



Debunked: J. Marvin Herndon's "Geoengineering" Articles in Current Science (India) and IJERPH

Discussion in 'Contrails and Chemtrails' started by Mick West, Jun 22, 2015.

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1

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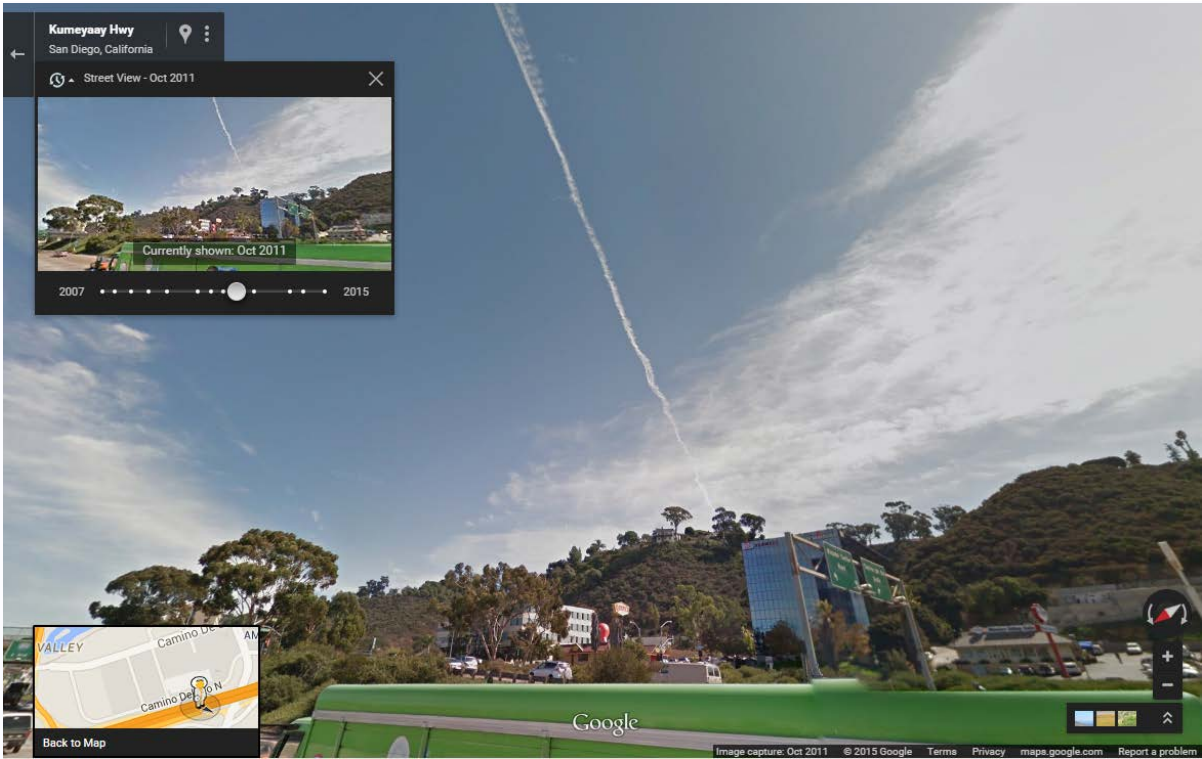
Trailblazer
Senior Member

JRBids said: [↑](#)

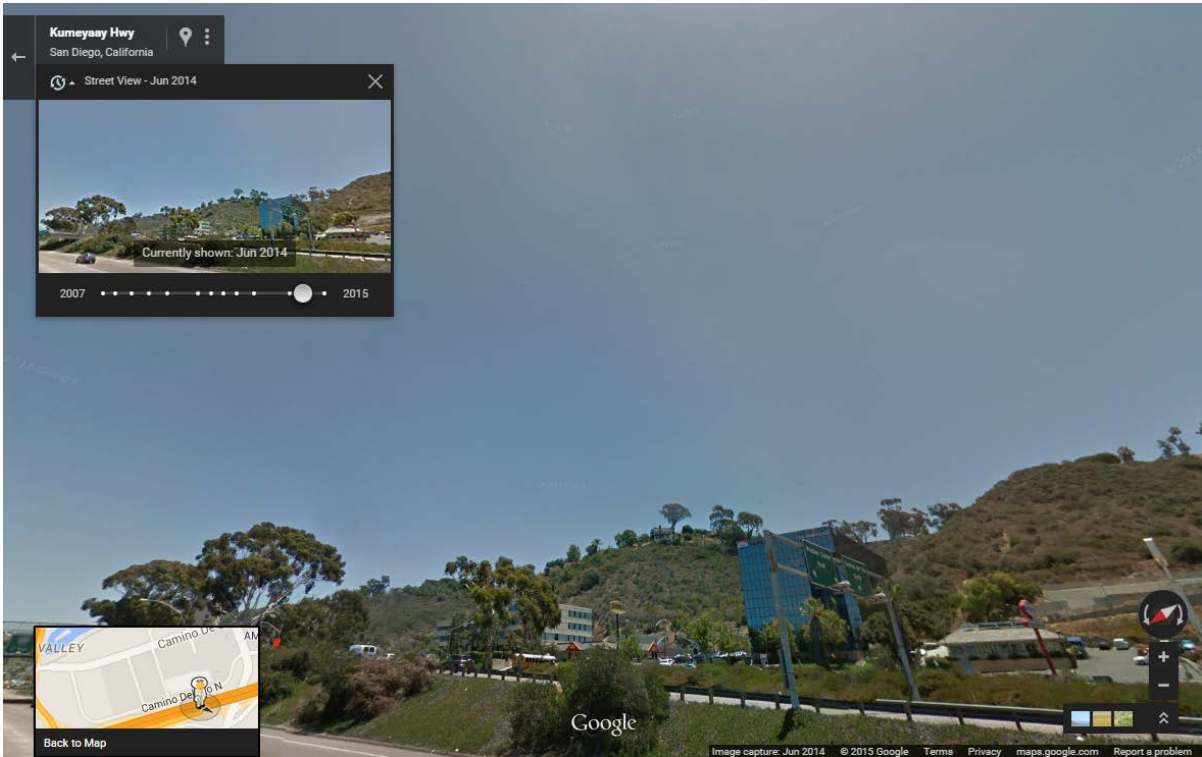
It is interesting that he only "began to notice" trails in spring of 2014. Supposedly the "program" has been going on for how long? Some people say the 50s, some the 90s. He says these are tanker jets but never says how he identifies them as tanker jets. That's enough for the chemtrail crowd though. They've posted the paper everywhere.

It seems the professor is not terribly observant. I just clicked a random point on a freeway in San Diego on Google Maps and looked back through the historical Street View imagery (of which there is a lot to choose from in this area).

This is from an image captured in October 2011:



The same spot in summer 2014, after the start of the alleged spraying campaign. 🤨



Trailblazer, Aug 20, 2015

#121

🤨 Funny x 3 🛠 Useful x 1



JRBids
Senior Member

In my opinion.....2014 is obviously when Herndon "woke up!"[tm], therefore, it's when the spraying started.

JRBids, Aug 20, 2015

#122

✔ Agree x 2 👍 Like x 1



George B
Extinct but not forgotten Staff Member

Staff Member

The problem is the believers begin with the position that Chemtrails exist and then proceed to collect evidence to support their beliefs. They don't question whether there are alternative explanations for their assumptions. Also, they reject emotionally that their assumptions supporting the existence of Chemtrails has a lower probability of being correct than the scientific explanations they reject. Herndon seems to have fallen into this rut.

Once someone believes the government or "they" are capable of lying and doing things to the people without their consent some people assume the worst first and it clouds their objectivity. Herndon may also fall into this category, it was certainly a trap I fell into.

Last edited: Aug 20, 2015

George B, Aug 20, 2015

#123

👍 Like x 2



Trailblazer
Senior Member

George B said: ↑

Yes, I think they will cite it everywhere; and that might not be a bad thing. Why?

1) It gives them a motive to further investigate science as a tool to support their positions.

2) This particular paper can be challenged using sound scientific principles which they now have ownership of. A position they have, until now, rejected except in the most limited ways. Turning to fringe websites and YouTube videos instead of NOAA, NASA, FAA, and academic sources, etc.

I think you are giving chemtrail believers too much credit. It doesn't matter whether it's credible, or even what it actually says. All that matters is that it got published and it appears to back up their position. End of story.

Trailblazer, Aug 20, 2015

#124

👍 Like x 1 ✔ Agree x 1



George B
Extinct but not
forgotten Staff
Member

Staff Member

Trailblazer said: ↑

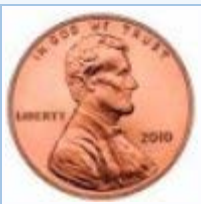
I think you are giving chemtrail believers too much credit. It doesn't matter whether it's credible, or even what it actually says. All that matters is that it got published and it appears to back up their position. End of story.

I really don't disagree for the vast number of believers; however, the rare one that will grasp that if one uses science to justify their position they are obligated to validate the correctness of the evidence. Sort of "he who lives by the sword dies by the sword."

George B, Aug 20, 2015

#125

✓ Agree x 1



JRBids
Senior Member

Trailblazer said: ↑

I think you are giving chemtrail believers too much credit. It doesn't matter whether it's credible, or even what it actually says. All that matters is that it got published and it appears to back up their position. End of story.

Absolutely! How many videos do they repost with the word "PROOF!" in the title which say nothing at all what the claim of proof is.

JRBids, Aug 20, 2015

#126



Jay Reynolds
Senior Member

George B said: ↑

The problem is the believers begin with the position that Chemtrails exist and then proceed to collect evidence to support their beliefs. They don't question whether there are alternative explanations for their assumptions.

I agree with you, George. Herndon's well was poisoned by the commonly accepted, though totally incorrect assumption that crustal elements would not be found in air or rainfall.

He designed his experiment exactly as you describe:

Content from external source

The author submits the following hypothesis: Coal fly ash is most likely the aerosolized particulate sprayed in the troposphere by tanker-jets for geoengineering, weather-modification and climate-modification purposes.

The objectives of the research are to provide substantial scientific evidence as to the correctness of the hypothesis, namely, that coal fly ash is the aerosolized particulate sprayed in the troposphere by tanker-jets for geoengineering, weather-modification and climate-modification purposes and to reveal some

of the adverse human public health consequences and the antagonistic consequences on Earth's environment and biota.

No background research seems to have been done regarding what else might be the source, past data on what has previously been established for common elements found in dry or wet deposition.

The closest he comes to approaching that subject is this false claim for which he cites no reference:

[Content from external source](#)
Beside the observational commonality, post-spraying rainwater was frequently found to contain aluminum and barium, two elements usually not present in naturally-occurring rainwater

Jay Reynolds, Aug 20, 2015

#127

👍 Like x 1



skephu
Senior Member

A basic rule in science is that we try to **falsify**, not confirm, hypotheses. Herndon seems unaware of this.

skephu, Aug 21, 2015

#128

✅ Agree x 5 👍 Like x 1 ⭐ Winner x 1



Jay Reynolds
Senior Member

Herndon has a long history of his ideas being rejected, for decades in fact. He may just be so desperate to find success that when he found a belief system within which a set of people would accept rather than reject him he is willing to give them what they want to hear and vice versa. He may feel that since he has always been rejected, further rejection by mainstream is a small price to pay (or one which doesn't even matter) for acceptance by even a small number of people quite willing to have their biases confirmed. It wouldn't surprise me at all that the ACP fees normally charged by MDPI journals, several thousand dollars, were paid by some interested party and not Herndon at all.

But skephu is correct, and [even children in lower grades are told about falsification](#).

Herndon's hypothesis could have been easily falsified by looking at what is ordinarily found in wet deposition(rain and snow) and dry deposition (ordinary dust in the wind). He didn't try to do so, he wanted to re-invent something which had already been established and well known.

Jay Reynolds, Aug 21, 2015

#129

✔ Agree x 2 ⓘ Informative x 2



MikeG
Active Member

There is an interesting 2012 review by John Timmer of Herndon's book *Indivisible Earth*.
<http://www.downloadtheuniverse.com/dtu/2012/07/ebooks-and-the-democratization-of-crackpottery.html>

Timmer makes the point that self-publication is an ideal way of avoiding the scrutiny of peer review.

I liked how he put one of the consequences of this process:

Content from external source

The writing itself is fine, in that it's easy to follow these ideas. It's just that the scientific reasoning has gaps you could drive an aircraft carrier through. I'll give just a few examples.

MikeG, Aug 21, 2015

#130

👍 Like x 2 ⓘ Informative x 1



JRBids
Senior Member

Anyone know what Herndon is doing in Greece in Sept?



Sylvain Henry
6 hrs

😊 Great news coming for our cause shortly!

👍 Like

💬 Comment

➦ Share

15 people like this.



Francis Hanney ? 😊
Like · Reply · 👍 3 · 6 hrs



Jacqueline Roberts Mmm, can't wait.. 🍷 🍷
Like · Reply · 👍 2 · 5 hrs



Francis Hanney Grounding and arresting of pilots and their pay masters? 😊
Like · Reply · 👍 3 · 5 hrs



Denise Chesna Oh do tell! The suspense is killing me.
Like · Reply · 👍 1 · 5 hrs



Sylvain Henry One of the "good news" items will be happening in Greece in September. Dr, Marvin Herndon will be involved with that.
Like · Reply · 👍 1 · 5 hrs



Sylvain Henry Another Item is that you will be soon hearing some of the modified national anthems here in this group and it will be shared in other groups as well
Like · Reply · 👍 1 · 5 hrs

JRBids, Aug 22, 2015

#131



skephu
Senior Member

It may be some conference in Greece where Herndon plans to give a talk or something.

skephu, Aug 23, 2015

#132



Chew
Senior Member

So Herndon could directly compare the fly ash leachate from his reference [10] to the rainwater collected in San Diego he converted the units to $\mu\text{g/L}$ for his Table 1. His fly ash leachate values comes from Table 8:
<http://www.researchgate.net/profile...es/links/00b495253c011d9e5d000000.pdf#page=12>

Here are the values for aluminum from his reference [10]:

38.3	0.1	218.2	0.2	5.2	114.8	129.1	1.2	87.4	35.9	37.6	0.5	1.5	43.3	5.2	26.3	2.4	2.8
271	0	1.8	193.9	18.2													

(he used 0 for the single reading of "<0.1")

Those values have an average of 53.7 µg/g. To convert that to µg/L multiply it by the number of grams in a liter of rainwater. The proper conversion is 53,700 µg/L.

But Herndon's Table 1 for leached aluminum reads only 5370 µg/L:

Table 1. Average chemical composition of the 23 un-leached and leached (leachate) European coal fly ash samples from Moreno *et al.* [10].

Element	Un-Leached µg/kg	Leached (Leachate) µg/L	Element	Un-Leached µg/kg	Leached (Leachate) µg/L
Aluminum	7.00×10^4	5.37×10^3	Molybdenum	1.10×10^1	3.66×10^{-1}
Antimony	1.20×10^1	3.60×10^{-2}	Nickel	1.22×10^2	1.68×10^{-2}
Arsenic	7.06×10^1	8.35×10^{-2}	Niobium		6.22×10^{-4}
Barium	1.38×10^3	5.34×10^{-1}	Phosphorus	1.22×10^3	2.22×10^2
Beryllium	9.66	3.00×10^{-4}	Potassium	1.43×10^4	
Boron	2.38×10^2	3.32	Rubidium	1.04×10^2	3.04×10^{-2}
Cadmium	1.87	7.61×10^{-4}	Scandium		4.32×10^{-3}
Calcium	4.03×10^4	3.48×10^5	Selenium	2.24×10^1	8.12×10^{-2}
Cesium		2.78×10^{-3}	Silicon	2.27×10^5	6.57×10^3
Chromium	1.54×10^2	2.99×10^{-1}	Sodium	2.98×10^3	1.51×10^4
Cobalt	4.13×10^1	2.30×10^{-3}	Strontium	1.09×10^3	5.09
Copper	9.94×10^1	6.97×10^{-3}	Sulfur	3.78×10^3	1.57×10^5
Gallium		2.24×10^{-2}	Thallium		4.61×10^{-4}
Germanium	1.18×10^1	6.20×10^{-3}	Thorium	3.25×10^1	9.83×10^{-4}
Hafnium		1.01×10^{-3}	Tin	8.48	6.96×10^{-4}
Iron	2.89×10^4	1.22×10^2	Titanium	7.01×10^3	4.27×10^{-2}
Lead	1.29×10^2	1.30×10^{-3}	Uranium	1.34×10^1	4.65×10^{-4}
Lithium	1.95×10^2	1.18	Vanadium	2.53×10^2	1.18×10^{-1}
Magnesium	1.02×10^4	2.85×10^3	Zinc	1.90×10^2	2.70×10^{-2}
Manganese	4.84×10^2	4.35			

He converted wrong! He only used 100 g per liter of water when he tried to convert to µg/L.

I checked half a dozen of his other "leached" elements in his table and he made the same mistake for each one. They're all off by a factor of 10.

"99% confidence interval" indeed.

Chew, Aug 23, 2015

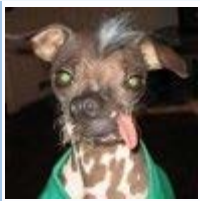
#133

Like x 6

Winner x 2

Informative x 2

Note: the above doesn't invalidate his conclusions. He was comparing ratios; he could have converted the original source by multiplying by pi and it wouldn't change the outcome.



Chew
Senior Member

But looking at the range of values does invalidate his conclusions. The leachate of aluminum ranged from <0.1 to 271 µg/g but he only compared the average. If his claim that the two statistical tests have greater than 99% confidence intervals is true then that means there was a greater than 99% probability that equal quantities of coal fly ash from 23 coal-fired power plants from 4 different European countries were mixed together, transported to the US, and sprayed hundreds of miles downwind from San Diego and timed just right that it would mix with clouds that were getting ready to rain when it reached San Diego. And these 23 coal-fired power plants that were used in this study just so happens to be the only 23 power plants in the world that could create this unique mix.

Chew, Aug 23, 2015 #134



Hama Neggs
Senior Member

Chew said: ↑
Note: the above doesn't invalidate his conclusions.

No, but it calls into question his general competence.

Hama Neggs, Aug 23, 2015 #135

✓ Agree x 2



Mick West
Administrator
Staff Member

Can someone check this:

He gives Arsenic, Leached, at $8.35 \times 10^{-2} \mu\text{g/L}$ (8.35E-02 in scientific notation as Excel displays it))

Arsenic in Moreno is given in ng/g, the values are:

260 13 315 1211 212 685 415 107 890 304 12374 44 64 370 511 958 64 51 176 10 11 138 14

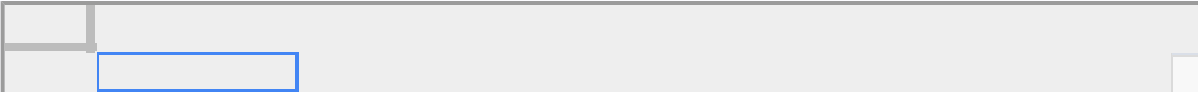
an average of 835 ng/g, or 0.835 µg/g, or 835 µg/L that 8.35E+02, yet he has it at 8.35E-02, which is 0.0835 µg/L, off by a factor of 10000

Which DOES invalidate his results. They seem to be all off by differing amounts.

Last edited: Aug 23, 2015

Mick West, Aug 23, 2015 #136

I've converted Table 8 into a spreadsheet, and am comparing it against Herndon's Table 1





Mick West
Administrator
Staff Member

Table 2 ▾Table 8 ▾Leach vs. Rainwater ▾She

◀▶

Explore

Mick West , Aug 23, 2015#137



Mick West
Administrator
Staff Member

Direct Link

Mick West , Aug 23, 2015#138



Mick West said: ↑

yet he has it at 8.35E-02, which is 0.835 µg/L

8.35E-2 is .0835, not .835.

Chew
Senior Member

Chew, Aug 23, 2015

#139



Mick West
Administrator
Staff Member

Chew said: ↑

8.35E-2 is .0835, not .835.

Fixed. Which makes him off by a factor of 10,000 then!

Mick West, Aug 23, 2015

👍 Like x 1

#140



Chew
Senior Member

~~No, arsenic is off by 10. Like his aluminum.~~

ETA: Mick is correct.

Last edited: Aug 23, 2015

Chew, Aug 23, 2015

#141



Mick West
Administrator
Staff Member

But as I'm calculating it, Arsenic is 835 µg/L, and he has 0.0835, what am I doing wrong?

Mick West, Aug 23, 2015

#142



Mick West
Administrator
Staff Member

My reasoning here is that, ng/g is the same units as µg/L (assuming 1L = 1,000g), so the µg/L is just the straight average of the values listed for the trace elements. For As (Aresnic) that's 834.65, or 8.35E+02.

Mick West, Aug 23, 2015

#143



Mick West
Administrator
Staff Member

I wonder if the off-by-10 thing might be related to

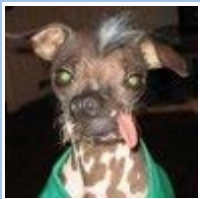
Content from external source

2.2.5. Leaching tests

To determine the potential mobility of trace elements from the fly ashes, the leaching test DIN 38414-S4 was applied. **This DIN method requires the mixing of 100 g of solid material (dry weight) with a liter of distilled water** in 2 l bottles during 24 h [30]. The major and trace element contents in the leachates determined by means of ICP-AES and ICP-MS.

Mick West , Aug 23, 2015

#144



Chew
Senior Member

@Mick West, you are right. He evidently is off by a factor of 10 for the major elements and off by a factor of 10,000 for his trace elements ("major" and "trace" as listed in Table 8 of reference [10]).

As for the leaching test, I would say no. His units are µg/L, not µg/100g.

Chew, Aug 23, 2015

#145



Mick West
Administrator
Staff Member

Take the more relevant Barium figure. In Table 1 he has Barium in leachate at 5.34E-01 µg/L which 0.534 ppb (there are a billion micrograms in 1L/1Kg)

Table 1. Average chemical composition of the 23 un-leached and leached (leachate) European coal fly ash samples from Moreno *et al.* [10].

Element	Un-Leached µg/kg	Leached (Leachate) µg/L	Element	Un-Leached µg/kg	Leached (Leachate) µg/L
Aluminum	7.00×10^4	5.37×10^3	Molybdenum	1.10×10^1	3.66×10^{-1}
Antimony	1.20×10^1	3.60×10^{-2}	Nickel	1.22×10^2	1.68×10^{-2}
Arsenic	7.06×10^1	8.35×10^{-2}	Niobium		6.22×10^{-4}
Barium	1.38×10^3	5.34×10^{-1}	Phosphorus	1.22×10^3	2.22×10^2
Beryllium	9.66	3.00×10^{-4}	Potassium	1.43×10^4	
Boron	2.38×10^2	3.32	Rubidium	1.04×10^2	3.04×10^{-2}
Cadmium	1.87	7.61×10^{-4}	Scandium		4.32×10^{-3}
Calcium	4.03×10^4	3.48×10^5	Selenium	2.24×10^1	8.12×10^{-2}

Moreno have Ba in ng/g in Table 8.

Table 8
pH, conductivity and leachable contents of major ($\mu\text{g g}^{-1}$) and trace (ng g^{-1}) elements from fly ashes using the DIN 38414-S4 leaching test

Fly ash	Narcea	Barrios	Escucha	Meira	Teruel	Espiel	Compo.	Robla	As Po.	Soto	Puerto.	Alkalín.	Nijmeg.	Neutral	CCB	Acid	A-8	A-9	Hemwe	Lignite	Fusina	Mon- tfal.	Sar- denga
PH	11.06	12.20	10.80	9.70	11.43	10.40	9.17	11.50	8.35	11.34	6.40	12.20	11.50	8.32	6.42	8.65	12.04	12.09	11.42	12.3	12.45	11.76	12.54
$\mu\text{S cm}^{-1}$	1460	4400	1030	2400	2200	430	1160	1600	1600	1410	340	4900	1780	1040	680	650	2800	2800	1500	5050	4800	1300	6600
$\mu\text{g g}^{-1}$																							
Al	38.3	0.1	218.2	0.2	5.2	114.8	129.1	1.2	87.4	35.9	37.6	0.5	1.5	43.3	5.2	26.3	2.4	2.8	271.0	<0.1	1.8	193.9	18.2
Ca	1648.5	7308.3	1712.6	6178.9	3127.9	618.1	1974.6	4378.3	4759.3	1660.4	537.8	6648.5	2783.5	1772.0	581.5	927.6	3131.5	3535.6	2566.5	7875.7	5680.9	1792.2	8791.6
Fe	3.1	<0.1	0.9	0.1	0.1	9.8	0.4	0.1	2.2	3.3	0.2	0.1	0.2	4.8	1.1	0.3	0.7	0.1	0.2	<0.1	0.3	0.1	2.4
Mg	0.2	0.5	0.8	17.7	0.1	4.8	10.4	0.6	15.4	<0.1	28.7	0.2	0.2	119.2	89.9	90.1	270.0	<0.1	0.1	0.4	0.7	<0.1	4.6
Mn	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Mo	3.2	2.8	3.2	0.4	6.7	1.0	3.0	4.7	2.5	3.4	5.1	3.0	4.8	2.6	5.8	3.8	4.2	3.7	6.3	3.3	4.6	6.1	2.2
Na	127.0	37.2	39.7	346.9	39.3	20.3	176.1	91.1	325.2	92.7	23.9	417.6	265.5	10.1	236.2	167.8	339.9	183.3	267.7	32.9	70.6	103.4	55.2
P	1.0	1.4	1.3	<0.1	2.6	2.7	3.7	<0.1	0.5	1.5	5.5	2.4	2.0	6.1	1.1	0.9	1.4	0.9	5.5	2.7	0.6	0.4	5.3
S	880.6	643.9	831.2	5419.2	1194.3	208.8	1799.2	2535.9	4341.8	821.5	415.2	2109.1	1465.1	1668.4	664.1	1059.9	1200.2	974.6	2013.9	3505.7	583.0	772.6	917.9
Si	49.0	35.8	25.0	410.3	52.7	139.5	34.9	67.5	44.4	92.5	43.9	51.1	69.9	35.0	35.2	23.7	56.9	53.1	41.7	19.9	37.9	35.5	53.4
ng g^{-1}																							
As	260	13	315	1211	212	685	415	107	890	304	12374	44	64	370	511	958	64	51	176	10	11	138	14
B	3796	1504	120486	13769	80860	35262	13250	3537	36860	16789	43548	19230	27781	51840	9839	25345	21056	32445	69056	1697	10083	106423	20209
Ba	2992	15251	2691	1271	2094	1083	204	3357	3746	1747	68	6370	7552	1878	1194	280	7870	14017	7958	3586	18435	5001	14076
Be	1	2	5	2	5	5	2	2	3	2	4	1	2	3	6	2	3	3	3	2	1	5	5
Cd	3	5	5	<1	13	<1	6	12	6	5	11	6	7	7	24	10	4	7	14	8	5	14	3
Co	7	27	8	23	15	14	9	18	21	8	4	36	11	27	119	6	17	19	13	37	28	9	53
Cr	9221	5039	410	202	2825	1834	2730	5702	249	3412	494	3112	3433	1727	17	1055	4134	2316	2184	9264	2524	1623	5310
Cs	32	17	6	3	6	23	20	23	28	13	8	157	36	1	5	7	40	9	20	148	12	6	20
Cu	37	45	35	97	44	55	88	70	97	36	43	57	43	341	55	38	46	42	75	93	42	31	94
Ga	292	7	477	4	303	159	152	37	164	491	191	8	47	361	3	296	17	227	1160	1	10	719	28
Ge	1	<1	11	2	1	57	5	1	19	4	1029	3	1	128	58	70	1	6	19	<1	<1	2	9
Hf	10	10	12	11	10	14	10	10	9	9	9	10	10	10	10	10	10	9	9	10	9	10	12
Li	11189	23559	10500	592	18201	7367	10743	12689	9736	9338	5895	9454	16232	4553	4983	17499	21984	14267	15674	2062	12663	11059	21475
Mo	2981	2740	3031	349	6441	952	2848	4497	2390	3201	4705	2899	4875	2431	5480	3594	4113	3755	6171	3264	4419	6558	2374
Nb	12	11	8	9	8	14	5	6	8	5	4	5	4	4	5	4	4	4	3	3	3	2	12
Ni	61	289	78	209	142	61	97	168	175	76	29	223	105	158	513	45	132	156	97	334	246	72	402
Pb	11	8	11	7	6	46	8	13	23	10	9	8	5	32	19	5	9	7	8	5	9	9	32
Rb	378	80	160	60	149	200	572	419	535	342	57	358	237	8	187	177	262	116	631	1833	70	85	71
Sb	195	10	101	20	10	449	474	9	113	50	5672	15	9	115	227	618	7	8	111	6	5	48	7
Sc	31	33	23	227	50	91	21	39	22	59	27	30	45	21	18	12	35	43	29	20	31	28	59
Se	208	45	384	216	171	948	258	254	1916	534	572	806	219	2097	3661	976	180	1654	2750	109	242	285	184
Sn	9	7	9	7	8	10	7	6	7	7	6	5	5	8	6	5	6	6	7	5	5	6	13
Sr	7699	144630	17368	35076	36714	2616	2595	21577	33167	8292	66	35809	92212	9201	12717	7746	95493	59735	19586	66096	169019	24406	269859
Th	11	11	8	8	11	16	11	8	9	9	7	9	10	10	10	9	11	7	7	8	8	10	18
Ti	180	129	141	793	243	1235	275	364	729	215	106	322	272	894	284	206	313	191	337	589	184	147	1670
Tl	2	2	2	3	3	7	1	8	1	2	1	3	4	1	19	23	1	4	5	4	3	3	4
U	2	5	4	4	7	11	6	1	12	3	4	2	4	2	8	7	<1	5	1	2	2	5	10
V	1950	51	1566	2698	1014	4062	865	611	1117	2476	1886	92	640	1048	1140	489	563	300	1084	163	358	2778	149
Zn	724	131	639	173	196	269	630	315	321	158	186	138	292	439	476	105	116	141	126	138	115	150	239

N. Moreno et al. / Fuel 84 (2005) 1351–1363

ng/g is ppb (parts per billion, as one ng = 1 billionth of a gram).
Notice the sizes of the number for Barium. Their average is 5335.7, so 5335.7 ppb (5340 ppb rounded)

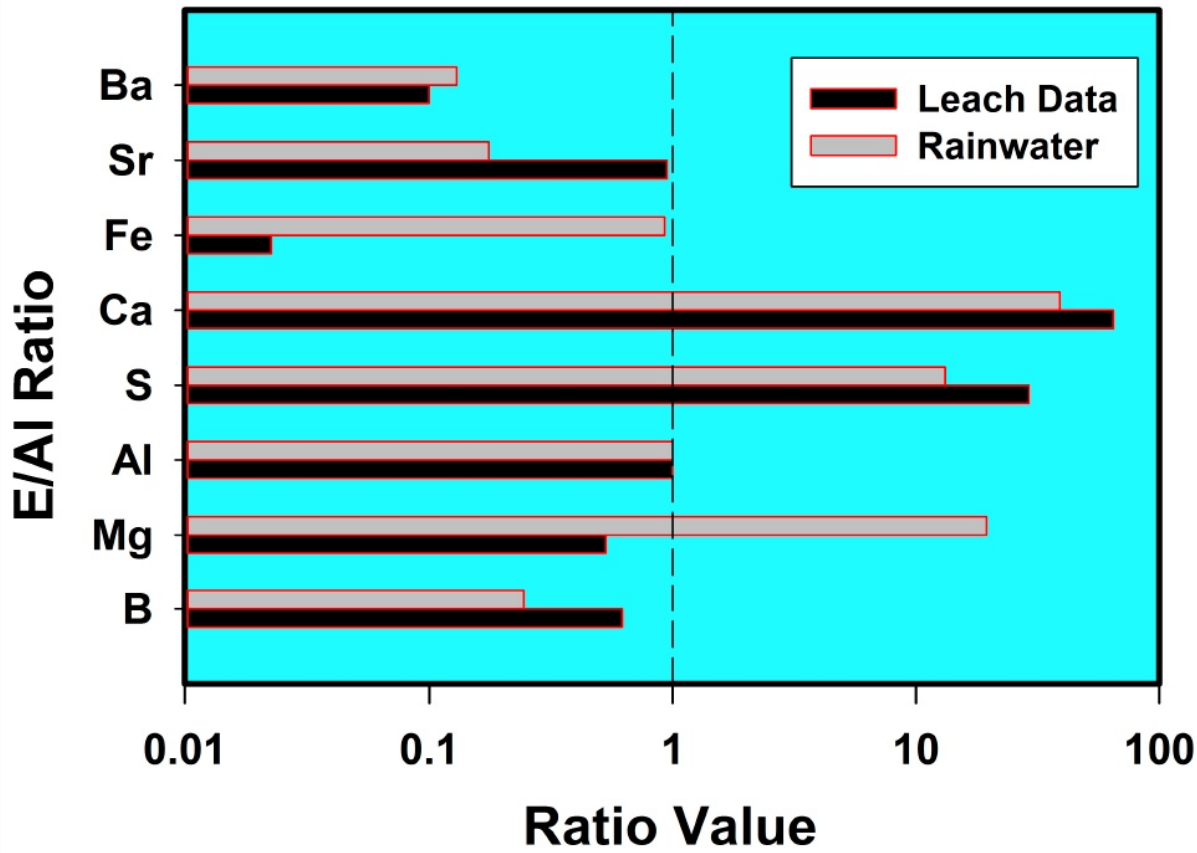
Mick West , Aug 23, 2015 #146

👍 Like x 1



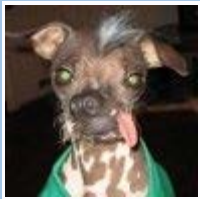
Mick West
Administrator
Staff Member

However he seems to be using the correct ratios in his charts, type just don't match his table.



Mick West , Aug 23, 2015

#147



Chew
Senior Member

@Mick West , where is his rainwater data?

Chew, Aug 23, 2015

#148



Mick West
Administrator
Staff Member

Chew said: ↑

@Mick West , where is his rainwater data?

It appears to be unpublished.

Mick West , Aug 23, 2015

#149

Mick West said: ↑



Chew
Senior Member

It appears to be unpublished.

Funny how the peer-reviewer didn't ask for the rainwater data...

Chew, Aug 23, 2015

#150



skephu
Senior Member

I noticed earlier that something is wrong with his data in the table. For example, his strontium data in the table is wrong, but I assumed he just forgot to append the multiplier. However, his figure seems to be generated from the correct numbers, and then hopefully the statistical test was also done correctly, even though he interprets it incorrectly.

It's interesting that the Moreno data show that the mean strontium value is almost the same as the mean aluminum value. In rainwater, strontium is much lower. By the way, the Moreno data show very skewed distributions, so I wouldn't even use means, I would have used medians instead.

skephu, Aug 23, 2015

#151

✓ Agree x 1



skephu
Senior Member

skephu said: ↑

his figure seems to be generated from the correct numbers

Except of course that he shows the ratios of the means, not the means of the ratios. This paper is just wrong in so many ways, pure junk indeed.

skephu, Aug 23, 2015

#152



Mick West
Administrator
Staff Member

How is he getting the Un-leached figures?

European coal fly ash samples from Moreno *et al.* [10].

Element	Un-Leached µg/kg	Leached (Leachate) µg/L	Element	Un-Leached µg/kg	Leached (Leachate) µg/L
Aluminum	7.00×10^4	5.37×10^3	Molybdenum	1.10×10^1	3.66×10^{-1}
Antimony	1.20×10^1	3.60×10^{-2}	Nickel	1.22×10^2	1.68×10^{-2}
Arsenic	7.06×10^1	8.35×10^{-2}	Niobium		6.22×10^{-4}
Barium	1.38×10^3	5.34×10^{-1}	Phosphorus	1.22×10^3	2.22×10^2
Beryllium	9.66	3.00×10^{-4}	Potassium	1.43×10^4	
Boron	2.38×10^2	3.32	Rubidium	1.04×10^2	3.04×10^{-2}
Cadmium	1.87	7.61×10^{-4}	Scandium		4.32×10^{-3}
Calcium	4.03×10^4	3.48×10^5	Selenium	2.24×10^1	8.12×10^{-2}
Cesium		2.78×10^{-3}	Silicon	2.27×10^5	6.57×10^3
Chromium	1.54×10^2	2.99×10^{-1}	Sodium	2.98×10^3	1.51×10^4
Cobalt	4.13×10^1	2.30×10^{-3}	Strontium	1.09×10^3	5.09
Copper	9.94×10^1	6.97×10^{-3}	Sulfur	3.78×10^3	1.57×10^5
Gallium		2.24×10^{-2}	Thallium		4.61×10^{-4}
Germanium	1.18×10^1	6.20×10^{-3}	Thorium	3.25×10^1	9.83×10^{-4}
Hafnium		1.01×10^{-3}	Tin	8.48	6.96×10^{-4}
Iron	2.89×10^4	1.22×10^2	Titanium	7.01×10^3	4.27×10^{-2}

For aluminum 7.00E+04 µg/kg is 7,000µg/Kg, or 7000/1000000000, or 0.0007%

But Moreno has roughly 25% Al2O3

Table 2
Major element concentrations, moisture and LOI values of the fly ashes

	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	CaO	MgO	Na ₂ O
Narcea	55.2	23.3	6.9	4.0	2.5	0.7
Barrios	42.6	35.6	2.6	8.4	2.1	0.3
Escucha	49.5	26.7	12.3	2.3	0.9	0.3
Meirama	49.2	17.6	10.4	11.8	2.0	0.4
Teruel	48.3	23.9	16.0	5.4	1.0	0.2
Espiel	52.3	28.5	5.9	2.0	1.5	0.5
Compostilla	51.2	25.5	7.5	2.8	2.0	0.8
La Robla	44.1	23.2	14.3	8.9	1.8	0.3
As Pontes	41.5	30.1	12.6	5.6	1.6	0.6
S. de Ribera	48.9	30.6	7.2	3.0	1.6	0.6
Puertollano	58.6	27.4	7.3	0.8	1.0	0.3
Alkaline	46.8	24.8	9.0	6.8	3.7	1.2
Nijmegen	45.3	25.0	8.8	6.4	1.4	0.8
Neutral	53.3	26.1	7.4	3.1	0.6	0.1
CCB	59.6	27.0	3.3	0.5	0.9	0.3
Acid	51.3	28.9	8.4	1.8	1.0	0.5
Amer-8	45.2	26.5	7.1	6.1	1.6	0.8
Amer-9	52.4	25.8	7.0	5.6	1.6	0.7
Hemweg-8	53.2	26.0	8.6	2.4	1.6	0.5
Lignite	28.5	17.9	8.4	27.3	3.8	0.2
Fusina	48.2	25.9	8.8	2.3	1.5	0.5
Monfalcone	50.8	33.4	6.4	2.4	0.8	0.4
Sardegna	41.7	29.0	3.8	10.0	2.4	0.5
UKQAA	48–52	24–32	7–15	1.8–5.3	1.2–2.1	0.8–1.8
NBS 1633 ^b	51.2	27.0	10.5	2.0	0.8	0.3
NBS 1633 ^b certified	49.2	28.4	11.1	2.1	0.8	0.3

Concentrations are in %wt.

Or roughly 14% Aluminum.

Content from external source

Molecular Wt: $2 \times 26.981 + 3 \times 15.999 = 101.932$

1) %Mass of Al is $2 \times 26.981 / 101.932 \times 100 = 52.94\%$

Mick West , Aug 23, 2015

#153

I played with the Al un-leached number too and saw he was off by a factor of 2 too. I haven't played with the other elements yet.



Chew
Senior Member

Chew, Aug 23, 2015

#154



Mick West
Administrator
Staff Member

And Moreno has Barium median value at 1302 mg/kg. (mg, not µg) $1302/1000000 = 0.13\%$

Table 3
Trace element concentrations (mg kg⁻¹) of the fly ashes

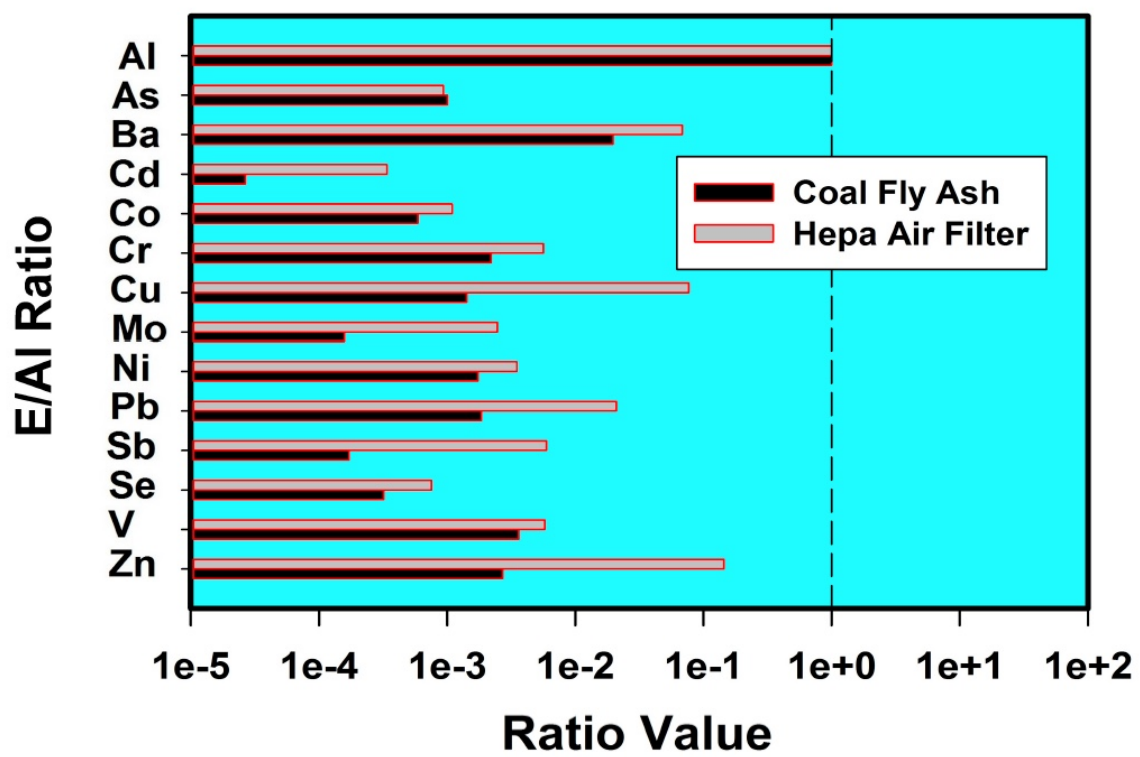
	As	B	Ba	Be	Cd	Co	Cr	Cu
Narcea	98	98	1047	5	2	30	177	86
Barrios	22	407	1960	9	6	40	148	68
Escucha	56	392	478	11	1	22	105	39
Meirama	94	158	1601	4	1	20	47	44
Teruel	79	342	311	12	1	25	107	52
Espiel	96	306	845	5	1	25	187	80
Compos- tilla	119	89	1029	6	2	35	137	90
Robla	162	117	619	5	1	41	148	81
As Pontes	129	340	1941	9	3	72	158	119
Soto Ribera	80	206	658	6	1	30	139	66
Puertollano	140	534	460	14	5	31	108	75
Alkaline	48	289	2037	17	2	55	140	186
Nijhegen	48	305	2215	9	2	34	161	81
Neutral	55	178	2182	8	2	112	196	154
CCB	40	24	993	10	1	35	145	120
Acid	109	68	1757	34	1	72	171	254
Amer 8	42	259	2074	8	2	34	159	75
Amer 9	34	229	1787	7	2	29	162	70
Hemweg 8	22	260	2313	8	1	35	133	93
Lignite	33	51	402	3	2	25	281	135
Fusina	52	152	1302	12	1	47	172	117
Monfal- cone	39	275	605	8	2	52	136	112
Sardegna	26	393	3134	13	2	48	235	89
UKQAA	4–109	5–310	<1– 36000	–	<1– 4	2–115	97– 192	119– 474
1633 ^b	141	142	690	13	2	46	182	107
1633 ^b certif.	136	–	709	–	1	50	198	113
Percentiles, minimum and maximum (mg kg ⁻¹)								
Perc25	40	135	639	6	1	30	137	73
Median	55	259	1302	8	2	35	148	86
Perc75	97	323	1999	12	2	48	172	118
Min	22	24	311	3	1	20	47	39
Max	162	534	3134	34	6	112	281	254

Herndon has it at 1.38E+03 µg/kg 1,380,000 mg/kg

Table 1. Average chemical composition of European coal fly ash samples from Moreno *et*

Element	Un-Leached μg/kg	Leached (Leachate) μg/L	
Aluminum	7.00×10^4	5.37×10^3	1
Antimony	1.20×10^1	3.60×10^{-2}	
Arsenic	7.06×10^1	8.35×10^{-2}	
Barium	1.38×10^3	5.34×10^{-1}	
Beryllium	9.66	3.00×10^{-4}	
Boron	2.38×10^2	3.32	
Cadmium	1.87	7.61×10^{-4}	

Herndon's un-leached coal fly ash Ba/Al ratio is on the diagram as being between 0.1 and 0.01



His figures from the table put it at $1.38\text{E}+03/7.00\text{E}+04$, or about **0.02** (0.0197)

But Moreno's Ba/Al ratio is 0.13/14, or **0.0092**

The Hepa filter results are
<http://losangelesskywatch.org/lab-test-results>

Component	Read (ug)	Size (ug)	PPM-1	MCL (PPM) = 2 ⁻¹ Water MCL	MCL / DL
		279800			
Aluminum	5,030	250,000	20,120	2.00	MCL
Antimony	29.9	250,000	120	0.012	MCL
Arsenic	4.7	250,000	19	0.02	MCL
Barium	344	250,000	1,376	2.00	MCL
Cadmium	1.7	250,000	7	0.01	MCL
Chromium	28.4	250,000	114	0.10	
Cobalt	5.5	250,000	22		
Copper	387	250,000	1,548	2.00	MCL
Lead	105	250,000	420	0.03	MCL
Molybdenum	12.4	250,000	50		
Nickel	17.6	250,000	70	0.20	MCL
Selenium	3.8	250,000	15	0.10	MCL
Vanadium	29	250,000	116	0.006	DL
Zinc	727	250,000	2,908	10.00	MCL

So 344/5030 (**0.068**)

And actual figures for abundance in the Earth's crust put the Ba/Al ratio at **0.0052**

Last edited: Aug 23, 2015

Mick West , Aug 23, 2015

#155



Mick West
Administrator
Staff Member

(I was off by 100 on the above, corrected now)

Mick West , Aug 23, 2015

#156



skephu
Senior Member

Mick, you should not compare the mean with the median.

skephu , Aug 23, 2015

#157

skephu said: ↑



Mick West
Administrator

Staff Member

Mick, you should not compare the mean with the median.

I'm not. I was just ballparking the "average" for the Aluminum values, as I'd not digitized that sheet, then the median value for Ba matched the value Herndon used (except his unit are wrong). I though there was a greater magnitude of error when I started down that road.

Mick West, Aug 23, 2015

#158



Mick West
Administrator

Staff Member

Actual Moreno figure for un-leached fly ash Al₂O₃ is average (mean) 26.6%, or 14% elemental aluminum, which is the figure I used above when ballparking. There's a possible extra 0.5% from the SiO₂/Al₂O₃ column (which is about 2% average) but it's not clear what the division is there.

Mick West, Aug 23, 2015

#159



Pete Tar
Moderator

Staff Member

I think this thread needs a debunk summary in the OP, as most of the debunking happens in the course of the discussion; and the current discussion needs to be translated for the non-statistically inclined as to how it affects Herndon's claim.

Pete Tar, Aug 23, 2015

#160

✓ Agree x 4

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Mick West
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