

Part II. Smallpox and the Descent of the Western Roman Empire Until Its Collapse in AD 476.

Smallpox is not that old of a pathogen to humans and the genomic evidence now indicates that it evolved from an ancestral rodent virus from Africa only 2000 to 4000 years ago. Not many pathogens can match the transcontinental reach that smallpox achieved in only several years. It was a deadly new pathogen that escaped the equatorial interior of Africa and cut a path of sickness and death that the Roman empire had never witnessed. The impact of the mortality was stupendous; in addition, there was a great variation in casualties according to where one lived within the empire. Cities on the integrated coast or those contiguously connected to the sea by rivers, inlets, bays, and waterways were the hardest hit; city dwellers, townspeople and villager fared far worse than those that lived in the distant reaches of the provinces where the remoteness of the open countryside mitigated the rapid spread of the virus. The pandemic killed infants and young children; a new generation of Roman youth was lost. Troops of the legions were decimated, and losses from smallpox in some of the worse hit barracks approached the high end of mortality in a society where 10-20% of the population succumbed. The disease penetrated the frontier of the Roman Empire during the reign of Emperor Antoninus Pius [AD 138 to 161] after a pestilence in Arabia in AD 156 and once inside the Roman territory it had few restraints besides its ferocity being slowed by its own effectiveness in exhausting its pool of susceptible victims. The microbe, a virus, escaped interior Africa and tight roped the webs of human trade and connectivity around the Indian Ocean. The Romans hypothesized that the dying started with the insurrection at Seleucia on the Tigris River, the city was a major entry point and collection center for goods and wares carried by Persian traders on the sea lanes crossing the Persian Gulf, Indian Ocean, and the Red Sea. The entrepôt of Seleucia was destroyed in AD 165 by the rebellious Roman general from Syria, Gaius Avidius Cassius, who was a usurper to the Roman throne. This Roman account of the plague's origin in Seleucia is doubtful and there is no certain proof that the causative agent of the Arabian pestilence was the same as that Antonine plague. But the association with the latter event is more than remarkable.

Smallpox was an illness that was directly transmitted by airborne droplets exhaled by the sick. The scope of the epidemic undercut the confidence of the Roman people who were ruled by an empire that had evolved from a hegemonic entity obsessed with geographical expansion into a territorial commonwealth; gradually, painfully at times, it had assimilated foreign diverse cultures into an entity that functioned under a common polity. The Roman citizens and residents had come to expect that Roman rule would ensure the common order, a predictable food supply, internal peace, and security. And in what was an insalubrious time to live compared to our present-day standards, a certain degree of health. The Roman Empire was urbanized far ahead of what was the norm for other areas of the ancient world. Historians appreciate the Roman engineering achievements, precocious marvels including public baths, communal toilets, aqueducts, cisterns, wells, fountains, and sewers that mitigated some of the most serious health hazards of living in densely packed quarters. At best, such innovation improved but did not come close to eliminating the plethora of possible health threats to their every-day lives.

Human activity fosters the environment that allow deadly organisms to live and move and is shaped by human endeavors and interference. Agriculture brought people in close contact with domesticated animals which often served as reservoirs of diseases like influenza, measles, tuberculosis, and leprosy; urbanization created the human congregation required for pathogens to circulate, and mercantile trade allowed endemic infections from one culture to exponentially expand into new, virgin territories. The Romans aggressively imposed their will on the land to suit their needs. Forest woodlands were cut for woodburning or cleared by slashing—and--- burning for cropland. They drained swamplands and built roads through intractable wetlands. They drained riverbeds or shifted their flow; Rome, the city itself, was no more than a series of hilltops rising over an alluvial floodplain and swamp. The eternal city suffered air pollution from extensive woodburning for fuel and in Latium soil erosion became a problem from the increased number of farming settlements. The reprisal for wide-scale encroachment was endemic malaria, which was always a killer, a perpetual albatross strung from the neck of Roman civilization. But the native people developed some degree of tolerance and endured. Starting in the second century, however, a new type of storm cloud gathered, an epidemic that quickly devolved into a conflagration. The smallpox *pandemic* was far-reaching on its effects on the functioning of a working society, the basic agrarian rhythms were sidetracked and some areas experienced famine for more than several years.

The great killers of Rome were spread by the spores of nature that existed beyond the reach of the empire. The most terrifying infectious disease since the times of Rome come from the wild, even today. Before the great Roman pandemics, most plagues recorded in the ancient histories were accentuations of endemic diseases; bacillary dysentery and malaria are prone to spikes and lulls across the span of years. The Roman world was repeatedly buffeted by epidemics brought about by environmental events that transiently caused native disease to accelerate into mass deaths. Originally Rome did not suffer from the invasions of fast-moving, exotic pathogens but the unexpected consequence of Roman expansion and social development was that such profound changes fostered a new disease ecology. Ironically, the very routes that brought the exotic beasts to gruesome slaughter in the Roman spectacles were that same pathways that brought to the Romans pathogen intruders that sparked the growth of new frontiers of disease. Diseases that unimaginably rendered a prosperous empire under Marcus Aurelius [AD 161 to 180] into an entity that was but 'dust and shadows' of its former self 500 years later.

To comprehend the origin of this decline, we must first examine the humblest of beasts, rodents--- especially those that resided in central Africa. Many rodents serve as hosts for the Orthopoxviral genus; the naked-soled gerbil, *Gerbilliscus kempfi*, harbors the orthopoxvirus species, *Tatera poxvirus*, which is the closest known species to the camel pox virus. Both viral species are the nearest genetic relatives to the smallpox virus, *Variola major*. Smallpox, camel pox, and *Tatera poxvirus* evolved from a common ancestor and each derivative species is specific to their individual, lone, obligate host. Human smallpox evolved from a rodent orthopoxvirus that correlates well with the range of the naked-soled gerbil in Africa. The centuries of later Rome were an age of pandemic disease. The first, as described, smallpox in AD 165, the Antonine smallpox plague, killed perhaps 7 million victims. The second, in AD 249, an indeterminate pathogen swept across the territories of Roman rule. And, in AD 541 the great pandemic of bubonic plague, arrived in force, waned, and reemerged in waxing spikes of deaths for two centuries. We cannot measure the impact of these repetitive cycles of plague on the decline of Roman life without outlining the alterations in the Roman climate which equally sapped the resiliency of the Mediterranean centric empire. As far as climate, *Fortuna*—the Roman goddess of good fortune—turned her backside

toward Rome. The warm and humid weather that was once everywhere in the lands adjoining the Roman world became blessings lost to the past. Variability of extremes persisted affecting various spheres and areas of the empire in diverse ways at different times. But the end of optimum weather was tumultuous in Roman life especially by the middle of the third century when some formerly fecund Roman territories experienced extreme drought and the resultant infertility due to the persistent aridity. The regional instability peaked then, but by the fourth century the climate had stabilized. After AD 266 there was not an impactful volcanic eruption, and the fourth century became warmer, and the Alpine glaciers were fast retreating by AD 350. The fourth century was more favorable but the Mediterranean world especially Italy was perched precariously now between the shifting and arbitrary winter storm tracks where strong rains would come or miss the peninsula altogether. At times, the northern parts of Italy received rainfall from the continent whereas central and southern Italy remained dry. Northern Italy resurged in the fourth century, but Campania and southern Italy became an 'emptied landscape' that no longer resembled the thriving agronomy of its recent past. Major droughts and famines were more often recorded in the written histories during the late empire. The deterioration of the climate started slowly, from AD 150 to 450 AD, Roman territories endured a transitional period, then dating from AD 450 to AD 700, a cold spell known as the Late Antique Little Ice Age. Often, climate change and pandemic disease acted synergistically and at other times significant climate events triggered ecological as well as genetic changes in pathogens that fostered more virulent disease. The global climate was beyond the control of humans whereas infectious disease is molded by human activity and interference. Biological change that initiated infectious diseases was nature's most terrible device for reprisal against human intrusion in the natural world and was the greater factor than climate change in deciding the fate of Rome. And of course, human societies when trounced by hardships do not lie still and accept their demise as their 'god-ordained' fate. They fight like 'dogs released from the bowels of Hell' to survive, at times trampling the lives and rights of those around them who have the resources for relief needed to deliver the suffering from their plight.

The 20-year period from circa AD 350 to 370 were megadrought years that are unparalleled for their severity for consecutive decades during the past two thousand years. Climate turbulence forced Hunnic nomads who perpetually sought out new and greener pastures to coalesce into an aggressive confederation whose center of gravity moved westward from the steppe lands between Kazakhstan and Mongolia. By AD 370, the Huns crossed the Volga River, and their warlike presence terrorized the Goths who inhabited the lands north Danubian plains for over one century. The Huns scornful of agriculture descended upon the Gothic food supply and snatched it like hungry wolves devouring a kid goat. The quiet equilibrium that the Goths maintained with the nearby Roman-ruled territories was rudely 'kicked off kilter.' Independent Hunnic cavalry launched ferocious assaults on sturdy horses skillfully ridden by riders who were excellent sharpshooters with their deadly weapon, the composite reflex bow. They were almost glued to their horses, who like the Huns were hardened to endure cold, drought, hunger, and casualties. Their lightning cavalry maneuvers, and 150-meter death zone accuracy of the Hun archers made them an unnerving sight to all who opposed them in battle. In AD 376, upwards of 100,000 Goth refugees—men, women, and children---in flight from the Hunnic brutality, sought asylum within Roman territory. The Romans were confused and indecisive on how to manage the border crisis. Some thought the Goths represented an opportunity to increase Roman military recruitment. Some of the fleeing Goths were ferried across the Danube River under Roman management. But altruism from imposition quickly transformed into venal exploitation. Starving parents were forced to sell their young into slavery as barter for food. Mongrel and scrawny dogs were offered as meat by some Roman

profiteers to a desperate human tide of panicked refugees. Anger simmered and rebellion ensued, and soon the Goths were in open revolt. Renegade, mercenary Hun cavalry units, always in search of plunder, independently aided the Goths for money in their rebellion against Rome. Valens, the eastern Roman emperor rushed hastily to the conflict and given faulty intelligence and impatiently refusing to await his western empire allies, attacked with his elite troops. Some 20,000 Roman soldiers were lost at the Battle of Adrianople in AD 378, a figure representing two-thirds of Valens's force who himself was killed during the debacle. Realistically, the entire elite fighting force of the eastern empire along with most of their battle-hardened command were massacred. The western Roman court seeing the evisceration of their eastern counterparts and discouraged by poor recruitment of the necessary troops needed by Rome as a counterforce, negotiated a new policy with the Goths. In exchange for refuge on Roman lands, the resettled bands of Germanic peoples would provide military recruits for Rome to secure its frontier border; the recruits would serve under their own native leaders. For half a millennium, assimilation of foreigners into the Roman army was a novel ploy to integrate Roman culture; now, in desperation Rome began what some saw was a dangerous 'barbarization' of the Roman military. The Romans gambled that the Goths would be loyal to the empire. Eventually, that bet placed during a time of weakness, went sour. The domination of the geopolitics of Rome and the control of its frontiers soon evaporated from the resourcefulness of the western empire. Militarily, the 'fall' of the western empire occurred during the years from AD 405 to 410. The empire was inundated by a series of attacks beginning in AD 405 when tribal Goths from beyond the border crossed *Noricum*---parts of Austria and Slovenia---and ravaged Italy. Generalissimo Stilicho was able to repel that threat but on December 31 AD 406 an alliance of Suevi, Alans, and Vandals---crossed over the Rhine River and advanced into Gaul and Spain. They would never be evicted and henceforth Roman control beyond the Alps was marginal or lost. The chaos of the years AD 405-408 were not invasions *persé* but rather mass migrations of refugees---once again caused by the shifting of Hun power westward. Masses of people from Germanic tribes including women and children in train fled into Roman territories from the middle Danube and could not be assimilated as easily as the Goths previously taken in by the Romans. The Huns under King Uldin were now dominating the homelands of others as far west as the Hungarian plain and the peoples displaced sought their fortunes in the Roman west. In the crisis, Rome deluded itself into believing that the Goth King Alaric would be loyal to the Roman government. After all, they were legally bound to obey the Roman emperor, but Alaric was crafty, and he led his warriors across the Alps and laid siege to the surrounded city of Rome. He embargoed the city's food supply and tried to extort a massive payment of tribute. The Romans resisted but after a long three years, on August 24 of AD 410, Alaric led his army into the city. The last time the eternal city had fallen into hostile hands was under an invasion of Celtic tribes in 390 BC, 800 years earlier. Alaric and his Christian Goths refrained from conducting wanton wholesale pillage and slaughter, but the extinguishing of complete Roman rule was a symbolic watershed. To many the brightest light in the entire world was darkened. The inability to maintain its military prerogative, had made the unimaginable, the unthinkable---quite a real calamity for the western empire. Former provinces like Britain were thrown upon their own devices while some provinces as in northern Africa were simply commandeered by local warlords. Rome through legal means still administered the settlements of Goths in Aquitaine, the Burgundians of Savoy and the Ostrogoths who had colonized Italy but often the needs of the provincials were dismissed to accommodate the increasingly desperate requirements of what remained of the Roman imperial center. Despite outnumbering all immigrants, the machinations of the state structure ceased to be Roman led, and the 'barbarians' wielded the levers of power.

The most infamous Hun, Attila, scaled up the Hunnic military in AD 440 and for a decade he mopped up the remnants of the Roman west especially the Balkans, enriching his royal court with plunder. In AD 447, when a high-intensity earthquake destroyed the defensive walls of the eastern capital, Constantinople, Attila the Hun posed an existential threat to the eastern empire also. It was written in AD 447 by Count Marcellinus: "*Paene totam Europam excisis invasisque civitatibus atque castellis [Attila] conrasit.*" Meaning, 'Attila ground almost the whole of Europe into the dust.' His soldiers were repelled only by the local germ pool that discouraged their advance. Attila recouped and led two grand campaigns against Gaul and Italy as his huge army of Germans and Huns crossed the Rhine River in AD 451. He was met by the Roman general, Aetius, who led a Roman contingency of Italians and Germans who in open battle proved successful in stalemating the Hungarian advance that was now far from its steppe homeland. The Hun leader made another encore when his thundering horde advanced into greater Italy and plundered the Po valley. Milan fell without a fight and Attila housed his entourage in the imperial palace. In Rome, unable to muster enough soldiers to seriously counter him, the Romans sent an embassy headed by Pope Leo himself to meet with Attila. The unmerciful Huns soon retreated, crossing the Alps to the Hungarian plains. To the Romans, to the Christian believers especially, the deliverance was nothing less than heaven-sent. What really was ordained however was the Hunnic collision with indigenous disease that protected the heart Italy with a gauntlet of pathogens that were often deadly to newcomers. Horses kept by the invaders were pastured in the frequently flooded lowlands where the *Anopheles* mosquito bred, the Huns were victims of the often-fatal protozoan infection of malaria. The fierce but calculating Attila, shrewdly reversed course sending his cavalry back toward the high steppe beyond the Danube where because of the cold and dry climate the biting mosquito could not follow. The plunderers and marauders were gone, and some historians believe that their only 'contribution' to the progress of Europe was the terror that uprooted the tribal nations of greater *Germania* and sent them afoot, running for their lives into the western Roman Empire. Attila again regrouped after taking refuge on the Hungarian plain but threatened to make war upon the Roman eastern empire when he did not receive his full tribute from Emperor Theodosius the Great—the last Roman emperor to rule a unified empire--- but his plans never materialized. His life ran out of time. For Attila, his end was ignoble. Before the campaigning season of AD 453, he added another wife to his lengthy line of breeding females, a girl of great beauty. At the wedding banquet, Attila drank far into the night and after retiring he did not reappear for almost all the next day. Eventually, his worried servants forced an entry into his sleeping quarters and found his young bride, still veiled, crying besides his dead body. His body had no trace of harm except that he had suffered a heavy nosebleed, not his first, and being so drunk, he had suffocated, drowning in a pool of his own blood.

The Huns retreated but the effect of their intrusion lingered, the Roman world left behind was uprooted from its central administration, the integrity of the empire wilted in the west. It was in these years that the Roman western army ceased to exist as an institution and in AD 476 their ceased to be an emperor in the Roman west. In most of the fifth century the vaunted productivity induced by the imperial reign was halted and reversed. Roman efflorescence and the imperial renaissance most evident in the cities under Roman rule, wilted away like a dying flower. The urban areas dwindled. The population of the Roman capital collapsed, and Rome devolved into only a shadow of its former glory. Rome became just another town suffering stagnation and decline. The circuits of wealth generation had been broken but illogically the gap between the 'have-nots' and the 'haves' widened. The great private fortunes of the Roman elite dissipated because of the disappearance of the imperial system that provided great profit to those who were in privileged positions as they supposedly served Rome, and fortuitously the

Christian church became the wealthiest landowner and as such became more influential in what was left of the Roman civilization in Italy. The northwestern provinces suffered a similar pattern of decline, in northern Africa the negativity was less pronounced and for the time being the eastern empire remained sheltered behind the natural barricade afforded by to its physical geography.

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*To be continued...

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