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Collapse of Earth's Biosphere: A Case of Planetary Treason

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ABSTRACT

Earth's life support systems are breaking down, including the stratospheric ozone layer, which protects all higher life on the planet from deadly ultraviolet radiation. This breakdown is a direct result of human activities including the large-scale manipulation of processes that affect Earth's climate, otherwise known as geoengineering. We present further evidence that coal fly ash, utilized in tropospheric aerosol geoengineering, is the primary cause of stratospheric ozone depletion, not chlorofluorocarbons, as "decreed" by the Montreal Protocol. The misdiagnosis was a potentially fatal mistake by mankind. Coal fly ash particles, uplifted to the stratosphere, are collected and trapped by polar stratospheric clouds. In springtime, as these clouds begin to melt/evaporate, multiple coal fly ash compounds and elements are released to react with and consume stratospheric ozone. Contrary to the prevailing narrative, the stratospheric ozone layer has already been badly damaged and now increasingly deadly ultraviolet radiation, UV-B and UV-C, penetrates to Earth's surface. Our time is short to permanently end all geoengineering activities, and to reduce and/or eliminate all sources of aerosolized coal fly ash, including first and foremost the jet-sprayed emplacements into the troposphere that are systematically breaking down Earth's support systems and poisoning life on this planet.

DELIBERATE COLLAPSE OF EARTH'S BIOSPHERE

Anyone with a deep connection to nature can see how badly the natural world is suffering. Once healthy forest are now dying. Fields and roadsides no longer bustle with insect life and each spring and fall migration brings fewer and fewer birds. The richness and diversity of life on Earth is disappearing at an incredible rate (Figure 1). Beyond the explosion of species extinction, there are massive population declines of both plants and animals with cascading effects on ecosystems necessary for our continued existence [1]. Human activities have destroyed over two-thirds of the world's wildlife in just the past fifty years [2, 3] and there is no end in sight. Few scientists have found the courage to sound the alarm about our dire situation [4]. And far fewer realize that much of our current environmental crisis is deliberately caused.

Science appropriately applied has the potential to improve life on Earth. But for decades Earth science has been twisted and defiled, used as a tool to disrupt natural processes on a global scale, to destroy life, and to deceive humanity. Here we disclose the causal commonality underlying the collapse of the biosphere which, we submit, constitutes no less than *Planetary Treason*.

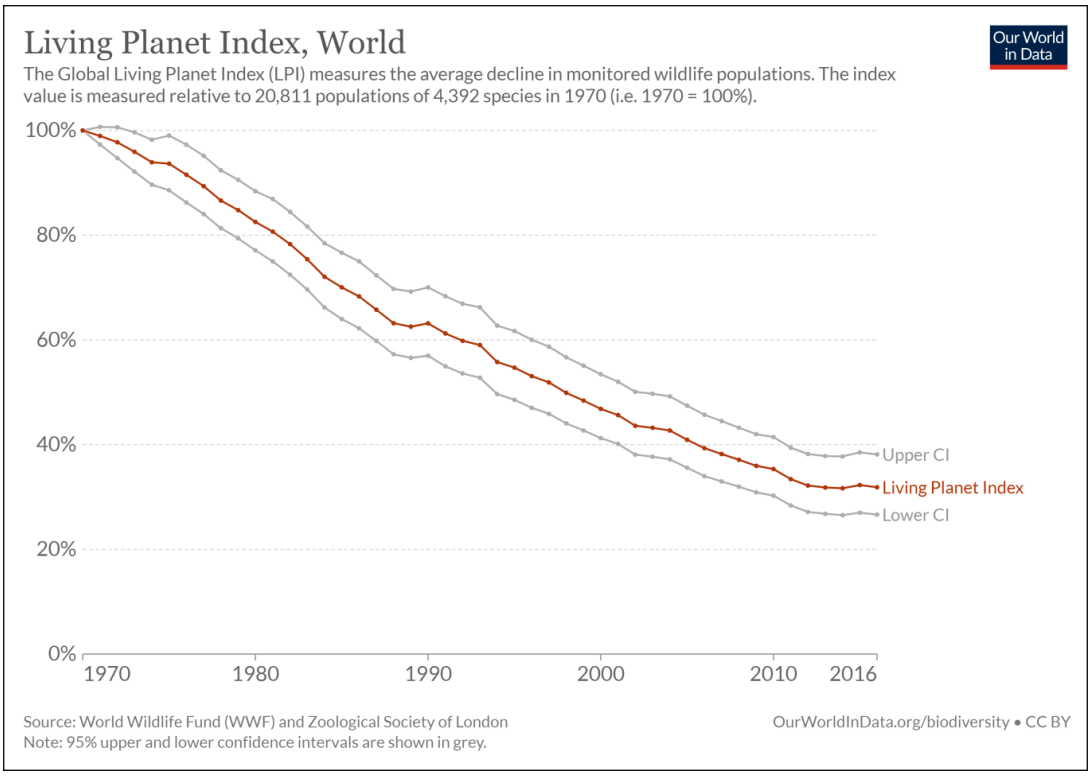

Figure 1. The global decline in 20,811 monitored wildlife populations of 4,392 species since 1970.

UNITED NATIONS COMPLICITY

The United Nations has been at the forefront of activities related to the destruction of Earth's natural environment and the collapse of the biosphere.

The 1978 United Nations' "*Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques*" [ENMOD] [5], as we revealed [6], obligates signatory nations to *fundamentally compromise their own sovereignty* and to bring about widespread, permanent agricultural devastation. Instead of *prohibiting* "*Hostile Use of Environmental Modification Techniques"*, as its title suggests, ENMOD *obligates* signatory nations to participate in unspecified "peaceful" environmental modification activities performed by unspecified entities, under unspecified circumstances, without limitation to harm. Whether harm is inflicted on a nation or a region's agriculture, its environment, or on the health of its citizenry does not matter from ENMOD's international legal point of view because its intent is "peaceful." Nevertheless, large-scale *environment modification* cannot be construed as "peaceful." Instead, it is fundamentally hostile as it damages Earth's self-protective natural processes.

The veil of ENMOD deception was pierced by applying precise knowledge of contract law to ENMOD's Articles [6]. The highly secret "*peaceful*" environmental modification project activity was discovered by an accidental release of material "pseudo-cryoconite" from an aircraft in 2016 [7, 8], which appears to have been formulated to melt Arctic ice, presumably, to open a northern passage for ships from China.

A more familiar display of the United Nations' sanctioned perversion of Earth's natural environment is the near-daily, near-global jet-sprayed particulate pollution of the troposphere shown in Figure 2. Forensic scientific investigations demonstrate that the jet-sprayed material is consistent with coal fly ash, the toxic waste product of burning coal [9-13].

Figure 2. From [14]. Deliberate jet-emplaced particulate trails, clockwise from top left San Diego, California (USA); Karnack (Egypt); London (England); Danby, Vermont (USA); Luxembourg (Luxembourg); Jaipur (India).

The coal fly ash jet-emplaced pollution, shown in Figure 2, is conducted covertly without the informed consent of the citizens who must breathe the toxic particles.

Published scientific and medical articles implicate aerosolized coal fly ash in neurodegenerative disease [15], COPD and respiratory disease [16, 17], lung cancer [18], cardiovascular disease [19], COVID-19 and immunopathology [20, 21].

Aerosolized coal fly ash contributes to global warming [22], disrupts habitats [23], contaminates the environment with mercury [24], decimates populations of insects [25], bats [26], and birds [27]. Aerosolized coal fly ash also kills trees [28, 29], exacerbates wildfires [30], enables harmful algae in our waters [31], and destroys the stratospheric ozone layer that shields surface-life from the sun's deadly ultraviolet radiation [32, 33]. Despite the official narratives of "ozone recovery" due to the *Montreal Protocol*, stratospheric ozone levels continue to decline [34]. Ozone depletion has already led to an alarming increase in deadly ultraviolet radiation, UV-B and UV-C, penetration to Earth's surface, with increasingly apparent devastation to both plants and animals [35-38].

UNITED NATIONS CONFLICTED

United Nations complicity in poisoning the air we breathe is best indicated by the *inactions* of the World Health Organization. On two occasions we submitted a "perspective" to the *Bulletin of the World Health Organization* warning of the adverse health consequences of deliberately jet-emplaced aerosolized coal fly ash into the air we breathe. In each instance those submissions were rejected without ever being subject to peer-review [17].

The Intergovernmental Panel on Climate Change (IPCC) was created in 1988 by the World Meteorological Organization and the United Nations Environment Programme allegedly "*to provide governments at all levels with scientific information that they can use to develop climate policies*." The IPCC, however, is agenda-driven and serves to promulgate the false idea that global warming is mainly caused by carbon dioxide and other greenhouse gases. The so-called "*scientific information*," is not scientific at all. First, there is no mention of the climate consequences of the jet-sprayed particulate matter, such as shown in Figure 2. Second, subtracting two large numbers, radiation from the sun minus radiation from the Earth, yields a small number that is overwhelmed by errors. Third, and most important, global warming and regional warming are caused mainly by tropospheric particulates [11, 39-44], not greenhouse gases.

On one hand the United Nations' IPCC deceives the public as to the cause of global warming [45]. On the other hand, the United Nations' sanctions are in fact causing global warming and climate chaos by "geoengineering" actions undertaken in secret under aegis of its *Trojan horse* International Treaty [5]. All the while, the World Health Organization ignores and suppresses mention of the adverse public health consequences of the tropospheric jet-emplacement of toxic coal fly ash [17]. But that is not all. Since 1989, the United Nations has exacerbated the destruction of stratospheric ozone, Earth's self-protective mechanism against the sun's deadly ultraviolet radiation.

The sun's light and warmth are crucial for life on Earth, but without our planet's natural self-protection mechanism, the sun's deadly ultraviolet radiation wreaks havoc. The sun's ultraviolet radiation interacts with the gases of the atmosphere forming ozone, O_3, a highly reactive gas that destroys the deadly ultraviolet radiation before it reaches Earth's surface. In 1974, Molina and Rowland [46] advanced a theoretical mechanism for ozone destruction putatively caused by chlorofluorocarbon compounds (CFC's), which were used for a variety of industrial purposes including refrigerants, spray cans, solvents, and foaming agents to create insulation.

In 1989, the United Nations (UN) formally adopted the "*Montreal Protocol on Substances that Deplete the Ozone Layer*" that included regulating numerous halogen-containing chemicals that readily form gases [47]. In doing so, the United Nations *decreed* that said halogen-containing chemicals were in fact the main cause of ozone depletion.

Despite the official narrative of "*gradual ozone recovery*" due to the *Montreal Protocol*, which led to the phasing out and later banning of chlorofluorocarbons (CFC's), the truth is that for 33 years Earth's stratospheric ozone continues to decline, and atmospheric scientists either do not know or will not say how badly the ozone layer has been damaged. The rapidly increasing penetration of ultraviolet radiation, UV-B and UV-C, to Earth's surface indicates a potentially dire depletion of stratospheric ozone [35-38]. The clearly visible destructive effects of ultraviolet radiation on global ecosystems, including forests [48-50], coral reefs [51, 52], and insects and microorganisms [53, 54] should be a warning sign that stratospheric ozone depletion may be the biosphere's most imminent threat [38].

The Antarctic ozone hole has worsened (Figure 3): Recently a large ozone hole was observed in the Arctic [55], and another in the tropics [56]. From these indications, as well as from the data shown in Figure 3 [57] and other data [58, 59], one thing is abundantly clear: The *Montreal Protocol* misdiagnosed the cause of stratospheric ozone depletion, and its sanctions on chlorofluorocarbons have not been the solution to this catastrophic problem.

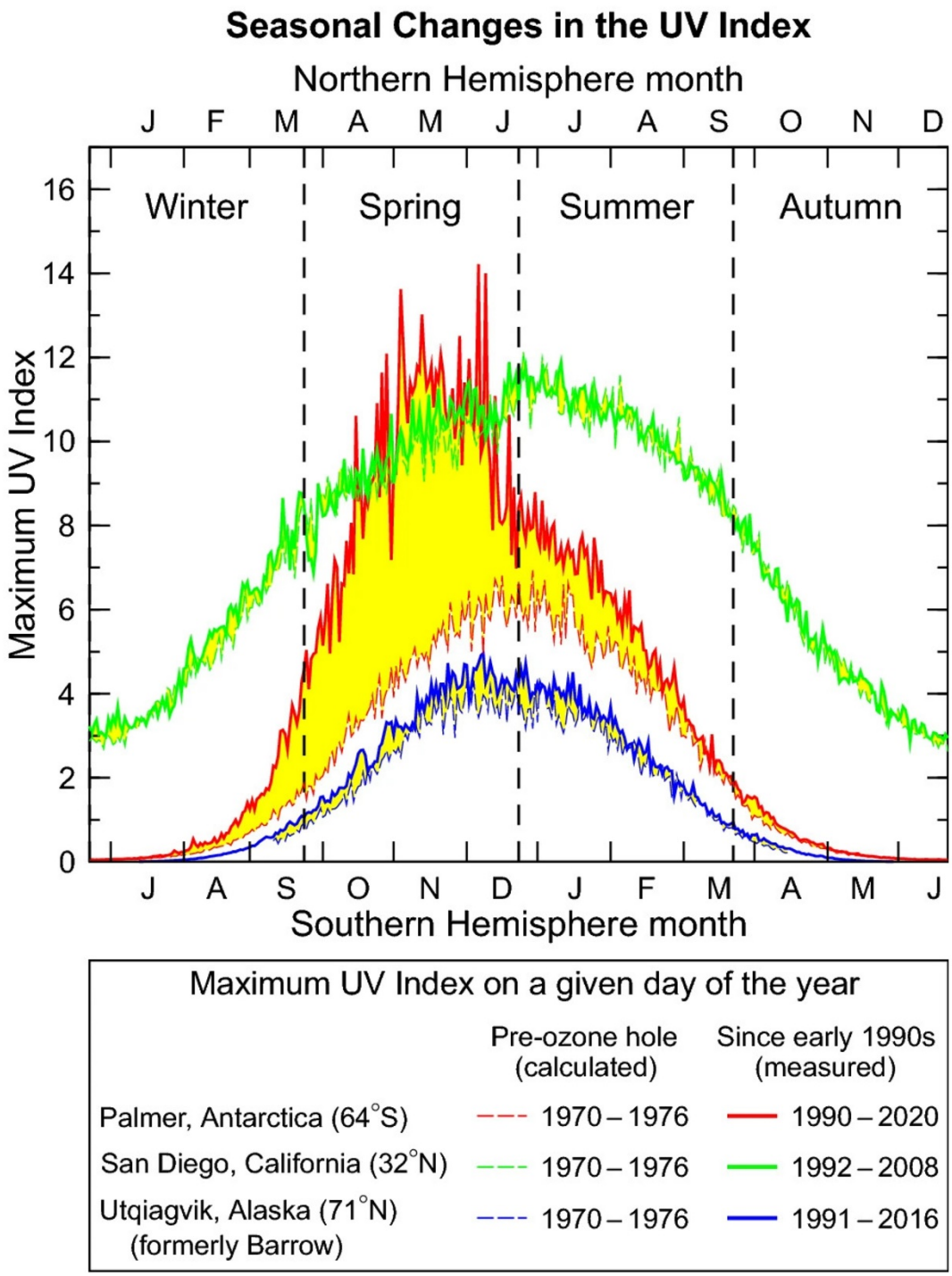

Figure 3. The current and historical status of stratospheric ozone revealed by measurements of UV Index disclosing the worsening of the Antarctic ozone hole. From [57]

COAL FLY ASH DESTRUCTION OF STRATOSPHERIC OZONE

In two previous scientific articles [32, 33], we questioned the idea that chlorofluorocarbon compounds (CFC's) are the main agents responsible for stratospheric ozone depletion, and presented considerable evidence that aerosolized coal fly ash is likely the most significant major cause of stratospheric ozone depletion (Figure 4), a cause that has been overlooked by

the scientific community. Here we review the evidence from the previous two articles [32, 33] and present additional supporting evidence that taken together indicates that aerosolized coal fly ash is a prime driver of environmental collapse and the precipitous decline in wildlife populations.

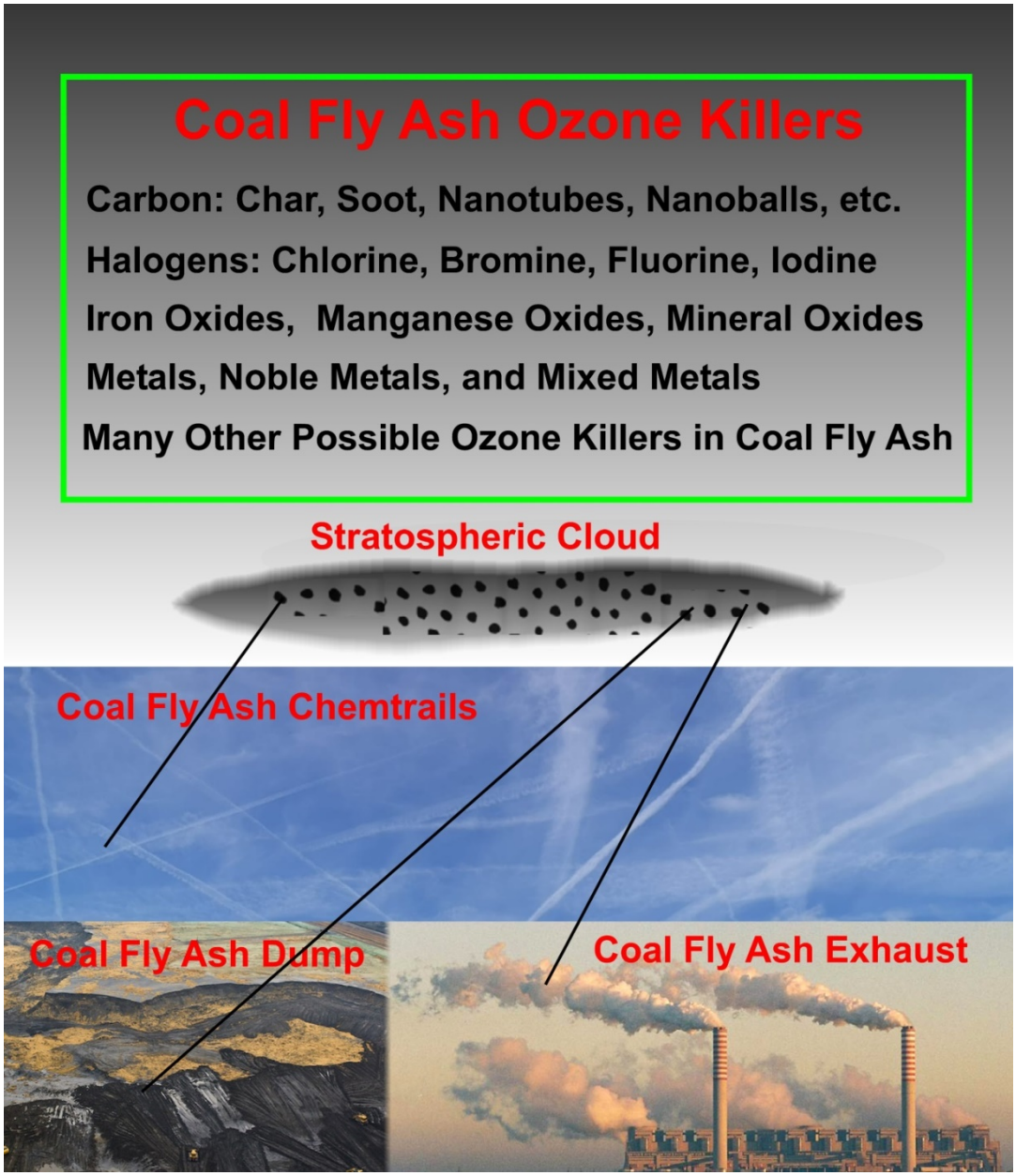

Figure 4. Graphic illustrating the major sources of aerosolized coal fly ash lofted into a particle laden polar stratospheric cloud, and some of the many components of coal fly ash that directly kill ozone [13, 32]

The use of coal is beset with serious environmental problems, including the formation of acid rain by sulfur dioxide and nitrous oxides. But far more devastating problems are caused by coal fly ash, the annual global production of which was reported in 2014 as 130 million metric tonnes [60].

During industrial coal burning, the heavy ash settles beneath the burner; the light ash, coal fly ash, forms in the gases above the burner and exits the smokestacks, unless, as in Western nations, it is trapped by electrostatic precipitators and sequestered. Even so, ultrafine aerosols from coal burning are likely to escape electrostatic precipitators [61] or be wind-blown from sequestration areas [62]. But the most devastating adverse consequence for life on this planet is the deliberate, covert, near-daily, near-global jet-emplacement of particulates, evidenced as coal fly ash, into the upper troposphere (Figure 2) [6, 13, 24, 63].

For decades, with increasing frequency and geographic range, particulate matter has been jet-sprayed into the troposphere (Figure 2). Internationally, officials decline to provide either the composition or the intent of the tropospheric particulate emplacement, and falsely assert that the jet-trails [64] are harmless ice-crystal contrails [65]. Academics participate in the deception [66, 67].

We published evidence that coal fly ash is the main aerosolized particulate jet-sprayed into the troposphere [23, 63, 68] by comparing element ratios relative to barium in rainwater and melted snow with corresponding ratios measured in the lixiviate of coal fly ash leaching experiments [69, 70] (Figure 5).

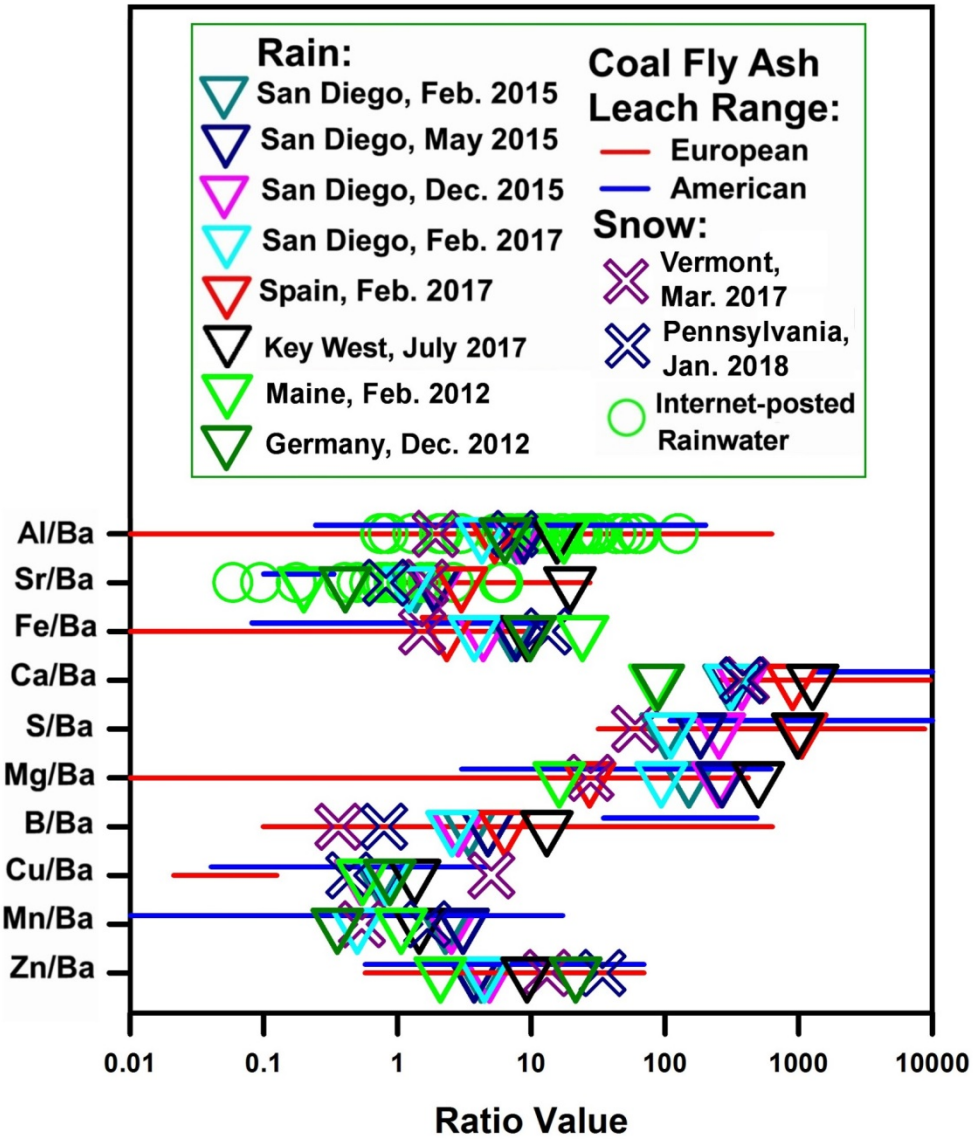

Figure 5. From [71], showing the similarity of element ratios measured in rainwater and snow with the range of comparable element ratios measured in the laboratory lixiviate of water-leach experiments [69, 70]

We have presented evidence [24] that tropospheric post-chemtrail snowfalls can collect and bring down coal fly ash aerosol particulates in a manner similar to the physical-chemical technique called co-precipitation [72] (Figure 6). One phenomenon we observed pertains to snow mold which sometimes forms beneath snow in northern latitudes, for example in Wisconsin, USA and Canada (Figure 7).

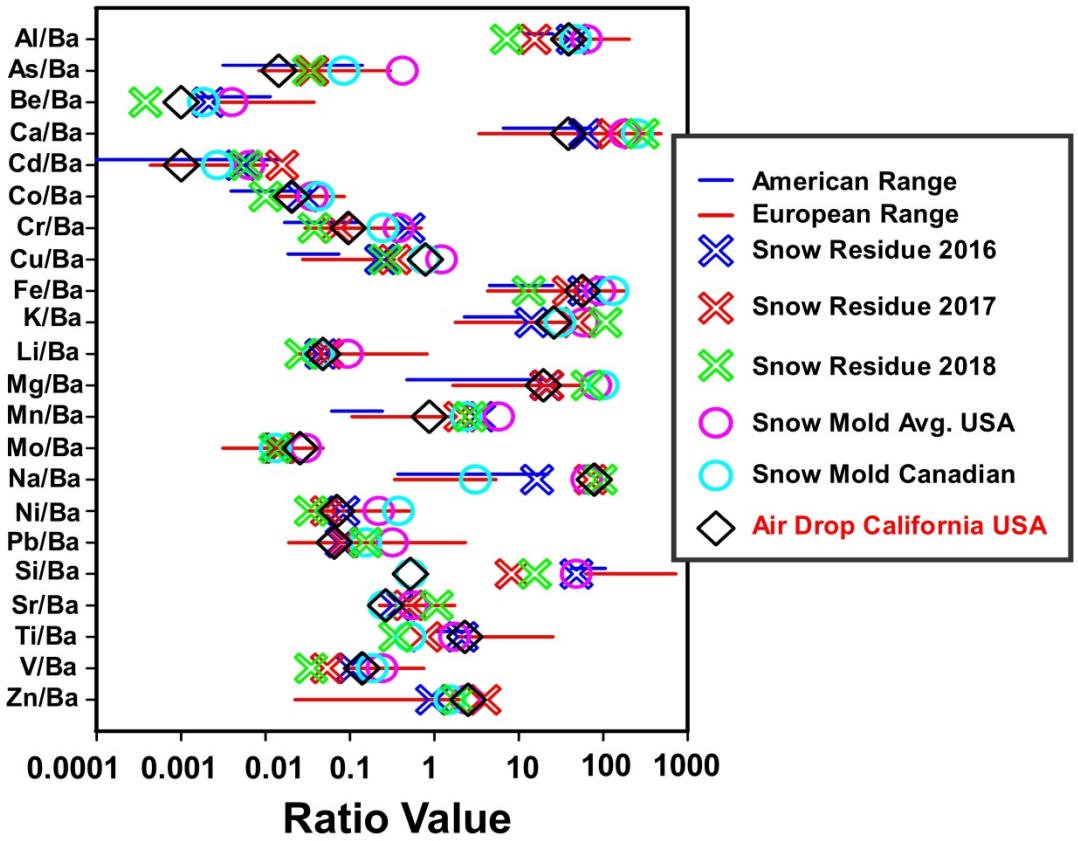

Figure 6. From [27], comparison of analytical results with the ranges of European [69] and American [70] coal fly ash samples

Figure 7. Snow mold fibers observed and sampled as snow was beginning to melt. From [24]

In springtime, as the snow begins to melt, it releases the trapped coal fly ash particles which descend and are re-trapped on the underlying snow mold. These observations suggest a commonality in behavior that is applicable to Polar Stratospheric Clouds and ozone destruction [32].

In 1970, Rosinski et al. [73] published an article appropriately entitled "Cirrus Clouds as Collectors of Aerosol Particles." In Figure 8 we present a re-plot of their mass ratios, converted to atom ratios, for comparison to average atom ratios of a set of measurements on 613 coal fly ash samples [74].

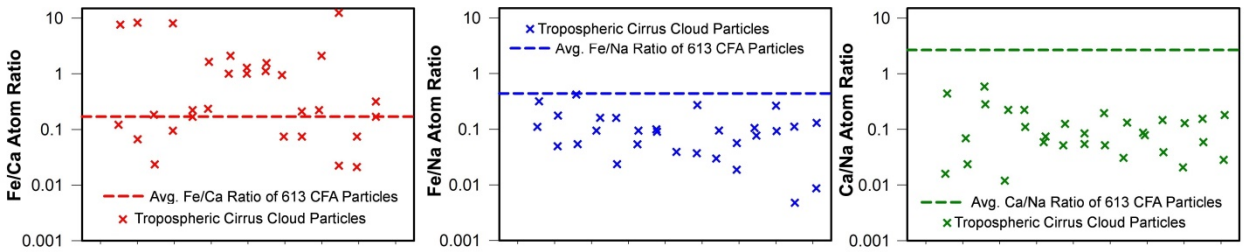

Figure 8. Fe/Ca, Fe/Na, and Ca/Na measurements of tropospheric cirrus cloud particles from [73] compared to the average values of corresponding ratios from 613 coal fly ash measurements [74]. Arbitrary abscissa units

Aerosolized coal fly ash has largely escaped notice as being involved in stratospheric ozone depletion, much less being the principal culprit [32, 33]. Previously, the origin of metal ions in the upper atmosphere has been ascribed to the evaporation of micro-meteors crossing the Earth's orbit and to mineral dust [75], but not to coal fly ash. The constituents of coal fly ash are considerably more reactive with ozone than either meteoric or mineral dust particles.

In 1982, McCormick et al. [76] reported sightings of Polar Stratospheric Clouds (PSC) by the Stratospheric Aerosol Measurement II (SAM II) satellite system. From SAM II data, Hamill et al. [77] concluded that light extinction could not be due to ice crystals alone, which implies significant particulate matter is associated with stratospheric clouds.

Polar mesospheric clouds, also known as noctilucent clouds, are thin layers of ice particles that occur between 82 and 87 km in the high-latitude summer mesosphere. Lidar measurements, using iron spectral wavelengths of 372 and 374 nm, show that these clouds overlap in altitude with a layer of iron, which they take up [78]. These results confirm our suggestion that coal fly ash particles (not just iron metal), lofted into the stratosphere, not only serve as ice-nucleating agents, but are trapped by clouds, including polar stratospheric clouds [32, 33]. In springtime, the icy stratospheric clouds melt/evaporate releasing their trapped coal fly ash particles, and making those ozone-consuming coal fly ash particles readily available for destruction-reaction with ambient stratospheric ozone [32, 33].

COAL FLY ASH IN THE STRATOSPHERIC POLAR VORTEX

Coal fly ash effectively nucleates ice at conditions relevant to mixed phase clouds. Enhanced ice nucleation by coal fly ash aerosol particles is initiated by their porous structure [79]. In the scientific literature, coal fly ash particles are often classified or confused with mineral dust particles. The majority of cirrus clouds freeze, or nucleate around two types of seeds, "mineral

dust" and metallic aerosols, presumably with important contributions from coal fly ash to both categories [80]. But as we describe with examples, there is considerable diversity of chemical composition which is characteristic of coal fly ash mineralogy.

Figure 9 shows an example of a captured tropospheric ice nucleus consisting of nanometer carbon balls [81] compared with similar carbon balls extracted from coal fly ash [82, 83].

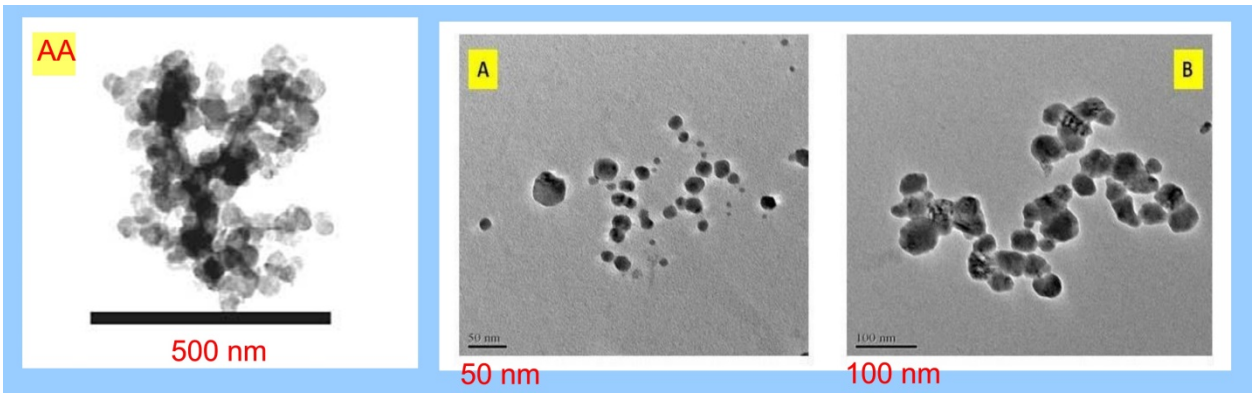

Figure 9. AA: Tropospheric ice nucleus composed of nanometer size carbon balls, adapted from [81]; A and B: similar carbon balls extracted from coal fly ash, adapted from [82, 83]

Carbon nanoparticles from coal fly ash occur in a variety of forms, as shown in Table 1, some of which have been observed in the polar stratosphere [84], for example, Figure 10.

Table 1. Different carbon nanomaterials extracted from coal fly ash. Adapted from [83].

Types of Nano-Carbons	Additional Descriptions	References
Fullerene (C_{60})	Hollow, spherical	[85] [86] [87] [88]
Nanocarbon and nanocoating	Nanoscale sooty or graphitic fullerene-like carbons; porous nanocoating	[89] [90] [91]
Carbon nanotubes	Single-walled or multi-walled; diameter of 8-20 nm; amorphous and crystalline nature	[92] [86] [93] [94]
Carbon nanoballs	5-10 nm	[95]
Carbon onions	Nanopolyhedra, onion-like particles	[96]
Chars	Porous, carbon-rich particles	[97] [98]
Soots	Ultrafine primary particles; aggregates of 10-50 nm diameter	[89] [99]

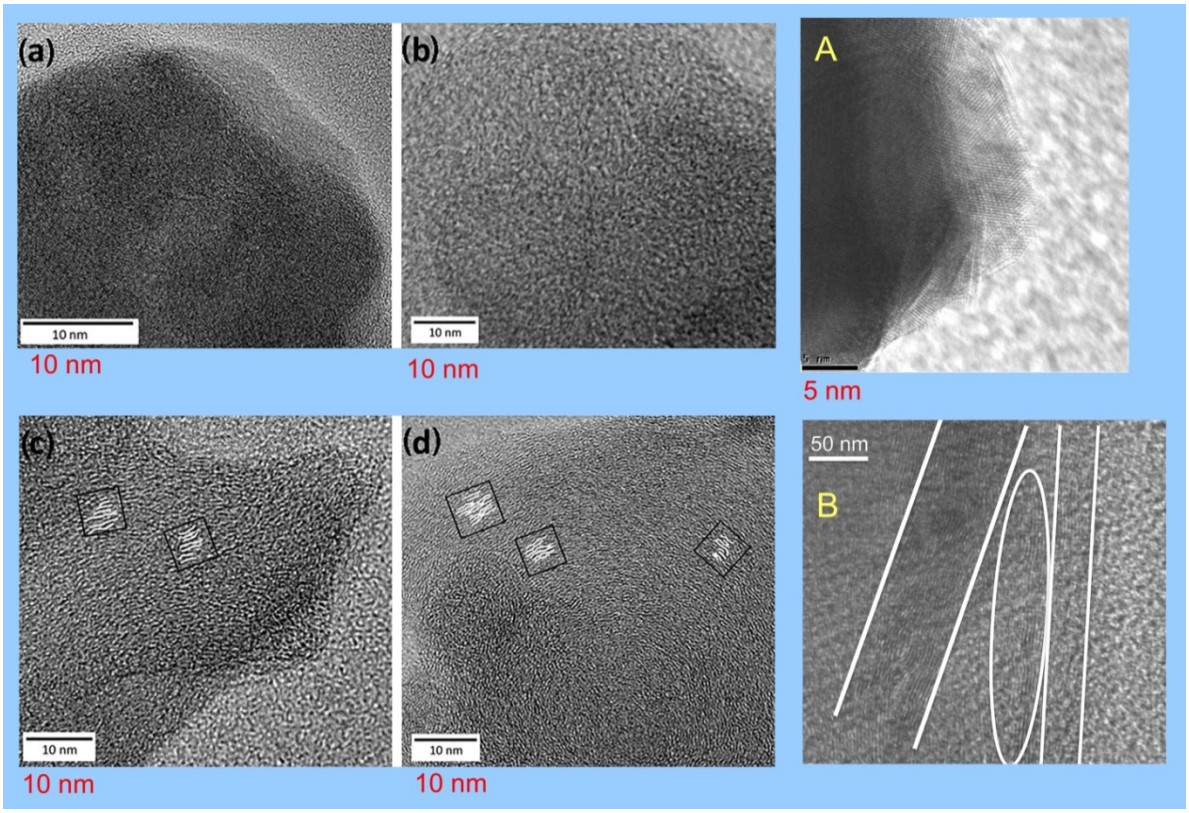

Figure 10. (a), (b), (c), (d): Carbonaceous particles from an altitude of 17.4 km in the polar stratosphere from [84]; (a) and (b) are amorphous, (c) and (d) showing regions of linear ordering. A from [100] and B from [101] are carbonaceous coal fly ash nanoparticles that also show linear structures, set off in B by white lines

Nanoparticles, lofted into the stratosphere [102-104], display a range of compositions characteristic of coal fly ash, as illustrated in Figures 11 and 12 by particles captured from Polar Stratospheric Clouds within the Arctic vortex [105].

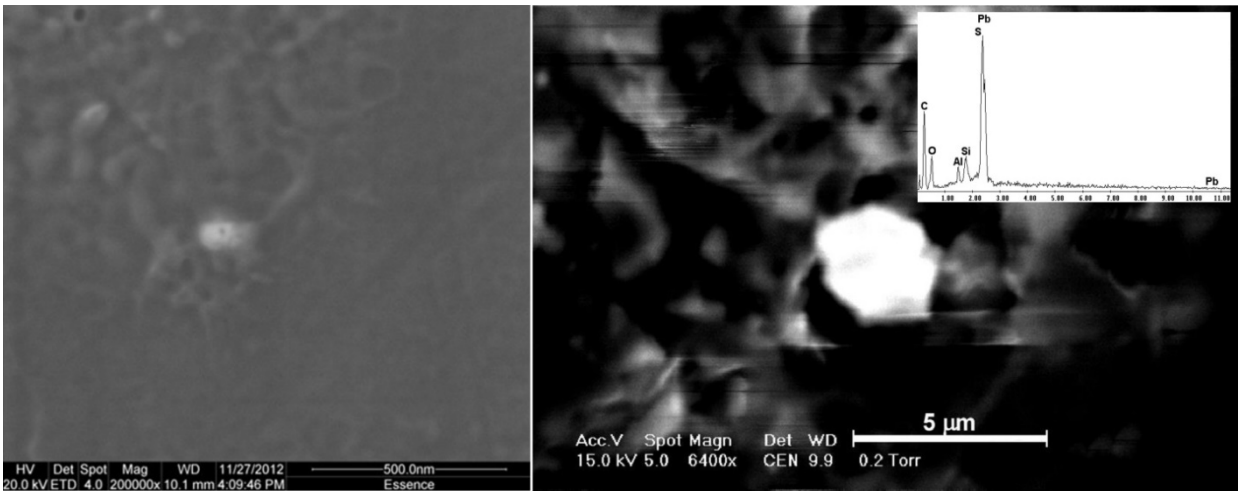

Figure 11. Left: Pb-rich nanoparticle collected from Polar Stratospheric Clouds within the Arctic vortex [105]; Right: similar PbS nanoparticle from coal fly ash [106]

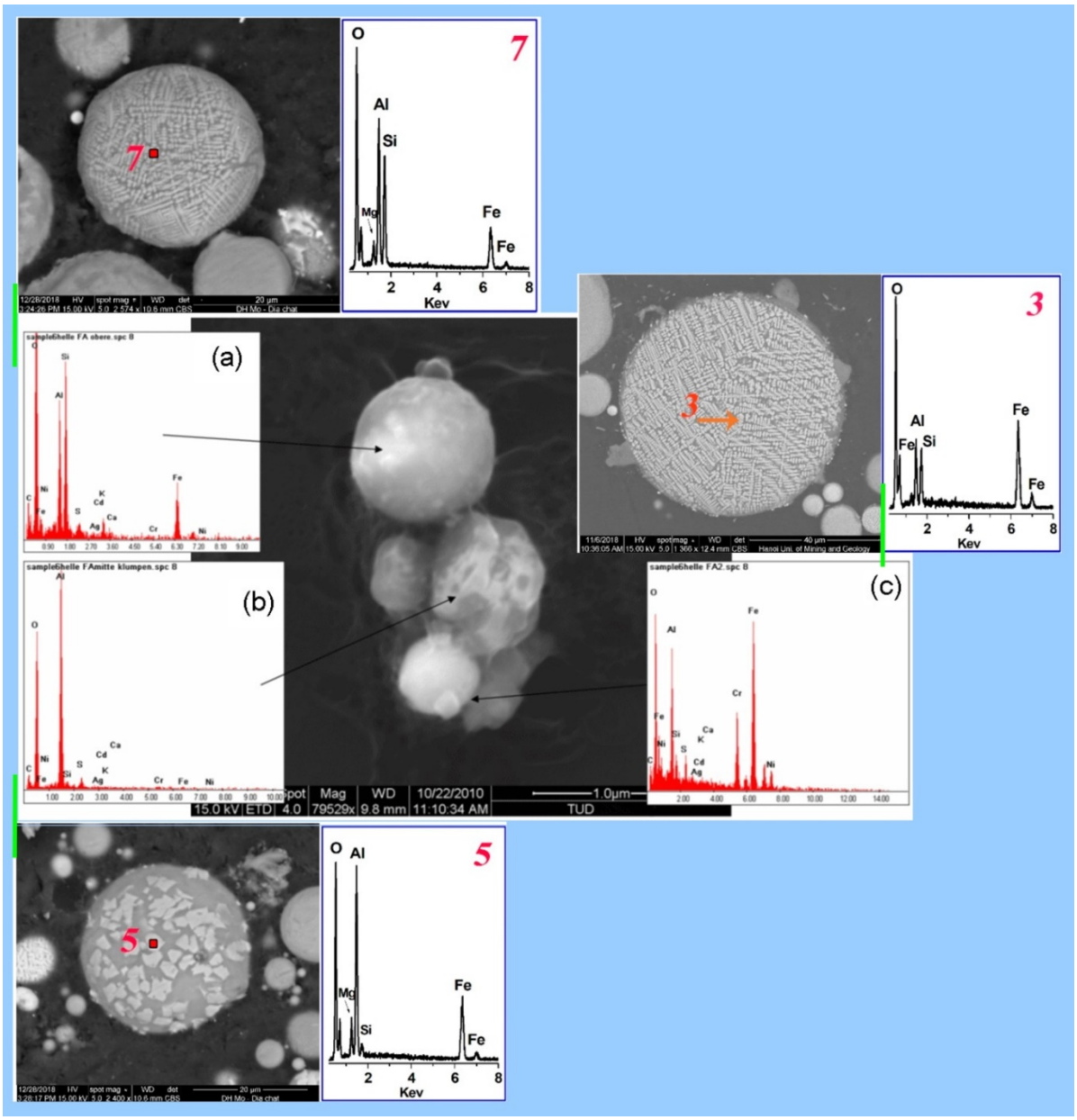

Figure 12: (a), (b) and (c): Nanoparticles collected from Polar Stratospheric Clouds within the Arctic vortex from [105]; Numbered: Larger particles displaying similar, although non-identical compositions. from coal fly ash [107]

Some idea of the compositional range of coal fly ash nanoparticles is shown in Table 2.

Table 2. Some examples of coal fly ash nanoparticle compositions

Coal Fly Ash Nanoparticle Compositions, Figure Numbers in Parentheses	References
Hematite (1); Jarosite (2); Fe-rich in carbonaceous matrix (3); Fe-Si-Al (4)	[108]
Ti-rich (2); Ti, Al-rich in char matrix (3); Fe-rich mixed with carbonaceous (4, 5); Fe-Si-Al (6)	[109]
Rutile (1); Spheres containing Zn,Ni, Mg, Al (2); Jarosite pseudomorph (3); Fe-Pb-As particle (4); Carbonaceous (6), Quartz (7)	[110]
Al-Si-Ti-K-Mg-Fe carbonaceous sphere (3); Pb in carbon nanotubes (6)	[111]
Glassy aluminosilicate (1); Al-Si carbonaceous (2); Carbon nano-tubes encapsulating fullerenes and Hg (3); Carbon-encapsulating As-Pb-Se-Br-Si-O (4); As-bearing jarosite plus As-O-Pb amorphous, As-bearing carbonaceous + Al-Si-Pb particle (5); Amorphous Al-Cr-Fe-Mg-Si-Ti (11)	[112]
Rock fragment + spinel + zircon (1); Al-Si-O-Fe-K-Ca sphere (4); P-Nd-Ce-La-Th particle (5); Hematite + goethite + magnetite (6)	[100]
Siderite containing Cd, Mo, Mn + nano-hemitite (3); Silicate containing As, Zr, U and Fe amorphous + nano-pyrite containing Se (6)	[113]
Fe-Cr particle (3); Iron oxide spinel (4)	[114]

COAL FLY ASH KILLS OZONE

When coal is burned industrially, coal fly ash condenses and accumulates in the hot gases above the burner. Nearly all of the chemical elements, present in trace amounts in the coal, become concentrated in coal fly ash. Many, but not all, coal fly ash particles occur as spheres which owe their shape to the surface tension of the suspended melt. Coal fly ash particles range in size from a few nm to tens of μm across and tend to be disequilibrium assemblages, having formed rapidly in an unnatural environment. Consequently, coal fly ash occurs in a multitude of elemental combinations and poses great risks to human and environmental health [12, 13].

Primary elements in coal fly ash are oxides of silicon (Si), Aluminum (Al), iron (Fe), and calcium (Ca), with lesser amounts of magnesium (Mg), sulfur (S), sodium (Na), Chlorine (Cl), and potassium (K). Carbon (C) is present in its elemental form. The many trace elements in coal fly ash include arsenic (As), barium (Ba), beryllium (Be), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), manganese (Mn), mercury (Hg), nickel (Ni), phosphorus (P), selenium (Se), strontium (Sr), thallium (TI), thorium (Th), titanium (Ti), uranium (U), vanadium (V) and zinc (Zn). Generally, concentrations of these trace elements in coal fly ash are typically higher than those found in the Earth's crust, soil, or even solid coal [115]. At least 39 elements can be partially extracted from coal fly ash by exposure to water [69]. Aerosolized coal fly ash makes atmospheric water more electrically conductive because of the many dissolved, ionized elements [116].

Ozone is destroyed by reaction with halogens [117, 118]. Coal burning in China led to an unexpectedly large atmospheric component of reactive bromine and chlorine in the atmosphere [119]. Coal fly ash contains halogen elements in the ranges shown in Table 3.

Table 3. Range of halogen element contents in coal fly ash [120].

Chlorine μg/g	Bromine μg/g	Fluorine μg/g	Iodine μg/g
13 – 25,000	0.3 – 670	0.4 – 624	0.1 – 200

Experiments are sometimes made to render coal fly ash safer and more amenable for commercial use, for example, as a component of cement. Experiments that employ ozone provide important information as to the ability of coal fly ash to destroy ozone. For example, the surfaces of coal fly ash carbon particles are oxidized by ozone [121] demonstrating that coal fly ash carbon particles kill ozone. Similar investigations also indicate that coal fly ash kills ozone [122, 123].

Inferences regarding ozone destruction by the components of coal fly ash can be made on the basis of ozone destruction by similar compounds: Ozone is consumed by reaction with carbon [124, 125]. Ozone is also consumed by reactions with mineral oxides [126-130]. Furthermore, ozone is consumed by reactions with oxides of iron , manganese [131, 132]. Additionally, ozone is consumed by reactions with metals [133, 134] and noble metals [132, 135]. All of these substances occur in coal fly ash nanoparticles.

POLAR STRATOSPHERIC CLOUDS AND OZONE DEPLETION

On the basis of three consecutive years of observations, Hamill et al. [77] notes: "[W]*e show that the evaporation of the* [Antarctic Polar Stratospheric] *cloud is highly correlated in time with the decrease in ozone concentration.*" There is general acknowledgement that aerosol particles can serve as cloud nuclei, however, nucleation is typically the extent of discussion. Our experience with aerosolized coal fly ash particles brought to ground by snowfall sheds some light on the connections between Polar Stratospheric Clouds and stratospheric ozone depletion.

Coal fly ash particles, lofted into the stratosphere, not only serve as ice-nucleating agents, but are further trapped by clouds, including Polar Stratospheric Clouds. In springtime, the icy stratospheric clouds melt/evaporate releasing their trapped coal fly ash particles, and making those ozone-consuming coal fly ash particles readily available for reaction with and destruction of ambient stratospheric ozone.

CONCLUSIONS

We have presented compelling evidence that supports our contention that aerosolized coal fly ash particles are the main agents responsible for stratospheric ozone depletion, not chlorofluorocarbon gases. Aerosolized coal fly ash particles, uplifted to the stratosphere, not only serve as ice-nucleating agents, but are trapped and concentrated in stratospheric clouds, including Polar Stratospheric Clouds. In springtime, as stratospheric clouds begin to melt/evaporate, said ozone-consuming coal fly ash particles are released making them available to react with and consume stratospheric ozone.

Aerosolized coal fly ash particles are responsible, not only for the destruction of stratospheric ozone, which shields surface-life from deadly solar ultraviolet radiation, but for harm to human and environmental health, including neurodegenerative disease [15], COPD and respiratory disease [16, 17], lung cancer [18], cardiovascular disease [19], COVID-19 and immunopathology [20, 21].

Aerosolized coal fly ash contributes to global warming [22], disrupts habitats [23], contaminates the environment with mercury [24], decimates populations of insects [25], bats [26], and birds [27]. Aerosolized coal fly ash also kills trees [28, 29], exacerbates wildfires [30],

enables harmful algae in our waters [31], and, destroys the stratospheric ozone layer that shields surface-life from the sun's deadly ultraviolet radiation [32, 33].

Despite the official narratives of "ozone recovery" due to the Montreal Protocol, stratospheric ozone levels continue to decline [34]. Ozone depletion has already led to an alarming increase in deadly ultraviolet radiation, UV-B and UV-C, penetration to Earth's surface, with increasingly apparent devastation to both plants and animals [38]

The global technological assault on our planet's natural environment and all its biota by barbarian entities without compassion or remorse is no less than *Planetary Treason*. Unless global populations demand an end to the technological assault on our environment, replete with its dissemination of false information [136], we will inevitably continue to charge forward in the first ever anthropogenic species extinction.

Geoengineering, including "solar radiation management," falsely portrayed in the scientific literature as a future endeavor necessary to combat global warming, has been going on for decades with devastating results, including causing global warming. All of those who participate in systematically altering Earth's natural environment [12, 13, 137-139], we allege, are complicit in the crime of *Planetary Treason*, the legal basis of which is every persons' right to self-defense.

One has only to tune into the terrible suffering of the natural world (Figure 1) and look up to the obvious atrocities in our skies (Figure 2) to understand our dire situation. Our time is short, it's less than a minute before midnight for climate collapse and complete biosphere breakdown. Our children face a ghastly future, potentially within the current decade.

All geoengineering must cease. All sources of aerosolized coal fly ash must be reduced and eliminated. Tropospheric jet-spraying of coal fly ash and any other particulate matter must cease and desist. That is necessary to salvage what we can of Earth's vital life support systems, including the stratospheric ozone layer.

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