

## ‘The Great Terror’

New England’s Dark Day May 19, 1780 with other accounts of natural and manmade atmospheric conditions in history.

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For several days leading to May 19, 1780, residents in cities, towns, villages noticed an unusual, strange activity in the gathering skies over New England. A welcomed spring had been preceded by one of the most bitterly cold winters on record. Though the air was warmer, it also appeared, felt thick and heavy. The previous evening the sun had taken on a reddish tone with the moon glowing pink at night continuing to the next morning. General George Washington, camped with his Continental Army in nearby New Jersey, penned a diary entry. "Heavy and uncommon kinds of clouds, dark and at the same time a bright and reddish kind of light intermixed with them." As a military man, surveyor in youth, he was keenly aware of weather, and atmospheric conditions. The gloomy morning skies were cool with a light rain falling. From Maine, New Hampshire, Rhode Island, Massachusetts, Connecticut, people rose for the day tending to occupations on farms, shops, and mills. By 8 or 9 AM most noted something was amiss with a mass of rust-colored clouds suddenly blowing in from the west blotting out the rising sun with a dimming to a hazy, copper-colored sky. In Weston, Massachusetts, merchant Samuel Philips Savage marveled over the veil the color of cider "descended over the whole visible heavens. The birds of the night were abroad and by their melancholy notes added to the solemnity of the scene."

Revolutionary War soldier, Joseph Plumb Martin, penned: "We were here [in New Jersey] at the time of the "dark day" happened, it has been said that the darkness was not so great in New Jersey as in New England. It was very dark where I was so much that the fowls went to their roosts, the cock crew and the whip-poor-wills sung their usual serenade; the people had to light candles in their houses to enable them to see to carry on their usual business; the night was as uncommonly dark as the day was." In Ipswich, Massachusetts frogs peeped, flower petals folded with a total darkness like night falling at 2:00 PM with a noticed strong, sooty smell in the atmosphere, rain water had a light film over it made up of particles of burnt leaves and ash. Laborers were forced to halt work not being able to discern the wall they were building to the dark sky. Professor Samuel Williams at Harvard noted, "This extraordinary darkness came on between the hours of 10 and 11 AM, continued until the middle of the next night." Other contemporary reports mentioned cinders and ash fell in parts of New Hampshire to a depth of six inches. Pennsylvania remained strangely untouched. At the height of darkness a piece of white paper held within inches of the eyes could not be discerned.

With communication and technology of the day primitive, people found the darkness to be baffling, inexplicable, frightening with increasing religious and superstitions to the event. Clergyman Timothy Dwight penned, "A very general opinion prevailed that the day of judgment was at hand. People rushed to churches to confess sins and pray." When searched out for a meaning to the terror, Dwight quipped he "was in the dark about the matter just as you are" with his famous pun. As the god-fearing took refuge in churches and prayer, others made a bee-line to the nearest tavern for soothing drink. In Salem, Massachusetts, lawyer

William Pynchon observed a group of booze-soaked sailors “went hallooing and frolicking through the streets” exhorting the town’s ladies to strip off their clothes and join them in morbid celebration with “Now take off your rolls [clothes, skirts] and high caps and be damned.”

A scene unfolded in the then Connecticut Governor’s Council abruptly being halted due to the frightening darkness. Councilman Abraham Davenport, a Connecticut military colonel with a strong resemblance to Benjamin Franklin, refused to end the meeting stating, “I am against adjournment. The day of judgment is either approaching, or not. If it is not, there is no cause for an adjournment; if it is, I choose to be found doing my duty. I wish therefore that candles may be brought.” Davenport’s courage was commemorated in a poem penned in 1866 by John Greenleaf Whittier titled ‘Abraham Davenport.’. Edwin Markham also commemorated the event in his poem ‘A Judgment Hour’ in his ‘The Gates of Paradise and Other Poems.’ A short excerpt from Whittier’s poem:

“T’was a May day of the far old year  
Seventeen hundred eighty that there fell  
Over the bloom and sweet life of the Spring  
Over the fresh earth and the heaven of noon  
A horror of great darkness like the night  
In a day, which the Nordland sagas tell—  
The Twilight of the Gods.  
And there he stands in memory to this day,  
Erect, self-poised, a rugged face half seen  
Against the background of unnatural dark,  
A witness to the ages as they pass,  
That simple duty hath no place for fear.”

Many believed the event one of the fulfillments of biblical prophecy. The Dark Day also provided Ann Lee, leader of the Shakers living in Niskayuna, New York to present her religious testimony to the public.

The Great Darkness lingered the rest of the day and into the night remembered as the darkest on record with people sleeping fitfully or not at all remaining awake. To the relief of all the darkness lifted the following morning with prevailing winds. Debates raged on the causes from transit of Venus or Mercury, a stalled solar eclipse, a meteor strike, mingling of evil vapors to the divine retribution of the ongoing American Revolution. Harvard professor Samuel Williams delved into weather data collecting personal accounts learning the Darkness was limited to New England with reports of “thick, dark and sooty” rain with the smell of burnt leaves. Could it have been a huge cloud of ash and smoke from distant wildfires? These theories dismissed as “simple and absurd” by newspapers of the day. At the time primitive weather forecasting known only to a few academics with farmers and sailors at sea having a better knowledge of winds on sea and land.

Decades would pass until another ‘Dark Day’ appeared in 1881 reducing sunlight in New England by 90%. The massive forest fire theories were confirmed in 2007 when researchers from University of Missouri found evidence of wide-ranging centuries-old forest fires in the Algonquin Highlands of southern Ontario. Studies of tree trunks found “fire scars” in tree rings dated to the spring of 1780. Religious teaching, art work, poetry reflected the event for years to follow with many New Englanders observing the date for fasting and prayer. Candidate for president, John Kennedy, ever the applied student of history, speaking on a campaign trip in the Carolinas invoked the memory of ‘The Great Terror’ exhorting his audience to cast their votes for him “Come the Great Terror or not!” There is no record how many of his audience made any connection or how they voted. Recently a study was conducted asking a diverse population what their own theories were causing ‘The Great Terror of 1780’ with fanciful explanations from aliens visiting earth, solar system cloud masses, natural earth phenomenon, planets out of alignment, great fires, clouds of insects to a very poetic opinion being “just an enchanted hue.”

#### ‘The Great Donora, Pennsylvania Smog of 1958’

A strange, choking ‘fog’ began building up in the Monongahela River city of Donora, Pennsylvania, population 14,000, 24 miles southeast of Pittsburgh on Wednesday, October 27, 1948 soon named ‘The Great Donora Smog.’ Sixty years later the incident was described by *The New York Times* as “one of the worst air pollution disasters in the nation’s history.” Respiratory distress first attributed to asthma grew by Sunday, October 31 and rain, with one-third to one-half of the population sickened with 20 deaths at the time, another 50 deaths within a month. Ten years later mortality rates in Donora were significantly higher. One notable fatality was Lukasz Musial, father of future baseball Hall of Famer and the 1948 National League MVP Stan Musial.

Hydrogen fluoride and sulfur dioxide emissions from U.S. Steel’s Donora Zinc Works and its American Steel & Wire plant became trapped in a temperature inversion with warmer air

aloft trapping pollution in a cold layer near the earth. The pollution mixed with natural fog to form a thick, yellow, acrid poisonous gases trapped in the layers lasted five days only to be ended with changing air flow, cleansing rains. Driving became impossible with some “scraping the curbs with heads out of the car to see.” Fire Chief John Volk and assistant made house runs depleting their 800 cubic feet of oxygen while the town’s eight doctors made house calls often conflicting with each other until Cora Vernon of the Red Cross set up a phone communication system to assist the triage of patients. The only remedy Chief Volk mentioned taking himself was “a shot of whiskey” each time he returned to the fire station. It wasn’t until Sunday morning, the 31<sup>st</sup>, when August Chambon, Donora Mayor, requested the plants be shut down which they had been doing since 6:00 that morning . When the rain fell quelling the smog, the plants opened promptly the following morning with business as usual.

Researchers found the zink plant the main offender already having killed all vegetation within a half-mile radius of the plant. Environmental Oncology, University of Pittsburgh Cancer Institute found autopsy results showing levels of fluorine in the lethal range 20% higher than normal with the trapped fluorine in the stagnant air the main cause of death. Research by Mary Amdur on the smog effects was pressured to withdraw her publication but refused to be bullied. Dr. Clarence A. Mills, University of Cincinnati, wrote thousands more could have been killed if the smog had lasted longer.

In lawsuits U.S. Steel never acknowledged responsibility for the cause calling it “an act of God.” The company in 1951 reached a settlement of \$235,000 for 80 victims which meant little after legal fees at less than \$3,000 each. American Steel and Wire settled \$4.6 million in 130 damage cases at 5% of what had been requested claiming the cause was from “freak weather conditions” that trapped over Donora “all the smog coming from homes, railroads, steamboats, exhaust from automobiles and the plants.” U.S. Steel closed both plants in 1966. The incident prompted the clean air movement and Clean Air Act of 1963. Award winning writer, Berton Roueche wrote articles, short stories focusing on the Donora incident. Devra Davis’ 2002 novel ‘When Smoke Ran Like Water’ opens with the Donora Smog. The ‘Donora Smog Museum’ opened October 20, 2008 with the logo “Clean Air Started Here.” At present fewer than 6,000 people live in Donora.

#### ‘The Great Smog of London, 1952’

London, England had suffered poor air quality since the 13<sup>th</sup> century that worsened in the 1600s and even more with the growth of the industrial revolution and the mining of various grades of coals for export, domestic use in factories, mills, rail locomotives, power stations, steamships, homes and public buildings. The ‘Great Smog of London’ may not have been met with hysteria, superstition, religious fervor as New England’s ‘Great Terror’ of 1780, but no less

concern for human health and mortality. The 'Great Smog' lasted from Friday, December 5<sup>th</sup> to Tuesday, December 9<sup>th</sup>, 1952. On December 4<sup>th</sup> an anticyclone settled over a windless London, causing a temperature inversion with cold, stagnant air trapped under a layer, called "a lid," of warm air. The resulting yellow-black smog mixed with particles of tarry soot known as a "pea soup" bolstered by new diesel-fuelled buses that had recently replaced the tried and true electric tram system.

Public service and private transport, sport events ceased with smog seeping into enclosed spaces, stages, movie screens, concerts, churches, and other large assembly areas making it hard to see from the seats. Walking out of doors reduced to shuffling to avoid tripping over curbs. Pollution sources, as mentioned, increased by cold weather demanding more coal heat in homes. The better quality of "hard coals" were mined, exported to pay off World War II debts, domestic coal low-grade with high sulphur content similar to 'lignite' was in general use. During the smog 1,000 tons of smoke particles, 140 tons of sulphur dioxide that naturally converted to 800 tons of sulphuric acid was released. Pollution control systems at the huge Battersea power station actually worsened the smog due to flue-washing systems cooling the temperature of the flue-gasses so they did not rise for upper air dispersion but sank to ground level. A case of man and nature combining to produce a disaster.

Most victims were the very young or elderly, those with pre-existing respiratory conditions with an early estimate of 4,000 deaths. In 1953 Marcus Lipton in the House of Commons suggested 6,000 deaths with 25,000 more people claiming sickness benefits in that period. Another report, in a veiled attempt to shield the real causes, blamed the deaths on an influenza epidemic. Most deaths from hypoxia, obstruction by pus arising from lung infections mainly bronchopneumonia or purulent bronchitis superimposed on chronic bronchitis.

Eventual legislation brought the Clean Air Acts of 1956, 1958 to the United Kingdom. Open coal fires were replaced by gas or electricity similar to new clean air initiatives here in Pittsburgh and other American cities, and towns with industrial bases. In Great Britain, coke as a low smoke fuel for a time was permitted. Slow progress in air quality control resulted in one later smog event in early December, 1962. Further statistical, clinical research in Great Britain in 2004, revealed higher death estimates at about 12,000 stemming from the 1952 event. Sound familiar? The 'Great London Smog' is the central event in episode 4 of the Netflix production 'The Crown.'

'Other 'Yellow Days,' 'Clean Air Days' From Natural, Manmade Causes'

But what of our own present day experiences with climate change, natural phenomenon, man-made causes within living memory with both heating and cooling of earth's atmosphere at high levels and earth's surface?

Scientists early as World War II noted earth surface temperature changes due to high level atmospheric changes from increasing air craft flights over England with resultant cirrus cloud coverage. May, 1944, massive German air raids employing 1,400 aircraft over England in the Blitz detected as lowering daytime surface temperatures by two degrees Celsius. Conversely, NASA scientists in studying earth warming linked high level cirrus 'contrails' from increased air traffic for twenty years starting in 1975. Events of 9/11 had FAA [Federal Air Administration] ordering 4,000 air craft grounded during the emergency reducing high level frozen vapor recording a two degree Celsius earth surface temperature decrease.

June 15, 2001 Mt. Pinatubo, Philippines, experienced a massive eruption ejecting 15,000,000 tons of aerosol pollutants 30 miles high nearly 100 times the normal level that circulated world-wide. For the next 15 months morning and evening light glowed with spectacular hues and colors along with a one degree F. decrease in world temperatures.

The massive eruption of Mt. Saint Helens, Washington State, May 18, 1980 was destructive but could have been far worse if closer to major cities. Many tonight recall four to five days later the light gray talcum powder volcanic ash falling over Cincinnati evident for two days on tops, hoods of cars, window sills, outside tables.

The year 2010 witnessed the eruption of Eyjofjalajokull volcano in Iceland forcing grounding of aircraft for days to avoid airborne volcanic ash being sucked in jet engines, converting to glass from engine heat with potentially disastrous results.

#### 'Air Quality Linked To Pandemics, Olympic Games, Global Recessions'

Bill Magavern, director for 'Coalition for Clean Air' told ABC News, "We're seeing in places the best air quality in decades; due to the drop in air pollutants from the COVID Pandemic with fewer surface vehicles, aircraft, exhaust from factories." During March, 2020, NASA found a 30% drop in air pollutants in the northeast section of the United States. Locales in China, India, mountainous regions of the U.S., people are seeing their horizons clearly for the first time in years with no smog. In 2008 Drew Shindell, Duke University, noted a drop in air pollutants due to the economic world recession. That year's Summer Olympics in Beijing smog dissipated with the government implementing temporary air pollution controls. Shindell cautioned that short term benefits "went back to normal levels once the events ended." The same no doubt has and will occur when full shelter-in-order regulations due to COVID are lifted. Whether obvious cleaner air figures are noted with policies working on further cleaner air initiatives are accepted remains to be seen. He ends with, "It can be apparent to people how smog is not natural and how much we can be in control of it."

June 25, 2020 a dozen U.S. states, Caribbean, and South America witnessed a 5,000 mile Sahara Dessert dust plume from the Sahel turning skies from a milky white to a brown color exceeding previous values of air tests reducing sun light by 20% with reduced heat. One benefit with short-term suppression of storms from dessert dry air but some increase in vertical wind shear. Past dust storms from Africa over a long period have benefitted the soil fertility in the Amazon rain forest. Readings in Cincinnati from June 25 to 28 were “moderate to unhealthy for those in sensitive groups.”

‘Epilogue’

Physicist William Corliss’ research found 46 accounts of “Dark Days” on earth from the year 1091 to 1971. Poets, writers for centuries have focused on “enchanted hues” to “Dark Days.” John Milton penned in ‘Paradise Lost.’

“Yet from those flames

No light, but rather darkness visible.”

From John Milton’s ‘Sampson Agonistes.’

“Oh, dark, dark, dark, amid the blaze of noon, Irrecoverably dark, total eclipse

Without all hope of day.”

For those of us here in the older generation there has been a silent, insidious “Great Terror” drifting down on us with Cincinnati being in the cross hairs from 1945 to 2018. Just in the U.S. from 1945 to 1990 with 904 nuclear atmosphere tests in Nevada, 209 underground tests in addition to those conducted from Amchitka, Alaska, Colorado, Mississippi, New Mexico including Russia, France, United Kingdom, People’s Republic of China, India, Pakistan, North Korea.

By the early 1960s there was no place on earth where the imprint of atmospheric nuclear testing could not be found in soil, water, polar ice. Those of us living in Cincinnati and the region are termed “Downwinders” in the fallout path. Prior to 2009 the United States the only nation to compensate nuclear victims with \$1.38 billion dollars since 1990, mostly to those living in Nevada and nearby states. An estimated world-wide 11,000 plus deaths related to thyroid cancer linked to iodide 131 and bone marrow cancers, but with the total number never accurately known to date. But clearly obvious the total then, now and in the future will no doubt increase but still never be known.

From what has been presented so far in this paper, we have come to see the difference between the “Dark Days” of natural disasters over the centuries to a blending that are both manmade and natural. A recent commentary in National Geographic’s ‘Explore’ by Elizabeth

Kolbert's titled 'When 'Natural' Disasters aren't' states "Perhaps fires, storms, and viruses fed by climate change should be called what they are: Man-made natural disasters."

During August of 2020 we witnessed again a hint of "The Great Terror" when a known 560 wildfires in California so bad smoke drifted across the continent again veiling the sun in New England. Author David Quammen moves many of these events further: "We disrupt ecosystems, and we shake viruses loose from their natural hosts." That new host is going to be us. Andrew Dessler, professor of atmospheric studies, at Texas A&M University, comments, "If you don't like all of the climate disasters happening in 2020, I have some bad news for you about the rest of your life."

Other incidents in living memory here of natural and man-made disasters working in concert are: The Great Dust Bowl of the 1930s. Ten Mile Island nuclear accident. Chernobly nuclear reactor melt-down that made its way in the form of radioactive fallout over Scandinavia, Central and southern Europe. The great Japanese earthquake, tsunami, and failure of the Fukushima nuclear reactor.

My own encounter with the Chernobyl disaster was in 1994 on an extended trip to Russia and the Ukraine. In Kiev, my group was entertained for an afternoon on a Dnieper River excursion boat. Noting a fine sand beach and park along the shore with Russians picnicking, playing volley ball—but nobody swimming in the river--I questioned Tanya, our translator and guide. She put her finger to her lips, pointed and in a whisper said, "Chernobyl—up river." Later she again whispered to me, "When you shop in local antique stores or city markets please do not purchase any antique item no matter how lovely. Many items were taken from the Chernobly radiation zone and are being sold in markets and are potentially hot with radiation. It is illegal but there is no control of this."

The concept of the 'Apocalypse' dating to Ancient Greece as "an uncovering...prophetic revelations" being manifested, made clear to man warning of his present and future condition. Christians believing that the biblical Book of Revelation depicts an "apocalypse" in the complete and final destruction of the world. The classic Four Horsemen of the Apocalypse being: Conquest, War, Famine, Disease and Death. Sound familiar?

In "Ten Notable Apocalypses That (Obviously) Didn't Happen," 'The Great Terror' of 1780 was included. But number one, and the oldest warning, penned on an ancient Assyrian clay tablet dating from 2,800 BC, now 4,821 years ago, translated in contemporary language today reading.

"Our earth is degenerate in these later days; there are signs that the world is coming to an end; bribery and corruption are common; children no longer obey their parents; every man wants to write a book and the end of the world is evidently approaching."

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Gentlemen, tonight I ask

What do you think?

END