Re: heat corpuscles in the mantle

Source: http://sci.tech−archive.net/Archive/sci.geo.geology/2005−12/msg00544.html

- *From*: "don findlay" <don@xxxxxxxxxxxx>
- *Date*: 12 Dec 2005 04:22:38 −0800

Alan wrote:
> In article <1134265314.314077.315840@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx>,
> don@xxxxxxxxxxxx (don findlay) wrote:
>
> > A little while ago I asked Stuart in sci.geo.geology about heat
> > corpuscles. And got no answer. I thought I might try here.
> >
> > Stuart is our resident policeman over here in sci.geo.geology, .. who
> > defends the vital vastness of plate tectonics against insurgents like
> > me, ..and he's very keen on convection in the mantle and subduction, as
> > the driving force for plate tectonics. So its' not easy to understand
> > why he doesn't answer this one. Recently Stuart's been joined by Big
> > Al Zenner, a team player from the physics side of the line who believes
> > that this world is the rightful inheritance of team players like him,
> > whether they be armed with nukes and AK47's or the backs of envelopes
> > with numbers on them. Al has a questionable style of prose and
> > attitood when it comes to people like me who ask what he thinks are
> > daft questions (though his prose seems to desert him when it comes to
> > articulting exactly what's daft about them). Al has recently been
> > conducting a heightist talkfest about schizophrenia with Aidan Karley
> > who's only 3' 9" tall. Both of them are concerned about the integrity
> > of the world we live in as this may be gauged by the capacity of people
> > in the world to learn *THINGS* instead of watching football and eating
> > meat. Stuart is also from the physics side of the line, but puts his
> > faith in books and reading them, more than envelopes and scribbling on
> > them, and heightist talkfests. Stuart has lost his badge recently.
> >
> > The question was, ..and this is about convection in the mantle and
> > whether it exists or not, ...Because if it doesn't, then nothing's
> > driving tectonic plates, and there is no convection, ..and that means
> > that the crust is overriding the mantle in a spin sort of way, and not
> > that the mantle is being driven under the crust in a subduction sort of
> > way, ..and if that is so, then the Earth is getting bigger, and the
> > entire geological model for the Earth and all things within it (and
> > Stuart) (and Big Al) is wrong. So this is important stuff.
> >
> > The question was, ..and since he was asked, Stuart is cogitating this
> > one and needing some help from anyone prepared to give him any, ..

> >
> > The question was:− In a mantle that is convecting because of the heat
> > produced by radioactive elements which might be considered little
> > corpuscles of heat tied up in minerals which are locked in the solid
> > rock, ..if these 'corpuscles' rise with the heated rock as convection
> > says they should, how do other corpuscles manage to stay behind in
> > order to keep the thing going next year, or in a million years? I
> > mean, ..don't they all rise at once − whether they want to or not?
> > Wouldn't the ones that do, carry with them the ones that don't, so that
> > they'd all end up pretty quickly at the top of the mantle? A once−off
> > rise? And heat things from there?
> >
> > Is anybody thinking about rising heat corpuscles in a convecting Earth?
> >
> > Also, when all these corpuscles get there, and make it to the top of
> > the mantle − give or take a few million years − (the top of the mantle
> > also being the bottom of the ocean) the bottom of the ocean is a lot
> > colder than the top, so how is the internal heat of the Earth lost to
> > space in order for convection to be set up and plates to be driven? It
> > says in my book that ocean currents are driven by winds and spin, not
> > by heat loss. Wouldn't we expect, that if heat drives convection in
> > the mantle, and that heat is being lost to space to drive convection in
> > the rocky mantle, that some vestige of that heat would drive convection
> > in the much more mobile water overlying it?
> >
> > I'm sure this is a question that gets asked many times and there must
> > be a pat answer, but what is it? If the heat loss is so low it can't
> > drive convection in water, why would it drive it in solid rock? (And
> > that bit about corpuscles.)
>
> Actually Don, as you ask, for a very long time I have had this site bookmarked.
>
> http://www.sentex.net/~tcc/siem.html
>
> Subcrustal Ice Earth Model
>
> What's Down Inside?
> Could the earth contain a subcrustal ice layer? Jupiter's largest satellites,
> Ganymede, (diameter 5,262 km, density 1.94 gm/cm3), and Callisto, (diameter
> 4,800 km, density 1.86 gm/cm3) have water/ice mantles and rocky cores.
> Ganymede's crust probably consists of a thick layer of water ice.
>
> The earth is unique in the solar system because of the presence of liquid water
> at the surface, and its high density core. The earth's atmosphere, also, is
> uniquely constituted for sustaining life. But evidence for ice and water
> elsewhere naturally leads to the question, why couldn't the earth's interior
> also contain an ice layer? The Subcrustal Ice Earth Model (SIEM) is being
> developed to investigate this possibility.
>
> According to the conventional theory of plate tectonics, water and other
> materials from the earth's surface are recycled to the deep interior by

> hypothetical processes of subduction and convection. The driving force for the
> postuated movements of the plates is mantle convection, a process invoked by
> Arthur Holmes as a mechanism for continental drift.
>
> The Inner Workings of the Earth by Michael Wysession, from American Scientist,
> March−April 1995 presents a discussion of current thinking about mechanisms for
> recycling water and other materials from the earth's surface to the deep
> interior. According to the theory, some of this water returned to the interior
> by convection driven processes becomes ejected in volcanic eruptions.
>
> The convection hypothesis comes under critical scrutiny in: Is mantle convection
> no more than a storm in Arthur Holmes' porridge bowl? This author of this
> article [presumably Dr. Ken Duckworth, professor of geophysics at the University
> of Calgary], uses the pseudonym A.H.E.Retic. He tilts against "a concept so
> powerful that even today it has become a Mantra to be chanted by all should they
> ever hope to get a grant to study any aspect of the crustal behaviour of the
> earth". The article identifies several fatal flaws in the standard dogma of
> mantle convection, and develops some helpful Retic's Rules.
>
> Could the concept of recyling of water from the earth's hydrosphere back into
> the depths of earth, (needed for the conventional view of an ancient earth,
> billions of years old) be wrong? Thermodynamics suggests bodies that are heating
> up degass. The high concentration of radioactive isotopes in rocks could mean
> the earth is heating up. See The Heat of the Earth.
>
> A 1995 paper by Lars Stixrude, Mineral physics of the mantle from Reviews of
> Geophysics considers possible mechanisms by which water and volatiles could
> exist deep in the earth's interior, combined with other minerals. Stixrude notes
> that 1% by weight water stored in the earth's mantle amounts to 30 hydrospheres.
>
> If the water and volatiles in the earth's interior are primeval, the earth could
> not be billions of years old!
>
> The New Alchemy by Robert M. Hazen reviews the history of high pressure
> research.
>
> Deep Waters is a recent article from New Scientist about why abundant water
> exists in the earth's mantle.
>
> Earth's Interior May Contain Oceans Of Water, Geologist Says
>
> http://www.sentex.net/~tcc/siem.html
>
> I actually had it bookmarked under "conspiracy theories", but now that I see
> what you are saying I am going to take another look.

I seem to remember Ken Duckworth saying some few years ago when I came
across it, that he wrote it for a joke. On the aspect of water,...
it's an interesting question what that 'bubble' of the Pacific that
predated breakthrough was like. (Quite feasible when the bubble burst,
there was indeed a lot of water. Water production goes with the

mantle. Must, because of the balance between growth and sedimentation. But even more interesting is how Stuart can only see it as meaning that subduction must therefore have been easier. (He's a funny guy, is our Stu when it comes to subduction. One could almost say he's fanatical, obsessed even, with it.) (Funny, ..I hadn't thought of Stuart that way.. I bet he wears aftershave too...)

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- ***References***:
  - ♦ ***Re: heat corpuscles in the mantle***
    - ◊ *From:* Alan

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