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Alleged National Academy of Sciences Violation of the Spirit and Intent of the Vienna Convention for the Protection of the Ozone Layer

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Abstract: Protecting Earth's stratospheric ozone layer is of such great importance that all 198 nations signed the Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol, both of which deliberately leave room to investigate ozone-depletion mechanisms beyond chlorofluorocarbons (CFCs). Despite restrictions on chlorofluorocarbon production since the Montreal Protocol was entered into force in 1989, the destruction of stratospheric ozone has not declined, but increased. Because virtually all life on Earth depends upon stopping the progressive deterioration of stratospheric ozone, fundamentally new advances related to solving that problem are encouraged by the Vienna Convention for the Protection of the Ozone Layer. But not by all institutions. Here we present just such a fundamentally new advance within the context of the allegedly non-scientific resistance it encountered from the U.S. National Academy of Sciences (NAS) while attempting publication. We previously have proposed aerosolized coal fly ash as an ice-nucleating and ozone-reactive particulate, and as an alternative source and activation platform for chlorine, bromine and iodine. Here we show that elemental analyses of coal fly ash are consistent with arrayed and published stratospheric particle data thus providing compelling support for previously published evidence that aerosolized coal fly ash is a major cause of stratospheric ozone depletion. The global technological assault on our planet's natural environment and all its biota by aerosolized coal fly ash must cease and desist.

Keywords: aerosolized coal fly ash, stratospheric ozone depletion, stratospheric particles, Montreal Protocol, ozone hole, ultraviolet radiation

INTRODUCTION AND BACKGROUND

We previously have proposed aerosolized coal fly ash as an ice-nucleating and ozone-reactive particulate, and as an alternative source and activation platform for chlorine, bromine and iodine [1-3]. Coal fly ash not only contains these halogens, but numerous other components that have been shown to kill ozone, e.g., carbon particles, mineral oxides, and oxides of iron and manganese. Aerosolized coal fly ash is presumably transported into the stratosphere by deep convection storms [4], by large scale atmospheric mixing [5], by the Asian summer monsoon anti-cyclone [6], by direct injections from high-flying aircraft [7] and perhaps by other means. Aerosolized coal fly ash (by analogy with terrestrial observations) is concentrated in stratospheric clouds whereupon in spring the coal fly ash particles are released making them available for depleting ozone [3]. Acidic processing, irradiation, iron chemistry and reactions on particle or ice surfaces mobilize the particle-bound halogens. The resulting Cl, Br and possibly I radicals participate in catalytic ozone-destruction cycles. Iron-bearing ash can additionally destroy ozone directly, generate reactive oxygen species and promote polar-cloud formation.

Although we were able to show the similarity of coal fly ash particles with captured polar stratospheric particles, these were quite limited in number [1]. Murphy et al. [8] arrayed vast amounts of stratospheric particle data in an attempt to make the case that these particles in large part consist of debris from meteors and reentry spacecraft. We found that same data to be wholly consistent with aerosolized coal fly ash. That identification profoundly supports our published association of aerosolized coal fly ash with stratospheric ozone depletion [1-3].

We chose to submit that fundamental identification as a Brief Report to the *Proceedings of the National Academy of Sciences* (PNAS), presented verbatim in the next section.

SUBMISSION TO PNAS

Abstract: Elemental analyses of coal fly ash are consistent with arrayed and published stratospheric particle data thus providing compelling support for previously published evidence that aerosolized coal fly ash, not chlorofluorocarbons, is a major cause of stratospheric ozone depletion. If healthy life is to persist on Earth, the aerosolization of coal fly ash must cease and desist.

Article: Vast amounts of money have been spent imaging and measuring stratospheric particles. Understanding their origins, however, has proved challenging. In 2023, Murphy et al. [8] arrayed stratospheric particle data in an attempt to make the case that these particles in large part consist of debris from meteors and reentry spacecraft. Within the framework of that arrayed data, we demonstrate an entirely different identification for these stratospheric particles, namely, aerosolized coal fly ash.

Evidence indicates that aerosolized coal fly ash particles can be uplifted into the stratosphere [1]. The ultrafine grain-size of coal fly ash [9] lends itself to aerosolization. Its massive annual production, which in 2019 was reported to be 4.61×10^8 tons/year [10], renders it a prime candidate for efficient transport into the stratosphere by various means including [4, 6].

Here we present elemental analyses of coal fly ash which explain within said arrayed data all the findings previously attributed to meteoric material and reentry spacecraft [8].

Rather than plotting atop the 4 graphs, which might be confusing, we reproduced the graphs of Murphy et al. [8]. Then we placed along their sides our graphs having identical ranges for plotting coal fly ash data, as presented by Figures 1 and 2.

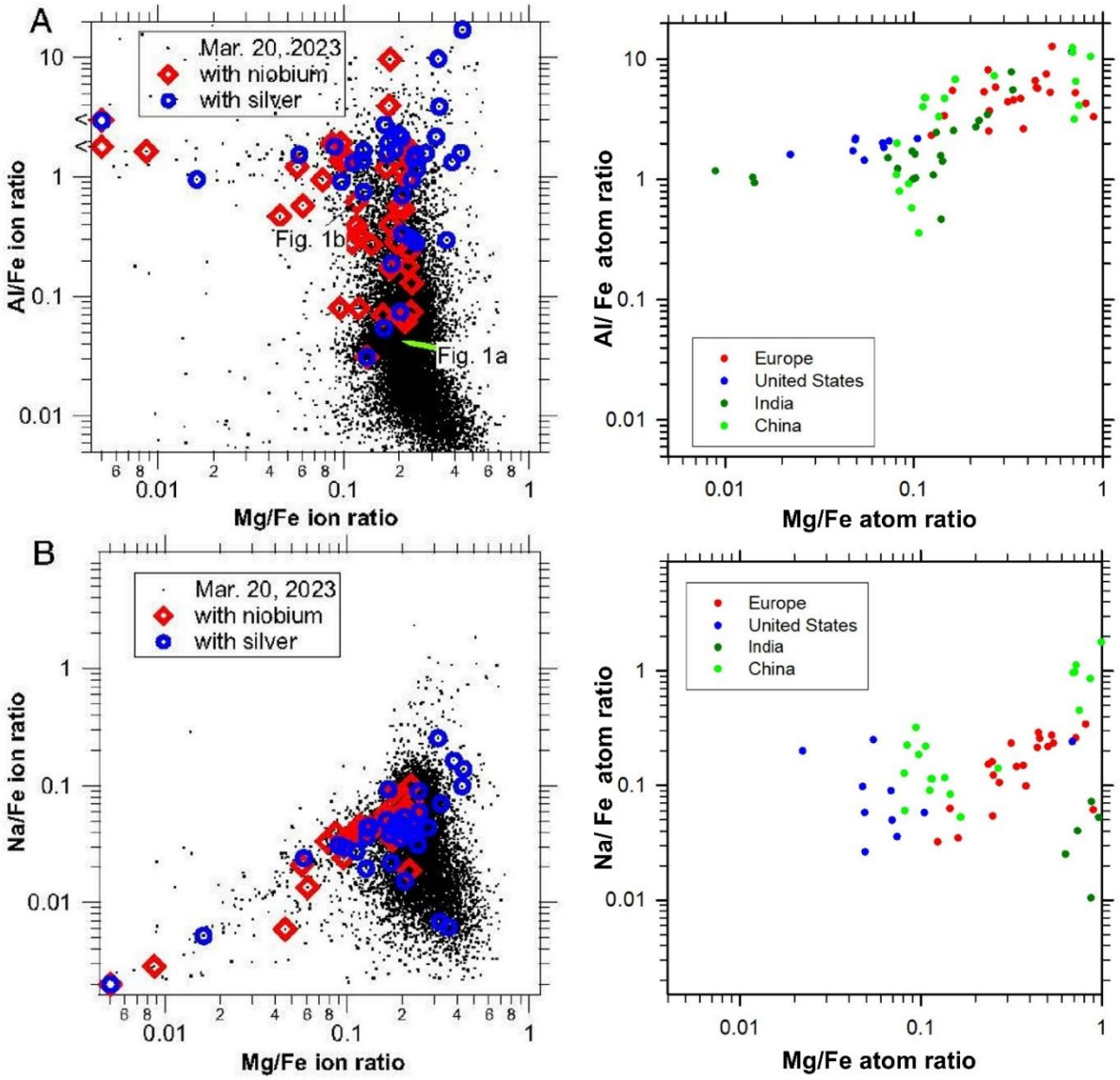

Figure 1: Left: Figure 2 of Murphy et al. [8] side by side with our plots of published coal fly ash data [11-17].

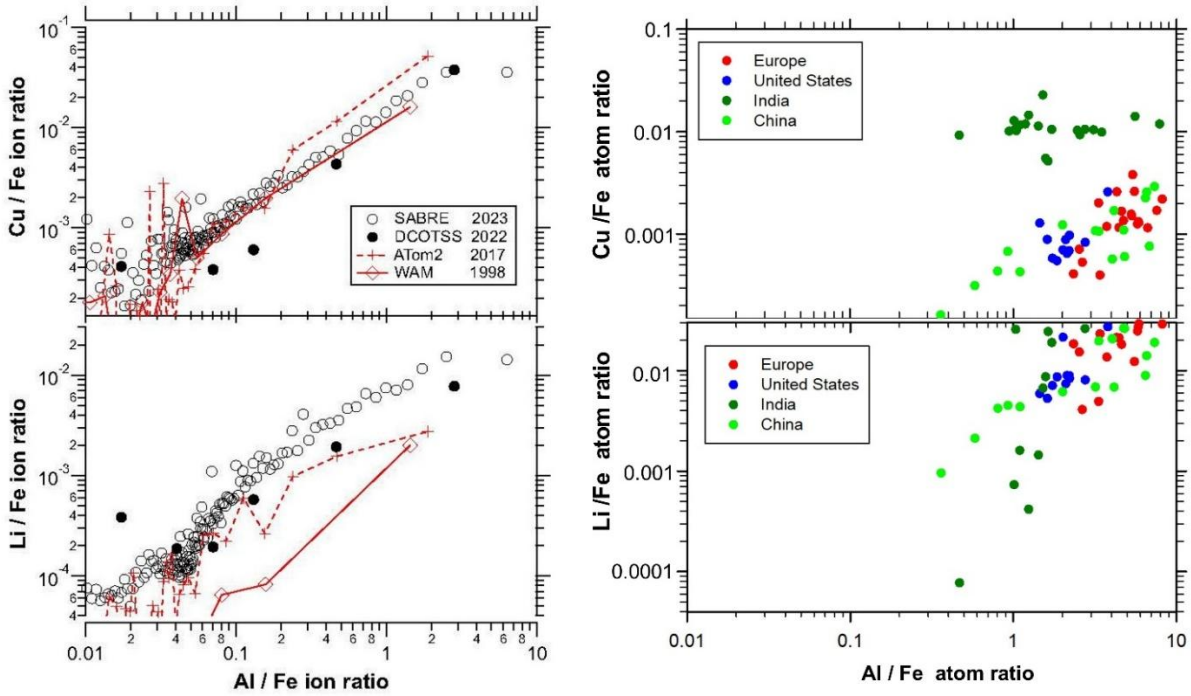

Figure 2: Left: Figure 3 of Murphy et al. [8] side by side with our plots of published coal fly ash data [11-17] .

Our data, used in Figures 1 and 2, consist of 12 United States coal fly ash samples [11], 23 coal fly ash samples from Europe [12], 20 from India [13], and 24 coal fly ash samples from China [14-17]. Only those data that plot within the respective graph-ranges are shown.

Even though from a population of only 79 coal fly ash samples, Figures 1 and 2 demonstrate quite clearly, without *ad hoc* assumptions, that aerosolized coal fly ash is entirely consistent with the multitude of stratospheric particles arrayed by Murphy et al. [8]. Moreover, the same document states: "In addition to the very clear reentry signals from Li, Al, Cu, Nb, Ag, Hf, and Pb, other elements were detected…. These include Be, Mg, Ti, Cr, Fe, Ni, Zn, Ga, Mo, Cd, In, Sn, Sb, Ba, Ce, Pr, Nd, Ta, W, and Bi." All of these elements are found in coal fly ash [11-17].

In the Supplemental Data, Murphy et al. [8] present a plot of numerous Hafnium Ion Signals (fraction of ions) versus Niobium Ion Signals and show a red linear fit. A Niobium value of 0.1 corresponds to Nb/Hf = 11.42 with unknown statistical error. Eleven Nb/Hf atom ratios from coal fly ash determinations [14, 16, 17] yield an average of 9.56 ± 7.74.

Despite restrictions on chlorofluorocarbon production since the 1989 Montreal Protocol, the destruction of stratospheric ozone has not declined, but increased [18].

Unlike debris from meteors and reentry spacecraft, coal fly ash contains numerous substances that have been shown to destroy ozone [1].

We have provided evidence that aerosolized coal fly ash is a significant killer of stratospheric ozone [1, 2]. The data shown in Figures 1 and 2 provide additional compelling evidence that aerosolized coal fly ash, not chlorofluorocarbons, is a major destroyer of stratospheric ozone.

Our planet has a naturally forming shield, stratospheric ozone, that protects surface life from harmful ultraviolet radiation from the sun. But that shield is progressively weakening. Here we show that elemental analyses of coal fly ash are consistent with previously

published stratospheric particle data. This provides compelling evidence that the fly ash waste product of burning coal, which can destroy ozone in numerous ways [1, 2], is a major substance destroying Earth's stratospheric ozone shield. If healthy life is to persist on Earth, the aerosolization of coal fly ash must cease and desist.

BASIS OF REJECTION AND REQUEST FOR RECONSIDERATION

The entire specific written justification by or for said Editor-in-Chief's decision to reject our PNAS submission without review is the statement: **"Correlation is not causation. Decades of work have shown that CFCs and other halogen-containing chemicals are a reason for ozone layer depletion, including the ozone hole."**

What is the basis for the trite phrase **"Correlation is not causation"** except to deceive?

Within the limited number of words and references allowed for our PNAS Brief Report submission, we clearly cited our previously published work associating aerosolized coal fly ash with stratospheric ozone depletion. The entirety of said PNAS statement, we allege, focuses only on consensus conformity ignoring published and cited alternatives.

The president of the National Academy of Sciences (NAS) never acknowledged our initial request for reconsideration; we set a deadline for him to acknowledge intent. He ignored that deadline and thus by default documented his agreement with the above PNAS editorial actions and statement.

What could cause the National Academy of Sciences, at one time America's premier scientific organization, we allege, to totally abrogate long-standing scientific standards in the instant matter?

IMPLICATIONS AND CONCLUSIONS

The Vienna Convention for the Protection of the Ozone Layer was the first international treaty to be signed by all nations of the globe, signifying the great importance to humanity of its objective. So why would a supposedly premiere national science organization act to halt publication of understanding that extends the scope of causes for stratospheric ozone depletion? A professional lifetime of experience by one of us (JMH) points to one possible explanation. Ten years of professional collaboration between us points to another.

For nearly half a century, scientists have feared losing their own funding were they to criticize others' government-funded work. Consequently, universities teach geophysics and astrophysics rooted in ca. 1930-40s refuted ideas, ignoring contradictory scientific advances that are crucial for understanding the origin and behavior of our planet [19], and for understanding the nature of the universe [20]. Was one reason for said PNAS rejection because our PNAS submission contradicted work funded by the National Oceanic and Atmospheric Administration (NOAA) and by the National Aeronautics and Space Administration (NASA) [8]? Do they not understand that science involves the replacement of less-precise understanding with more-precise understanding?

There is, however, another potential reason underlying said PNAS rejection: Over a period of 10 years, the authors have collaborated on numerous published investigations pointing to a major-scale, covert, international activity that jet-emplaces particulates into the troposphere, which are consistent with aerosolized coal fly ash, and which is destroying life on Earth, causing global warming, harming human health, and disrupting the planetary environment [21, 22].

In accordance with the spirit and intent of the Vienna Convention for the Protection of the Ozone Layer, we have made a fundamental advance by demonstrating that aerosolized coal fly ash elemental analyses are consistent with arrayed and published stratospheric particle data. That identification thus provides compelling support for our previously published evidence that aerosolized coal fly ash is a major cause of stratospheric ozone depletion [1-3].

The global technological assault on our planet's natural environment and all its biota by aerosolized coal fly ash must cease and desist; otherwise, we will inevitably continue to race forward in the first ever anthropogenic species extinction.

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