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[redacted]

RECIPIENT NAME + ADDRESS REDACTED

Dear Mr. [redacted]:

These are figures on dust influx onto the Earth and also the Moon. The figures I am using below for the calculations come from Hawkins, G.S. ed., 1976. Meteor Orbits and Dust, Smithsonian Contributions to Astrophysics. Volume II, Smithsonian Institution and NASA, Washington, D.C. These collected papers are based on radar, rocket and satellite data well into the "space age".

METEORIC PARTICLE MASS FLUX ON EARTH IN ONE YEAR

$= (10^{-12}) \times (10^{2}) \times (4\pi(6.4 \times 10^{8})^{2}) \times (1.3 \times 10^{-6}) \times 10^{4} \times (3.2 \times 10^{7}) \times (10^{-6})$

a) 10^{-12} = estimated near earth meteoric flux in particles -cm^{-2} -sec^{-1} $\text{-}2\pi\text{ster}^{-1}$ (in the above reference, p. 268)

b) 10^{2} = the measured flux average frequently showed increase by a factor of 170 for extended periods of time (so this factor is used to estimate changes in the flux) (p. 269).

c) $4\pi(6.4 \times 10^{8})^{2}$ = area of Earth's surface.

d) 1.3×10^{-6} = average mass if meteoric particle in grams.

e) 10^{4} = factor from observation and theory for gravitational enhancement of particles sink for the Earth (p. 222).

f) 3.2×10^{7} = the seconds in a year.

g) 10^{-6} = conversion from grams to tons.

In one year 2.14×10^{8} tons would come onto the Earth. For the Moon,

$(10^{-12}) \times (10^{2}) \times (4\pi(1.6 \times 10^{8})^{2}) \times (1.3 \times 10^{-6}) \times (10^{3}) \times (3.2 \times 10^{7}) \times (10^{-6})$.

So. then 1.34×10^{6} tons come in on the Moon in one year.

So, there is plenty of dust to arrive in the alleged "4.5×10^{9}" year age of Earth and Moon on the basis of later data than I used before.

Thickness of dust on Moon after 4.5×10^9 years:

$$\rho(\text{volume of dust}) = 4\pi R^2 h\rho = IT$$

where R = radius of the moon, ρ = density of meteoric matter, I = influx rate of dust on the moon, T = 4.5×10^9 years, and h = thickness of dust layer on moon.

So, $h = \dfrac{IT}{4\pi R^2 \rho}$

For ρ = density of iron = $0.28 \dfrac{\text{lb}}{\text{in}^3}$

$$h = \frac{(1.34 \times 10^6)(4.5 \times 10^9)(2 \times 10^3)}{4\pi(10^3 \times 5280 \times 12)^2} \text{ (in)}$$

$$= 854.22 \text{ in} = 71.2 \text{ ft}$$

However, for ρ = ordinary density of meteoric material = 0.07 lb/in^3

$h = 71.2 \times 4 = 284.8$ ft.

There is another source for the dust-- namely the break up of the moon's surface from high-energy radiation from the Sun. This has been estimated to contribute several miles of dust in 4.5×10^9 years (Lytlleton, R. A., The Modern Universe, Harper and Row Publisher, 1956, p. 72, New York).

Yes, in spite of Mr. Menninga emotional outburst there should be much dust on the Moon on the basis of the evolutionary time-scale but there is only a trace.

If you use the figures (Cassidy, W. A., Cosmic Dust, Science, V 144, June 19, 1964, p. 1476) from a symposium at Brown University the influx rate was estimated as more than 10^9 tons/year. This will give when transferred to the moon an influx rate of about 6.7×10^6 tons/year. This means a dust layer of thickness after 4.5×10^9 years of approximately 356 ft or 1424 ft, depending on which of the values for density is used.

I hope this is of some help to you.

Sincerely,

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