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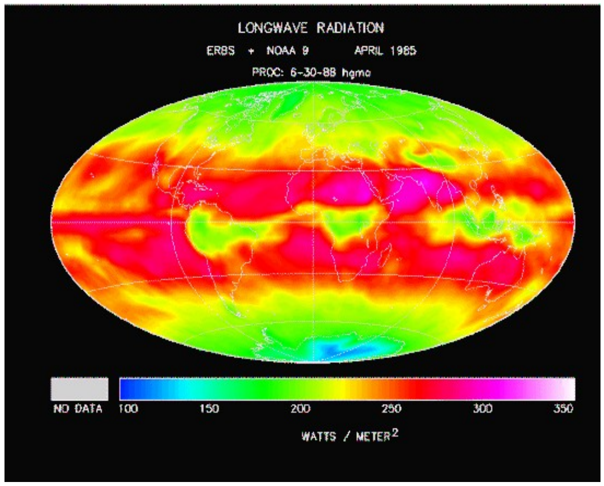
What Causes the Earth's Heat? Answer: CHARGE

how to calculate the Earth's heat straight from the fundamental charge



by Miles Mathis

Abstract: I will briefly critique the current theory of Earth's heat, including core theory and nebular theory. Then I will show you that the Earth's heat is actually caused by charge, proving it by calculating the total heat content of the Earth straight from the fundamental charge—in about four lines of math.

In a recent paper I confirmed for the third time that the charge field should peak in the infrared. Using a new round of equations, I showed that we must look for charge at energies beneath the visible. So I will open this paper by expanding on that a bit.

One of the questions I field most often is, "Where is this charge field of yours? If it has a field strength on the Earth .1% of gravity, why don't our machines pick it up?" They do, but they can't separate it from the heat of the Earth. Infrared photons rising up from the Earth are indistinguishable from heat. Heat is infrared. Heat rises. My charge rises. So to directly measure the charge field of the Earth would require us sifting some infrared photons from others. Neither I nor anyone else knows how to do that yet. The only other way to measure them would be indirectly, by subtracting out the energy not due to charge. Even if we assumed that things like Vulcanism *were* caused by charge rising up through the crust, we would still have to subtract out surface warming by the Sun and all other infrared sources. I think it might be possible to get very rough estimates this way, but it is not something I have done yet.

Another method might be to calculate the amount of heat that could be created by that much charge. If we add to it the amount of heat caused by Sunlight falling on the surface and get a total amount that matches the temperatures on Earth, we would have confirmation. No one has ever thought to do that, and if they had thought to do it, the calculations would seem daunting. How would you even begin to calculate the total charge of the Earth? I will show below that it is shockingly simple.

Of course, if these total heat calculations have been done, the gap would currently be filled with heat from the core. And if we study the history of core theory, it turns out the hot core has been hypothesized, in part, to explain the temperatures on Earth and in the Earth. In other words, it is filling that gap right now. The current theory is designed to answer the heat question without charge.

Despite that, it is generally known that core theory is just a floater. As NASA admitted (Ralph McNutt) in 2011, "A full theoretical description of how planetary dynamos work is still lacking and is the subject of ongoing research." A big understatement, as we will now see.

Which brings me to my latest discovery of a hole in theory, and the reason for this paper. The Earth is currently given a total heat content of about 10^{31} Joules. It is also given a core temperature of about 11,000F, (hotter than the surface of the Sun!). About 80% of that is given to radioactive decay. The other 20% is residual heat from formation. Two questions come to mind. One, how can 20% of heat from formation be left over after 4.5 billion years? What is the heat trapping mechanism that is so incredibly efficient? Remember, the Earth has an overall density of only 5,515 kg/m^3, and the upper levels have a density of only around 3,000 kg/m^3. That isn't very high, especially from the point of view of heat. If we add the high spin rate of the Earth, the centrifugal effect should force heat out from center very efficiently. I have looked at some of the models, and they always seem to leave out that centrifugal effect when calculating residual heat.

Two, of that 20%, 10% is actually given to gravity. Which leaves us with 10% residual, from formation. Well, if 10% is left over, then that implies that there was originally ten times more "residual" heat. Just following this heat would give us an original core temperature on the order of 110,000F. And that isn't even counting heat from radioactive isotopes, which we will look at in a moment. This is a problem because the current theory of planetary formation for rocky planets like the Earth is a theory of accretion. *Accretion is not gravitational collapse*. Therefore, accretion could not possibly cause such high internal temperatures. Accretion is a slow process, and even the "runaway accretion" can last 100,000 years or more, according to the theory. In a slow process of accretion, heat easily escapes. There is no possible mechanism for trapping that amount of heat. Even if we imagine the Sun much hotter and the space around it much warmer than it currently is, accretion of a planet gives us no mechanism to trap that amount of heat, and lots of mechanisms for releasing it. Heat acts like a gas, remember, not like a solid. If you want to trap a gas inside a sphere, you have to do it fast. You can't build your sphere one rock at a time and expect to trap anything gaseous inside it. I would think this is obvious and doesn't need to be said, but that is not the way science works anymore. Everything is said *except* the obvious.

The only way that could work is if all parts being accreted were fabulously hot to start with. Every dust speck or rock that was being accreted would have to be even hotter than 110,000K. Since that is *17X* hotter than the surface of the Sun, the Earth must have accreted inside the Sun somewhere. But that is not the current theory. It is not my theory, either, so don't worry.

As more evidence that we are being fed another big fat contradiction, see this quote from Joe Anuta at Physorg:

First, there's the heat left over from when gravity first condensed a planet from the cloud of hot gases and particles in pre-Earth space. As the molten ball cooled, some 4 billion years ago, the outside hardened and formed a crust. The mantle is still cooling down.

Why was that ball molten, exactly? According to the current reigning theory of planet formation SNDM,

The disk of a Class 0 protostar is thought to be massive and hot. It is an accretion disk, which feeds the central protostar. The temperature can easily exceed 400 K inside 5 AU and 1,000 K inside 1 AU.

That's 1,000K, notice, not 70,000K, which is what we need to match the theory above. And that's only in the earliest stages of accretion. We actually require a cooling to facilitate accretion in the disk, so as the Earth accretes it cools far below 1,000K. There seems to be some lack of communication between nebular physicists and core physicists. They haven't matched up their temperatures very well. We have a miss of around 200 times here.

But even that number 1,000K is too high and unsupported. Where does all that heat come from? The Sun itself is still collapsing at that point, so it can't be producing the heat via fusion. And once the Sun finishes its own collapse, the heat is in the Sun, not at 1AU from the Sun. Currently, any dust in space existing at 1AU is very near zero temperature, despite the nearness of a huge fusing star. How could dust at 1 AU from a pre-collapse protostar have a temperature of 1,000K? No fusion and no local collapse (at 1AU). What is producing the heat?

But even if we give them the 1,000K, the theory is still a non-starter. The core physicists seem to assume that the Earth would gain temperature during accretion, but it wouldn't. It would have to lose temperature continuously. That is why Joe Anuta has to misdirect you with imprecise language. He says that we have gravity "condensing" a planet. But accretion is not condensation. He is trying to make you think the Earth is somehow gravitationally collapsing like a star, but that isn't the current theory by a long shot. Again, accretion is not a gravitational collapse. You only get gravitational collapse with stars, and gravitational collapse requires a minimum amount of mass—mass the Earth does not have! By talking about gravitational "condensing", Anuta is pushing you toward the idea of gravitational collapse, making you think that heat can be trapped by pressure here in some way. But accretion doesn't trap any pressure or heat. That is what accretion means. Look it up.

Say you have some hot rocks you want to glue together. We will assume you have some magic protostar glue that allows you to glue hot rocks together. What method of gluing or accreting are you going to use to prevent your rocks from releasing their heat? If the space around your rocks cools off, what is to prevent them from radiating heat into that cooler space? You will say, "I am going to do like Joe Anuta. I am going to put all my hottest rocks at the center and surround them with a crust." But wait! You don't get to create your planet all at once, and you don't have a bunch of different materials you can use. You only have hot rocks, all of them pretty much the same. You have to build this planet up slowly, over a million years, say. And there are no choices to be made. If you want to add something, you have to pretty much close your eyes and throw it in there. It could be anything. You don't have temperatures and densities to choose from. Just hot rocks.

Supposing your lump of hot rocks happens to turn out somewhat spherical, and supposing your medium starts to cool, what exactly causes the shell of your hot rocks to form a "crust"? And how does that crust prevent cooling? If you bake a loaf of bread and take it out of the oven, it develops a crust, yes, but that crust doesn't prevent it from cooling for 4.5 billion years. Even if your bread somehow magically developed a crust of lead or gold or platinum, that wouldn't prevent it from cooling. What kind of magic crust is Joe Anuta proposing here? The current crust of the Earth doesn't prevent cooling, and it is pretty thick and dense, compared to bread. It slows cooling somewhat, but doesn't *prevent* it at all. The reason for this is that normal matter is not a heat barrier, no matter what it is made of. ANY natural material will transfer heat. *There is no material naturally in the Earth that does not transfer heat across it.* Some transfer slower or faster, but all transfer heat. So even if we grant Joe Anuta his molten ball with a crust, it doesn't explain anything. The crust we have transfers heat, and any crust we could make would also transfer heat.

But let us return to the formation of the proto-planet. Following the argument of these people, you are led to forget what you are taught in first-year astronomy: if a body has less than a certain amount of mass, it cannot collapse. That is why we don't see stars under that mass. That is why Jupiter, with a mass of over 300 Earths, still did not become a star. The Earth could not meet the Jeans mass criteria, and that is why we are taught that it accreted, not collapsed. But if it accreted, it lost heat as it accreted, it did not gain it. Therefore there is no way to get the original heat content to 30 times current levels. There is no way to get the original heat content up to *current* levels. You simply cannot create internal temperatures of 100,000F by accreting dust that is at an initial temperature of 1,500F.

Three, 80% of 10^{31} Joules comes from radioactive decay? That's a heat content of 8 x 10^{30} Joules all from radioactive decay. Since the Earth is not a star, fusing elements, that heat must be from fission of elements there from the beginning. We are told that, “The major heat-producing isotopes in the Earth are potassium-40, uranium-238, uranium-235, and thorium-232.” So here's a question for you: given that the Earth cannot have fused these large isotopes itself, and given that the Sun was forming at the same time as the Earth—and therefore could not have fused these large isotopes—where did they come from? To produce 8 x 10^{30} Joules of energy requires a huge amount of isotopes. Are we being told it all just drifted in from the nearest supernova?

Now let's check those half-lifes. U235—700 million years. U238—4.4 billion years. K40 1.2 billion years. Thorium232—14 billion years. Only the Thorium would persist at anything like original levels. About 1/5 would be gone. But half the U238 would be gone by now, 12/13ths of the K40 would be gone, and 85/86th of the U235 would be gone. So the current theorists must be telling us there was twice as much U238 in the past, 13 times as much K40, and 86 times as much U235.

And, logically, if 80% of current heat is caused by radioactivity, and if there was so much more radioactive material in the past, the Earth must have had 20 to 50 times more heat from radioactivity in the past. Let's use the lower number, to be generous to current theory. The Earth in the past would have had 20 times more heat from radioactivity, and 10 times more residual heat. That's a total of 17 times more heat than it has now. That's a heat content approaching 2 x 10^{32} Joules and an internal temperature of something like 180,000F. How can dust particles accreting at 1,500F create temperatures of 180,000F?

Remember, according to the SNDM model, the protostar disk in which the Earth formed is made up mainly from Hydrogen and Helium. But now we are being told that enough radioactive material is available to create 10^{31} Joules of energy 4.5 billion years after the fact in a small rocky planet. By that reasoning, the Sun must have had copious amounts of radioactive isotopes from the beginning as well. Since the Sun has a mass of 333,000 Earths, we must assume it had that much more radioactivity from the beginning. So let's do the math. If the early Earth can create 2 x 10^{32} Joules from its radioactive isotopes, the early Sun should be able to create 6.67 x 10^{37} Joules. If we add the gravitational heat of the Sun, using the same method as they use on the Earth, that gives us 1.86 x 10^{39} Joules (the Sun has

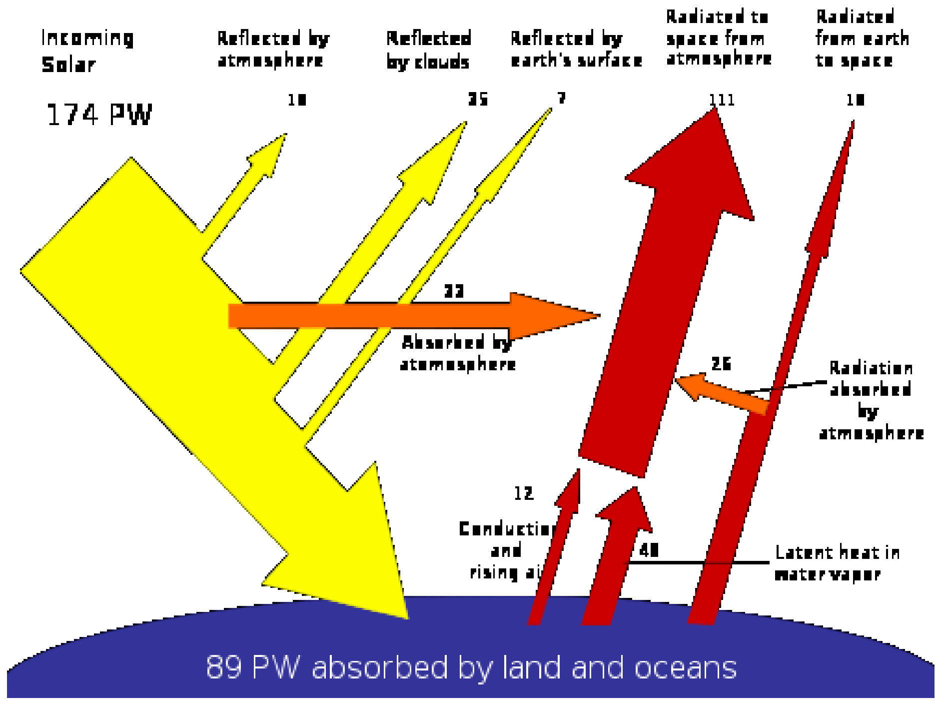
28 times as much gravity). Does anyone believe the Sun has that much heat due to original radioactive isotopes? No. If we could create that much heat from radioactive isotopes, the Sun could fuse as a sidelight.

Which brings us to another problem. Notice that they always tell you the heat content of the Earth in Joules, rather than the heat *creation* in Joules per second. But once we compared the Earth to the Sun, we could begin to see that the problem is more than just one of heat content. The Earth has to be losing heat all the time, just like the Sun. The Earth is obviously radiating much less, but it is still radiating. The atmosphere is not a total heat trap. And since the Earth cannot be creating any new energy, except through radioactivity, its heat content should be steadily dropping. This is precisely why they have diverted us more and more into radioactive isotopes. They are the only source of created energy. Without the radioactive isotopes, you see the Earth should have lost 90% of its original heat, even by current theory. But even with the radioactive isotopes, the problem remains, since they have diminished even more than the residual heat. The residual heat is $1/10^{th}$ of what it was, we are told. But unless we give the bulk to Thorium, the radioactive isotopes have also diminished by 2 to 86 times. Either way, we should be seeing a large and steady decrease in heat over time, and we aren't seeing that. We don't have any data showing a large, steady decrease in heat content over the past billion years. We see longterm fluctuations that seem to follow solar cycles, but we don't see anything that indicates a steady cooling of the core, following a pattern of isotope half-lives.

Also notice that according to the isotope theory, the rate of cooling should be increasing with time. Half-life is a power decrease, which means we should be seeing a power decreases in heat with time. The Earth should be cooling at a power of 2, by the definition of *half*-life. I think that would be pretty hard to miss, 4.5 billion years after the fact.

You see, with the theory of isotopes, geophysicists think they are able to dodge the question of continuous energy production. But they aren't, due to the little problem of half-life. By choosing isotopes as their fudge, they have just provided me their own refutation.

An even bigger problem is that there aren't enough radioactive isotopes currently in the Earth to constantly maintain 8×10^{30} Joules. That would be true even if the atmosphere were a near-perfect heat trap. But it isn't. The atmosphere is actually quite porous to heat. The heat is trapped only temporarily, as we see from this lovely chart I got at Wikipedia (on the page "Earth's Energy Budget").



Even the 26 PW absorbed by the atmosphere (little orange arrow) is only absorbed temporarily. It joins the 111 and is released into space. Although this diagram is analyzing sunlight, not heat produced by the Earth itself, the process must be the same. The atmosphere cannot fail to trap incoming Solar but succeed in capturing large amounts of Earth radiation.

What is more, NASA just released data last year showing that the Earth releases more heat more quickly than we thought. Data from CERES showed that the computer models long used to predict heat trapping were very wrong. It turns out this data affects not only the global warming argument, but the entire theory of Earth's own radiation.

It is important here because it proves that whatever is heating the Earth from within must *constantly replenish* the 10^{31} Joules of energy we are finding. Radioactive isotopes cannot possibly do that. Yes, they continuously emit, but since they can't replenish themselves, they burn out.

As a final blow to this radioactive isotopes theory, we may look at the amount of those elements thought to exist in the Earth. Thorium—7 ppb, Uranium—2 ppt, Potassium40—10 ppb. Even if those numbers are correct, that isn't enough to continuously replenish 8×10^{30} J of energy. And if radioactive isotopes were creating a continuous amount of heat in the amount of 8×10^{30} J, we would also see a lot more Technetium and Promethium in the Earth than we see. After 4.5 billion years of fission, we should see a sizeable amount of by-product, including these extremely rare elements. We should also see more Rubidium and Cesium than we do see, and Lead208, and so on. Not only are the radioactive isotopes not there in the amounts required, the by-products of fission are also not there.

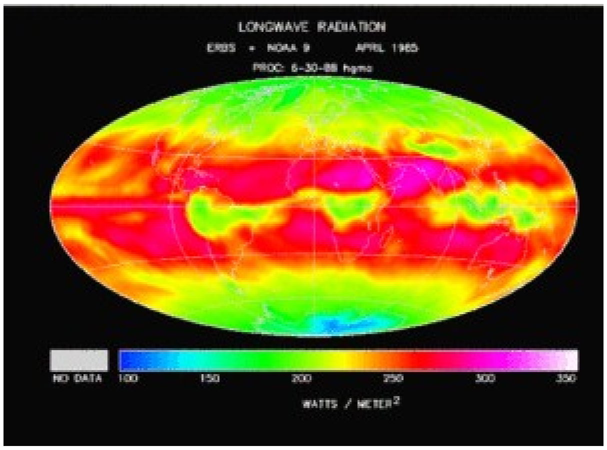
As it turns out, Mars and the Moon also provide obvious data against the radioactive isotope theory of heat creation. Both Mars and the Moon are very cold, though they are also rocky accretions. Where is their heat from radioactive isotopes? If the entire interstellar medium is awash with radioactive isotopes from supernovae, in concentrations high enough to heat the Earth to 10^{31} Joules for 4.5 billion years, we ought to see that heat everywhere: in comets, asteroids, interstellar dust, everything. If not, why not? If it got into our protostar mix, it should be everywhere.

I predict that when this all comes out in the wash, it will turn out that radioactive isotopes are not responsible for even 1%. Beyond that, it will turn out that this existing radioactivity is due to an underlying cause, which means radioactivity is the root cause of 0% of the heat. What I mean is that the "spontaneous" fission of these larger unstable elements will turn out to be not spontaneous at all, but due to the charge field. It is the charge field that energizes neutrons in the Earth's interior, freeing them up to start fission and thereby radioactivity.

I am able to predict this with confidence, because I know that the charge field is the cause of the Earth's heat, and it always has been. It never had anything to do with trapping heat from a molten condensing proto-Earth. It never had anything to do with radioactive isotopes. These threadbare and contradictory theories are pegged together only because modern physics has forgotten about charge. Nine-tenths of current theory is misguided, and it has been misguided for the same reason: the ignorance of charge. We have seen this with dark matter, unification, quantum theory, orbits, tides, the Coriolis Effect, atmospheric weight, the bullet cluster, Bode's law, planetary tilts, planetary eccentricities, Lagrange points, and on and on. Because physics lost track of charge 200 years ago, it keeps having to fill that hole in every problem it has. In mainstream theory, charge has become virtual: a ghost. It has never been given any real field presence. It was unassigned potentials for Faraday in 1830, it was unassigned potentials for Schrodinger in 1925, and it is still unasssigned potentials today. If anything, the situation is worse now than in Faraday's time, because then they had some hope of filling the theory out. We have since given up. The "successes" of QM and QED have buried charge under a mountain of math and pseudo-philosophy, and charge is now virtual. Charge is now brazenly and aggressively non-physical, and no one even has a problem with that anymore. It is not seen as something to work on. It is only seen as something to deny.

But charge is the answer to everything. It is the ultimate source of the Sun's energy, it is the source of most Solar System motions and reactions, it is the source of the heat in the protostar medium, it is the cause of collapse with a star and the cause of the glue in accretion. And here, *it is the root cause of all internal heat in the Earth*.

I now draw your attention to the diagram under title, which I borrowed legally from Wikipedia.



I just found that diagram, but it hit me like a sack of bricks. Why? Because it is direct proof of my charge theory. I am going to add it to about 30 of my old papers. Here we have a diagram taken straight from data (NOAA ERBE, 1985) that shows more longwave radiation at the equator and less at the poles. What have I been saying for the past five years or more? The Earth is recycling charge and charge peaks in the infrared (infrared is longwave). Every particle and body in the universe—from the electron to the galaxy—is a charge reactor. It is a machine that recycles charge. It most cases, it does this by spinning. A spinning sphere in a charge field immediately and naturally sets up charge potentials, and if that sphere is porous to charge, the charge comes in the poles and is emitted at the equator. The Earth does this just like the proton does and the Sun does and the galaxy does. We can SEE it doing this in this diagram! Look at the hole at the south pole. Also look up "coronal hole." Coronal holes are most often at the Solar poles, just like this. This is where photons are going IN.

In fact, I can now prove this assertion by calculating the total energy of the Earth straight from the fundamental charge. I just scale up from the fundamental charge and the proton, using the proton's known mass and my radius of the proton:

$1e = 1.602 \times 10^{-19}\text{C}$
$1\text{C} = 2 \times 10^{-7}$ kg/s
$1e = 3.204 \times 10^{-26}$kg/s
$M_E/M_p = 3.6 \times 10^{51}$
$E_E = 1.15 \times 10^{26}$kg/s

But now we need to write that as Joules, so we need a distance. You will say why not just write your first equation as *e*V instead of *e*, and you are done. You would have Joules instead of kg/s. Can't do that, because Coulombs transfer directly to Joules only at the quantum level. Charge and energy have a one-to-one like that only for the fundamental charge. We are calculating the charge on the Earth, so that won't work. We have scaled up using the mass differential, but that isn't enough. It isn't enough, because we also need to consider charge density. We can do that by incorporating the density of our objects. The simplest way to do that is by incorporating the radius differential as well as the mass differential. So we will incorporate the radius differential *while* comparing it to the mass differential, to skip a step. The radius of the proton over its mass is

$R_p/M_p = 4.09 \times 10^{-14} / 1.67 \times 10^{-27} = 2.45 \times 10^{13}$
And for the Earth: $1/R_E/M_E = 9.41 \times 10^{17}$
So the differential is 38,381

$\mathbf{E_E = 4.41 \times 10^{30} J/s}$

[If that math is not clear, I am finding a sort of density differential, but using radius instead of volume. I have to reverse the numbers for the Earth because with the Earth we are above the number 1, while with the proton we are below 1. So in comparing mass to radius, we have to reverse the numbers, you see. If you still don't see what I mean, look at the way the radius is squared to achieve the mass of the proton. The same thing applies to the Earth, although we don't get a straight squaring. To go toward the mass of the Earth given the radius, you again square, you don't squareroot. But this is strange, right, because mass of the Earth is larger than its radius, while the mass of the proton is smaller than its radius. This is all due to the fact that if you want an area or volume below the number 1, you don't square or cube, you squareroot or cuberoot.]

Anyway, what this means physically is that the recycled charge has 38,381 time further to go along the

Earth's radius than the proton's radius, relative to the mass of each body. Or, if that doesn't make sense to you, think of it this way: although the charge *field* is the same at all levels, how much energy it produces is dependent on the amount of matter present. The Earth is basically 38,000 times denser to charge than the proton. So as charge moves through the Earth, it energizes 38,000 times as much matter per second as it does with a single proton. That's why we have to scale up using both mass and radius. Because a Joule includes the distance through which an energy applies—a Newton-meter, for example—we need that transform in order to write our number as a Joule instead of a kilogram. As you see, I get very near the current estimate of 10^{31} Joules. But my number comes with the full math, which is elegantly simple. It also gives us the energy per second, instead of just a raw energy.

Some have still not understood, so I will answer another question. They say, "Why not just scale using density?" Try it. Neither cubing nor cube-rooting the radius of the proton gives you a logical density. So in comparing quanta to macro-objects, I always scale up or down using a radius and mass. This allows me to solve problems logically. It also allows me to match data, so it leads me to believe I am right. In calculating charge *differentials*, we don't need three dimensions anyway. We just let charge move down the radius, and compare the way it moves at the quantum level and the way it moves at the macro-level.

The question after that is, "Well, if that is your method, why flip one of the R/M terms? If you aren't going to two or three dimensions to solve, then your point about area and volume doesn't apply." It *does* apply, since although I am using the radius to scale size instead of volume, I am still comparing mass to size, and both mass and size are 3D. My density is a sort of one-dimensional density, it is true, but the reversed relation of mass and size below the number 1 still applies. This is because although we are following only radius, and radius is a length, the radius *applies* to a sphere. It is a bit tricky, I admit, and this subtlety seems to have corrupted a lot of solutions in the past. But I stand by my method.

As you see, I just calculated a heat content straight from charge. Since charge causes the heat, and since both can be written in terms of Joules, the energy I found can be applied to either one. The total charge of the Earth IS its total heat content due to charge.

This also proves that the Earth must be radiating rather than trapping energy. The crust *cannot* be trapping internal energy for 4.5 billion years, or the buildup would long ago have been fatal. The heat content of the Earth is far from static. Charge is moving through the Earth all the time.