

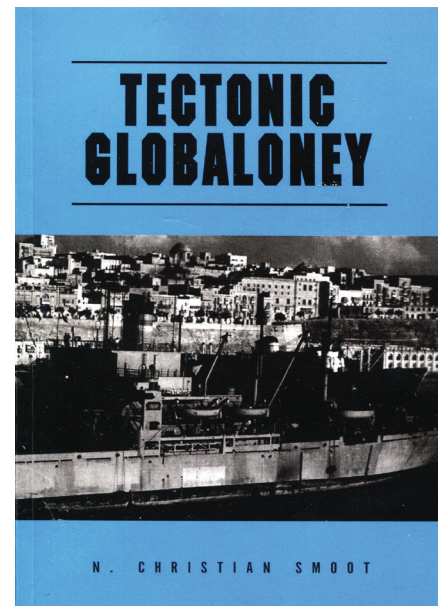
# A SUMMARY OF TECTONIC GLOBALONEY

by N. Christian Smoot

written by Ellen J. McHenry

NOTE: I was able to contact Mr. Smoot and let him know that I was writing this summary. He gave permission for its distribution as long as it is not-for-profit. He understands that there is no intent to plagiarize or take credit for any of the ideas or passages quoted. Mr. Smoot would like to make the reader aware of his more recent book, Marine Geomorphology, (2015), which is formatted like a textbook (not a paperback) and has many illustrations and data charts.

PLEASE ALSO NOTE: This is not an analysis; it is merely a summary.  
I leave analysis to the reader.



**Introductory page:** Smoot's definition of "globaloney": a word used by students when they are being sold shares of the Brooklyn Bridge by snake-oil salesmen. It means just what it says: "I don't believe you."

## CHAPTER 1: Introduction

Smoot tells us that he worked for the Ocean Survey Program of the US Naval Oceanographic Office from 1966 to 1998. He gathered information about the seafloor that would be used by submarine pilots. Some of the information was released to the public in the 1970s, but much of it was also kept classified until the 1990s. Smoot was one of the people who declassified information both in the 70s and the 90s. He retired to Hawaii and enjoys how the natives there "talk story" so he warns us that he will attempt to entertain us once in a while with some anecdotes from his sailing days.

## CHAPTER 2: Background

He begins by establishing his audience. He knows better than to speak to practicing geodynamicists, because they adhere to tightly to the Plate Tectonic paradigm established in 1966 (more on that later). He wants to get facts out to students and practicing neophytes who are still able to assimilate real data and formulate their own thinking.

Smoot then proceeds to go over some basics that he sees as facts, and not part of Plate Tectonic theory.

- 1) The earth is 4.5 billion years old and so are the other planets. It strikes him as odd that Earth has life and is tectonically active, but he points out that Venus and Mars have some surface features that look like they were created by hydrodynamics.
- 2) The deepest we have ever drilled into the earth is the Kola Superdeep Borehole in the Kola Peninsula. The hole is 12 km deep, basically a scratch on the surface.
- 3) The only way we can learn about what is deep inside the Earth is through either earthquake seismology or seismic stratigraphy. The speed of sound varies depending on what it is going through. Sand is 800 ft/sec, and granite is 20,000 ft/sec. Denser materials carry waves faster.
- 4) There are two theories about what is at Earth's core: 1) hot, liquid iron/nickel, or 2) cold, liquid plasma. Outside the core there is a more solid area, then outside of that is the mantle, then the firm, cold crust on top. There are two types of crust. Oceanic crust is made of basalts, which are iron-rich silicon rocks. Continental crusts are made of granites, which are iron-poor silicate rocks. If the core is made of cold plasma, it would consist of hydrogen and helium constantly transforming into atoms, including iron atoms which go to the outer core.
- 5) Earth has three possibilities: it can expand, it can contract, or it can stay the same size. Only one can be true.

## CHAPTER 3: Geodynamic Models Culminate with the Plate Tectonic Model

This chapter is devoted to an overview of the theory of Plate Tectonics. The first step away from "Flood geology" was to theorize that much of the geology of Europe was caused by the Ice Age(s). James Hutton's paper in 1785, "Theory of the Earth, or an Investigation of the Laws Observable in the Composition, Dissolution and Restoration of Land upon the Globe," theorized that our present rocks were formed by the wastes of rocks of past eras. Next came Charles Lyell with this principle of uniformitarianism, and his *Principles of Geology* book in 1829.

At this point, Smoot feels the need to define some geological terms before he goes on with his history. He gives definitions for: anticline, fault, foot wall, geosyncline, hanging wall, mobile belt, normal fault, reverse fault, strike-slip fault, structural basin, syncline.

Smoot reminds us that in the 1800s, vertical tectonism was still the majority viewpoint. Mountains were built up and worn down, but nothing moved side to side. Seas would come and go, and then be overlain by layers of sediment. This was the explanation for fossilized sea creatures in places that are now desert or at high elevations. There were actually a few people in the 1930s who formulated a theory that the Earth was expanding, and that would explain the cracks and bumps we see. However, neither vertical tectonism or earth expansion could explain earthquakes, volcanoes, and ocean trenches.

Alfred Wegener came up with the theory of continental drift in the 1920s, after he noticed the apparent fit of the continents. His ideas were rejected by mainstream geology. Gutenberg and Richter proposed in 1949 that the Earth's crust is a series of plates that have areas of tectonic activity between them. Hugo Benioff discovered large thrust faults along the rim of the Pacific. Bill Menard discovered large fracture zones in the North Pacific. Bruce Heezen in 1960 theorized the mid-ocean rift system to be a dynamic part of the ocean floor. Harry Hess theorized seafloor spreading in 1962. Tuzo Wilson in 1965 showed that magnetic anomalies were offset upon formation along transform faults, instead of after the magnetic signature had been imprinted.

At the 1966 Geological Society of America meeting in San Francisco, the theory was accepted in toto, and seen as the grand solution to all of modern geology's problems. The Benioff zones must be where the plates are diving down into the mantle, and the volcanoes along those edges would be caused by the melting of the diving plate. The deep trenches are subduction zones, where oceanic plate is disappearing into the mantle. The hot rock acts like a conveyor belt, and comes up again under mid-ocean ridges where it creates new seafloor. Spreading centers were called divergent boundaries and subduction zones were called convergent. Volcanoes not at the edges of plates must be "hot spots" where a plate is sliding over a fixed diapir in the mantle. Movement at the plate boundaries causes shallow earthquakes. Deep earthquakes must be the result of the diving plates in subduction zones.

The fit of the continents was named the "Bullard fit." A fossilized tetrapod named *Lystrosaurus* played a key role in backing up the continental drift theory, as it was found in India, South Africa, and Antarctica. These three land masses must have been connected so that *Lystrosaurus* could migrate. This theorized land mass was called Gondwanaland. The rest of the continents were lumped together to the north and called Laurasia. Between these continents they theorized the Tethys Sea.

How do continents move, according to Plate Tectonic theory? Again, it is a conveyor belt type movement of the mantle, with the very thick plates riding on top. We are reminded just how thick they are. Oceanic crust can be as thick as 7 km. Continental crust can be up to 80 km thick, with their cratons being up to 600 km thick. We are reminded again of the definitions of divergent and convergent boundaries and what happens at each. Fracture zones along the ridges are places where uneven spreading pressure has been released, so these fracture zones must point in the direction of seafloor spreading. When continental plates collide, they can also collide, creating mountains.

Smoot lists the plates recognized as of 2003, which are 12 large ones and a few smaller ones. He says that a number of geologists want to increase this number and recognize many more smaller plates. He ends by pointing out that even with this theory in place, we are no closer to being able to predict earthquakes and volcanoes.

## **CHAPTER 4: Applications of the Plate Tectonic Model**

Smoot opens this chapter with a sentence worth quoting. "For the working hypothesis to function, it must explain every geological phenomenon in every instance. Otherwise, we are left in netherworld of ad hoc explanations for every aberration...and plate tectonics is the ultimate repository for adhocism."

This short chapter is mostly a summary of how plate tectonics has theorized the movement of the continental masses over time. He gives us two very small ink drawings to try to illustrate what he is saying, but they aren't much help. A much easier way to see this overview of plate motion is to watch the video summary by Chris Scotese, available on YouTube. Smoot refers to Scotese's work in his text, although at the time of writing, Scotese had only made maps and diagrams. Now that a video is available, the reader is encouraged to watch that instead of spending time trying to decipher all these complicated written descriptions.

Smoot adds a personal note, remembering a conference he went to at Texas A&M in 1983. He presented maps of his bathymetry in the western Pacific near the supposed subduction zones. What a shame, he says, that this was 17 years too late.

## **CHAPTER 5: Neglect of Field Data at the Altar of Conceptual Models**

Smoot opens with this comment about the theory and the way it is funded. "By the mid 1970s, everyone more-or-less accepted the plate tectonic hypothesis. What? You don't believe that? Funny, neither did I. Our tax dollars, mucho dinero to be exact, paid for that worthless bit of nonsense."

Not everyone accepted the theory. For example, Howard and Arthur Meyerhoff (father and son) immediately questioned the validity of the theory. They countered (in 1974) with the idea of heated channels above the asthenosphere. The idea of periodic surges (cyclic thermal runaway) was first proposed by A. Rice and Rodes Fairbridge in 1975. Lynn Sykes, one of the founding fathers of plate tectonics, discovered that magmatism and earthquake zones, though invisible from the surface, extend from the ends of ocean ridges, often running for hundreds of kilometers, even onto land. (Smoot does not explain the relevance of this last example.)

Bathymetry data that became available in 1974 showed that the fracture lines on the floor of the Pacific made a fanning pattern, as if seafloor spreading had started at a point in the west and the plate had expanded eastward. Also, the dating of the base-

ment rock on the ocean floor has long been suspect. Individual samples from various points on the ocean floor gives dates that seem more random than anything else. This has caused theorists to propose many “microplates,” that can try to explain these aberrations from expected results. The Global Time Scale is constantly being updated to try to accommodate all the new data.

Smoot now does some simple math calculations to show that the amount of seafloor being created does not equal the amount of seafloor disappearing into convergent zones. The mid-ocean ridges total up to about 74,000 km. If spreading is occurring on both sides, that gives us a total of about 148,000 linear km of new material constantly being created. In theory, there should be that amount of convergence, also. Trench zones give us only about 30,500 km of convergence. The mountainous Mediterranean-Zagros-Himalayan-Indonesian collision zone (where the plates are over-riding instead of subducting) give us only another 9,000 km.

Here are some examples of plates that have divergent/convergent issues:

- The Antarctic plate has no convergent margins at all. (That should have been a red flag that something was wrong.)
- African plate has a similar problem. It has divergent boundaries on the west, south and east. The only place it could be converging to is the tiny Aegean Trench.
- Similarly, no convergent margin exists for the proposed Eurasian plate.
- No convergent margins can be found for the Gorda, Juan de Fuca, and the Cocos plates. (Much time and money has been spent trying to locate a convergent margin near Washington state and British Columbia, but with no success.)
- The Manihiki and Magellan plates have neither spreading centers nor convergent margins.
- No plate boundary exists between the North and South American plates..0

Smoot goes on to say that the proposed Pacific Magnetic Quiet Zones (areas of low magnetism that are hard to interpret) are used as a catch-all rescue device for problems with the Pacific seafloor. However, he points out that in the 1980s, data collected by David Handschumacher and Gene Morganthaler shows the Pacific plate in the area of the supposed quiet zone, as actually moving to the southeast. If we stay consistent with the theory, this would indicate that the western Pacific plate is moving southeasterly and subducting into the Vityaz Trench system, not the trenches to the north and west.

At this point, Smoot gives us a series of very simple ink drawings that show us an alternate hypothesis for the formation of the Pacific plate, based on Handschumacher's data. He shows a triangular intersection of three (hypothesized) previous plates, the Izanagi, the Phoenix and the Farallon (before 170 ma). As this intersection pulls apart (170 ma), we see a tiny triangle appear in that space, the beginnings of the Pacific plate. That triangle grows into a larger triangle (170-118 ma), and some fracture zones start to appear (with no explanation for them given). At 118 ma we see the beginnings of the Mendocino megatrend, running approximately east to west (no explanation given). In this picture we suddenly see the top of the plate, with its curved cusp shapes (no explanation given). The last drawing shows the Pacific at 82 ma, with the Mendocino fracture line running all the way across the top of the Pacific and a few north-south fractures.

An entire page is devoted to describing and explaining these diagrams, so it seems to be an important point to Smoot. However, it is less clear here than in other places in the book, what he hopes the take-away lesson from this will be. He does not point out fallacies along the way, but simply presents the scenario as if he is presenting facts. He ends with a summary of what he's been trying to say in this chapter. “It appears that the combined effort of the Pacific-Izanagi and the Pacific-Phoenix spreading has caused the western portion of the Pacific plate to grow appreciably faster than the eastern portion of the basin. That changed the plate's shape from a westward pointing triangle to more rectangular.” He says he has stayed within the constraints of the working hypothesis, so the reader guesses that perhaps he doesn't actually believe everything he has been telling for the past three pages.

He ends by saying this: “And, while we're here visiting the geophysicists, somewhere during all this action, this erudite body decided that Earth's core was a hot, liquid mass.”

## CHAPTER 6: Field Data vs. Globaloney

Chapter 6 is a long one, so Smoot has divided it up into smaller sections. The division is his, not mine. His introduction to these sections is another swipe at the theorists who refused to consider course correction once more data became available. He states that his original intent years ago, was not to attack the theory but only to diagnose what had gone wrong along the way. However, as time went on, he found that “not only did we need a course correction, but also somebody had changed the entire navigation suite!” He continues in a sarcastic tone: “So, a new and unusual way to do business was opted for; I collected the data and see where it led.; like letting the horse pull the cart, or the dog wag the tail.” He assures us that what he will present here is from actual data you can see, not from the “dreamland of geophysicists.”

### 6.1 Geology versus Geophysics: A Rocky Beginning

He begins with a disturbing anecdote told to him by a friend who was on a cruise with Bruce Heezen, one of the big names in ocean floor science in the 1960s and 70s. They were doing a survey of the Cayman Trough in the Caribbean and needed some fresh basalt to prove that the trough was actually a spreading center. Heezen pulled up samples during the entire cruise before he finally got one sample of basalt. He based his entire report on that one sample.

The rest of chapter 6 is organized into sub-sections, exactly as noted here, with each section presenting first a plate tectonic presumption, and then following that up with what he calls the “Actuality.”

**PLATE TECTONIC PRESUMPTION:** The ocean floor is much younger than continents. The estimated age of the ocean floor is not more than 200 million years (ma).

**ACTUALITY:** The magnetic values given for the ocean floor are not directly linked to any absolute data. (Here he diverts briefly to a discussion of the San Andreas Fault and says that very old rocks on either side of the fault show that California is not about to slip into the sea as many people fear. It has not moved very much for a very long time. Faulty magnetic data got people alarmed unnecessarily.)

Drilling the ocean floor is very difficult. In 35 years, the ODP (Ocean Drilling Program) has not been able to get core samples from places off the ridge. (The ridge is more shallow, of course, and thus easier to drill and dredge.) Also, drillers have a problem with chert, which is an extremely hard type of metamorphic rock commonly found as they try to drill into the ocean floor. Smoot says that if you take the time to look at the actual descriptions written about the ODP's drilling sites, you will find that most of them state that the drillers hit chert and could not drill any further. "We couldn't get through the chert, but we can assume that the age and composition of the rock beneath these layers must be..." And off they would go, without any actual data.

Other drilling programs, not ODP, have come up with data that does not support the young age of the ridges theory. The ODP folks try to explain away these findings as anomalies due to "ice-rafting" and "ship's ballast dumping." Neither of these makes sense in context.

The statement that the mid-ocean ridges are not more than 180 million years old can be proved false in many ways:

- 1) Rocks from St. Paul's Rocks, (islands) in the Atlantic between Brazil and Africa, give radiometric dates of up to 4.5 billion. Granite (a continental rock) has also been dredged up from this site.
- 2) The equatorial region of the Mid-Atlantic Ridge has a surprising variety of rocks. There are continental flood basalts, sericitic mica phyllite, quartzite, shale, brown coal, and many other rocks derived from continental sources. There is a plateau capped with sedimentary rocks 400-1,200 meters thick.
- 3) A Soviet study in 1989 found granitic metamorphic rocks on the western side of the Mid-Atlantic Ridge from the equator to 30 degrees south latitude.
- 4) Boris Vasil'yev presented a map at the 2002 meeting of the Russian Academy for Sciences, that showed the ocean floor based on rock ages, not on magnetic stripes. The rock age map did not match the magnetic map at all. He found the trenches to be young!
- 5) At this 2002 conference, V. T. Frolov presented data that disproved the theory of the Paleozoic Ural Ocean. His data did not support subduction or tectonic piling.

Smoot closes this section by accusing the DSDP/ODP (Ocean drilling programs) of suppressing drilling data that conflicts with plate tectonic theory. He points a finger at the National Science Foundation for being the ultimate funding source for misinformation about tectonics.

## 6.2 Midocean Ridges and the Creation of New Seafloor

Smoot opens this section with a reminder of how the MAR (Mid-Atlantic Ridge) was first discovered in the 1800s as they were laying transatlantic cables from North America to the UK. They called it the "North Atlantic Shoaling Ground." Bruce Heezen and Marie Tharp were key map makers who put together the first reasonable map of the North Atlantic, showing all current data about its shape. At this time, the name "Mid-Atlantic Ridge" was adopted (and "Mid-Ocean Ridges" outside the Atlantic).

**PLATE TECTONIC PRESUMPTION:** The mid-ocean ridges are formed by seafloor spreading, as proposed by Bob Dietz and Bruce Heezen. Magma rises at the ridge and creates new seafloor, pushing the old seafloor aside. The ridges represent the newest and youngest parts of the ocean floor. The perpendicular fault lines, or fracture zones, can be explained by the fact that seafloor spreading would not occur everywhere all at once, but rather, would occur in various places at various times. This uneven spreading led to uneven forces on the seafloor, creating fracture zones from 15-500 km in length that slid either east or west. Seamounts that are off-ridge now had to have originated on-ridge, where magma was flowing out, so that means these seamounts have slowly moved along with the seafloor. The reason that there are very few seamounts in the North Atlantic is because this part of the ridge is spreading more slowly than the other parts. The East Pacific Rise must be a fast-moving system because it has produced so many seamounts.

**ACTUALITY:** Smoot restates that the age assessments of the rocks on the ridges are in error. He now spends an entire page listing each section of the Mid-Ocean Ridge, and how long it is. The total number of km of all the ridges is about 75,000 km. Seafloor spreading is said to occur in both directions, away from the ridge. so we have 150,000 km of potential spreading.

Interestingly, the term Mid-Ocean Ridge is not true for the Pacific. The ridge is not in the middle of the basin.

Another interesting observation is the similarity between the northern MAR and the profile of the Rocky Mountains at 39 degrees north latitude.

*Smoot then inserts one of his "sea tales" at this point, telling of a buddy who jumped off the ship as it was pulling away from the dock in order to get one last kiss from his girlfriend. He twisted his ankle and had to be hauled on board with ropes.*

Researchers have surveyed a large portion of the MAR. The Mohs Ridge in the Arctic Ocean has been completely scanned by SeaBeam surveys. Smoot shows two images of the ridge, made using data from multibeam sonars. The point of these illustrations is apparently to say that a series of parallel-ish valleys were discovered, but they are not perfectly parallel, more diagonal.

The northern MAR has a large disjointed section, and Iceland sits at the middle of this disjointed area. The MAR is not visible north of Iceland, only south of it. The section of the ridge directly south of Iceland is perhaps the most famous part of the entire mid-ocean ridge system and has been used to "prove" seafloor spreading, using magnetic stripe data from the ridge.



He then spends several paragraphs describing the locations and measurements of the fracture zones between 35 and 37 degrees north (with no editorial comments as to their relevance).

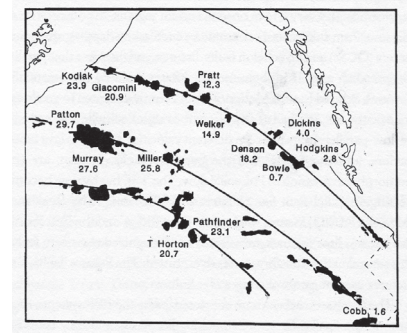
He points out that photo mosaic images of the axial valley (right at the center of the ridge) show it strewn with pillow basalts and broken lava rock debris. This central rift valley is about 2 km wide, and has linear ridges on the floor, and the walls are characterized by narrow flat-topped terraces and benches with outward-facing antithetic scarps (from 36 to 37 degrees north).

He gives several more paragraphs of description and measurements of various sections of the ridges, with no editorial comments about them. He gives us texture images of the Atlantis Fracture Zone area.

He points out that in the Pacific there is no clear spreading center. The “ridge” isn’t a ridge, merely a slight rise. He also points out that the East Pacific Rise sort of “runs aground” near Baja California, and follows the west coast of North America (where we find the San Andreas fault and the coastal mountain ranges) and re-emerges as the Juan de Fuca Ridge.

He shows us a picture of the ocean floor off the coast of North America and points out that there is no trench at the Cascadia margin. The continental shelf and slope plunge directly down to the seafloor plain. There seems to be no area of convergence.

At this point he asks the reader’s pardon while he delves into the “esoteric world of science” in order to prove a point. He refers to a visual he has put together, showing a sonar-based tectonic diagram of the Gulf of Alaska. Because his point is directly tied to this visual, it is necessary to show it here. He points out that no definite intra-chain age sequence occurs, according to this data. (Diagram shown here on right.)



*Smoot pauses for another anecdote, telling of how lucky he was to survive a severe winter storm in the Gulf of Alaska.*

Next comes a short list of some features that lie parallel to the ridges, such as fissures, en echelon faults, and overlapping spreading centers. Then he reasons that according to Stoke’s Law, magma should flow along the ridge, not away from it. Poiseuille flow patterns are flow-parallel shears between different velocities (such as in lava tubes). So, he reasons, these parallel crack features must be the geomorphic expression of Poiseuille flow. Parallel features found along other tectonic belts reinforce this point, as further proof that magma flows along-strike, not away from the ridges.

Magma flowing out at ridges does not have enough force to push plates apart. There cannot be any hydraulic press effect here because the magma is not in a closed system. Therefore, ridge push as a force to move tectonic plates is impossible.

Notice that on-ridge seamounts are non-existent on the MAR, except for Iceland (if you can count it as a very large seamount) and Ascension Island in the South Atlantic.

## 6.3 Convergent Margins

*Smoot gives us another anecdote here. He remembers a cruise to the Pacific where they made a stop right over a very deep trench and took a water sample from a depth of 6,000 meters. He comments that it tasted salty.*

**PLATE TECTONIC PRESUMPTION:** Slab pull is one of the major forces driving plate motion.

Several types of subduction zones exist:

- 1) In a collision between two oceanic plates, one goes down (subducts) and the other overrides it. The subducting plate is called “seaward” and the overriding plate is called “landward.”
- 2) In a collision between a continental plate and an oceanic plate, the oceanic plate always subducts because the oceanic lithosphere is thinner.
- 3) In a collision between continental and oceanic plates where there is also oceanic crust seaward of the continent, the landward oceanic crust can subduct the seaward oceanic crust first.
- 4) Two continental plates can meet in a collision and form a suture zone, or mobile belt. If there was a shallow sea between these continents, the sea is eliminated as the continents press together. The sedimentary rock between is compressed and then elevated as the collision begins to form mountains. The sediments can be folded and igneous rock can make intrusions.

There are also passive margins, such as continental shelves. They are non-volcanic and do not form mountains. The sediments at these margins generally get thicker as you go seaward. Continental rifting precedes passive margin subsidence. As passive margin could turn into an active margin under certain circumstances.

**ACTUALITY:** A list of trenches is given, each segment with its length (e.g. Mariana 2550 km). The trenches are usually underlain by earthquake activity. A prominent feature of many convergent margins is the cusp (e.g. the north Pacific). Nearly all of the subduction zones are in the Pacific and they face east. (This will be significant later in the book, when Smoot proposes his own tectonic theory.)

He debunks the proposed Cascadia subduction zone. The bathymetry clearly shows that no trench exists. Earthquake data shows only scatter shallow quakes. So, no trench, no deep earthquakes-- this means no subduction zone. Scratch 1,600 km from the total convergent margins. The same holds true for the supposed Vityaz “trench.” There’s no trench. Subtract another 2,500 km.

Smoot then describes the work of Ted Ranneft, who proposed that the trenches are discreet segments, with different azimuths and depths. (He notes that trenches are usually shown as continuous and all the same depth.) Tectonic events at active margins are explained by Ranneft as oblique faulting (30, 60 or 80 degrees, and perpendicular to supposed convergence angle of the plates) all over the Pacific Basin. Oblique faults also occur on the higher parts of the inner walls of the trenches.

Bathymetrically, the idea of a smoothly descending slab seems unlikely. We should also investigate earthquakes since they were used as a key piece of data to support the theory of plate tectonics when it was proposed. According to the theory, we should find more deep earthquakes as we move landward from the subduction zone.

Shallow earthquakes are defined as those occurring down to 70 km. Intermediate quakes are from 70 km to 300 km. At this point, around 300km deep, we find very few earthquakes. Then as we go deeper, up to 600 km, we find more quakes again, although not nearly the number of shallow quakes. Below about 600 km we don't find any quakes. A table of the number of the number of earthquakes at various depths shows this to be true.

If we map out areas of deep earthquakes on the globe, we find that they mostly occur in nine areas, many in and around the Pacific, and all of which are on the northern side of their respective active margins, and they appear to be segmented. This means that only one active margin fits the definition of a subduction zone, according to seismic data.

This means that the subducting plate melting back into the mantle is a myth. But this should not come as a shock to anyone, because Benioff himself (who the subduction zones are named after) showed that the deep earthquake data (from under the convergent margins) when plotted, turned out to be at a totally different angle than the shallow earthquake data. Joining these two groups of data into a continuous descending slab is inexplicable.

To reinforce this point, Smoot shows some charts made by Dong Choi, an exploration geologist consultant in Australia. Choi plotted earthquakes at trench areas off the west coast of South America. and found that almost all earthquake activity was above 200 km, and there was no activity at all between 200 and 600 km. He also found that the angle of inclination in these slices [of the same plate] varied from 12 degrees to 27 degrees. That would mean the plate was very crooked. Choi concludes that deep earthquakes are related to deep tectonic zones that are responsible for subsidence of the upper mantle and crust along the major deep fault systems such as the western Pacific and the Peru and Chaco-Panama basins off South America. He believes that the seismic focal plane leans seaward, which indicates that the Benioff zone is a reverse thrust fault system.

Shallow earthquakes are not unique to the convergent margin areas. They occur mid-basin, as well. Seismic profiles show the lithosphere to be the same on both sides of Benioff zones. We can then remove all these supposed subduction zones from the tally of convergent margins, leaving us only about 20, 000 km.

*Here he relates another anecdote, although this one is actually tied to the chapter content. The small group of plate tectonic dissenters would meet together every few years. They called themselves "New Concepts in Global Tectonics." In 1998 they met in Japan and went on a cruise with some Japanese geologists. The Japanese scientists agree that subduction under Japan was a physical impossibility because of the shape of the fault planes that the seismic data showed.*

Plate tectonics advocates have come up with a rescue device to explain the shallow/deep earthquake data. Faulting occurs in the descending crust and this accounts for shallow earthquakes. As they hydrated oceanic crust sinks, it is heated and becomes dehydrated. This process produces intermediate quakes (as the olivine turns into spinel). As the slab descends deeper, the inner olivine (that was still cold until now) finally melts and we then have deep earthquakes.

The reader should notice, he says, that no mention has been made of the convergent zones in the Mediterranean region. If you plot earthquakes for this region, you get a circular pattern. Circular patterns do not have a place in plate tectonic theory, so the data is ignored.

## 6.4 India and the Tethys Sea(s): Polygamy Was Not a Part of Okeanos' Program

Now we turn our attention to the convergent margins that do not subduct, but rather collide. These are found mainly in Eurasia, from the Mediterranean through the Arabian peninsula and across the Himalayas.

**PLATE TECTONIC ASSUMPTION:** The Tethys Sea formed between Gondwanaland on the south and Laurasia on the north. Celal Sengor has postulated two Tethys Seas. The migration of India and part of the Arabian peninsula across the Tethys Sea basin from south of Africa to Eurasia is an integral part of all plate and expansion models, an event which began 65 ma.

**ACTUALITY:** (*"How is it that this august body of academicians has never bothered to use any of this data, data that is readily available to even the most myopic of students of earth geodynamics?"*) The Zagros Crush Zone lies between the Arabian peninsula and Iran. No trench exists in this region, merely the stepped signs of compression. The next region over is the Makran convergent margin. It begins in the Gulf of Oman and climbs up to the Dasht-e-Lut, an off-shoot of the Zagros Mountains. [Smoot ends abruptly right here, with no further comment.]

**PLATE TECTONIC ASSUMPTION:** Edward Seuss introduced the concept of the Tethys Sea in 1893, and Celal Sengor went one step further in 1984 by giving us two Tethys Seas. Smoot spends several paragraphs describing the relative positions of various land masses. The broad consensus in the plate tectonic world today seems to be that the Indian subcontinent was still down south, attached to Australia, Antarctica, Africa, and South America during the Permian period, and that they Tethys began along the southern margin of a basin that lay on the northern margin of Gondwanaland, the northern boundary of what was to become India. (Editor's note: The best way to visualize this is to watch one of Chris Scotese's time lapses video animations.) What is not addresses is the nature of the Himalayan belt, a rock sequence that should be right where the southern passive margin of this ocean should have been.

**ACTUALITY:** Ismail Bhat, of the Wadia Institute of Himalayan Geology, collected rocks all over the Himalayan region and analyzed their composition and age. His analysis is that the sedimentation history after the Late Archean rifting event and its associated mafic volcanism (Rampur flood basalts) shows a progressive northward shift of the fall line (line between crystalline basement rock and softer sedimentary rock) probably because of mantle rifting that occurred up until late Cretaceous. Unlike other rifting phases, the early Paleozoic rifting was not associated with mafic magmatism, but caused large-scale partial melting of the crust, shown by the white striped granites in the higher Himalayas. The rifting events resulted in uplift of the basin, and eventually produced the

Himalayan Mountains. The Late Archean and Early Paleozoic rifting phases resulted in the stable rift shoulders such as the Shield and Lesser Himalayas, but the later events did not.

If the Tethys Sea once existed where we now have mountains, we should be able to find some hint of this in the stratigraphy of that region. We should find, according to plate tectonic theory, is an interbedded succession of sedimentary and mafic litho-units, and a sill complex. What we actually find is evidence of high-density magma upwelling in a basin having undergone severe extension and rapid sedimentation.

Marine fossils are found in the first 16 km of the 26 km thick sediment record just south of the Indus-Yarling-Zangbo-Suture-Zone, which is the proposed subduction zone of the Neo-Tethys Sea. Celal Sengor's model does not allow for a seaway during this era of 600 ma. Late Cambrian marine fossils are overlain by huge stromatolite-bearing carbonate deposits.

The Himalayan stratigraphic record following the late Archean basin formation suggests that sedimentation occurred from the shield region all the way up to the higher Himalayas, up until the early Cambrian. Marine conditions came to an end by the early Paleozoic for these regions, but continued to the north where the basin experience differential uplift and erosion with widespread granitic magmatism, accompanied by sedimentation. This produced the higher Himalayan Cambrian-Ordovician granites. From that time forward, none of the Himalayan region was under water. So India could not have "docked" where it is at 15 ma. There was no Neo-Tethys Sea and there was no Gondwanaland.

Increasingly, detailed field work has shown that suture zones (also known as mobile belts or collision zones) are not zone of collision at all. Many of these proposed sutures are now seen as old tectonic environments where mafic and ultramafic rocks have risen to the surface along fault systems. This means that theories about Asia being a collage of micro-continents is in serious doubt, and that the Sengor model is globaloney.

## 6.5 Seafloor Spreading, Megatrends, and Intersections

*Smoot begins with an anecdote telling how a friend of his was able to collect rock specimens from a dredging project on top of a guyot that he had named after his wife, Jaybee Guyot.*

**PLATE TECTONIC PRESUMPTION:** Fracture zones are locked in place and inactive, preserving the direction of seafloor spreading at the time they were formed.

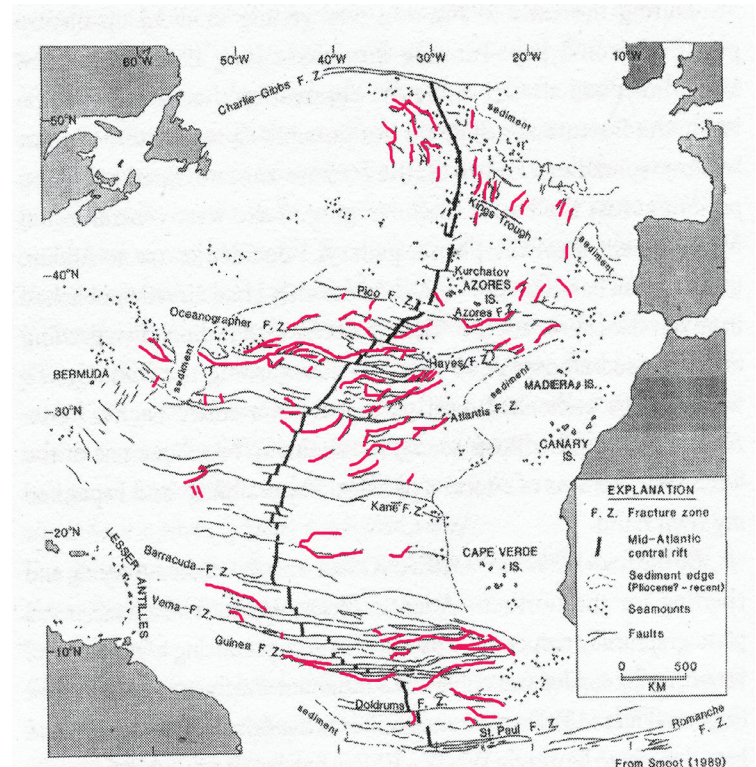
**ACTUALITY:** The Meyerhoffs had already (in the early 1980s) made the observation that in the Pacific Basin, the fracture lines could not possibly show the direction of sea floor spreading because they made a fan shape, converging to a point in the west central Pacific. Smoot's own work indicated that the seamount chains appeared to be extensions of the fracture lines, reinforcing this observation that the fracture lines can't possibly show seafloor spreading.

Plate tectonic definition of fracture zones is "extensions of the transform faults along mid-ocean ridge spreading centers." Many fracture zones in the Atlantic do not conform to this definition. This is best seen in a map that Smoot provides. The red marks of those of the editor of this paper, not Smoot. Red marks fractures that are a problem for plate tectonic theory. There is no good explanation for what is going on in places where there is a V shape, or places where the fractures are perpendicular to the mid-ocean ridge. The fracture lines brain, meander and splay. (Smoot says that PT advocates try to say that his map is out of proportion, but he says no, this map is extremely accurate.)

Smoot speculates that these fracture zones are actually the result of mid-plate seismic events, and are related to the buckling and fracturing caused by the release of mid-plate stress. Plate tectonics theorizes that seamounts and island chains are an age-related feature, showing seafloor spreading over time. Smoot counters by saying that magma leaks up not according to time, but according to where there are weak spots in the crust.

Very detailed bathymetric studies have shown that some fracture lines actually continue up onto continents, crossing features that PT theory says they should not cross (such as the San Andreas Fault) and a few seem to not only cross the continent, but come out on the other side. Some seem to circle the globe! (Unfortunately, he does not give us any diagram or maps to go with this statement.)

GEOSAT imaging in the late 1980s confirmed the bathymetry data. GEOSAT measured the relative height of the ocean and found that gravity pulls the water higher around islands and seamount and ridges, so you basically get a map of the ocean floor when you measure sea levels.





This new data collection method (GEOSAT sea level) meant that data could be collected in parts of the ocean that were difficult to get to by boat, such as the polar regions. This new data showed things to be connected that had not previously been thought of as connected. This led to a new geography term: megatrend. A megatrend is a feature that is made up of multiple features. It is sort of like playing dot-to-dot with underwater features, and seeing how many of them look like they are aligned. So a megatrend might include a chain of islands, underwater seamounts, and seafloor fractures zones that look aligned. Megatrends completely cross ocean basins, and totally refute the idea of seafloor spreading. Smoot speculates that megatrends are older than other ocean floor features, as in billions of years on the old earth time scale, because the megatrends go through rocks that are Phanerozoic and Paleozoic.

### 6.5.1 Pacific Ocean Basin Megatrends

An example of a Pacific megatrend is the Chinook Megatrend. (In many places in this book, Smoot goes into great detail giving a long lists of connected features. Most of these lists have been omitted from this summary, but this list is shorter than most, so it has been included as a sample.) The Chinook Megatrend begins at Japan, crosses the trench at Uyeda Ridge, continues through Nadeshda Basin, goes under the Shatskiy Rise, passes through the Emperor Seamounts and Hess Rise, crosses the Emperor Fracture Zone, becomes the Chinook Trough, and finally goes up through the Gulf of Alaska in the form of three splayed seamount chains.

The Mendochino megatrend (given in a long list) ends the same way as the Chinook megatrend, with a splay on its eastern end. Smoot sees this as significant. (He will use it as evidence for the Surge Tectonic theory.)

*Smoot gives us another cruise anecdote here. One on cruise where he was the head scientist and they were following a fracture zone in the Pacific, they came across a seamount (extinct volcano) right on the fracture line. (This surprised some of the crew, but did not surprise Smoot.) Smoot ordered that a line be dropped on top of the seamount, with a thermometer to check for any residual heat, but they did not find any.*

He then describes the Kashima megatrend, the Mamua megatrend, and the Krusenstern megatrend, using lists of features. Here he includes a few of his bathymetry images, though the exact significance of them to his argument is hard to determine.

*Then, another random anecdote. He tells of one cruise where they arrived early at their port in Hawaii, so they spent the rest of the day using their research boat to go fishing near a wildlife sanctuary. They only thing they caught was glimpses of birds.*

The next megatrends he describes are the Emperor Megatrend, the Central Pacific Megatrend, and the North Pacific Megatrend. The next two pages are lists of the features in these megatrends, as he plays dot to dot with ridges, seamount chains, trenches and fractures. He gives us two diagrams, but they are of little use to the lay reader, as they tiny and ambiguous. He mentions that his colleague, Dong Choi, has studied the ocean floor west of South America and has noted that seismic data suggests that the geological features on the continent are likely extensions of the features from the adjacent ocean floor.

The significance of all this seems to be that he believes submarine features appear to be directly controlled by the Proterozoic (Precambrian) structures on land. He says that this view would lead to the conclusion that there were "paleo-lands" in what is now the eastern Pacific Ocean, even up through the Mesozoic and into the Paleogene. The PT advocates say that the Cocos Ridge is subducting, but Smoot says, "...into what? There no trench in this region." There is nothing in this eastern Pacific region that even remotely corresponds to what PT theory needs to have at this location-- no trenches, not spreading center, no propagating rifts. In the bathymetry, this region looks like an eastward pointing delta, with morphology reminding one of stream flow characteristics.

The three megatrends he has described are the only ones he thinks are "active." He believes that this means they are relatively young. He ends with a short discussion about features on Mars, and how they show similar characteristics to Earth's Central Pacific Megatrend.

### 6.5.2 Atlantic Ocean Megatrends

Smoot and Arthur Meyerhoff did a study of Atlantic fracture zones in 1995. They found that between 0 and 55 degrees (north) latitude, 13 transform faults cross the MAR. 25 to 38 fracture zones lie off-ridge. Between 42 and 55 degrees latitude there are no fracture zone. Therefore, it seems that fracture zones are not necessarily connected to transform fault. Some are, and some are not. This would lead one to believe that fracture zones may have been in place before the formation of the MAR.

*An anecdote about dolphins: They were using transponders to estimate depth, and they would communicate with the transponders using sound frequencies. A certain frequency would release the transponder from its clip and let it come back to the surface. A school of dolphins came along, and began imitating that exact frequency, causing all the transponders to surface before the task was complete. The dolphins hung around and kept doing this. Finally they had to leave the area because they could not get their work done!*

Geology student are led to believe that all fracture zones in the Atlantic go East-West. When he and Meyerhoff actually looked at the data, they found very few that actually went East-West. The North Atlantic is characterized by a high number of seamounts (about 200) that have no particular alignment (they do not form a megatrend). Nowhere else in the Atlantic Basin do you find this. Why? No one knows, but he thinks it could have something to do with the fact that the ocean basin is very narrow here.

Below his area, down to the equator, you find three megatrends that go across the entire basin. These are described.

For the Bullard fit to work, Massachusetts must line up with Morocco, and fracture zones must join them. In fact, the megatrend that goes through Massachusetts ends up further north, in Spain.

This section ends with a discussion of megatrends in the Indian Ocean, with feature by feature descriptions. The 5 megatrends look chaotic and jumbled, and some intersect. He notes that none of the fractures in the Indian Ocean cross the 90 Degree East Ridge. The Indian Ocean does not have many seamounts.



## 6.6 Geophysical Superswells vs Bathymetric Contours of a Region

**PLATE TECTONIC PRESUMPTION:** Bathymetric superswells are random areas on the ocean floor where a mantle plume deep below is pushing magma to the surface. A superswell was proposed in the western Pacific, to explain all the volcanoes there. Also, Harry Hess proposed a giant superswell in the southern Pacific, although he retracted this claim in later years. (But his students went right on with it.)

**ACTUALITY:** If there are superswells pushing up from below, surely we would be able to detect a rise in the bathymetry. The bathymetry of the southern Pacific clearly show a constant depth of 5400 meters all the way across, except for a few seamounts and island chains that crisscross it.

*At this point, Smoot tells a story about Bill Menard. Early in his career, Smoot wrote a paper about guyots, summarizing the bathymetric findings that he and a few others (including Harry Hess) had found. He submitted the paper to a major journal and the editor sent the paper for review to Menard. When Menard sent the paper back with revisions, mostly inserting himself as the discoverer of all these features, even though he never had no access to the actual data. Smoot complained to the editor, but because Menard was a "big name," his name won the day and the editor intended to allow Menard to say anything he wanted to. Smoot retracted the paper and found a much smaller journal to publish it.*

In the North Pacific, the bathymetry showed a fracture zone, not a swell. In fact, the bathymetry clearly shows that there is not a single superswell in the entire Pacific Ocean. In fact, Smoot can't see any evidence of even any small hotspots. Very few age progressions exist with actual data to back up this idea. Several independent investigators have tried to find actual evidence of hotspots and have come up with nothing. Hotspots don't exist. Smoot does think there are "hot lines," however, but these are simple channels of magma under the crust, NOT coming up from the mantle.

Why, he asks, are they still promoting the hot spot theory when the evidence clearly shows they do not exist? All ocean floor features reside atop at least two megatrend intersections. ALL of them.

## 6.7 Paleobiogeography and Gondwanaland

*Smoot has always been interested in fossils of "early man." Smoot has kept up with the research and is happy to point out all the disinformation that is being given to the public. For starters, the "out of Africa" folks don't tell anyone that erectus fossils are found in places other than Africa, such as Indonesia, China, India, and the country of Georgia. All of these give radiometric ages of 1 to 2 Ma, the same as the Africa fossils. Fossils in Australia seem to show ancient Aborigines, and these date the same as the Africa fossils. Yet the funding stream always goes to the "out of Africa" researchers. When findings seem to disprove them, they do sleight of hand with definitions in order to not seem wrong (so they don't get defunded).*

**PLATE TECTONIC PRESUMPTION:** We know continental drift happened because of fossil evidence. Lystrosaurus and Glossopteris fossils are found across the continents, showing that India moved north and smashed into Asia, causing the Himalayas to rise.

**ACTUALITY:** A study was published by the Geological Society of America in 1996 under the leadership of Arthur Meyerhoff, that mapped out fossil locations all over India and southern Asia. They found that there was a large area from 50 degrees north to 50 degrees south where norther and southern species were all mixed together. This suggests that India has always been right where it is now. There may have been some slight shifting around E-W, but certainly no drifting of the Indian subcontinent.

*At this point, Smoot wants to tell the reader about his relationship with Art Meyerhoff. Smoot met him when Meyerhoff was older and having severe respiratory problems. Meyerhoff didn't like telephones and had a secretary type letters for him. Smoot still has stacks of letters from him. It was Meyerhoff who persuaded Smoot to start writing books instead of just trying to get papers published. Smoot was at Meyerhoff's house one day when a letter arrived from the GSA stating that they were in a quandary about publishing one of his papers because although they didn't like Meyerhoff (as a whistle blower on PT) they had to admit that the science he was presenting was legit. They had to admit that this "intercalary fossil bed" was strong evidence against PT.*

A study that mapped all of the Lystrosaurus fossils has them in Antarctica, Africa, India, Western China, Vietnam and the Moscow Basin in Russia. Only in Antarctica have four species been found in the same fossil bed. However, members of these species have been found individually in places as far away as Svalbard Islands in the Arctic, and in Asia. Now the evolutionists speculate that Lystrosaurus evolved in the north and migrated south during the Triassic period. This speculation removes Lystrosaurus from being proof of continental drift. (Remember, Lystrosaurus played a huge role in the original proposal of the idea of continental drift.)

Australian fossils also seem to disprove the Gondwanaland hypothesis, showing Australia to have been always isolated.

The non-drifting hypothesis is challenged by the presence of crocodile bones in both Antarctica and Greenland, but the presence of reptiles in these places can be explained by a shift in the tilt of the Earth. NASA has proposed shifts of even up to 120°.

Smoot believes that Gondwanaland never existed, and that India, Australia and Antarctica were never joined. He does not believe in continental drift, even across the Atlantic Ocean. He sees all the shallow water fossils and continental type rocks along the MAR and in equatorial regions between Brazil and Africa as being evidence against continental drift.

## 6.8 Mass Extinctions

**PLATE TECTONIC PRESUMPTION:** The Cretaceous-Tertiary mass extinction, and others, were caused by asteroid impacts. The K-T extinction was caused by an impact in the Yucatan area. We are all familiar with the great dinosaur extinction descriptions in popular literature. The Chicxulub Crater in the Gulf of Mexico has been featured in geoscience publications as the site of the asteroid impact.

**ACTUALITY:** This has been a controversial theory from the start. Charlie Officer and Jake Page made a more complete analysis of the rock material and refuted every one of the proofs for this theory (such as the ejecta blanket). (See “The Great Dinosaur Extinction Controversy” Addison-Wesley Publishing Co., 1996)

Art Meyerhoff was one of the first people to interpret the stratigraphic sequence of Yucatan well #66 in 1966. This well penetrated an orderly sequence of Pliocene-Miocene, Oligocene, Eocene-Paleocene, and 350 meters of late Cretaceous sediments with Maastrichtian fauna above and Middle Campanian fauna below a volcanic sequence. No disturbance exists at the K=T boundary, suggesting that there had been no asteroid impact at this location. This core sample has now been conveniently “lost.”

By now the reader should be catching on to the fact that the name “Meyerhoff” is anathema to all pseudo-scientists. But too many shares of the Brooklyn Bridge have been distributed! By the time Art died in 1996, he could not get anything published in his name. He had to use co-authors, but he did not mind as long as the truth was getting out. Smoot has had comments about Art Meyerhoff’s work taken out of his own publications by editors. When Smoot challenged someone at a GSA conference about the mainstream interpretation of the Yucatan well (that Meyerhoff had debunked) this person said that he had personally told the GSA not to publish Meyerhoff’s opinions.

Smoot asks if rock ages count for nothing in the field to tectonics, and whether this realm is reserved as a dreamland for geophysicists. Meyerhoff knows as much about rocks as anyone else.

Smoot pauses to comment that we are bombarded in the news with scare tactics about global warming, but he’d like to point out that the greenhouse effect has been part of the planet since its beginning.

Once the “bolide impact” theory became accepted, everyone climbed on the bandwagon. Walter Alvarez won a Nobel Prize for his discovery of the iridium layer.

Then someone took a look at the stratigraphy. Now the Ordovician die off is being blamed on an ice age, the Devonian extinction is blamed on the rise of trees or on large tsunamis. These events are said to have happened over the course of 20 million years, so a bolide impact is irrelevant. The Permian extinction is theorized to have been caused by rapid climate change, lowering of sea level, and poisonous acid rain caused by volcanoes. A bolide event is still credited for the late Triassic event, but the evidence has only been found in a few places.

## 6.9 Who’s Messing with Gaea’s Thermostat?

The data supporting global warming is questionable. We are definitely getting a little warmer, but we need to look at why, what, and why. Smooth thinks that people are more concerned about extreme weather now because they are moving into areas closer to coastlines. Case study is the Outer Banks of North Carolina, where people built fancy beach houses on land that was slowly shifting and eroding. When a hurricane hits, we have twice the dollars of damage than we had decades ago. Smoot lived in Mississippi for twenty years and old timers there would tell him that the hurricanes between 1977-2000 were less severe than in 1930-50. He says he has not seen convincing climate change data.

## 6.10 Deep and Superdeep Drilling Defies Geophysics

*Smoot starts with a funny story about shipboard entertainment. Someone kept putting a copy of “Pinocchio in Outer Space” in their video library. They couldn’t get rid of it. During the cruise they met up with another boat and decided to swap some movies. They put Pinocchio into their swap bag to get rid of it, but wouldn’t you know it-- the bag from the other ship also contained a copy of that same movie!*

**PLATE TECTONIC PRESUMPTION:** The temperature increases with depth in a predictable fashion, gradually rising to 8500°C. The rock types reflect the amount of heat at each interval, as rock density is generally expected to increase with depth and pressure. The expected sequence is 0 to 4.7 km of metamorphized sedimentary and volcanic rock, a granitic layer from 4.7 to 7 km, and a basaltic layer below that. The Conrad Discontinuity occurs between 7.5 and 8.6 km. Seismic waves travel at a different velocity above and below this level. The Discontinuity is probably due to a change in rock type.

**ACTUALITY:** The Kola Superdeep Borehole in the Kola Peninsula, Russia, reached a depth of about 7 miles, the deepest hole ever drilled into the crust. The densities did initially increase, but at 4.5 km down the density decreased, probably due to increased porosity. The seismic data did not match the rock types that they found. Granite did not appear until 6.8 km, and no basaltic layer was found. At the depth where the Conrad Discontinuity should exist, they found no change in rock type, no fault, no boundary. What, then, is the Conrad Discontinuity? Apparently no one knows.

The Russian geologists on the project said, “The traditional idea that geological data obtained from the surface can be directly correlated with geological materials in the deep crust must be reexamined.” They also commented, “The Kola borehole revealed how far from truth scientific theories can roam.”

At the bottom of the borehole, they found highly mineralized water, helium, methane, and other gases. Another borehole (in Germany) produced hot fluids in open fractures at a depth of 3.4 km. The brine was rich in potassium and twice as salty as ocean water.

The assumption that Earth’s temperature steadily increases with depth must not be true because the temperature at only 10 km deep was already 180°C, instead of the predicted 100°C. It can’t possibly get hotter at this steady rate, or the mantle would be molten below about 100 km!

All this information gathered in boreholes showed that geologists’ modeling of how Earth’s interior works is probably erroneous. Our tax dollars are going to research that has proved useless.

## 6.11 Earthquakes Defy Physics

*Smoot starts out with an overview of the Richter scale, and the Mercalli scale (effects on structures).*

**PLATE TECTONIC PRESUMPTION:** Almost all earthquakes occur at the plate boundaries, with the larger ones occurring in the subduction zones on a dip angle reflective of the direction of the descending slab. Strike-slip zones are outlined by shallow earthquakes.

**ACTUALITY:** The Bolivian quake of June 1994 (8.3 on Richter) was 636 km deep and it cut horizontally across the slab and extended well beyond the supposed olivine layer. The motion of earthquakes at this depth had been expected to be vertical, or nearly so. Big, deep earthquakes should not happen at all, due to the enormous pressures at depth.

The Shikotan quake of 1994 (9.3 on Richter) occurred on an intraplate transverse zone in the Kuril-Kamchatka arc, demonstrating “non-subductional mechanism.”

India has had many earthquakes, and its interior is not on any plate boundary, although they do seem to form an approximate belt across the country.

The Yellowstone area has had many small earthquakes, and it is not anywhere near a plate boundary. If you map out these small quakes, they appear to line up with the Mendocino Megatrend in the Pacific. In an earlier section, Smoot mentioned that the Pacific megatrends have been theorized to keep going right into the continent.

## 6.12 Mantle Plume vs Sub-Lava Flow Stratigraphy

*Smoot tells a short anecdote about dropping anchor at an island near the Mariana Trough. The name of the island was Maug, which is Guam spelled backwards. However, almost everyone had to stay on the ship and could not visit the island.*

**PLATE TECTONIC PRESUMPTION:** Large convection cells are one of the proposed mechanisms driving plate tectonics. There must be a band of high heat flow under the mid-ocean ridges and landward of the trenches, with bands of low heat flow seaward of the trenches. The interior of the plates must have low heat under them, also.

**ACTUALITY:** Seismology has shown just the opposite. Seismic waves travel faster the deeper you go into the mantle, which means the mantle is getting more solid as you go down. Heat flow studies in 1984 (based on seismotography) showed a band of elevated heat flow primarily under the equator, with cold areas east of the trenches, under continents, and in the mid-ocean. These heat bands are associated with micro-earthquakes. Based on all the data, convection cells do not exist in the mantle.

Continental cratons have been shown to be much deeper than originally thought. North America’s craton “roots” can be as deep as 500 to 600 km. This so deep that some scientists are beginning to believe that the continents are not capable of moving.

## 6.13 Last of the Red Hot Mamas: EMST and a Cool Core

*This section begins with an observation from a trip to Colorado. This anecdote is related to the information that follows. In the southern Colorado Rocky Mountains, there are many dike structures. Dikes are expected in volcanic regions. But here in the Rockies (and also in the Alps and in eastern Australia) there are no volcanoes in sight. It was like the surrounding rock was simply removed and this other rock came and filled in the gaps.*

**PLATE TECTONIC PRESUMPTION:** When a body cools, it usually contracts. It is theorized that the Earth cooled until at least 200 Ma. Contraction has been less than 3%. Tectonic processes are related to a heat engine Earth.

**ACTUALITY:** One of the other people present on this trip to Colorado was a man from the Greek Seismological Institute, Stavros Tassos. Both he and Smoot were there in Colorado to attend a convention of the New Concepts in Global Tectonics Working Group. Mr. Tassos had been looking very carefully at seismic data from the mantle and core and had come up with a different interpretation of the data. When asked about the “cold dikes” they had seen, this is what Mr. Tassos said:

*Earth’s geodynamics are likely the result of quantum mechanical processes, not heat-related processes. Seismic studies have shown that the mantle is solid, but the core seems to be liquid. However, we do not know what the liquid is. If it was molten iron, the “Q factor” (inversely proportional to attenuation factor, but this is not explained in the text) would be other than what has been measured. The energy needs of the Earth amount to about  $6 \times 10^{14}$  Watts per year. What is producing this heat? Only three sources have been proposed. 1) primordial heat trapped since Earth formed, 2) radioactive elements, 3) tidal heat. Primordial heat (estimated at  $6 \times 10^{22}$  Watts) would have run out after the first 100 million years. Radioactive isotopes seem to be found only in the upper part of the crust, and only in continental granitic rock, so we have no reason to believe there are any radioactive atoms deep inside the earth. Also, the heat produced by these radioactive elements is only  $3 \times 10^8$  Watts, not nearly enough. Tidal pull on the crust (from the moon) only generates about .0016 of the needed yearly heat. The Earth’s core might be cold, and geodynamic processes might be driven by something other than heat. The lack of transmission of S waves in the outer core and its extremely low dumping (high Q factor) might be taken to imply a friction-free superfluid core. Large amounts of helium in the outer core would probably occur, but this would likely produce the seismic data we see.*

Tassos is working on this EMST theory (Excess Mass Stress Tectonics), theorizing that the cold plasma in the inner core eventually turns into atoms. Simple hydrogen and helium units are eventually transformed into larger atoms through electromagnetic confinement, laser clustering, and nuclear fusion. (Remember the H and He in the Superdeep borehole?) Iron is the last atom to form because it is the atom with the highest nuclear binding energy. The transformation would take place in the outer core. The newly formed atoms are added, one-by-one, as solid wedges in the preexisting and overlying mantle and crust. This increases their volume, which creates extra pressure and this causes fractures and their associated earthquakes and volcanoes. Once all the cold plasma has been “used up” the Earth will become a magnetically and tectonically inactive planet, like Mars and the Moon.



EMST proposes that about 4 billion years ago, some of the plasma was transformed into iron-poor but Na, Ca, and K rich continental rocks. Currently, we are in second phase of transformation, which began about 200 million years ago, when about 65% of the nucleons have been transformed into iron-rich mantle and oceanic crustal rocks.

EMST says that the core of the Earth is an electrically unbalanced gas of particles which are subject to the exclusion principle. The degeneracy pressure due to electrons should be greater than the gravitational pressure due to nucleons. The degeneracy pressure is reduced during periods of electron clustering. During periods of intense clustering, the degeneracy pressure is reduced, and the Earth contracts somewhat. The net result of the electrical imbalance is the pulsation of the Earth, which is superimposed on its prevailing expansion.

The EMST attributes phase changes (e.g. perovskite to spinel to olivine to eclogite to basalt) to the upward movement of excess mass from a high-pressure-high-frequency-low-temperature environment (way down deep) to a low-pressure-low-frequency-high-temperature environment closer to the surface.

In a related hypothesis, called oceanization, the Earth was once covered all over with a layer of continental crust, which essentially made the entire earth one big continent. It would have had on its surface many small and shallow seas. Underneath this would have been the cold plasma core, at this point in time very large. As the plasma core has been transforming into atoms, it has been shrinking. The newly formed atoms have become more iron-rich over time, explaining the mafic quality of oceanic basalt.

Over time, the continental shell has experienced pressure from below, due to an increase in volume from the creation of atoms, and this pressure has caused it to split in various places. These cracks open up and become wider over time and eventually an ocean basin is formed. This means that the Earth has expanded over time. Spaces have opened up between the continents without the continents having moved. *(Editor's note: You can see a video of this on youtube. Just search for "expanding earth." There are some amazing animations. The continents really do go together if you shrink the globe.)*

To explain magma, EMST proposes that as atoms are being added from below, these new atoms cause, "micro-cracks" as they embed themselves in the material above them. More and more micro-cracks are formed and they eventually group together to form macro-cracks. So you end up with cracks in the mantle. These cracks become "hot lines" in the upper mantle and lower crust. Infrared radiation causes heating in these cracks, and this feeds magma into the cracks/channels.

EMST says that helium deep inside the earth can explain magnetic reversals, but details are not given.

## 6.14 Fat Bottom Girls, or Gaea Does Not Have Middle-age Spread

The case for an expanding Earth was reopened way back in 1976. Since then, there have been many different models proposed. Until EMST theory came along, all models were based on the idea that the interior was molten. He mentions the last names of many of the expanding earth modelers of the 1980s and 90s.

One problem with any expanding Earth theory is that the moment of inertia constraints must be overcome. A smaller Earth would necessarily rotate faster. This means that many of the physical processes we see today would have gone faster in the past. How would the moon behave with a smaller Earth? Some theorists point to data such as growth rates in fossilized mollusk shells, and say that they show the year used to be 447 days.

Some NASA physicists say that the Earth's spin rate has slowed down in the past 900 million years. They speculate that the Earth's day was only 19 hours long at 900 Ma. The drag of the oceans' water on the bottom of the seafloor can create friction and affect the Earth's spin in a very small way.

Chandler wobble and axis tilt might also affect the rate of spin. The change in tilt affects the rate of rotation. Perhaps the Earth used to be tilted 54° which would explain the fossils in Antarctica and Siberia.

More data and evidence are needed. The jury is still out on Earth expansion.

## CHAPTER 7: So, What Do We Have Here?

The opening anecdote is mostly a lengthy mention of his run-ins with the U.S. Government Board of Geographic names. The "academicians" would sometimes balk at the people he chose to name things after (guyots and ridges mostly). He defends his choices and points out that these desk-sitters have wasted many tax-payer dollars and should have more respect for the guys out there on the boats doing all the work.

He talks briefly about Thomas Kuhn's book about the structure of scientific revolutions. It seems that most of the older generation must die off before a new paradigm can be accepted. The primary working hypothesis of plate tectonics was formulated in the mid 1960s. It's about time to change the paradigm.

Now he will present reasons that he believes surge tectonics is a better explanation of the data. He reviews three facts:

- 1) There is no reason to believe that Earth is any different from the other planets which have already fulfilled their tectonic cycles and have a cool interior.
- 2) We notice that the Earth rotates and that creates centrifugal force, like water swirling in a bowl.
- 3) We know that gravity is a very real force.

Then he lists the major problems with PT theory:

- 1) A geometry that won't work
- 2) Misinterpreted magnetic data
- 3) Along-ridge magma flow

- 4) rocks on the mid-ocean ridges that give radiometric dates of over a billion years
- 5) interconnected heated channels
- 6) fracture zone intersections
- 7) seamount chains associate with fracture zones
- 8) vortex structures
- 9) horizontal earthquakes
- 10) only one pre-Carboniferous Tethys Sea
- 11) India having never been part of Gondwanaland
- 12) nothing in the rock sequences to show a bolide impact on the Yucatan
- 13) no subduction

The “unresolved problems” admitted by PT proponents, and topics up for study are:

- 1) a driving mechanism
- 2) along-ridge axis mantle flow
- 3) whether interconnected channels exist between ocean ridges and off-axis plumes
- 4) the origin of gravity lineations in the Central Pacific which seem to defy any plate model

He notes that “along axis mantle flow” is a cross purposes with orthogonal mantle flow, and orthogonal is the building block of the PT model.

Failures of the PT model include:

- 1) Its inability to include ocean and atmospheric dynamics within overall Earth dynamics
- 2) Its treatment of land and sea distribution as merely coincidental (movable like pieces of furniture in a room)
- 3) Its inability to find a place for rotational force

A list of 29 geological and geophysical data sets remains to be explained by PT proponents. If one recalcitrant fact is enough to wreck a theory, how about 29?

## CHAPTER 8: Gaea’s Basic Forces: An Updated Working Hypothesis

Smoot wants to go over the basics of Surge Tectonics once more. This theory proposes a series of interconnected magma channels in which partial melt rises from the asthenosphere at discrete locations and is in motion parallel to the trend of the channel. Surge channels alternate between active and inactive. The channels occur at depths from 50 km down to the asthenosphere, and they underlie all geological features: mid-ocean ridges, mountains, rift zones, strike-slip zones. Channels are associated with phenomena such as micro-earthquakes, thermal springs, and volcanoes. The fracture zones along mid-ocean ridges are interpreted as being streamlines, indicating that the mechanism producing them involves viscous drag resulting from fluid motion going parallel (not orthogonal as in PT) to the trend of the tectonic feature. All of the compressive stress in the lithosphere is oriented at right angles to their walls. The hard mantle underneath all of this acts like a giant hydraulic press. The surge channel system is the containment vessel, the fluid is the magma, and the trigger is worldwide lithosphere collapse into the asthenosphere. Earth’s rotation slowing moves the asthenosphere (which is not as stiff as the lower mantle) and this is what causes it to weaken and be unable to hold up the lithosphere. Evidence for rotation being a root cause of tectonism can be seen in island arcs.

These channels lie in the 50-150 km deep range, based on earthquakes data (or lack thereof). The magma will generally flow in an easterly direction because of Earth’s rotation, but this will not always be true, as magma will take the path of least resistance, which might be a side channel. When the magma hits too much resistance, it pools and creates a bulge. Bulges are what caused the strange bulge at the tip of South America, the Lesser Antilles, and also the cusps in the western Pacific.

The channels are emptied every so often, the lithosphere cools, contracts, and collapses, and this creates a void. As nature abhors a vacuum, the surrounding region closes in and then compressional features are formed such as trenches and fracture zones. These two opposing forces exist side by side and interplay of compression/contraction causes earthquakes.

He ends this section by noting that the Superdeep borehole showed us that rock porosity increases with depth. He suggests that the excess mass from the core is rising to fill the voids.

## CHAPTER 9: Applications

### 9.1 Plateaus and Rises vs Micro-plates

Vortex structures can be explained by the intersection of two magma channels. When two trends intersect, this creates an area of great magma flow and it begins to back up. It heats the rock around it and this creates a pool of magma. The magma “swirls” around in a direction that depends on which hemisphere it is in. Thus, a swirl like pattern will appear in the bathymetry. Where the excess magma finds a path to the surface, it creates seamounts, aseismic ridges, volcano arcs and mid-ocean ridges. Even though the area around mid-ocean ridges would be expanding somewhat, this in no way constitutes seafloor spreading.

Where magma goes deeper into the mantle, this produces “negative gravity” vortex features such as overlapping spreading centers and micro-plates. Side-scan sonar around Easter Island on the East Pacific Rise show ridges and valleys going in a count-

er-clockwise direction, as if the seafloor had been twisted by a strong hand. Another example is the area north of Africa, where the Aegean "trench and subduction zone" are. If you combine the bathymetry and the topography, you get a circle. Earthquake data also shows a circle.

Next comes a long list of features with their locations (sometimes with latitude and longitude listed) that all lie on the Central Pacific Megatrend. (The reader can refer to the original book to get all the details.) The significance of this list seems to be to show this same pattern of the results of easterly flow of magma and vortex patterns where megatrends intersect. He says that this pattern can be shown for every instance of rise-type features. For example, the Shatskiy Rise lies atop the intersection of the Mamua and Chinook Megatrends. The Mid-Pacific Mountains lie atop the intersection of the Molokai and Mamua Megatrends. The Dutton Ridge Plateau lies atop the Udinstev and Mendochino Megatrends. Vortexes are also on continents. India has been the best example, with its earthquake patterns.

## 9.2: The Surge Channel Breakout From SE Asia into the Pacific Basin

Proposing that India has been stationary for its entire history helps to explain its tectonics. Looking at rock data, Smoot feels confident in saying that much of Southeastern Asia is underlain by Proterozoic basement rock.

The next two pages are a lengthy and detailed explanation of how the Asian land mass could have evolved. Instead of summarizing, I will simply show the graphic he gives us, drawn by Art Meyerhoff (in the early 1990s). The written explanations tell what is going on in each picture.

He then discusses the Mariana Trough, a feature that plate tectonics says is young. This means we should see a minimum of sediment cover on top, and it should be geologically active. This trough is actually an area of low seismicity, with no major quakes. Since shallow quakes decrease to the south, this is interpreted by surge tectonics to mean that most of the surge channel magma is deflected to the east as breakout channels. Paleomagnetic data from the area is interpreted to show as much as a 55 degree clockwise rotation at some point in the past, possible in the Miocene era.

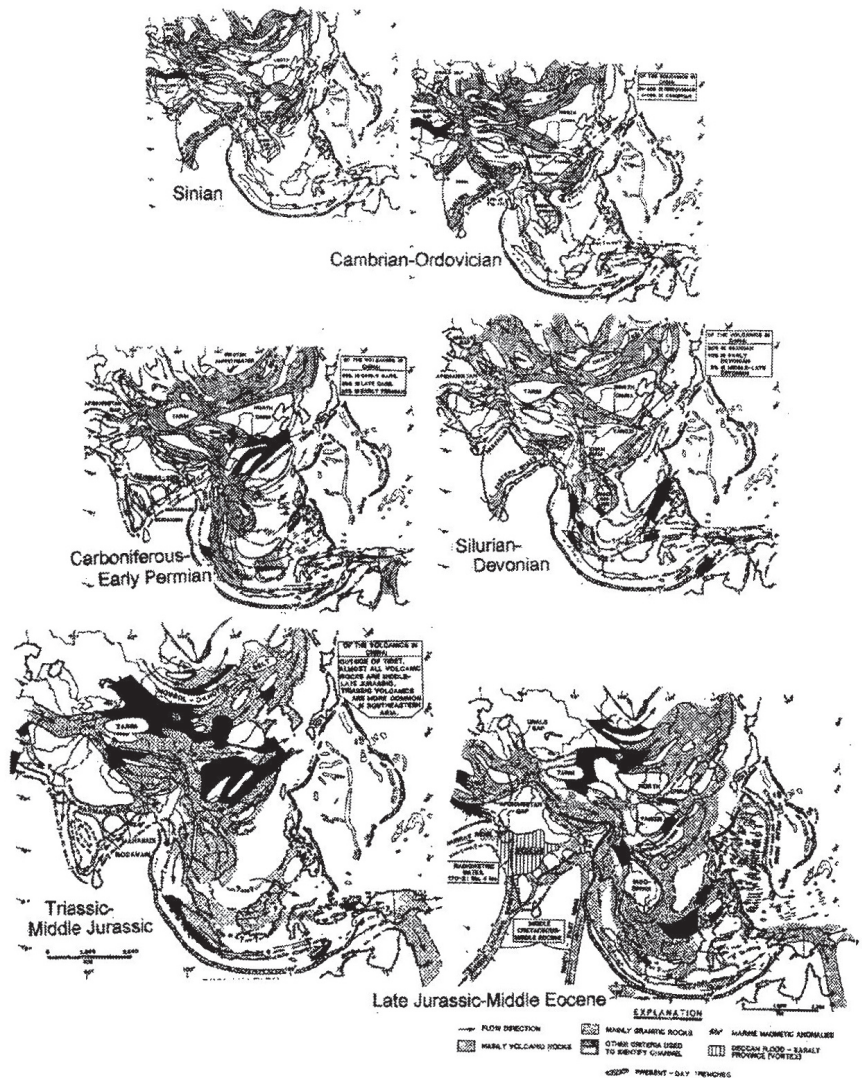
The eastern flow of magma is blocked at Benioff zones in the western Pacific except where breakout channels occur.

The western Pacific is thought to be the oldest part of the ocean floor, (600 ma) according to PT. Lithosphere flexure estimates put western Pacific sites at only 170-180 ma. One borehole has recovered material that gives a radiometric age of 156 Ma. A transect across a convergent margin has never been drilled down to basalt. We have seen that magnetic data is very suspect. Continental crust overlies most of the Pacific basin east of the trenches.

Surge Tectonics explains the volcanoes in the western Pacific as the result of magma from breakout channels (branching off from the active margin channels near the Japan Trench) seeping through various gaps during the Cretaceous period. The surge theory also postulates that fracture zones were formed before rises. For example, the Chinook Fracture Zone became active before the emplacement of the Hess and Shatskiy Rises.

In some cases of anomalous ridges and rises, these could have formed when the Earth was tilted differently. So although they might not be going E-W now, they would have been when they formed.

The East Pacific Rise and the San Andreas fault are different expressions of the same surge channel. The San Andreas is an almost inactive zone now, without any magma underneath. There is a slight triple junction where the East Pacific Rise meets the MOR that goes under South America. While PT theories this junction is where the Pacific, Cocos and Nazca plates meet, surge tectonics theorizes that this is site of a feeder channel going east. To take things a step further, this easterly surge channel splits again at the western coast of South America, going around the continent with the northern branch ending up in the Caribbean bulge (the Lesser





Antilles) and the southern bulge ending in the South Sandwich Islands. The South American craton appears to be 600 km deep, so there isn't any subduction going on here. (Also 350 seismographs show mantle flow not dropping down but parallel to the craton.)

### 9.3: Active Megatrends Affect Ocean Circulation and Climate

After pointing out that we still don't know how to predict earthquakes, this last section deals with practical application to global climate study.

There are three main global atmospheric fluctuation patterns: 1) Southern Oscillation (associated with El Nino, 2) the North Pacific Oscillation, which mainly affects North America, and 3) the North Atlantic Oscillation which affects Europe and Siberia.

There are some interesting observations that correlate seismicity with weather patterns:

- 1) Increase in T-phase seismicity over hundreds of kilometers of the East Pacific Rise has been observed to precede a drop in the high pressure cell located over the Easter and Juan Fernandez Islands.
- 2) Increased volcanic activity and hydrothermal venting along the East Pacific Rise seems to be linked to El Nino. In fact, increased seismicity along the EPR can be used as a predictor of El Nino.
- 3) No one has ever addressed why the low and high pressure areas of these oscillations are located where they are.
- 4) The Central Pacific Megatrend seems to be a key to understanding El Nino.

He then lists six more points about the link between El Nino and tectonic activity, via gravitational teleconnection. These explanation use phrases such as microgravity oscillation, tectonic vortex street, anomalous gravity trends, Bouguer gravity anomalies, and planetary-scale tectonic vortex diameters. If you'd like to read the details they are in the book.

He ends by saying that "global warming" is more likely to be caused by tectonism than by human activity.

### 10: Tectonic Globaloney: Your Tax Dollars Hardly at Work

After reviewing the strongest points of the argument against plate tectonics, he proceeds to ask how in the world this could have happened in an enlightened society that supposedly values science. He says that in his later years he was asked to review many National Science Foundation and Office of Naval Research proposals, so he knows how the system works. A certain amount of money is allotted by Congress each year. (The Marine Geology and Geophysics Division was allotted 21 million in 2003.) Individuals (often at universities) write proposals asking for grants to do their research. Reviewers are used to review all the proposals and then some are chosen and the others rejected. The Kola drilling project and the data from some major earthquakes should have forced reassessment of who was going to be funded. It was obviously that something major was wrong with the plate tectonic theory, so those trying to prove the theory correct should have been last in line for funding. The problem is that the people who control the funding at the universities, and the big name researchers, are the same people. That's right, they are policing themselves. No one is acting as watch dog. Those who ask questions become pariah. The fact that the monies are given to the same universities all the time makes the problem even worse.

He ends with, "How do you feel about where your tax dollars are going? Better put your hands on your wallet, its gonna get worse. Globaloney is not the only shares in the Brooklyn Bridge being peddled."

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### Professional Background:

Employed by the Ocean Survey Program, 1966-1975, and 1977-1998.

67 cruises, over 600,00 nautical miles

Has worked with bathymetry, gravity, magnetics, physical oceanography.

Data collection with both hand surveying and computer assisted surveying

Have used GPS, LORAN-C and Omega, single-beam sonar, SASS, Seabeam, Simrad multibeam sonar, SeaMARC II side scan,

Nansen casts, salinometers, Niskin samplers, bathythermographs

Discovered missing submarine USS Scorpion in 1968

Senior scientist from 1981-1998

Named 34 ocean floor features

Compiled data from thousands of point charts

Reviewed many NSF and ONR proposals

Declassified SASS bathymetry data in the 1970s and 1980s

Have many published papers in journals such as *Journal of Geology*, *Tectonophysics*, *Journal of Geophysical Research*, *Marine Geology*, *Journal of Volcanology and Geothermal Research*, *Surveying and Mapping*, *Journal of Petroleum Geology*, *Bulletin of Volcanology*, *New Concepts in Global Tectonics*, and others.