 Demirtaş 2004, 24; Deprem 1983, No. 1367

206 Durrell 1957, 173.

1954 A typhoid outbreak at Elmalı²⁰⁷.

1957 add to the chronology relating to the 1957 Fethiye - Rhodes earthquake: One is reminded of John Malalas's record of the destruction of Antioch in the earthquake of 526 A.D. that killed more than 250,000 people, of the clear danger of building on an alluvial plain. He writes in Book 17 of his chronicle describing this earthquake: "Christian loving Antioch became desolate. Nothing remained in this famous city except only one row of dwellings built against the mountain (ie. with foundations built upon rock)"²⁰⁸. The Australian travel writer Nancy Phelan who visited Fethiye shortly after this quake records: "with ruined buildings open to the sky and jagged walls leaning weakly up against each other in the heat, and rubble and masonry lying about in the dust. There was also the impression that the mains (water - sewer system) had been bombed and the water supply ran loose in the streets. It was quite true, there were plenty of houses "finish". They lay where they had fallen, with doors and windows gaping. In one part of the town streets of little wooden boxes (emergency housing) had been set up like a wartime settlement, and people were carrying on (living) in these. They were so close together that you could barely squeeze between them, and rather surprisingly in the middle of a row (of these little wooden boxes) was an upright Lycian tomb with a top like a fireman's helmet"²⁰⁹ (Fig. 4).

A detailed account of this earthquake shows that it comprised of two shocks, first a smaller one, then 7 hours later the major one, followed by a series of after shocks, on the 24th and 25th of April. The shock from the main earthquake was felt in Çanakkale, Konya and Adana, and in Cyprus, Lebanon, Israel and Egypt. 80% of the buildings in Fethiye were destroyed, in part, because they were built on alluvial ground where water seeped through to the bay, rather than on rock and they also suffered from poor construction methods and materials, only 2 buildings in the bay front district (Kıyı Mahallesi) were undamaged. At Kayaköy 43 houses were totally destroyed and 150 badly damaged, all were built on alluvial soil, but those houses in Kayaköy that were built on rock were only slightly damaged. Of the 425 buildings at Üzümlü 25 km. from Fethiye, 242 were rendered uninhabitable by this quake and the Beylik Period mosque's keystone was displaced and the arch was cracked. At Göcek Köyü 38 km. S.W. of Fethiye, of the 173 building, all were cracked and 40 were made uninhabitable while the school was destroyed and the mosque badly damaged. At Dalyan Köyü all the 350 houses were damaged and 200 were rendered uninhabitable. In the town of Marmaris west of Fethiye, 79 houses were destroyed, 224 houses were badly damaged and 310 partly damaged from a total of 800 houses, two mosques, the Özel İdare building and the Kaymakam's house were destroyed and, of the 120 shops, 40 were badly damaged. At Rhodes there was major damage to buildings in the N.W. of the Island, Rhodes city suffered major damage, particularly within the walled city, with houses collapsed, structural cracks and the wooden portico to the Sultan Mustafa Mosque collapsed. At Datça 40 buildings were destroyed, 17 were badly damaged and 30 slightly damaged. At Muğla, Ula and Yatağan about 1% of buildings were slightly damaged. The Ministry report following this earthquake lists a total of 3,796 houses, 20

²⁰⁷ Bayburtluoğlu 2004, 15.

²⁰⁸ Malalas 1940, 128.

²⁰⁹ Phelan 1965, 182. Photo 4.

schools, 3 mosques, 23 official buildings and 124 workplaces that were totally destroyed. A further 586 houses, 34 schools, 5 mosques, one official building and 14 workplaces were badly damaged; while 669 houses and 46 schools were slightly damaged²¹⁰.

1959 Add to the chronology, of the Köyceğiz earthquake of the 25th of April: One district of the town of Köyceğiz was almost totally destroyed, of the 19 houses in Karagünlük district, 15 were destroyed and the other 4 suffered severe damage. Of the other 9 districts of the town, containing 2,290 houses, 5 were destroyed, 108 were severely damaged, 171 were damaged, and 279 were lightly damaged, as were 10 mosques and 5 schools²¹¹.

1961 add to the chronology, of the Marmaris-Rhodes earthquake of the 23rd of May: Over a wide area natural springs of water were cut off and were displaced and there was widespread damage to buildings, not only in Marmaris but also on the Island of Rhodes from this event²¹².

1967 In this year, 58 villages in Antalya province, with a population of 74,682, were sprayed with 19,540 kilo's of D.D.T., due to the widespread occurrence of malaria, with 668 dangerous cases of malaria being treated in the province in the period 1966-7 and 90,774 blood tests for malaria amongst the population of the entire province were taken. In addition, of the other legally notifiable diseases, 51 cases of typhoid and 31 cases of anthrax poisoning were reported in the province²¹³.

1968 As a result of the widespread use of D.D.T. in Antalya Province in 1967, in 1968 only 3 cases of malaria were reported in Antalya, 1 in Akseki, 2 in Alanya, 7 in Manavgat and 3 cases in Serik, a total of 16 cases of malaria²¹⁴.

1969 Add to the chronology: The correct date was the 14th of January 1969. There was much damage to the schools and mosques in the area of Kalkan. In addition to 50% of the houses in Kalkan township being rendered uninhabitable, in the adjacent areas 8 houses were totally destroyed and 26 partly destroyed, while in Bezirgan and Yayla villages 14 houses were rendered uninhabitable. The shock from this earthquake was strongly felt in Finike, Kaş and Fethiye²¹⁵. The cost of this earthquake to just the schools in the effected region is given in the Province's budget for 1970, together with the cost of repairing flood damage to schools in the province in the same year, which reached a total of 1.238.742 TL²¹⁶.

1969-70 The German archaeological survey team working at the antique city of Phaselis, by Kemer, Antalya, was stricken with malaria and two members, H. Schlager and Ali Özgür died from it²¹⁷. Malaria had been prevalent from before the 2nd quarter of the 3rd century A.D. at Phaselis, due to the areas of stagnant water and swamp, caused by

²¹⁰ Eyidoğan et al. 1991, 98-100, Şekil 36c, 36d, 3.38.

²¹¹ op.cit. 1991, 105-6 Şekil 3.43 Çizelge 3.3.

²¹² op.cit. 106 Şekil 3.45.

²¹³ Antalya 1967, 129.

²¹⁴ Antalya 1968, 96 Tablo 43.

²¹⁵ Eyidoğan et al. 1991, 141.

²¹⁶ Antalya 1970, 29 "Sel ve depremden zarar gören okullar için talep edilen ödenek. 1.238.742 TL"

²¹⁷ Bayburtluoğlu 2004, 75.

the gradual silting up of the port²¹⁸. Alexander the Great, even earlier, at Phaselis in 334 B.C. suffered from malaria which he had contracted in the area. It may be that the fever suffered by Alexander after swimming in the icy Cydnus River by Tarsus in July 333, was in fact a malarial relapse, brought about by the sudden change in his body temperature, with his fever lasting from July to October²¹⁹. The Lycian port city of Patara was doubtless also infested with malaria from before the 12th century A.D., for this same reason, the silting up of the port, leading to the formation of marsh and swampland and breeding grounds for malarial mosquitoes, as was also the case for the small port by Manavgat and also by the estuary of the Kargı Çayı West of Alanya. This was also the case with the nearby Carian port of Caunos, at one time forming a part of Lycia²²⁰, a city that has been noted since antiquity for the prevalence of fever, almost certainly malarial, amongst its population living within an area of swampland, that has been steadily enlarged over the course of centuries, due to alluvial silt deposition and to the changes in the course of the Dalyan (Çayı) stream over time. Strabo in Book XIV of his Geography relates that the 4th century B.C. harpist Stratonious, seeing the Caunians were pitifully pale green (in complexion), said that this was the thought of the poet (Homer) in the verse, "Even as in the generation of leaves, such is that also of men", and when people then complained that he was jeering at the city as though it were sickly, he replied, "Would I be so bold as to call this city sickly, when even its corpses walk about?"²²¹; while Freya Stark described Caunos as: "a death-trap from malaria through all the centuries that preceded the discovery of D.D.T."²²².

Perhaps the only benefit to be gained from malaria was in the treatment of the insane, a observation recorded by the Bukharan born physician Abu Ali al-Husayn ibn Sina (980-1037), known in the Latin West as Avicenna, in his "al Qanun fil al Tibb", translated in the West as, "The Cannon of Medicine"²²³. It seems this 11th century work influenced the work of the Western physician Julius von Wagner-Jauregg early in the 20th century, when he successfully treated syphilitic patients by deliberately infecting his patients with malaria. The malarial fever induced temperature destroying the syphilis, with the malaria then controlled by quinine, a therapy that won him the Nobel Prize in 1927 and this therapy was employed in the West until the late 1940s, when antibiotics replaced the malarial treatment of syphilitic patients²²⁴.

The founder of the medical branch of science, Hippocrates (460-377 B.C.?), who practiced medicine on the Island of Cos, opposite Bodrum, had identified the tertian and quortan, 3 and 4 day, fevers that are associated with malaria, showing its prevalence in the region in the 5th century B.C.²²⁵, although the link of malarial fever with the malarial

²¹⁸ op.cit. 74; Livy also remarks on the unhealthiness of Phaselis XXXVII 23.1.

²¹⁹ My thanks to H. Çimrin for drawing my attention to Alexander's case of fever at Phaselis; Hammond 1997, 85 for the fever at Tarsus; Willis 1997, 151 "Plagues" for a modern parallel to Alexander's, in my opinion, probable case of malarial relapse at Tarsus.

²²⁰ G. E. Bean, Lycian Turkey (1978) 30.

²²¹ J. Freely, The Western Mediterranean Coast of Turkey (1997) 179.

²²² Stark 2002, 109.

²²³ Hitti 1967, 215.

²²⁴ Wills 1997, 170-1, 199.

²²⁵ Jones 1909, 62-4.

plasmodium, through the vector of the Anopheline mosquito was not established until the 1890's²²⁶.

The exposure of the native population inhabiting the Southern Coastline of Anatolia to chronic malaria over the course of centuries has resulted, as is also the case in the malarial regions of West Africa and elsewhere, in genetic modifications and to the production of sickle cell red blood corpuscles in heterozygous individuals, providing some valuable resistance to this disease. Perhaps the earliest evidence for thalassemia and of malaria in the region dates from the Chalcolithic period settlement of Lemba-Lakkous on Cyprus perhaps 6,500 years ago²²⁷. However, the intermarriage of couples carrying this genetic alteration can lead to genetic disorders (Thalassemia) and to a relatively high rate of infant mortality and to other health problems and, since the near elimination of malaria by the 1970's in Antalya Province, medical attention by pediatricians and other specialists has focused on this problem, amongst those families that have been resident in the region for generations and have acquired the genetic defect giving resistance to malaria. The figures for the various forms of anemia are not distinguished into types, sickle cell, iron deficient etc, at the provincial health directorate level, which reported a total of 765 male cases and 1996 female cases of anemia in the province in 2004, figures which may suggest quite significant under reporting of anemia. In the first 11 months of 2004 at the University hospital in Antalya, one of a number of State and private hospitals in the region, 15 adult cases of thalassemia were treated including 3 new cases, while a total of 12 cases of childhood thalassemia have been treated at this relatively new, 22 year old, hospital with one new case being admitted this year²²⁸. Due to the problem of thalassemia, amongst others, marriage in Antalya province can only be conducted after blood tests are taken to ensure that sufferers from sickle cell anemia-thalassemia do not marry each other and pass on their genetic inheritance to their children, although they can get married without a blood test in other provinces of Turkey, as this is a law pertinent only to the marriages in the province.

It is only since the suppression of mosquitoes with D.D.T. by the late 1960's that the population of the province has been able to rapidly expand, and this increase in population has largely been the result of large scale immigration by citizens of the Turkish Republic from other parts of Turkey, who have been drawn to the region through the growth generated by international tourism, in part supported by World Bank Loans, in the province since the 1960's, with the population of the province increasing nearly 7 fold, from 232,345 in 1926 to 1,719,751 in November 2000, and with an increase in Antalya city's population 41-fold over the same period, with the bulk of this increase occurring over the past 40 years. Without the suppression of malarial carrying mosquitoes, the development of international tourism and associated high rise skeletal-frame concrete construction in the province would not have happened, and the recent phenomenal increase in the human population of the region would not have been possible.

²²⁶ MacNeill 1977, 280. In the 'Hippocratic Writings' Ed. G. E. R. Lloyd, 1987, it is noted that: 'The diseases usually peculiar to rainy periods are chronic fevers', 214, and other malarial fevers, 100-101.

²²⁷ K. Deckers 2002, 27-34.

²²⁸ A survey of all the records of thalassima in all of the province's hospitals will be published by haematologist Yrd. Doç. Dr. A. Küpesiz in 2005; my thanks to Assistant Prof. A. Erdoğan M.D. for his assistance.

1972 A tsunami-like wave 5 m. high swept into Antalya Bay into Konyaltı and swept away the entire newly constructed harbour arm of the main harbour to the West of Konyaltı Beach²²⁹.

1977 This quake recorded in last years article's chronology should read SSE of Antalya, not SSW.

1982 The use of D.D.T. was officially terminated in Antalya Province and substitute poisons are today employed to control the mosquito problem in the region. Although official D.D.T. use was stopped in this year, the consequences of the long term use of this toxic cumulative poison, which accumulates in fatty tissue and is passed on in milk from mother to child, from cow to calf, and builds up in the upper reaches of the food chain and in the soil, remains, as in all the other areas of the world where D.D.T. has been used over a long period. It is to be noted that 8 varieties of *Anopheles* mosquito have been found in Antalya Province to date: *Anopheles Superpictus*, *A. Algeriensis*, *A. Claviger*, *A. Hyrcanus*, *A. Maculipennis*, *A. Marteri*, *A. Plumbeus* and *A. Sacharovi* and, *Anopheles Superpictus* has been found in Antalya city for the first time in 2003²³⁰.

1996 On the 9th of October an earthquake measuring 6.2 struck Paphos in Cyprus at 16:11. The shock from this event was felt along the Southern coast of Anatolia, in Israel, Palestine and Egypt and there was significant cracking to buildings in Cyprus and 2 people died in Egypt, as a result of this quake²³¹.

2002 On the 3rd of February Sultandağ. Afyon was struck by an earthquake of magnitude 6.5 on the Richter scale, causing significant damage and loss of life in the area. The shock of this earthquake was felt in Antalya.

2002-3 The Antalya Province's Health Directorate recorded 11 cases of the legally notifiable disease of malaria in this period.

2003-4 The Antalya Province's Health Directorate recorded 4 cases of the legally notifiable disease of malaria in this period. However, there is doubtless considerable under reporting in the official statistics, as not all those infected with malaria, particularly in areas away from the tourist developments and away from those areas that are sprayed with organophosphates, and in agricultural areas, organochlorates, to kill the mosquitoes, ever see a health worker, visit a doctor or hospital. The use of organophosphate spraying to suppress mosquitoes in Antalya city continues, although mosquito resistance to organophosphates is increasing and the human health risks from the use of organophosphates are known. In 2004 12 tons of Temophos, classified as "Moderate Toxic", were sprayed within the city of Antalya, although it is hoped that in 2005 only 10 tons will be used and that 3 tons of insect growth regulator (I.G.R.) will also be used, I.G.R. is classified as "Caution", rather than as a "Moderate Toxic", in a process leading to the gradual phasing out over the next few years of organophosphates, a toxin to which mosquito resistance is increasing. It has been suggested that the following program be introduced in

²²⁹ Personal communication from H. Tungar ABC press agency

²³⁰ İ. Şahin, "Antalya ve çevresindeki sivrisinekler (Diptera-Culicidae) ve Filariose vektörü olarak önemleri üzerinde araştırmalar II. Sivrisinek Faunasını belirlemek amacıyla yapılan çalışmalar", *Doğa Bilim Dergisi* 3, 1984, 385-396, 388. My thanks to H. Çetin for his discovery of *A. Superpictus* in Antalya city in 2003.

²³¹ Demirtaş 2004, 25.

Antalya city as a priority, if the ongoing spraying of organophosphates is ended: the use of insect growth regulators, bacterial toxins, plant extracts, the closing of the breeding areas of mosquitoes, particularly their access to septic tanks of which there are 90,000 in Antalya city, which is their main breeding ground in the city, the monitoring of mosquito resistance, the use of fish to eat mosquito eggs and larvae, and the education of those workers concerned with mosquito control employed by the municipality in respect to health and safety²³².

2004 On the 11th of April the province's Özel İdare Building of 13 storeys, built in 1978 in Antalya, had to be evacuated due to one of its concrete posts explosively disintegrating. It is suspected that this was the result of seismic activity over the last 25 years, probably along a fault that runs in the ravine, north from the sea at Kadınyarı, to the East of Güllük Caddesi which is directly adjacent to the rear of this building, stressing the structural reinforced concrete columns of this building, one of which disintegrated. Likewise the same month, in this same area, two further buildings, one Akdeniz University's Sağlık Yüksekokulu, had concrete structural columns disintegrate, so weakening these structures that they, like the Özel İdare building, have had to be evacuated and will probably have to be demolished.

In December 2004 the same happened to the State Hospital in Antalya, where a reinforced concrete support column exploded, possibly due to seismic stressing of the structure over the past 3 decades; while the "Çürük Raporu", the unsound building report, concerning state buildings in the city of Antalya of the same month was presented to the Governor of the Province of Antalya. It listed 119 unsound state buildings, including 9 schools and 3 hospitals in the city²³³. The city of Antalya has been listed as being in a zone 2 earthquake risk zone since its re-zoning from a zone 4 area (of negligible seismic risk) in April 1996²³⁴. The majority of structures listed in this report, along with most of the non-state buildings in the city, were built before 1996, when the serious seismic risk to the city of Antalya was officially recognized and so were constructed according to building regulations applicable to an area of negligible risk from earthquakes.

²³² My thanks to Research Assistant H. Çetin, one of only three underfunded specialists to be conducting field research on mosquitoes in all of Turkey today, research assistant at the Biology Dept. of Akdeniz University, for his knowledge and advice on this subject; H. Çetin, A study related to mosquito (Diptera: Culicidae) species in Antalya, their living areas and attempts to control them, (Unpublished MSc. Thesis, Akdeniz University, 2002) 97.

²³³ For example, "Çürük Raporu!", Antalya Ekspres and Akdeniz Hürriyet Gazetesi, 31 Aralık 2004 of the same day.

²³⁴ Duggan 2004, 153-4.

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Özet

Antalya İli ile Komşu ve İlgili Bölgelerdeki Deprem ve Salgın Kronolojisine Ek Tamamlayıcı Veriler

Bu makalede, Adalya VII, 2004'de yayımlanan ve Antalya İli, komşu ve ilgili bölgelerdeki 2300 yılı aşkın bir süreyi kapsayan salgın ve deprem kronolojisine eklenmesi gereken kronolojik sırada 90'dan fazla dipnotlu veri sunulmaktadır.

2004'te yayımlanan kronolojide üç düzeltme yapılması gereklidir: Antalya Körfezi'ndeki 1977 depremi Antalya'nın güney-güneybatısında değil güney-güneydoğusunda olmalıdır; 1931 depremi sonrasında Yivli Minare Camii'nin onarım tarihi 1953 değil 1935'tir; ve, Nureddin B. Zengi'nin Suriye'deki kalelerini tahrip eden deprem silsilesi (1169-70 başlığı altında verilmişti) 1158'de değil 1156-57'de olmalıdır. Kıbrıs'ı da etkileyen bu depremler Antalya'yı da etkisi altına almış olabileceğinden önem arz etmektedir.

Şu depremler hakkında ek bilgi verilmektedir: 240 Antalya, 1540'lar Alanya, 1743 Antalya, 1896 Rodos, 1911 ve 1931 Antalya, 1957 Finike ve 1969 Kalkan. Ayrıca Tekeli Mehmet Paşa Camii'nde 1850'de ve Bali Bey Camii'nde 1849-50'de gerçekleştirilen restorasyonların 1849 Antalya depremi sonrası ve Kaleiçi'ndeki Aya Yorgi (St. George) Kilisesi 1863 yılı restorasyonunun, 1858 Antalya depremi veya bir olasılıkla 1863 Rodos-Fethiye depreminin şoku nedeniyle yapılmış olabileceği öne sürülebilir.

Kıbrıs'dan gelerek, Antalya Körfezi, Meis/Kaş, Rodos/Fethiye üzerinden İstanköy'e uzanan fay hattı boyunca 20 yıl veya daha kısa zaman dilimlerinde meydana gelen şiddetli deprem ve tsunami dizilerinin periyodik tekrarına dikkat çekilmelidir. Bunun bilinen örnekleri şöyledir: 15. yy.'da 1481 Rodos, 1489 Antalya, 1491 Kıbrıs ve 1492 İstanköy; 18. yy.'da 1741 Rodos, 1743 Antalya, 1756 Rodos ve 1759 Antalya; ve de bir olasılıkla 20. yy.'da 1926 Finike, 1926 Rodos, 1931 Antalya ve 1933 İstanköy. Aslında bunların deprem silsilesi değil de yalnızca bir dizi tekil olay da olabileceği göz önünde bulundurulmalıdır. Bu 15. ve 18. yy. deprem silsileleri, adı geçen fay dizilerinde önemli bir zaman dilimi boyunca biriken gerilimin sonucu olup önemli boşalma/ayarlamalara, depremlere ve tsunamiye yol açtığı öne sürülmektedir.

Kıbrıs Adası'ndaki büyük veba salgınları 1346, 1362, 1438, 1641, nüfusun üçte ikisinin öldüğü 1692, 22,000 kişinin öldüğü 1760, ve ada nüfusunun üçte birinin öldüğü 1835 veba salgınları olup bunlar, daha az belgenin bulunduğu komşu Antalya için de güvenilir bir gösterge sağlamaktadır. Çünkü Antalya ve Kıbrıs arasında ticaret, göç ve Kıbrıs Paşalığı'nın idari yapısı -Anadolu'nun Alanya, İçel, Tarsus ve Sis sancaklarını da içeren, yani Köprü Çayı boyunca uzanan Teke Sancağı sınırına kadar olan güney sahilini denetim altında tutan, Osmanlı İmparatorluğu'nun 1571-1670 arasında kurduğu idari yapı- nedeni ile ilişkileri vardı.

19. yy.'da Kıbrıs ve Mısır'da karantina altına alınan ve Antalya bağlantılı hastalıklı gemilerle ilgili vakalar sıralanmaktadır.

Güney Anadolu'nun 1835'te veba salgınına uğramış bölgelerindeki dehşetli sonuçlar hakkında çağdaş, açık ve yetkin anlatım veren Alexander Hamilton'ın günlüğünden

ayrıntılı bir alıntı verilebilir; Hamilton, başka gözlemlerin yanı sıra, tarlalarda hasat yapılmadığını çünkü hasadı yapacak kimse kalmadığını ve evlerin sahipsiz ve boş kaldığını çünkü yasal hakkı olan herkesin salgından öldüğünü yazmaktadır. Beyşehir Gölü'nden aşağıya yapmayı planladığı seyahat Antalya ve civarındaki salgının şiddeti nedeniyle iptal edilmek zorunda kalmıştı. Bu alıntı, bölgede baş gösteren büyük bir salgının sonuçlarını bir çağdaşın kaleminden göstermekte ve her büyük veba salgını sonucu ortaya çıkan büyük nüfus kaybının sosyal ve ekonomik sonuçlarına kılavuzluk etmektedir.

1835-40 veba salgını bölgeye Kıbrıs'tan gelmiş olabilir ve 540 yılındaki ülkeler arası veba salgınından daha az etkili olduğuna dikkat çekilmelidir. 540 yılı büyük veba salgınıyla ilgili olarak Likya'daki durumu yakın zamanda 6.-7. yy.'larda terk edildiği gösterilen yerleşimlerle ilişkilendirirsek, yine aynı salgından yüksek ölüm oranı yüzünden yerleşimlerin terk edildiği Kilikya ve Kuzey Suriye'deki benzer durumla bağ kurabiliriz.

Bu ek makalede 1503, 1831, 1835, 1848 ve 1850 veba, 1853 çiçek hastalığı, 1920, 1945, 1948, 1969-70, 2002 ve 2003 sıtma vakaları için karantina kayıtları ve düzenlemeleri hakkında daha fazla bilgi verilmektedir.

Fig. 1

A photo of two children in Antalya Province, both suffering from enlarged spleens, published in *Türk Akdeniz Dergisi* in 1938.



Fig. 2 A photo of canal digging, part of the campaign against malaria with the draining of marshes and swamps, published in *Türk Akdeniz Dergisi* in 1938.



Fig. 3 An inspection for malaria cases at the village of Macar, published in *Türk Akdeniz Dergisi* in 1938

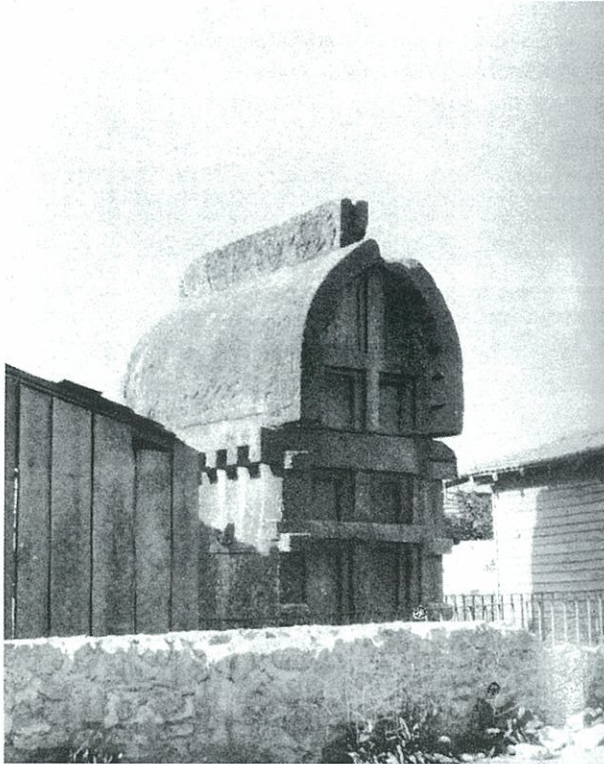


Fig. 4

A photograph of emergency wooden housing erected by a Lycian tomb at Fethiye, following the earthquake of 1957, taken by N. Phelan.

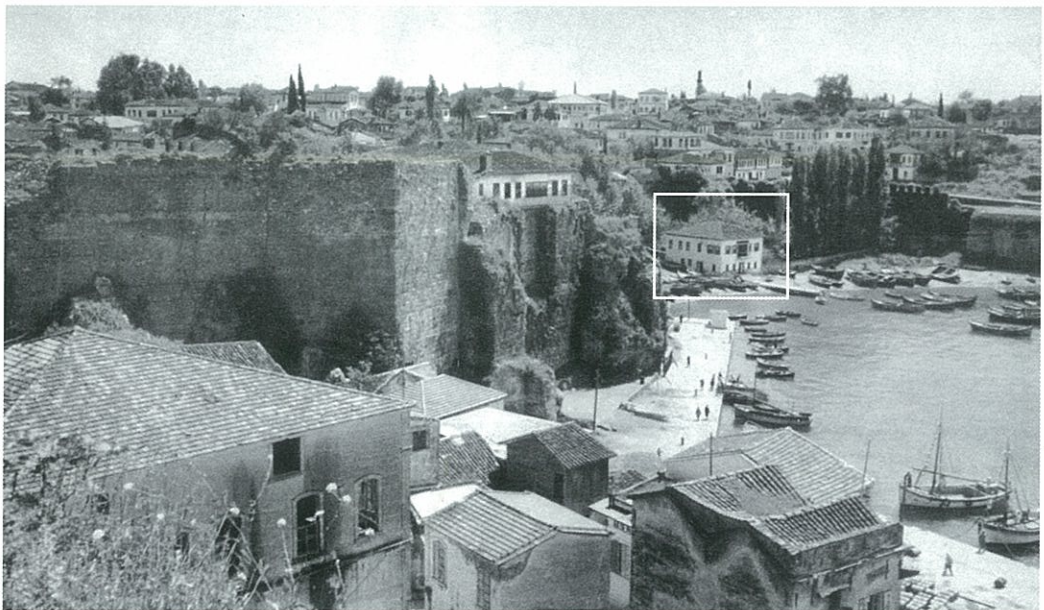


Fig. 5 Photograph of the, former 2 storey, pitched roof quarantine station built in the late 19th century inside the walled harbour of Antalya, demolished in the 1980's.