Highlights from The Universal Model by Dean Sessions

Ch. 5 The Magma Pseudotheory

UniversalModel.com



Compiled by Nate Richardson RichardsonStudies.com

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5.1 Magma Defined

Magma and Lava Defined

Magma is **only** a **theoretical** molten rock material generated deep within the Earth in the outer core or mantle.

Extrusive lava is molten or fluid rock that is manifest on the surface of the Earth.

Intrusive lava is the molten sub-surface rock that occurs within the crust of the Earth.

p.70

Magma is Only a Theory

"Because so much is known about planets that are light-years away, one might assume that science has unearthed everything worth knowing about the one beneath our feet. To the contrary, Earth's innermost reaches remain, in many ways, as mysterious as the cosmos at large.

p.70

A Theory Taught as Fact

"Magmas properly belong to the realm of theoretical petrology."

Eric K. Middlemost (petrologist)

p.71

"The question of where the magma comes from and how it is generated are the most speculative in all of volcanology. We cannot see to any appreciable depth below the surface of the earth and have few direct measurements of the nature of the materials in the earth's interior."

p.71

6

<u>James Hutton – the Father of Geology</u>

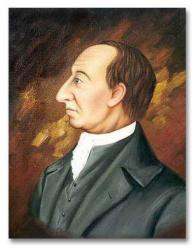


Fig 5.1.3 - James Hutton, father of geology, uniformity, and magmaplanet theory. p.72

The Uniformity Myth

The Catastrophic Principle

Why is Magma so Important to Modern Science?

The Catastrophic Principle: Major geologic events occurred in the past, including processes that are not happening today.

p.

5.2 The Magmaplanet Belief

Why Do Geologists Today Believe In A Magmaplanet?



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(The Age Model chapter further discusses how magma is needed for radiometric dating, which is needed for an old earth, which is needed for evolution theory.)

Why Does Science Believe The Interior Of The Earth Is Hot?

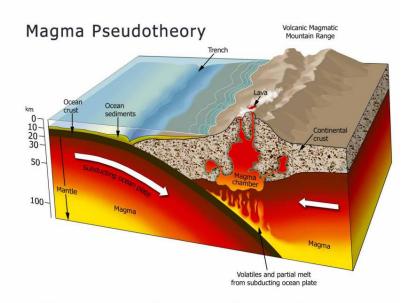


Fig 5.2.1 – This diagram depicts the modern science Magma Pseudotheory. Scientists believe observable surface lava comes from magma far below. p.74

Fossils and deep geologic time are based on the theory of origins of rock formation, P73

"Mantle convection...central framework linking...Earth science" p73 scientist quoted

Radioactive elements in the interior is completely theoretical, they say this is why the interior is hot. They say infalling chunks of matter make the interior hot, this is also completely theoretical. These have never been demonstrated. P74

They say evidence for interior earth heat is global plate motions, earthquakes, and uplift of mountains. But we can't definitively observe the internal heat that science says drives these processes. P74

(Here we see why it's important that uplift of mountains has not been observed? But they had to rise sometime, but how?)

On the concept of melted rock under pressure, the issue is that **of pressure not** being able to account for the heat:

1. Pressure by itself does not create heat.

2. Pressure decreases as melted rock moves upward or by the removal of material above the rock.

Quote on studies of meteorites "the study of meteorites, have all been used to construct models of the chemical composition of the core [of earth]". (quote on p75) These are theoretical models, all on indirect evidence.

"How do we know the temperature? The answer is that we really don't—at least not with great certainty or precision. The center of the earth lies 6,400 kilometers (4,000 miles) beneath our feet, but the deepest that it has ever been possible to drill to make direct measurements of temperature (or other physical quantities) is just about 10 kilometers (six miles).

Fig 5.. the Ea do thr Howe becau

"As a result, scientists must infer the temperature in the earth's deep interior indirectly." Note 5.2a

p.75

Seismic Waves And Magma

Only fluids are known to not transmit shear waves. The shadow zone where there are no shear (s) waves lead to the idea that the core is liquid, the waves are "bent downward rather than upward when they enter the core, much as a light beam bends downward after it enters water." (quote p75) (the quote tells all of this). But the fact that it's liquid doesn't establish which TYPE OF LIQUID it is. Magna/lava is NOT the only liquid found in nature.

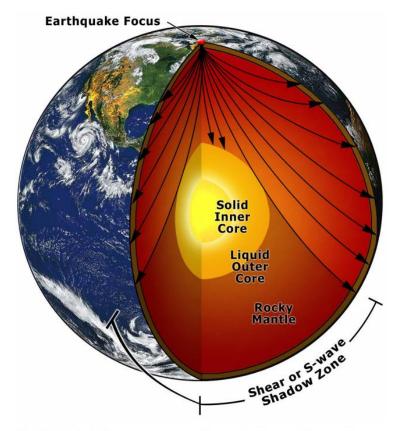


Fig 5.2.2 – Seismic S-waves create observable sound patterns as they travel through the Earth. Because these wave patterns travel differently through solids than they do through liquids, it is known that there is a liquid outer core and a solid inner core. However, the type of liquid is unknown, but science assumes that liquid is magma because of the theoretical high temperatures at the core.

p.75

The "Old Idea of Universal Magma"

early 1900s. Quoting from a 1911 encyclopedia:

"The **old idea** of a **universal magma**, or continuous pyrosphere, **has been generally abandoned**." Note 5.2b

"The old idea of universal magma, or continuous pyrosphere, has been generally abandoned." (quote on p76)

"lavas... can hardly be drawn from a common source." (quote on p76)

In volcanology, "two problems demand attention: first the origin of the heat necessary for the manifestation of volcanic phenomena, and secondly the nature of the force by which the heated matter is raised to the surface and ejected...neighboring volcanoes seem in some cases to draw their supply of lava from independent sources,

favoring the idea of **local cisterns or intercrustal reservoirs**. It is probable, however, that subterranean **reservoirs of magma**, **if they exist**, do **not** represent relics of an **original fluid** condition of the earth, but the molten material **may be merely rock which has become fused locally by a temporary development of heat or more likely by a relief of pressure**." (quote on p76) This fits with the hyquaterm model, of local earthquakes liquefying rock into lava.

"In discussing the cause of vulcanicity two problems demand attention: first the origin of the heat necessary for the manifestation of volcanic phenomena, and secondly the nature of the force by which the heated matter is raised to the surface and ejected. p.76

Magma Summarized

They never identify the source of how magma is made (there's none just lava).

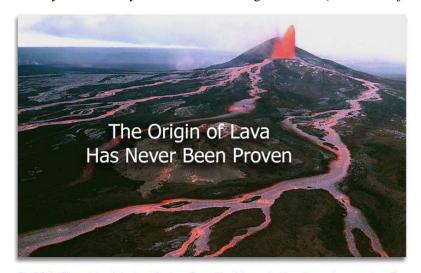


Fig 5.2.4 - The origin of the heat for lava flows like this one in Hawaii remains a mystery. The idea of a universal magma was discarded in the early 1900s, but a revised version of it is still central in nearly all Earth science texts.

5.3 The Lava-Friction Model

Skin-Friction Analogy



p.77

Rub your hands together, frictional heat causes "skin lava". Temperature goes up immediately.

3 principles of the lava-friction model:

- 1. Lava originates from frictional heat, which heat is generated by movement within the crust.
- 2. Crustal movement is from the solar and lunar cycle's diurnal effects.
- 3. Resulting melted rock moves along paths of least resistance, including faults, subjecting the rising melted rock to further decompressional melting.
 - Lava originates from frictional heat (The Frictional-Heat Law) generated by movement within the crust.
 - Crustal movement is attributable to the solar and lunar cycle's diurnal effects. (The Gravitational-Friction law)
 - The resulting melted rock moves along paths of least resistance, including faults, subjecting the rising melted rock to further decompressional melting.

p77

Do Earthquakes Cause Volcanic Activity?

USGS flat out says earthquakes don't create lava.

Scientists "believe that most earthquakes are caused by slow movements inside the Earth" pushing against the crust breaking rocks suddenly. Note: it's just a belief.

Earthquakes actually happen in swarms (small enough we don't feel them) over days or weeks. Lava can be produced because of the friction between the plate, which rises to the surface through fault lines.

In Italy, in Mt. Etna, "the eruption was accompanied by hundreds of earthquakes measuring up to 4.3 on the Richter scale." (quote p78)

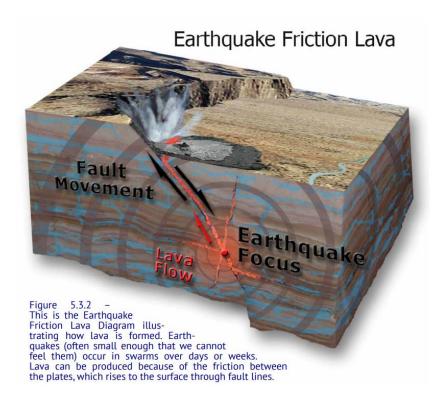
"Seismic investigations have shown that the rising magma produces **little noise** and appears to move rather **smoothly**, without encountering major obstacles." (quote p78) This shows its not just sudden snaps from deep slow pressure of magma???

What Do Scientists Think Causes Earthquakes?

The Earthquake-Lava Connection



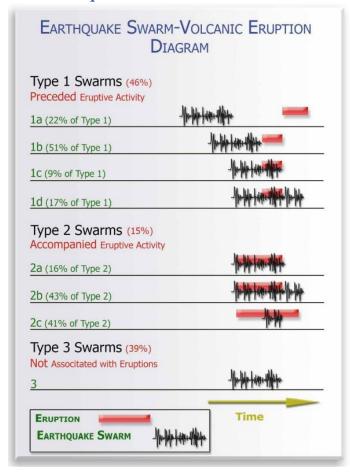
Fig 5.3.3 – Lava flow along a fault line in Hawaii. Courtesy of USGS



p.78

Does magma cause earthquakes or do earthquakes cause lava?

The Earthquake Swarm-Lava Evidence



p.79

Every swarm that accompanied a volcanic eruption preceded the eruption, or occurred during the eruption. No earthquake swarms started immediately after volcanic eruptions.

p.79

Every swarm that accompanied a volcanic eruption preceded the eruption, or occurred during the eruption. No earthquake swarms started immediately after volcanic eruptions.

The swarms are happening general before the eruptions, and never strictly after.

Only a tiny percent (about 9%) of eruptions happen before a swarm, and even those kind do have a swarm in the middle of the eruption.

How Much Does Science Know About Frictional Heat Generated By Faults?

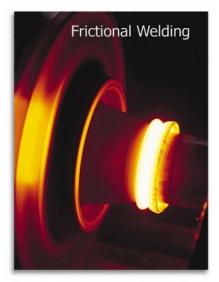


Fig 5.3.6 – Modern 'frictional welding' welds dissimilar metals with frictional heating in a fraction of a Second. Courtesy of American Frictional Welding, Inc.

p.80

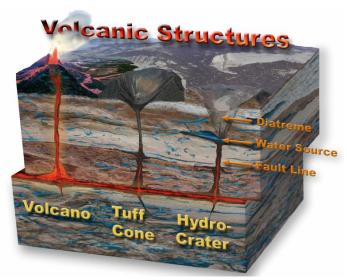


Fig 5.3.7 – This diagram illustrates different types of Volcanic Structures resulting from fictional heating. The most recognizable structure, volcanoes are not the only example. Tuff cones and hydrocraters remain less known due to a lack of vicwable cruptions in modern times. Large earthquakes in the past caused massive steam explosions, which formed the various craters, and mountains.

p.80

"The possibility of frictional melting during faulting has been suggested by several investigators." (quote p80)

Heat flow is focused around large faults.

They admit faults allow magma to reach the surface, but not that they create lava.

Tuff cones and hydrocraters are from large eruptions in the past, shooting out massive steam explosions. (This is unlike the volcano tower mountains from minor eruptions building them up.)

Image

Modern frictional welding uses frictional heat to weld dissimilar metals in a fraction of a second.

Image

"...frictional melting can occur if the stresses involved in faulting are sufficiently high. Despite these studies, frictional melting is not generally regarded as an important process during earthquake faulting because of uncertainties in the stress levels..." (quote p80) However, we've seen things get much hotter than is required for melting of most (silicate) rocks. The Bolivian quake was said to have upwards of 52,000 C, and only 1,700 C is needed to melt most silicate rocks.

The Frictional-Heat Law

The frictional-heat law: Frictional heating produces lava from pressure and movement in fault planes.

"It is now believed that the number and sizes of observed earthquakes can be explained with a fairly simple **friction law**."

Peter Cervelli

p.81

The Frictional-Heat Law

Frictional heating produces lava from pressure and movement in fault planes.

p.81

"It is now believed that the number and sizes of observed earthquakes can be explained with a fairly simple friction law." (quote p81)

(What was before friction law, just magma pushing up via convection from the deep???)

Earthtide – An Origin Of Earthquakes & Lava

Earthtide: The daily tidal movement of the Earth's crust. $_{\rm p.81}$

"Earth has solid ground tides too, but they amount to less than 20 centimeters (about 8 inches)."

NASA

p.82

Earthtide is the daily tidal movement of the Earth's crust.

"...Earth tides have a fluctuation of between seven and fifteen centimeters." (quote p81)

"Earth has solid ground tides too, but they amount to less than 20 centimeters (about **8 inches**)" (NASA, quote p81)

Over time, stress builds from the constant, daily up-and-down movement caused by the gravitational influence of the moon, accumulating until released in an earthquake. (So they were right about it being gradual???)

The amount of heat generated depends on the magnitude of the seismic activity and the pressure present at the movement location; increased pressure equals increased heat. Therefore, we can expect higher temperatures as the depth of the seismic event increases.

Lunar Earthquake-Eruption Cycle Evidence

Lunar Earthquake-Eruption Cycle Evidence

If the Moon's orbit affects the movement of the Earth's crust, then evidence of the connection between the Earth's diurnal (daily) rotation, the lunar cycle, and earthquakes should exist. We see evidence of this association at the most active volcano in the world, which is in Hawaii. In 1988, scientists announced in the *Journal of Geophysical Research*:

"Between 1967 and 1983, four earthquake swarms occurred on Kilauea Volcano, Hawaii, with durations ranging from 68 to 156 hours. Plots of the number of events per hour show a remarkable modulation having diurnal and semidiurnal periodicities...tidal influences appear to be the best explanation for the modulation of the activity." Note 5.3n

In Hawaii, measured "earthquake storms...show a remarkable modulation having diurnal and semidiurnal periodicities...tidal influences appear to be the best explanation for the modulation of the activity." (quote p82)

"...the discovery of silent earthquakes is forcing scientists to reconsider various aspects of fault motion...One curious feature of these silent earthquakes is that they happen at regular intervals – so regular, in fact, that scientists are now predicting their occurrence successfully." (quote p82)

"...the discovery of **silent earthquakes** is forcing scientists to reconsider various aspects of fault motion...One **curious** feature of these silent earthquakes is that **they happen at regular intervals**—so regular, in fact, that scientists are now predicting their occurrence successfully." Note 5.3r

The Earth Breathing Evidence

Why Japan earthquake seasons of Sept-Dec, not just diurnal daily cycles? Where earth is in relation to the sun of course.

"Now, some suspect that **Earth is also 'breathing,'** compressing its crust and extending it once each year. This **cycle** is most evident in Japan, geophysicists told the meeting, where it may be responsible for that country's **'earthquake season.'** Elsewhere, it may lead some volcanoes to erupt **almost solely between September and December.**" Note 5.3s

p.82

"Now, some suspect that **Earth is also 'breathing**,' compressing its crust and extending it once each year. This cycle is most evident in Japan, geophysicists told the meeting, where it may be responsible for that country's **'earthquake season**.' Elsewhere, it may lead some volcanoes to erupt **almost solely between September to December**." (quote p82)

"Geophysicists have traditionally shied away from making such connections." (quote p83)

Moonquake Tidal Evidence

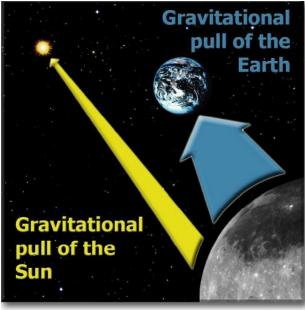


Fig 5.3.9 - The gravitational tug of Earth and Sun, not magma, causes 'moonquakes' on the Moon. p.83

The gravitational tug of Earth and Sun, not magma, causes 'moonquakes' on the moon.

Moonquakes, as first observed by Apolo 12 seismometers in 1969, "occur at intervals of about fourteen days. Apparently **they are triggered by the tidal forces exerted by the Earth**." (quote p83) We admit moonquakes due to tidal forces exerted by the earth, why can't we apply this to our earth's quakes too?

What causes lava and the heat in the crust? The daily Earthtide.

What causes lava and the heat in the crust? **Answer**: the daily Earthtide.

Moon has little or no remaining internal heat:

"The Moon, a body much smaller than the Earth, lost its internal heat relatively early in its history. As a result, it ceased to be an internally active planet about a billion years or more ago." Bib 133 pl93

There are no volcanoes or active lava flows on the Moon—but there are moonquakes, therefore, if the Moon has no internal heated magma to cause quaking, why do they exist? From the book, *Melting the Earth*, the author states that the Moon is "dead" inside, and that "tidal forces exerted by the Earth" cause cycles of moonquakes:

"When the Apollo 12 seismometers detected the first moon-quakes in November 1969, scientists got a direct confirmation that **the Moon is 'dead' inside, harboring no volcanic energy**. Moonquakes, it was found, originate about 600 to 800 km (375 to 500 mi) below the surface, are highly localized, and occur at intervals of about fourteen days. Apparently they are triggered by the tidal forces exerted by the Earth." Bib 136

p.83

"This long-term decrease in activity appears to correspond to the 6-year variation in tidal stress which results from variations in the relative phase relationships among several of the lunar orbital parameters. The strong correlation between moon-quake occurrence times and energy release and lunar tidal amplitudes and periodicities suggests that tidal energy is an important, if not dominant source of the energy released as moonquakes." Note 5.31 p2522

p.83

The Solar-Cycle Evidence

The Rock-Burst Tidal Evidence

Juan De Fuca Ridge Tidal Evidence

"Earthquakes occur more frequently near low tides, especially the lowest spring tides, when the extensional stresses are at maximum in all directions." Note 5.3y

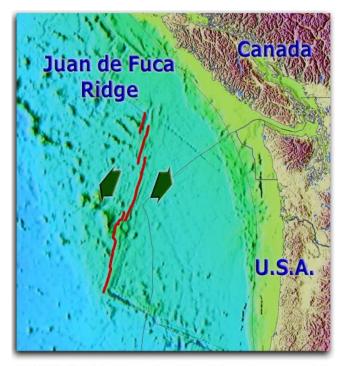


Fig 5.3.10 – This is the Juan de Fuca Ridge off the northwest coast of the US, where spring tidal movements trigger earthquakes which occur more frequently at low tide.

p.85

Large Earthquake Tidal Evidence

Geyser Tidal Evidence

At 11:37 P.M. on the night of August 17, 1959, a large 7.5 earthquake rocked Yellowstone. The earthquake and the tremors following it caused hundreds of geysers to erupt:

"One of the greatest and longest-lasting reminders of the quake was its effect on the geysers and hot springs. On the night of the tremors and within the next few days, hundreds of geysers erupted, including many hot springs that had not previously been

known as geysers." Bib 134 pl4

Bib 134 p15 p.85

The Gravitational-Friction Law

The Gravitational-Frication law: **Frictional heating in the crust of celestial** bodies is caused by the gravitational pull and release of the crust by other celestial bodies.

The Gravitational-Friction Law

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p.85

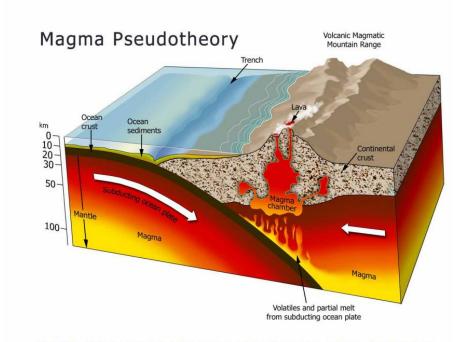


Fig 5.2.1 – This diagram depicts the modern science Magma Pseudotheory. Scientists believe observable surface lava comes from magma far below.

p.74

(cf. p.87)

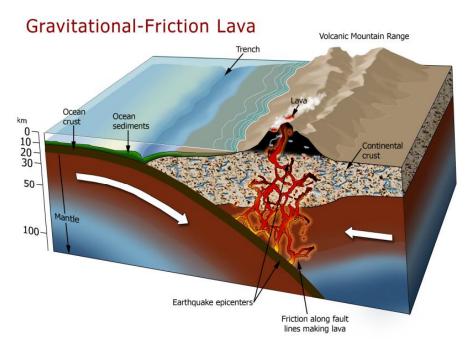


Fig 5.3.13 – This diagram illustrates lava formation resulting from friction between continental plates, not from magma deep inside the Earth. Although magma has long been theorized as the source of lava, researchers are beginning to recognize that Earth's tidal forces cause frictional heating, and that heating is producing lava beneath volcanic centers.

p.87 (cf. p.74)

Earth Movement By Water

The Ring Of Fire Evidence

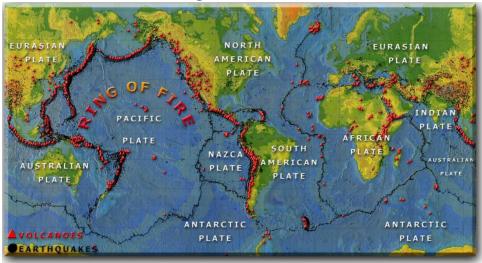


Fig 5.3.14 - The 'Ring of Fire' is a ring of earthquakes and volcanoes along Pacific Ocean plate boundaries. The lines are actually thickly clustered black dots, which are major earthquakes, the red triangles are volcanoes, both occurring where most of the friction takes place—along the plate boundaries, marked out by the lines of seismicity, it is there where the greatest daily rubbing of the daily Earthtide takes place.

p.88

"Only about 10 percent of the world's earthquakes occur along the oceanic-ridge system, and they contribute only about 5 percent of the total seismic energy of earthquakes around the world. In contrast, earthquakes occurring where plate boundaries converge, such as at the trenches, contribute more than 90 percent of the world's release of seismic energy from shallow earthquakes, as well as most of the energy from intermediate and deep-focus earthquakes." Note 5.3ad

Intraplate Earthquake Volcanic Evidence

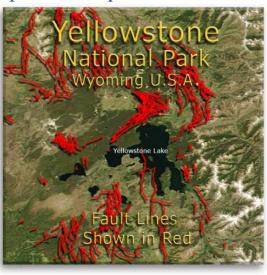


Fig 5.3.15 - Yellowstone National Park, USA boasts of intersecting faults that produced heat by earthquakes in the middle of the North America Plate.

p.88

Hundreds of miles away

from any plate boundary, the Yellowstone continental crust is relatively thick, roughly six times thicker than oceanic crust and there is no known 'great crack or rift' providing a path for the theoretical rise of magma to the surface. Other than the presence of heat, what evidence does science have that magma is burning its way through to the surface, or that a giant magma plume exists? They have none.

p.88

Frictional Heat Realization In Taiwan

Denying The Earthquake Origin Evidence

Evidences of the

Gravitational-Friction Law:

- 1. Earthtide
- 2. Earthquake-Eruption Cycle Evidence
- 3. Earth Breathing Evidence
- 4. Moonquake Tidal Evidence
- 5. Solar Cycle Evidence
- 6. Rock-burst Tidal Evidence
- 7. Juan De Fuca Ridge Tidal Evidence
- 8. Large Earthquake Tidal Evidence
- 9. Geyser Tidal Evidence
- 10. Earth Movement by Water
- 11. The Ring of Fire Evidence
- 12. Intraplate Earthquake Volcanic Evidence
- 13. Frictional Heat Realization in Taiwan

The Unequivocal Io Evidence

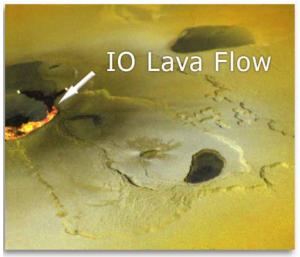


Fig 5.3.16 – Actual lava flows on the surface of Io, one of Jupiter's four largest moons. The lava comes not from magma, but from the Gravitational Earthquake Friction Mechanism. Courtesy of NASA:

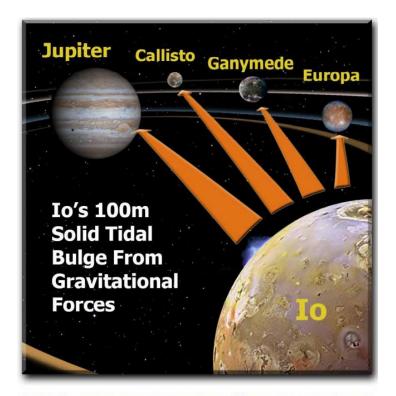


Fig 5.3.18 – Jupiter's moon lo experiences a 100-meter tidal bulge (vertical crustal movement) each day during its daily rotation and orbit around Jupiter. This is direct, empirical evidence of how the Lava-Friction Model works. p.90

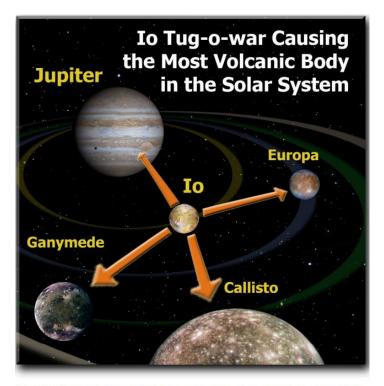


Fig 5.3.17 – Gravitational tidal forces act on Jupiter's moon lo, pulling it like a football, causing the greatest amount of volcanism in the Solar system. p.90

As NASA states it:

"Solid tidal bulges on Io are about 100m high, taller than a 40-story building!" Note 5.3ai p.89

"All this bending causes heat to build up inside Io. Io gets so hot inside that some of the material inside melts and boils and tries to escape any way it can. So it blows holes in the surface! That's what volcanoes are. Some on Io have shot their hot gas plume 300 kilometers (about 200 miles) into space!"

Note 5.3aj

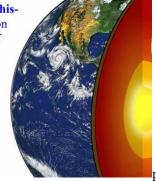
p.90

5.4 Magma Theory Defies Heat Flow Physics

<u>Theoretical History Of Earth – A Problem Of</u> 'Enormous Difficulty'

"It has already become apparent that the thermal history of the earth, its constitution and the distribution of various materials with depth, are reflections of the way in which the earth was formed. The contemplation of these matters has occupied many of the great geophysicists and mathematicians of the last hundred years, among them Poincaré, Jeans, Eddington, Jefferys, Lyttleton and Hoyle, but no finality has been reached – cogent objections have been raised for every model proposed.

The problem is one of enormous difficulty." Bib



p.91

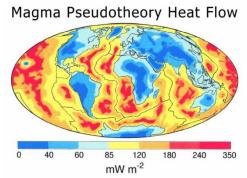
Thermal history of the Earth a problem of "enormous difficulty" O. M. Phillips

p.91

Heat Flow Physics Defined

How Magma Defies Heat Flow Physics

Global Heat Flow Assumption Versus Reality



Actual Heat Flow

0 40 60 85 120 180 240 350 mW m⁻²

Fig 5.4.4 — This map illustrates the *assumed* heat flow through Earth's crust, based on the magmaplanet theory and the USGS map of crustal thickness (Fig 5.4.3). This map was produced using a color gradient derived from crustal thicknesses of the USGS map. Thinner crustal areas, those that should show the highest amount of heat flow are red while the thicker crustal areas, (brown and green areas on the USGS map) are colored blue, indicative of a lower heat flow. The theoretical Magma Pseudotheory Heat Flow map makes it possible to compare theory with observed data, shown on the Actual Heat Flow Map, Fig 5.4.5.

Fig 5.4.5 This map illustrates **the actual** measured heat flow through the crust of the Earth. The greatest concentration of heat, shown in red and yellow, land on plate boundaries where gravitational frictional heating is highest. Compare the Actual Heat Flow map with the Magma Pseudotheory Heat Flow map in the Magna Pseudotheory Heat Flow map in the Magna Flow on the Magna Flow through the crust cannot originate from a theoretical magma heat source beneath the crust, confirming the Frictional Heat Law and the Gravitational Friction Law.

Courtesy of H. N. Pollack, S. J. Hurter, and J. R. Johnson. – Heat Flow from the Earth's Interior: Analysis of the Global Data Set, Reviews of Geophysics 31(3), p2G7-280, 1993

p.92

crust. Note that we are not referring to why the *surface* of the Earth is warmer than the bottom of the ocean—that is primarily due to solar heating. We are considering the flow of heat *through* the crust. Let us look at the known empirical facts.

The Crustal Heat Flow Mystery

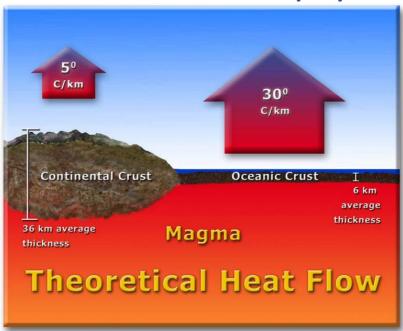


Fig 5.4.6 – This theoretical Heat Flow diagram illustrates a *Hypothetical* flow six times higher through the thin oceanic crust versus continental crust. This is what should take place if the heat source below the crust was magma. The thicker continental crust should act as an insulator as compared with the thinner oceanic crust, which should shed heat six times faster than the thicker continental crust.

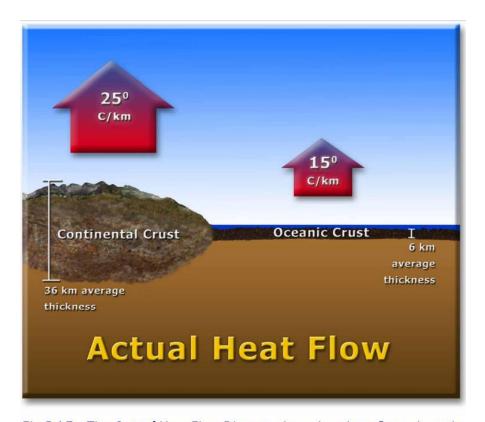


Fig 5.4.7 – The **Actual** Heat Flow Diagram shows how heat flows through the crust; oceanic heat flow is less than continental heat flow, contrary to magma theory. Thicker continental crust allows for increased *gravitational frictional heating*, which is confirmed by measured actual heat flow numbers.

p.93

"Like the crust, the upper mantle portion of the lithosphere beneath the plateau *should* thicken as the continental plates collide, which *should* make the lithospheric mantle colder and stronger. Yet, the upper mantle in this region, in contrast,

appears not only to be weak, **but is also relatively hot**, as evidenced by the uppermost Tibetan mantle and the presence of active volcanism throughout much of the plateau. **That is hardly what we would expect from thickened, cold lithosphere**.

"This unexpected heat, common to many mountain-building regions, has been termed the orogeny paradox." Note 5.4c

The Geotherm Belief

Geologists admit they have very limited information about the temperature of Earth's interior:

"At present, all geologists can do is draw certain conclusions from the limited information they have about temperature." Bib 59 p497

Simply said, *geologists do not know the temperature of the mantle or of the core of the Earth.* Because of this, researchers can only infer what the temperatures are. Here is an example from a college geology textbook:

"They combined the temperature of lava that originates in the mantle and emerges from volcanoes, laboratory data on the temperatures at which rocks and iron begin to melt, and information from seismology to **infer** the geotherm from the surface to the very center of the Earth, where they **believe** the temperature rises to between 4000° and 5000° C." Bib 59 p498

The astonishing fact is that:

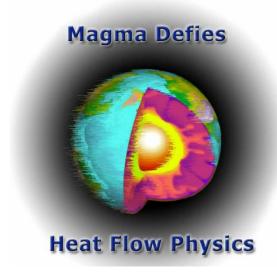
All of geology has been built on the Hot-Earth belief!

p.94

Deep Borehole Drilling And The Geotherm

"Direct measurement of temperatures in the well **compels revision of ideas about the distribution and flow of heat in the earth's interior**." Note 5.4e

Too Hot Too Fast



p.95

Fourier's Heat Flow Law Violated

The predicted magma
"...thermal conductivity and
thermal gradient variations
are not consistent with
the Fourier law..."

p.96

5.5 The Accretion Theory

Accretion Defined

Billiard Balls Do Not Stick Together



Fig 5.5.1 – Billiard balls obviously do not clump together. What if they were traveling hundreds of times faster in space? There would still be no clumping; just pieces of billiard balls would result. p.97

"It turns out to be surprisingly difficult for planetesimals to accrete mass during **even the most gentle collisions**." Note 5.5c p54 p.97

The Melting Pseudotheory

5.6 The Radioactive Myth

Why Is The Interior Of The Earth Hot?

Do Radioactive Rocks Come From Magma?

Where do we find 'hot' uranium, in nature? We don't. It's no hotter than any other typical rock.

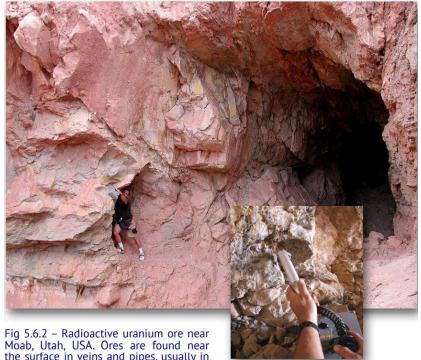


Fig 5.6.2 – Radioactive uranium ore near Moab, Utah, USA. Ores are found near the surface in veins and pipes, usually in sedimentary material that has not been melted.

RADIAC DETECTO

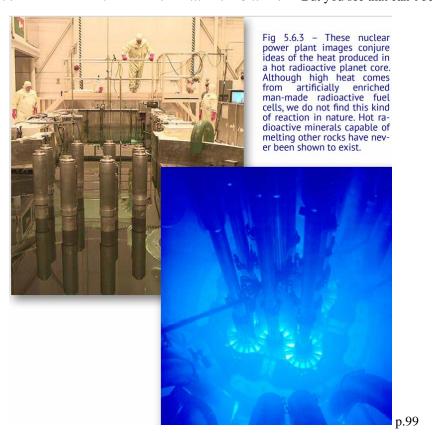
Fig 5.6.1 – 'Hot' radioactive uranium ore sets a Geiger counter buzzing, but is no hotter (temperature wise) than any other rock. $p.98\,$

Radioactive Dogma

How can lava from radioactively melted rock, not be radioactive? It wasn't from radioactively melted rock. Lava isn't radioactive. "the matter is complicated...I don't think the final chapter has been written on magma formation." (quote p99)

They say:

"Earth's internal heat engine is powered by the heat generated by **radioactivity**." Bib 59 pl1 But you see that can't be.



"Current **uncertainties** prevent a definitive assessment of the radioactive heat sources in the core." Note 5.6b p.99

How can lava from radioactively melted rock, **not** be radioactive?

Where Is The Radioactive Lava?



Fig 5.6.4 – Signs like this one would be seen at lava flows all over the world, if lava really came from radioactive magma. Radioactivity from heated lava does not just disappear—it never existed.

p.100

Fig 5.6.5 – Lava flows around the world have no, "Danger Radioactivity" signs.



Missing Radioactive Evidence from Deep Boreholes

"Since the **radioactivity of the rocks** traversed by the well can **make only insignificant contribution to this heat flow**, it [the heat flow] must plainly come from the mantle below." Note 5.6d p.100

Heavy Elements Did Not Sink To The Center

No Radioactivity, No Magma

"Again, why should the radioactive materials be concentrated in the surface layer? The elements involved are very dense; if the earth cooled from a liquid mass, one would expect them to settle to the center. But no: they are apparently found almost entirely at the surface why?" Bib 63 p151

p.101

5.7 Glass Is Not Quartz

The Importance Of Quartz



nthetic quartz crystal has il quartz; neither (natural a melt.

"Quartz is the most common mineral on the face of the Earth. It is found in nearly every geological environment and is at least a component of almost every rock type. It frequently is the primary mineral, >98%. It is also the most varied in terms of varieties, colors and forms.

This variety comes about because of the abundance and widespread distribution of quartz." Note 5.7a

p.101

Why Glass Is Not Quartz



Fig 5.7.2 – This natural quartz crystal cluster with amethyst tips was grown the same way all quartz minerals are grown—from an aqueous solution, not a melt.



Fig 5.7.1 – This man-made synthetic quartz crystal has the same properties as natural quartz; neither (natural nor man-made) is grown from a melt.



Fig 5.7.4 – Manufactured glass items formed from melted sand; even though they are made of silica, they are not quartz.

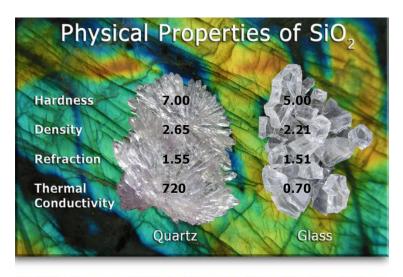


Fig 5.7.3 – These are the Physical Properties of two SiO_2 minerals, Quartz and Glass and their characteristic differences. Note 5.7b p.102

If we do not comprehend how quartz, the most common mineral in the crust of the Earth forms, how can we explain the formation of the Earth?

p.102

Silica Phase Diagram

Natural quartz does **not** form within 'magma conditions' (high temperature-high pressure).

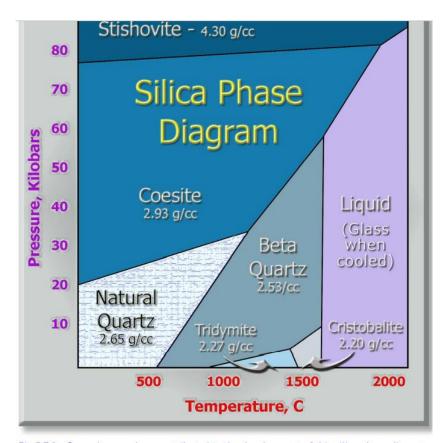


Fig 5.7.6 – Several researchers contributed to the development of this silica phase diagram, which illustrates how different silica minerals form in various temperature/pressure combinations. Natural quartz forms only at the low end of the combined temperature/pressure environment, yet it exists in **abundance** all over the Earth. With the application of high temperatures to silica, liquid glass forms (on the right). Temperature and pressure extremes produce coesite and stishovite, both silica minerals, similar but different from quartz. It is important to note that the high temperature/pressure minerals, coesite and stishovite, which should be plentiful on a magma-formed planet, occur only **rarely** in nature.

p. 103



Fig 5.7.8 – Each type of silica in the Silica Phase Diagram is unique in its geometric shape. This Silica Crystal Forms diagram shows the various shapes of each crystal, which are dependent on the temperature and pressure that existed when the crystals grew. In nature, *only* natural quartz is found in any significant quantity—confirming the UM extraordinary claim that the natural quartz-based rocks found all around us did not come from magma.

Natural Quartz Mystery

High Temperature-Pressure Mineral Mystery

The Rock Melting Experiment

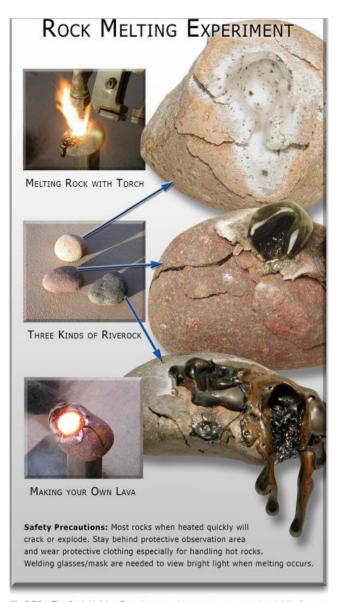


Fig 5.7.9 – The Rock Melting Experiment melts average quartz rocks, vividly demonstrating that melted rock makes glass, not quartz. p.105



Fig 5.7.5 – Natural glass tubes known as fulgurites form when lightning strikes and melts sand. Neither natural nor synthetic glass can grow into crystals like natural quartz.

One well-known gemologist, Kurt Nassau, melted rubies in what he called a 'reconstruction attempt' in an attempt to produce larger rubies by melting smaller rubies. He heated the rubies to 1800°C (3300°F) with an oxygen-hydrogen blowtorch, but in the end, he demonstrated that smaller, melted natural rubies could not make larger rubies:

Fig 5.7.7 – Synthetic qu melt, which are different boules do not have the r or shape as quartz found

"These experiments conclusively demonstrated that the most popular explanation [melt technique] for the

production technique of 'reconstructed' rubies cannot be correct." Biblio4 p48

p.104

Two Different Camps

Glass – Not Quartz – Comes From A Melt

Reproduction of minerals falls into one of two groups:

1. Melt – no water required

Glass—Not Quartz—Comes From a Melt

The techniques describing the reproduction of natural minerals fall generally into one of two groups.

- 1. Melt no water required in process.
- 2. Solution water required in process.

p.104

"Although the melt growth techniques provide rapid growth and are basically simpler and easier to control than growth from solution, there are certain materials for which melt techniques cannot be used. This is the case when the melt is so viscous that a glass would form, as happens with quartz..." Bib 104 p6

p.104

p.105

"Quartz cannot be grown from a melt ... because silicon dioxide [quartz] melts are so viscous that they form glasses rather than crystals when they are cooled." Note 5.7d

"Quartz cannot be grown from a melt..."

n 105

Glass Planets Do Not Exist

If the moon cooled from molten magma, its crust must be glass, but it is not.



Fig 5.7.10 – The Moon is not glass. Modern Moon origins suppose that it formed from magma along with the Earth, but it clearly could not have come from a melt.

p.106

5.8 The Piezoelectric Evidence

Piezoelectric Rocks

The Curie Point Evidence

"Quartz cannot be grown from a melt because the piezoelectric phase necessary for formation of electronic crystals is not stable at the melting point..." Note 5.8a

p.106

"Any growth process for quartz must be effective below 570°C, the $\alpha \rightarrow \beta$ quartz transition, if it is to produce the piezo-electrically useful alpha phase. The melting point of silicon dioxide is above 1700°C, ruling out melt growth." Note 5.8a p33

"At a temperature of approximately 573° C, quartz transforms from **Alpha to Beta quartz**. During the transformation, most of the piezoelectric characteristics are lost, **rendering Beta quartz unsuitable** for the manufacture of crystal units." Note 5.8b





Fig 5.8.1 – Two quartzite rocks as seen in the dark when struck against each other produce light.

p.107



Fig 5.8.2 – The blue arrow is pointing at the quartz oscillator in a quartz watch, which uses the piezoelectric effect to keep time. p.107

5.9 The Non-Iron Core Evidence

The Earth's Core Has Not Been Directly Observed

"Geologists still know nothing about the composition of the core from direct observation." Bib 59 p492

p.107

They infer an average density of Earth as 5.52g/cm³. The crust is observed as 2.7g/cm³. Therefore, they think what's below the crust must be much more dense to account for the average. They say iron or a mixture of iron & nickel could fill the gap.

"Geologists still know nothing about the composition of the core from direct observation." (quote p107)

The Cavendish Experiment in 1798 to show earth's density had flawed assumptions. Unlike the Earth, the lead balls are not in outer space, and thus, the balls, restricted by the air and influenced by the Earth's gravity rendered incorrect data. Their attraction should have been measured in a vacuum, in low gravity. Air, a denser medium than the vacuum of space, along with the attractive gravitational force of the Earth, slowed the balls' oscillation rate. Cavendish neglected to account for the reduced oscillation in the original experiment, leading to an incorrect gravitational constant and errors in the Earth's density calculations.

???? Some say Cavendish used a vacuum sealed container????

(The best summary of Cavendish experiment, how it works and how things were derived is here: https://www.youtube.com/watch?v=207AwmcxKVY)

The New Mass of Earth's density is 2.3g/cm³. (why???)

The Earth's Density Pseudotheory

If surface rocks have an average density of just 2.7 g/cm³, and if the Earth's overall density is 5.52 g/cm³, there must be a relatively *common* mineral assemblage (not a single element because those are not common in Nature) in the Earth with a density *significantly* greater than 5.52 g/cm³. But, therein lies the problem—it does *not* exist.

p.107

The gravitational constant is not at all constant.

Geophysisists do not explain what type of naturally occurring minerals actually achieve the density of 5.52g/cm³ (Earth's supposed density) after accounting for crustal density of only 2.7g/cm³. They claim that as this is less than half of their supposed total average density, that the Earth's interior "must consist of much heavier material than the outer part." If the density was 5.52, there must be a relatively common mineral assemblage

Inner Iron Core Does Not Work

phase diagram. Just as liquid water becomes solid ice or gaseous steam at certain temperatures and pressure, so does iron. What did researchers from the Mineralogical Society of America find?

"To the extent that the inner core consists of pure, or nearly pure iron, its crystalline structure is determined by the iron phase diagram. While there has been considerable progress in experimental determination of the phase diagram at pressure approaching the inner core, the stable phase of iron at inner core conditions cannot yet be uniquely identified on the basis of phase equilibrium measurements." Note 5.9a

Another report states:

"The stable phase of iron at inner core conditions is un-known." Note 5.9b

It is "unknown" because as far as anyone knows, it does not exist! Although stable iron phases exist at *low* pressure, empirical evidence from actual experiments proved that at high temperature and pressure, iron is not stable:

"[We]...find no evidence for phases other than those long known from low pressure work..." Note 5.9b p273

We know through seismic waves that the Earth's core has both liquid and solid components. We also know that H_2O ice proved in recent experiments that ice forms a stable crystalline structure under high pressure, says *Reviews in Mineralogy*:

"The prototype system is H₂O ice, where recent experiments have shown that a symmetric hydrogen-bond state of ice forms at 60 Gpa, and persists to at least 210 Gpa." Note 5.9h p628

At these high pressures, ice did not melt even up to 50° C $_{\rm p.108}$

"Considerable uncertainty still shrouds the outer core and inner core from our complete understanding."

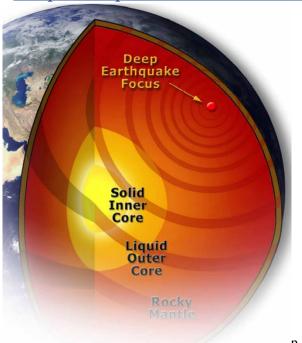
No Iron Core – No Iron Meteorite Origin

No Iron Core—No Iron Meteorite Origin $_{\rm p.109}$

5.10 Deep Earthquake Evidence

Deep Earthquake Controvers

Deep Earthquake Evidence Is Real



p.110

Magma Theory Leads Only To More Speculation:

"At present the **mechanism** for these very deep focus earthquakes remains **speculative**..." Note 5.10b p.109

5.11 The Drilling Evidence

Drilling To Know

"I never was a big enthusiast for drilling...But the more we drill, the more we find out **how little we know**." Note 5.11a

p.110

The Magma Energy Source

Scientists doubt geothermal energy will ever be something we will be able to use large scale.

The Long Valley Magma Myth

Magma Drilling Comes Up Short

"The Phase 3 science studies to date provide no evidence for a hydrothermal system or magma from which heat can be exploited within the central part of the resurgent dome of the Long Valley caldera." Note 5.11d

The researchers continue:

"The **observed temperatures** favor a model in which **there** is no massive magma chamber in the upper 10 km..." Note 5.11d p.111

"The more we drill, the more we find out how little we know." (quote p111)

"The more we drill, the more we find out how little we know."

Alfred Duba

Bore Hole Fact – No Magma Chambers



Fig 5.11.1 The Long Valley California, USA, borehole. An attempt to reach a magma body and exploit the heat of magma for energy production failed. No magma was found.

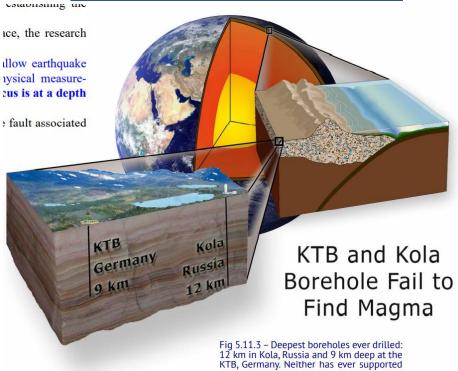
_p.111

"In actuality, geological and physical models of magma chambers cited in literature visualize them in general to be small volumes (2-3 km dimensions) of total melt. On the other hand, geophysically inferred magma chambers seem to have volumes of tens to hundreds of km³..." Note 5.111

Borehole Evidence

The 'Christmas Present' Quake Evidence

The KTB and Kola Borehole Evidence



p.113

any evidence for the existence of magma.



Fig 5.11.4 – This is the site of the German KTB 9 km deep borehole Scientific drilling project carried out 1987-1995.

5.12 Earth's Magnetic Field Pseudotheory

Magma Pseudotheory Relic - Earth's Magnetic Field

The Earth's Magnetic Field Mystery

"The science from the hole means the geology textbooks will have to be rewritten" (quote p115)

A heated iron core does not make a magnetic field. Heat annihilates magnetism, it does not facilitate it.

Magnetic Fields and Magma Don't Mix

In one attempt to describe the Earth's complex magnetic field, the International Association of Geomagnetism and Aeronomy, working since 1968 on a model dubbed the International Geomagnetic Reference Field (IGRF), derived a model based on the belief that the magnetic field originates from a fluid core and magnetized rocks within the Earth's crust. The following quote comes from one of the contributors to the current model.

"The IGRF is **inevitably an imperfect model**. Firstly, the numerical coefficients provided will not be correct: the model field produced will differ from the actual field we are trying to model - ... If you measure the magnetic field at a point on the Earth's surface, **do not expect to get the value predicted by the IGRF!**" Note 5.12b

Here we see the researchers acknowledge that their magnetic field model does not work. If we take that thought further, we should expect that *any* model of Earth's magnetic field based on the magma theory must fail, because magma does not exist.

In the April 2005 issue of *Scientific American*, an article titled *Probing the Geodynamo* has one geophysicist admitting:

"At last count, more than a dozen groups worldwide were using them [computer dynamo models] to help understand magnetic fields that occur in objects throughout the solar system and beyond. But how well do the geodynamo models capture the dynamo as it actually exists in the earth? The truth is that no one knows for certain." Note 5.12c

An interesting answer considering the widespread acceptance of this theory!

"Unfortunately, although a good description of the magnetic field can be given if we assume a permanent magnet at the center of the Earth, this model has a fatal defect. Laboratory experiments show that heat destroys magnetism, and materials lose their permanent magnetism when temperatures exceed about 500° C. Material below depths of about 20 or 30 km in the Earth, therefore, cannot be magnetized because the temperatures are too high." Bib 59 p498

The Dynamo Theory That Does Not Work

"Unfortunately, proposed tests of geodynamo theory are few and the results of those tests ambiguous." Bib 36 p423 p.115

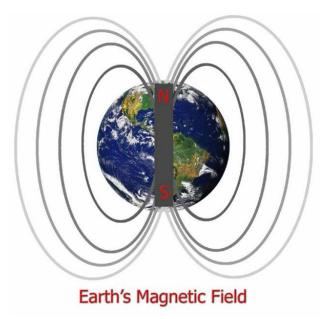
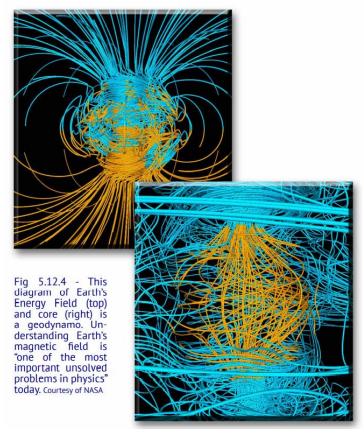


Fig 5.12.3 – The typical diagram of Earth's Magnetic Field in most modern science textbooks represents the energy field as a permanent bar magnet centered inside the Earth. This representation and associated theory is incorrect.



Magnetic Field Movement

- What causes the magnetic field and why does it exist?
- 2. How does the field fluctuate instantaneously?

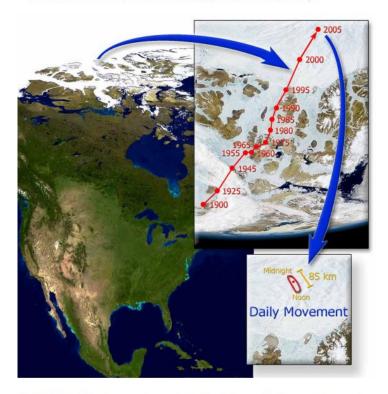


Fig 5.12.5 – This diagram shows both the daily oscillation and the yearly migration of the Earth's Magnetic North Pole. Every day, magnetic north oscillates as much as 85 km, and the central point, or the magnetic pole migrates dozens of kilometers each year. The rate of migration shows an increase during past few years. Such movement is in conflict with the molten iron dynamo theory.

p.117

Finding The True Source of The Earth's Energy Field

5.13 The Continental Uplift Pseudotheory

Uplift Denied

Micro-uplift: the **actual** rising or lifting of hills or mountains above the surrounding landscape over a **short** period of time.

Macro-uplift: the **theoretical** lifting of large landmasses or continents above the surrounding landscape over **long** periods of geologic time.

p.118

Vertical Movement Map Myth

"However, the large-scale flow patterns involved in **subduction and exhumation** of continental crust, with preservation of the UHPM [ultrahigh pressure metamorphic] record, **remain poorly understood**." Note 5.13c

p.118

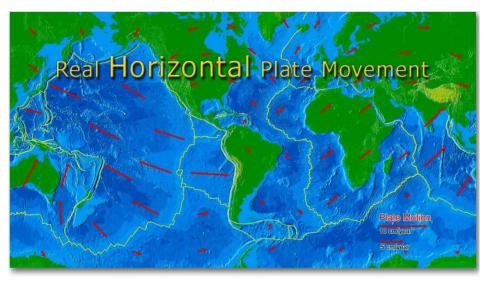


Fig 5.13.1 - World map of actual **horizontal** plate movement in centimeters per year. Modern technology makes it easy to measure the small horizontal movements of the plates. Courtesy of USGS.

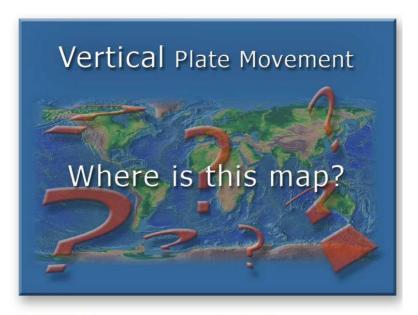


Fig 5.13.2 – Where is the world map of *vertical* plate movement? A real map showing continental uplift does *not* exist because modern geology has no data showing uplift exists. This is important because the Uplift Pseudotheory is continually taught in the classroom and found in scientific literature.

Continental Uplift & Magma Pseudotheory Connection

It is claimed that:

"The internal heat melts rocks, forges volcanoes, and supplies the energy to build and move continents and to thrust mountains upward." Bib 59 pl1

<u>The Continental Uplift Pseudotheory – The</u> <u>"Unresolved Controversy"</u>

"Without uplift and erosion, there would be no Grand Canyon. Up until the close of the Cretaceous Period 60 million years ago, the area that is now northern Arizona was for most of its existence a low flat-lying plain. Sometimes it was slightly above sea level receiving deposits from rivers and windblown sand; at other times the area was below sea level. It was not until this whole area was uplifted over 10,000 feet, then eroded and sculptured to its present form, that the Grand Canyon as we know it today, came to be." Note 5.13e

p.119

"...unresolved controversy that still continues in regard to exactly how the Grand Canyon was formed. One thing is certain: the history of the formation of Grand Canyon is not a simple matter of the land rising with the river cutting down through it like a knife through a layer cake!" Note 5.13e

Mount Everest Evidence



Fig 5.13.3 – Modern GPS measurements accurate to within a millimeter confirm that over the last several years Mt. Everest is not moving up or down. This direct evidence refutes the Uplift Pseudotheory but remains suppressed or ignored with no alternative in Modern Science. For the first time in history, models in the UM are able to clearly and simply explain the workings of geology where the theories of modern geology have failed.

p.121

Other Geological Evidence Opposing Uplift

The Isostatic Adjustment Myth

The Micro-Fracture Evidence

The Missing Continents



Fig 5.13.4 – According to the continental uplift theory, continents experience both uplift **and subsidence**. If so, where are the submerged continents? This stylized map is an artistic depiction of randomly inserted submerged continents that, according to modern science, should exist. None do. The scientific literature emphasizes the "uplift side" of the pseudotheory, but ignores the fact hat submerged continents must also exist in the uplift/subsidence cycle. This fact alone should cast doubt enough to require a complete reassessment of the current continental plate theory.

p.122

"...the **horizontal** position of Everest seems to be moving steadily and slightly northeastward —between 6 centimeters (2.4 inches) a year," but "**no measurable change in the height** of Everest" has been observed!

Bradford Washburn - Head Researcher

p.120

Where are the submerged continents currently under the ocean's surface?

This is the one thing noticeably absent—there are no large continental landmasses hiding below the ocean's surface.

p.122

5.14 Other Magma Pseudotheories

Other Magma Pseudotheories Identified

1. Bowen's Reaction Series Pseudotheory

2. The Magma Convection Pseudotheory

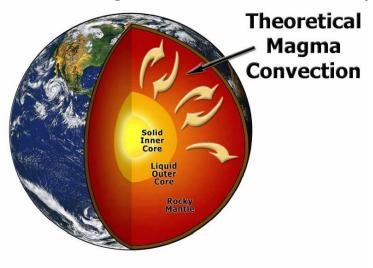


Fig 5.14.1 – The decades-old Magma Convection Pseudotheory has no basis in observable fact. Several researchers suggest that the theory has "major geologic problems" and that it is "highly speculative"—yet it remains widely accepted and taught as fact.

"Fixed Hotspots Gone With The Wind"

"It seems that we must abandon the convenient concept of fixed hotspots as reference points for past plate motions." Note 15.14f

In another science journal, *Tectonophysics*, an article had this to say about mantle plumes in 1999:

"Hypothesized mantle plumes do not appear responsible for most large igneous provinces; instead, their very existence is questionable. No geological evidence of any kind – geochemical, petrological, thermal, topographic – requires mantle plumes." Note 5.14g

In an uncommon challenge to an important aspect of the magma theory, this particular article emphasized a position of outright abandonment of the theory:

"All the evidence that has been used so far to support the plume model – geochemical, petrological, thermal, topographic – is equivocal at best, if indeed not contrary. The plume idea is ad hoc, artificial, unnecessary, inadequate, and in some cases even self-defeating, and should be abandoned." Note 5.14g p23

p.124

3. Mantle Plume Pseudotheory

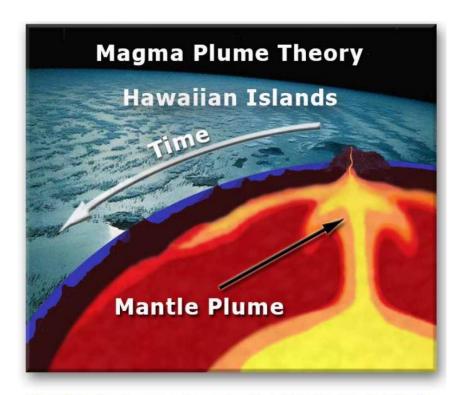


Fig 5.14.2 – For many decades, geologists held to the idea that the Hawaiian Islands formed over a Mantle Plume. Now the mechanism that supposedly brought "magma" to the surface is "gone with the wind" say researchers. They acknowledge that geology was "making up excuses and modifications to make plume theory work".

"One of the more damning pieces of evidence against mantle plume theory:

tle plume theory is that regions of the crust above suspected mantle plumes don't actually appear to be hot—despite the fact that huge fountains of magma from the hot core should be rising directly beneath... In Hawaii, however, they found the temperature below the sea floor to be much the same as everywhere else—there is no anomalous heat flow." Note 5.14h

To make the false plume theory work, scientists concede:

"You just have to keep making up excuses and modifications to make plume theory work,' says Foulger." Note 5.14h

Perhaps geologists finally see that what they thought they knew may be wrong after all:

"And there are no samples of the inner Earth being spat out of the Hawaiian volcanoes as we once thought. Everything is up for grabs.

"We'll have to acknowledge we know far less about the centre of the Earth than we thought we did,' says Foulger."

Dots 5.14h

D.124

"Although there is a chain of progressively older volcanoes marching from Yellowstone toward Idaho, a variety of seismic studies from a number of plume-hunters have shown no signs of hot magma below a depth of 200 kilometers and no disturbances in the mantle below that. 'Yellowstone was supposed to be the granddaddy of all plumes. It's a huge volcanic centre but its status as a plume has evaporated,' says Dean Presnall, a petrologist with the University of Texas at Dallas."

p.124

"Most aren't convinced that mantle plumes should be dumped entirely. But they're willing to admit that the geological community is standing on the brink of a radical shift in thinking that could completely change our ideas about the inner workings of the Earth." Note 5.14h p34

4. Magma-Based Tectonic Plate Pseudotheory

"The other attraction seemed to be an opportunity to drill through the buried boundary between two tectonic plates that collided 320 million years ago to help form the present Eurasian plate. But the suture, first predicted to slant under the KTB site at a depth of about 3 kilometers on the basis of surface geology, **failed to show up at 3 kilometers**, or at 5 kilometers as later hoped. And at 7.5 kilometers, researchers still 'haven't seen any sign of a dramatic change' that would mark the boundary between the two plates, according to Jörg Lauterjung of the KTB project." Note 5.14j

p.125

"Unresolved" Questions Of Plate Tectonic Pseudotheory

"Everything is up for grabs.

'We'll have to acknowledge we know far less about the centre of the Earth than we thought we did..."

Gillian Foulger

p.126

"...the geological community is standing on the brink of a radical shift in thinking that could completely change our ideas about the inner workings of the Earth."

Nicola Jones

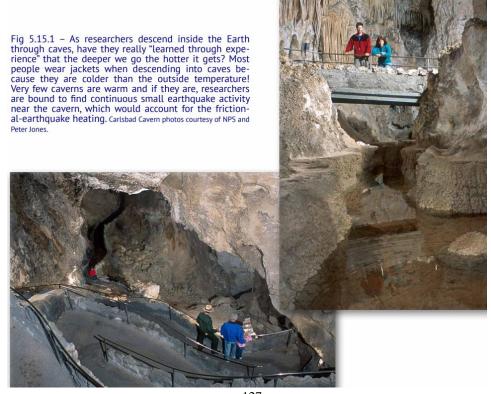
p.126

5.15 The 'Smoking Gun' – Tomography

Missing 'The Boat' On Critical Observations

Caves get cooler as you enter and descend, not hotter!

Warm mines and caves are the exception, they're near fault lines, and are heated by gravitational-friction.



p.127

The 'Smoking Tomography Gun'

Seismic Tomography Evidence Theoretical Magmaplanet Geotherm

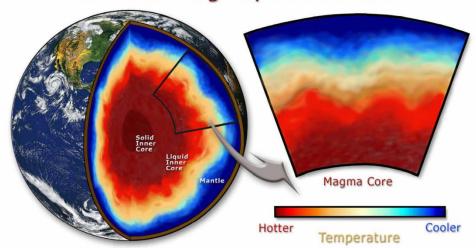


Fig 5.15.2 – This theoretical Magmaplanet Geotherm shows a cross-section of Earth with a hotter interior (red) and cooler (blue) areas in the outer mantle of Earth. The inset section on the right shows colder temperatures with a gradient towards a hotter interior. If the Earth's heat comes from the molten core, this is what the tomographic evidence should reveal. See Fig 5.15.3 for the *actual* geotherm of the Earth as derived from the seismic tomography.

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Where The Earth's Heat Really Comes From

As far back as 1901, scientists recognized a problem with the origin of the Earth's heat, recorded in the 1901 book, *Lessons in Physical Geography*:

"The fact that while the temperature of the earth-crust increases downward, the temperature of the sea decreases in the same direction, constitutes one of the most interesting problems of oceanic geography." Bib 142 p252

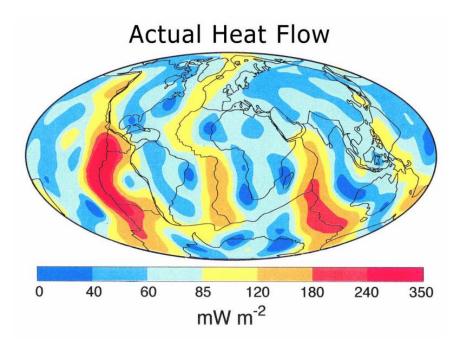


Fig 5.15.4 – For the first time, the Actual Heat Flow map of the Earth as seen here makes sense (first shown in Fig 5.4.5). The oceans are not evenly heated by magma because magma does not exist. Oceanic heat comes from the vertical plate boundaries that experience continual friction because of the Moon's gravitational force and Earthtide. The areas that are the most active show as red and orange on the map.

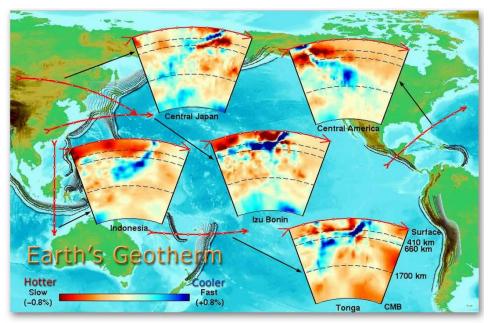


Fig 5.15.3 – This diagram portrays several cross-sections corresponding with the curved red arrows. Compare this chart to the Theoretical Magmaplanet Geotherm in Fig 5.15.2. These **actual** geotherm profiles are *complexly opposite* the predicted profile. Instead of the hotter areas being at the base of the cross-sections as displayed in the theoretical Magma Geotherm, the red areas are at the **top** of these profiles where frictional heating occurs, clearly near plate boundaries. Look, for example, at the Central American profile. The area showing the hottest is at the top left of the cross-section, exactly where the corresponding arrow crosses the Central American continent and plate boundaries, and right where earthquakes and frictional heating happen. Courtey of and adapted from the work of Nob Vander Hillst at the MIT.

"Despite the availability of data for the upper third of the crust, models to predict temperatures for greater depths still contain uncertainties." Note 5.15b

"The model that emerges is one in which the internal temperature of the earth is governed largely by the generation of heat in the earth's crust and possibly a little below it." Bib 63 p150 p.129

"...the 'fire' is **not** concentrated **deep in the heart of the earth** but is an encircling **sheet near the surface itself!**" Bib 63 pl 49 p.129

5.16 The Magma Freeze

Discarding The "Tentative Hypothesis"

in an online geology blog for a course taught at Yale University: "...in an average slice through the Earth, there is no molten rock between the core-mantle boundary and the surface, save perhaps in the asthenosphere at the base of the tectonic plates (100-200 km), where a partial melt of a few percent may exist. As a result, unusual conditions must prevail in regions that produce magma for surface volcanism." Note 5.16a

p.130

"So let us make the tentative hypothesis that the core of the earth is made mostly of iron... Remember, however, that it is still tentative, and should we discover facts with which this model cannot be reconciled, it will have to be discarded."

O. M. Phillips