

**All the rocks that are fit to hit:**  
the education of Dartmouth Rox graduates

Carol Frost '79  
1  
Rox Reunion, June 17, 2014

# Off to adventure



HMS Beagle by Conrad Martens  
[www.wikipedia.org](http://www.wikipedia.org)



Charles Darwin, 1840  
[www.smithsonianscience.org](http://www.smithsonianscience.org)

It has been said that the love of the chase [sic] is an inherent delight in man, --a relic of an instinctive passion. --if so, I am sure the pleasure of living in the open air, with the sky for a rook, and the ground for a table, is part of the same feeling. It is the savage returning to his wild and native habits...I do not doubt every traveller [sic] must remember the glowing sense of happiness, from the simple consciousness of breathing in a foreign clime, where the civilized man has seldom or never trod.

*Beagle Diary*

“One of my two favorite rocks courses was a senior seminar on periglacial phenomena by Link Washburn.”  
*Robert E. “Butch” Pendergast ‘58*

## Albert Lincoln Washburn ‘35 (1911-2007)

- Dartmouth ‘35 geology major
- 1934 Dartmouth-Harvard expedition to Mt. Crillon, AK
- 1936 Olympic ski team
- 1936 National Geographic expedition to Mt. McKinley
- 1937 Geologist on Boyd’s expedition to East Greenland
- 1947 publication of PhD (Yale) research on Victoria Island, NWT
- 1945-1953 Director of Arctic Institute and CRREL
- 1953-60 Dartmouth faculty member
- Research in Greenland, Antarctica

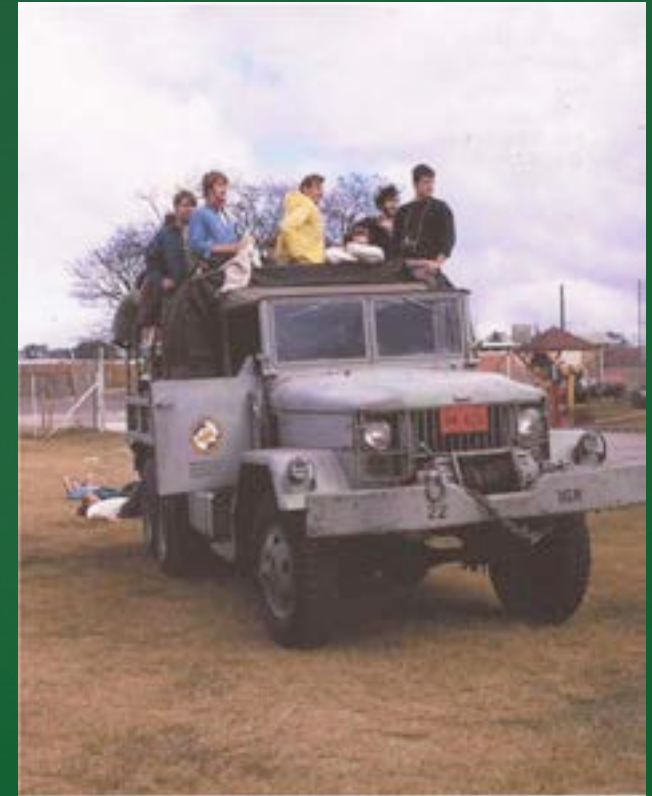


[www.igsoc.org](http://www.igsoc.org)



1969 Stretch Flight to Guatemala, November 28, 1969  
 Back Row (L-R) Dave Harlow, Richard DiPritoro, Robert Lamarre, Dave O'Connor, Bill Saumsiegle, Dave Abbot, Dennis Bell, Dick Stoiber, Bob Brown, Greg Horne, Pan Am Rep., Richard Shepard, Steve Barret, Mark Nibblink, Peter Stone, Greg Boyt. Front Row: Thomas Goldthwait, Albert Lamarre, Sheldon Perry, John Valley, Tom Loucks, Roger Prince, Phil Ehret, Bill Locke.

*Photos by Tom Loucks '71 A73*



1969 Stretch: Mark Nibblink, Sheldon Perry, Greg Horne '57, John Valley, Greg Boyt

## The 3-way Stretch:

“exercises in the large scale, the story in the sequences and the structures”

*Carrick Eggleston '83*



Santiago Volcano in Guatemala, May 1979.  
 Front row: John Drexler, Joe Francica, Pedro  
 our guide; Back row: Dick Stoiber (hidden by  
 big hair), Ted Kavanaugh, Melanie Leschen,  
 Geoff Slater *Photo from Joe Francica A80*



Above: Lake Powell houseboat  
 Below: Sheep Mountain, Wyoming  
*Photos from Hugh Shipman '80*





Doug Burbank on  
Santiaguito, 1976  
*1976 Stretch photo collection*



Raising the Stretch flag on  
San Cristobal  
*1976 Stretch photo collection*



John Valley '70, Sapper  
fumerole, Volcan Santiaguito  
*Tom Loucks '71 A73*

# The best of teachers



Adam Sedgwick  
[www.bbc.co.uk](http://www.bbc.co.uk)



Charles Lyell  
[www.aim25.ac.uk](http://www.aim25.ac.uk)

Eleven years ago, I spent a whole day in the valley, where yesterday every thing but the Ice of the Glacier was palpably clear to me, and I then saw nothing but plain water, and bare Rock. *Darwin, writing to Fitton*

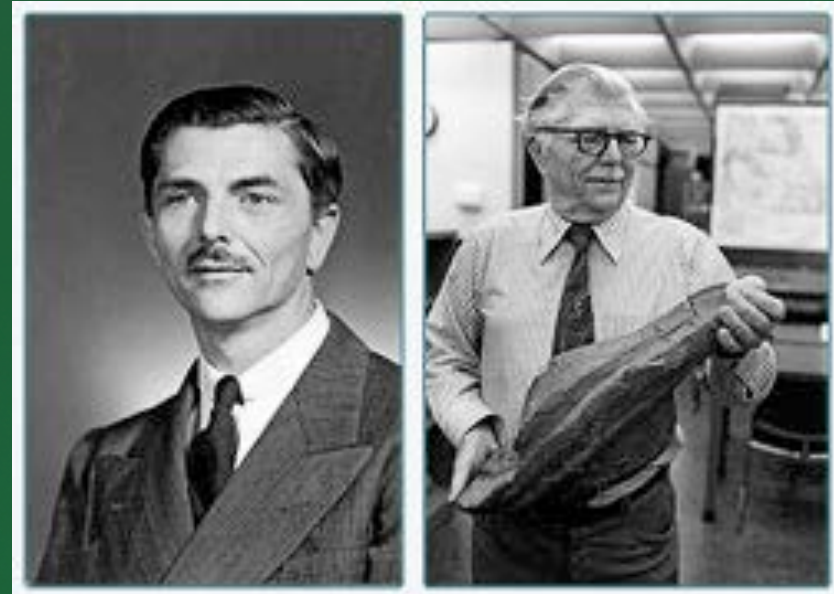
# Richard Stoiber '32 (1911-2001)

- Dartmouth faculty 1935-76



Central America, 1975

*"Life with Dick was a wild and joyous ride."  
Tony Morse '52*



*www.dartmouth.edu*



*Photo from Tom Loucks '71 A73*

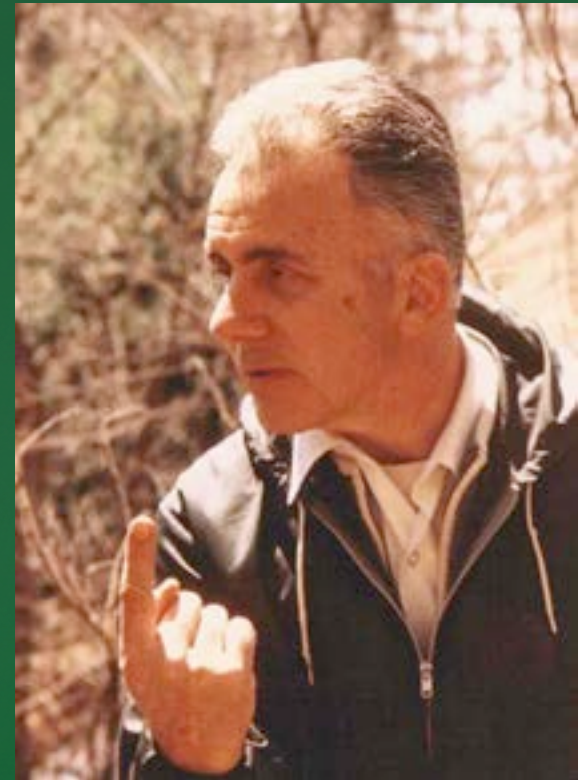


# John Lyons (1916-1998)

- Dartmouth faculty 1946-1982



JBL with tourmaline  
vein in paragneiss  
November 1972  
*Tom Loucks '71 A73*



John Lyons 1973  
*Photo: Chuck Douthitt A75*

"His quiet sternness masked a warm heart and wonderful sense of humor. Who can forget a field trip with John? He knew every outcrop in New England and could cite every detail of the literature about the particular spot." *Dick Birnie '66*

# Gary Johnson

- Dartmouth faculty 1971-2013



Gary standing with his final graduating students, Hehe Jiang, Helena Witte, and Sam Michalak (Spring Picnic)



Gary on KPK120  
Photo by Pam Rey '78



"Gary's taking me to Pakistan lies at the root of much of my career in petrology and geochronology." *Peter Zeitler '78 A83*

"Gary was a friend and mentor through the period of the most rewarding academic endeavor of my career." *Pamela Rey '78*

## Dick Birnie '66

- Dartmouth faculty 1974-2009



On Santiaguito, Stretch 1966  
*Photo from John Peirce '68*

In the image processing lab, May 2002  
[www.dartmouth.edu](http://www.dartmouth.edu)

"In mineralogy class I couldn't figure out how to spell the mineral he was pronouncing as "galenar." Finally, when he talked about "micar" and "idear" I had my answer." *Pamela Rey '78*



"In 1964 Henry Faul (USGS) taught a short course in geochronology. I followed him to SMU to become a geochronologist. Dartmouth gave me the foundation that permitted me to apply fission track dating to many diverse areas of geology." *Chuck Naeser '62 A64*



"In Decker's geophysics class we poured over the magnetic maps of the ocean floor and recognized that the ocean ridges were the locus of new crust. We just didn't know the ages of the magnetic stripes. This was just before Vine and Matthews' paper that really started plate tectonics." *Chuck Naeser '62 A64*



"During my master's program the department brought in Art Lachenbruch who taught a course on heat flow. Art talked about greenhouse gases and the potential for climate change. Talk about cutting edge work!" *Chuck Naeser '62 A64*



"Paleontologist Andy McNair [faculty member from 1935-1970, leader of arctic expeditions] was a great teacher with a kind and welcoming spirit. He was a fine companion and a good friend."

*Tony Morse '52*

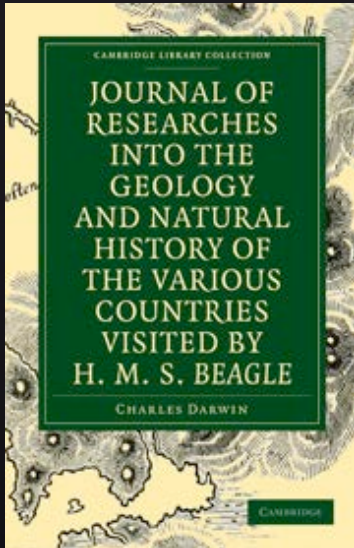
Glacial features, Lake Sunapee

"On a glacial geology trip I picked up a rock that stood out because it was so light colored, in contrast to all the dark colored metamorphic rocks that were everywhere. It was like a piece of chert, very light and sort of grainy. I took it to Andy [McNair] for his opinion because it had some little round balls in it, albeit they were the same color. He took a look and said, "These look like fossils." Then he looked at it under his microscope and said, "Jesus Christ, they are fossils." And Andy was not a swearer.

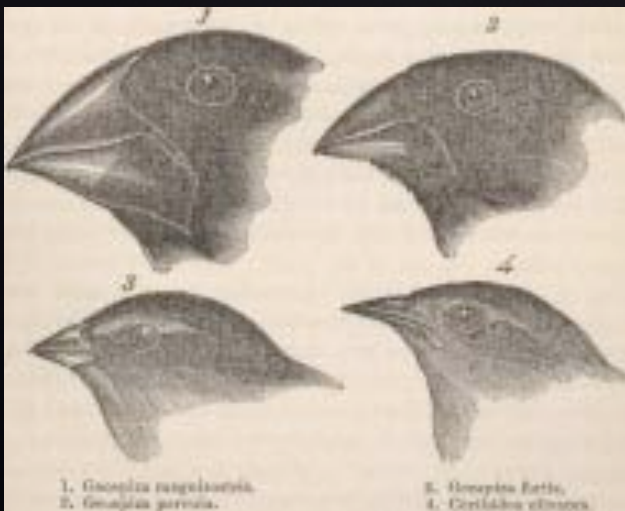
It turned out it was a rock from the Paris Basin. These rocks had been used as ballast in sailing ships, then distributed around New England to be used as millstones for grinding grain. Never forgotten that incident or Andy."

*John Chapman '56*

# Dive into research



[www.cambridge.org](http://www.cambridge.org)



Darwin's finches, Galapagos  
[www.dlib.org](http://www.dlib.org)



114 *Galapagos Archipelago.* PART I.

formerly have occupied the hollow of the crater, but is now attached only to a few of the circumferential hills, character between an earthy fracture. a matter in small (in height) must cent. great stream ction, worn by the ass of basalt, sur-iff, having in parts ous fracture. The vertical dikes, with id not doubt were oke off fragments. f like that of the surrounding strata, but more compact, and with a smoother fracture; hence we must conclude, that

No. 12.



The Kicker Rock. - see text high.

figures were formed and filled up with the finer sand or tuff from the crater, before its interior was occupied, as it now is, by a solidified pool of basalt. Other fissures have been subsequently formed, parallel to these singular dikes, and are merely filled with loose rubbish. The change from ordinary scoriaceous particles to the substance with a semi-resinous fracture,

Kicker rock  
[www.pinterest.com](http://www.pinterest.com)

"A student is never educated enough to start doing research. It works the other way, start research and become educated." *Mike Carr '69 A74*



*Genet Ide '78*  
*Photo by C. Frost '79*

"John Lyons taught me to interpret geologic structures, primarily from the two field seasons mapping in the Concord quadrangle. Multiple folds were the hardest to get my mind around—F3s and F4s were doozies. John would take paper or paper napkins and fold them up, then get me to visualize the outcrop patterns after erosion. It was amazing." *Genet Ide Duke '78 A84*

"Fundamental observations in the field are key to interpreting data. I remember both John Lyons and Dick Stoiber in the field with their insightful views of what a single outcrop can tell us. Because of their influence I built a course at Stanford modeled after the Stretch." *C. Page Chamberlain A81*



Helderberg Escarpment, New York  
*www. <http://albanycob.blogspot.com>*

"In the Helderbergs during the stretch I reckoned I had the whole mapping thing pretty well figured out: simply a matter of going to an outcrop, identifying the formation, then connecting the dots. The old master, JBL, joined my group of three for a few hours on day three and showed us how it is really done. I especially remember spending over an hour on a steep slope on the north side of the anticline and him driving us to figure out there must be an unexposed thrust fault in there." *Dennis Geist '80*





Gary Johnson and students at the Jhelum dump.  
*Photo by Pam Rey '78*



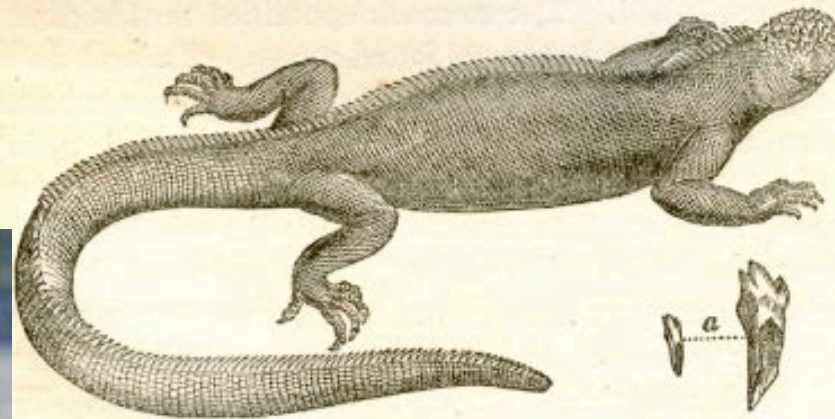
Carol Frost & Bob Raynolds at Rhotas  
*Photo from Bob Raynolds '73 A81*

"The really important points are generally not learned in the classroom. The real learning takes place in the field and in the laboratory...the hands-on part involving struggle with unknowns where the stuff you are trying to figure out is not idealized and canned for student consumption." *Carrick Eggleston '83*

## The value of field-based study



The *Amblyrhynchus*, a remarkable genus of lizards, is confined to this archipelago: there are two species, resembling each other in general form, one being terrestrial and the other aquatic. This latter species (*A. cristatus*) was first characterised by Mr. Bell, who well foresaw, from its short, broad head, and strong claws of equal length, that its habits of life would turn out very peculiar, and different from those of its nearest ally, the Iguana. It is extremely common on all the islands throughout the group, and lives exclusively on the rocky sea-beaches, being never found, at least I never saw one, even ten yards in-shore. It is a hideous-looking creature, of a dirty black colour, stupid, and



*Amblyrhynchus cristatus*. *a*, Tooth of natural size, and likewise magnified.

ish in its movements. The usual length of a full-grown is about a yard, but there are some even four feet long; a

2 c



Mark Nibbelink making geophysical measurements

*Photo by Tom Loucks'71*



Sheldon Perry taking strike and dip, Catskills.

*Photo by Tom Loucks'71*

"The first afternoon of field geology consisted of Noye Johnson having everyone go down to the Department supply office to check out Brunton compasses and hart hats from Roger Morse for the term." *David Abbott '69*

# Map-making

Leopold von Buch (1774-1853) wrote to Murchison, “a map is always a decisive criterion of they who aspire to the rank of geologists. Everyone who has not compiled a map, wants the necessary talent of combination.”

“The spirited Darwin, with all his remarkable vivacity of mind, is for me no Geologist, only an able history maker of what nature as he believes, has done, and what never she did...This man could never make a tolerable geologic map.”

Secord, *King of Siluria*, p. 414-415

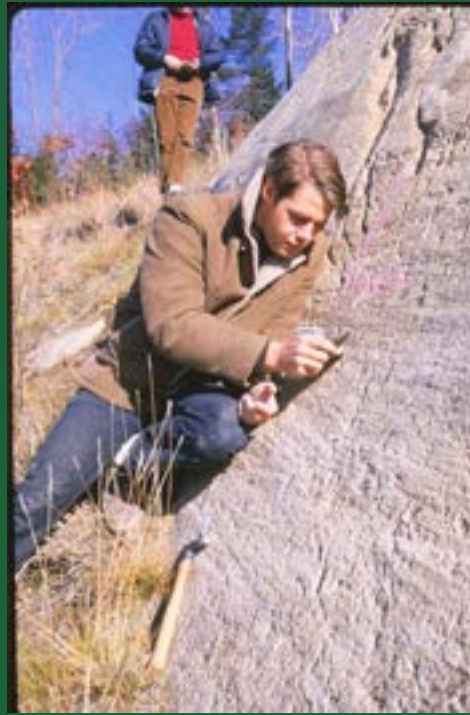


Darwin's geological map of S America  
[www.lib.cam.ac.uk](http://www.lib.cam.ac.uk)



John Valley

*Photo: Tom Loucks '71 A73*



Mark Nibbelink

*Photo: Tom Loucks '71 A73*



Greg Horne '57

*Photo: Tom Loucks '71 A73*

"I did a mapping thesis with John Lyons. Dartmouth gave me the window to what the Earth really looks like, at outcrop and microscopic scale. Working in New England with lichen-covered outcrop was good experience in formulating conclusions based on limited data/exposure." *Mary Ann Love Malinconico A82*



Lake Mascoma

[www.moosemountainreality.com](http://www.moosemountainreality.com)

"Noye Johnson sent me out to map the glacial deposits around Lake Mascoma without revealing a word of what I'd find. I discovered stranded terraces up creek valleys, asked landowners about the depth to bedrock in their wells, and sleuthed out pothole-ridden creek beds related to earlier outlets of the glacial lake. I couldn't believe how much I could learn simply by looking at a topographic map, wandering the countryside looking at the lay of the land, and pondering the results." *Jake Lowenstern '85*



Robert Brown  
 Albert Lamarre  
 Robert Lamarre  
 Thomas Loucks  
 Mark Nibbelink

*Dartmouth College Field Service*

**DARTMOUTH UNIVERSITY**

**HANOVER, NEW HAMPSHIRE U.S.A.**



"Five us signed up [for a senior honors thesis project] to complete the mapping of the San Jose Pinula Quadrangle. Dartmouth provided us with ID cards for the purposes of looking official. Given that "college" means high school in many foreign countries they printed Dartmouth University." *Tom Loucks '71 A73*

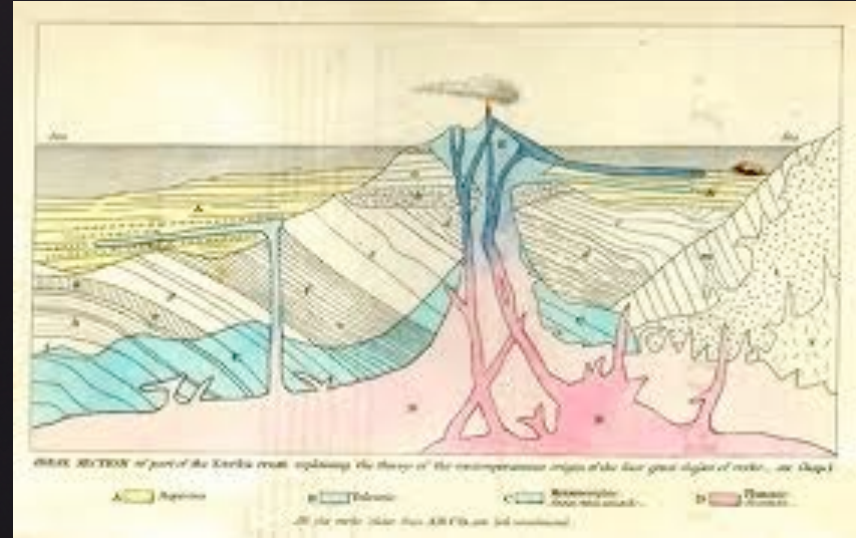
"Before leaving the states, Professor Stoiber presented us with a list of things he wanted us to do to enhance our learning experience. Item #6 was: "Write a letter to me every Sunday. I want a running commentary of what is going on."

Being smart-alecky twenty-year olds, in one of our letters we wrote, "They shot two guerillas last night, but it wasn't us." I'm pretty sure Stoiber did not see any humor in this as it was during the Guatemalan civil war." *Albert Lamarre '71*

*Photos by Tom Loucks '71*

# Geology as an active process

Frontispiece, Lyell's *Principles*  
[www.wikipedia.org](http://www.wikipedia.org)



Darwin glimpsed eruption of  
 Volcán Osorno in January 1835  
[www.wikitravel.org](http://www.wikitravel.org)



He also felt the Feb. 1835 Concepcion  
 earthquake, Chile (M8.2), and noted  
 uplift [www.wikipedia.org](http://www.wikipedia.org)





Motagua fault after  
1976 Guatemala quake  
[www.usgs.gov](http://www.usgs.gov)

"The conceptual models taught in the classroom could be rather poor representations. Having learned about strike-slip faults as simple planar structures, how surprising it was to find the Motagua fault represented by disconnected, *en echelon* ruptures. Most illuminating was a cow-pie draped across one of the displaced *en echelon* ruptures. Photos of this fractured cow-pie have entertained budding geologists, reinforced the law of superposition, as well as encouraged a sense of empathy for the poor cows that were both shaken and stirred." *Doug Burbank A82*



San Cristobal, Nicaragua  
*Photo by Tom Loucks '71*

"Central America incorporated active processes into our geological thinking: now geology was not just figuring out stratigraphy, faults, and folds. We stayed up all night with Dick Birnie, monitoring temperature changes at Izalco and spent the next day with John Hughes digging for vanadates in active fumaroles. We had the opportunity to go underground with Half into a gold mine where active hydrothermal fluids were streaming through the rock. And the incomparable experience of watching Fuego erupt with Stoiber and climbing Pacaya with him."

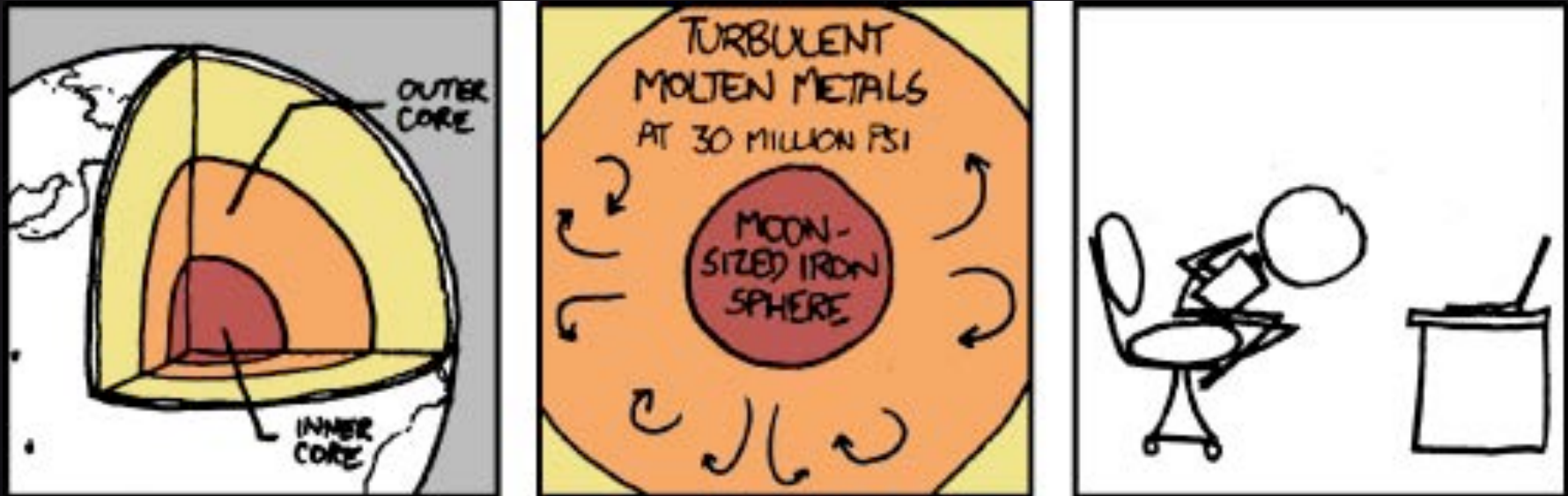
*Dennis Geist '80*



Terry Plank '85  
[www.dartmouth.edu](http://www.dartmouth.edu)

Poas Volcano, Costa Rica  
[theextinctionprotocol.wordpress.com](http://theextinctionprotocol.wordpress.com)

"In Costa Rica, on the flanks of Poas or Irazu volcano, Barbara Barreiro gave a lecture outside, on an easel, about this new discovery that came from  $^{10}\text{Be}$ . How it is cosmogenic, so rains down into the ocean and sediments, with a short half-life, and yet was discovered in arc lavas, especially there in central America. It proved sediment got subducted and recycled to volcanics in millions of years--short. I all of a sudden felt, on the flank of a volcano, above a subduction zone, this connection with the sea and processes that happen deep in the earth. The connection between geology and tectonic processes was real." *Terry Plank '85*



I FREAK OUT ABOUT FIFTEEN MINUTES INTO  
READING ANYTHING ABOUT THE EARTH'S CORE  
WHEN I SUDDENLY REALIZE IT'S *RIGHT UNDER ME.*

<http://imgs.xkcd.com/comics/core.png>

# Camaraderie

Alfred Russel Wallace came up with the idea of natural selection independently, but at the same time as Darwin.



Alfred Russel Wallace  
[www.evolutionabout.com](http://www.evolutionabout.com)



Dick Stoiber and Sam Bonis at Huehuetenango,  
Guatemala

*Photo by Tom Loucks '71 A73*



Eric Posmentier, Dick Birnie and Joe  
Francica atop Irazu Volcano, Costa Rica,  
April 1980

*Photo from Joe Francica A80*

"Learning and research are driven by excitement and enthusiasm. Without a driving force, the hard work of learning and research does not get finished."

*Mike Carr '69 A74*



At Santa Anna Volcano, El Salvador. Front Row; Robert Lamarre, Sam Bonis, Robert Brown, Dave Harlow, Richard (Chico) DiPritoro, Richard Shepherd '70, Sheldon Perry. Back row; John Valley, Roger Prince, Greg Boyt, John Thomas (?), Thomas Goldthwait, Mark Nibblink, Albert Lamarre, Tom Loucks, Dennis Bell, Phil Ehret (?) '70, Bill Locke '70, Bill Saumsiegle, Peter Stone '70.

*Photo supplied by Bob Lamarre '71*

"I attribute the breadth of knowledge and the sophistication of my thinking to the wonderful mentorship, excellence in the classroom and the field experiences that are the heart of a Dartmouth geology experience." *Steve Bohlen '74*



Earth Sciences Graduate Student softball team (aka AmmonooSox), October 1974. Back row, friend of Crafford, Tom Crafford, Jon Dykstra, Dave Merritt, John Aleinikoff, John Doherty. Front row, Lindsay McClelland, Gary Malone, Bill Condit, Brad Deen. *Photo from John Aleinikoff A75, 78*

"The personal, intellectual and technical training gained through close contact with geology profs in the classroom and most especially in the field has been helpful beyond words." *Steve Bohlen '74*





Lost geologists at Hoosier Pass,  
Colorado, Sept 2, 2012 Robert Lamarre  
'71, Dave Herrick '71 (non-geologist),  
Jeff Stimson '72, Thomas Goldthwait '71  
*Photo from Bob Lamarre '71*

"Dartmouth faculty and alumni in industry, academia, professional societies made me feel quickly that I was part of a community of scientists."

*Mary Ann Love Malinconico A82*

"The greatest thing I took away from my years in the Dartmouth geology department was the camaraderie developed between students and faculty on field trips and in the labs. Someone was always willing to help you move your thinking along the correct track." *Hank Woodard '48 A49*



Silsby Hall, former home of the  
Rox department  
*[www.dartmouth.edu](http://www.dartmouth.edu)*

"Beer and other alcoholic beverages were not allowed in classrooms and office space, at least in the late '60s. When the Geology Club met, beer would sometimes be discovered in the classroom where the meetings were held. John Lyons was on the "Bad Boys Committee" that dealt with infractions of such rules. He would urge us to remove the offending liquid through reasonably rapid consumption."  
*David Abbot '69*



Enjoying refreshments after a hard day in the field. Robert Lamarre, Thomas Goldthwait, Albert Lamarre and Dick Stoiber  
*Photo supplied by Bob Lamarre '71*

"Three of us geology majors were standing outside Robinson Hall one evening when who should come by but Dick Stoiber. When he asked what we were up to, we told him we were pondering how we could get some beer so we could quench our thirst. (We were not yet 21 years old so we could not buy it ourselves.) Dick responded, "I can help you, how much do you want?" and he started to walk to the nearest liquor store. We immediately fell in line and off we went. Just like that we had a brown paper bag full of cold 6-packs!" *Albert Lamarre '71*

# Geologic thinking

“Imagination under the banner of science.”

*Erasmus Darwin*



“I think geologists are more converted than simple naturalists because more accustomed to reasoning”

*Darwin to Alfred Russel Wallace*

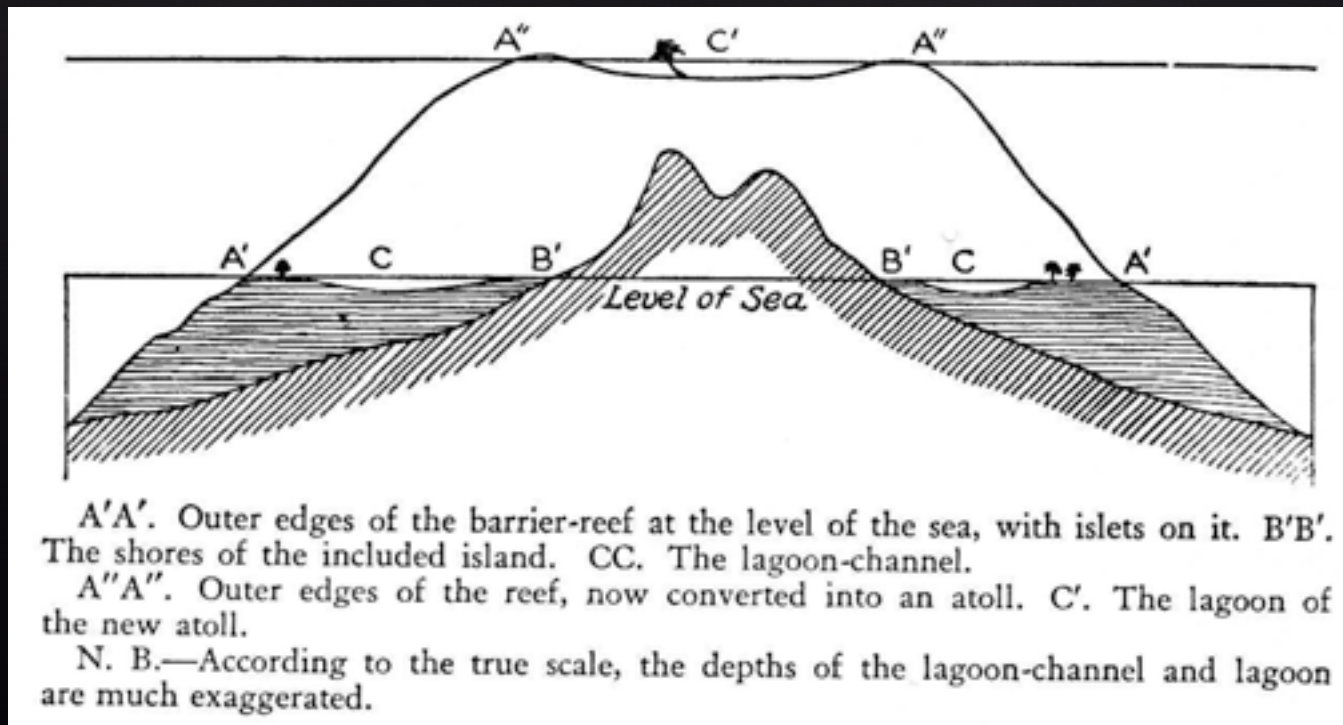
*18 May 1860*

*npr.org*

# Darwin and the origin of coral atolls



[www.geocaching.com](http://www.geocaching.com)



[www.darwin-online.org.uk](http://www.darwin-online.org.uk)

# Darwin and crystal fractionation



Crystal-phyric lava  
Genovesa, Galapagos  
*Photo by Carol Frost '79*

At Buchaneer Cove, Santiago, Darwin helped develop modern ideas of fractional crystallization by reconsidering the popular notion that crystals in lava were from granite partially melted by and caught up in magma. Darwin was “unwilling to take up this opinion.”

He surmised that certain ingredients in molten lava aggregate and form crystals while the rest of the melt remains fluid. He knew that crystals vary in specific density, and gravitational settling of crystals could explain how different lavas can form from the same melt extruded from the same vent.

In finding common origins for volcanic rocks, he may have been predisposed to ponder biological diversity from a common parent.



Old Man of the Mountains, pre- and post-2003  
*www.flickr.com; www.concordmonitor.com*

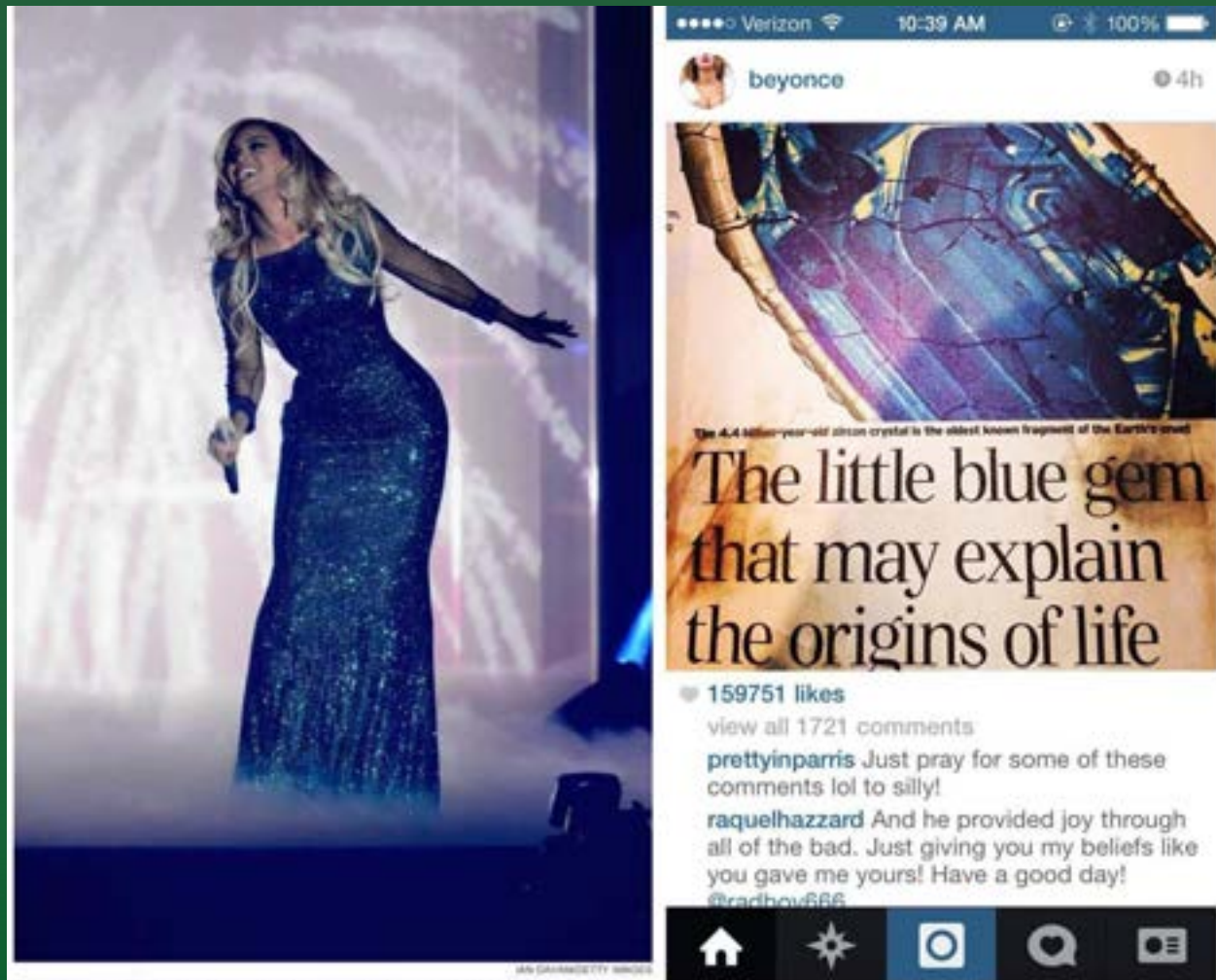
"one class in particular stands out for planting the seeds of geologic thinking -- Noye Johnson's geomorphology class. Each week we would head out to a location in northern New England to explore the landscape and piece together a plausible story for the processes that shaped it. In particular, I remember a trip to Franconia Notch where we hiked over the top of the Old Man of the Mountain's head to look at the cables and structures installed in an attempt to delay the Old Man's eventual destruction by the forces of weathering." *Phil Resor '89*



Bob Raynolds discussing chitty mitty with Pakistani locals  
*Photo by Pamela Rey '78*

" We needed to find a volcanic ash that we valued for various dating and research efforts. Jhelumites called the ash "chitty mitty" and used it as shampoo, so asking them where to find it was part of our fieldwork. In fact, asking where the chitty mitty might be is the only Urdu I still recall. Gary spent a fair amount of time talking with the locals about this resource and its location." *Pamela Rey '78*





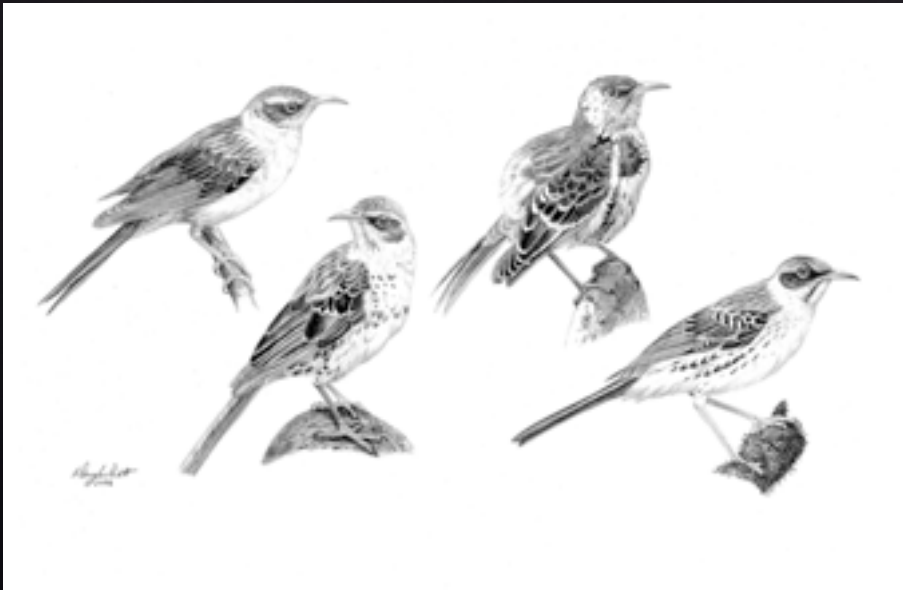
Beyoncé wore a glittering blue Vrettos Vrettakos gown that featured 400,000 blue zircon crystals.

Beyoncé loves zircons. On Feb. 19, 2014 Beyoncé performed at the Brit 2014 Awards in London wearing a Vrettos Vrettakos gown adorned with up to 400,000 (accounts vary) blue zircons (above, left). Four days later, Nature Geoscience published a paper by Valley et al. on the oldest known piece of Earth, a 4.4 Ga Hadean zircon and its blue CL image. Beyoncé copied this image and sent it in an Instagram to one million of her fans (above, right). Within 4 hours, 160,000 people had looked at the zircon and liked it. The Instagram was recorded by Alexa Zilberfarb, an undergraduate geology major at Scripps College.

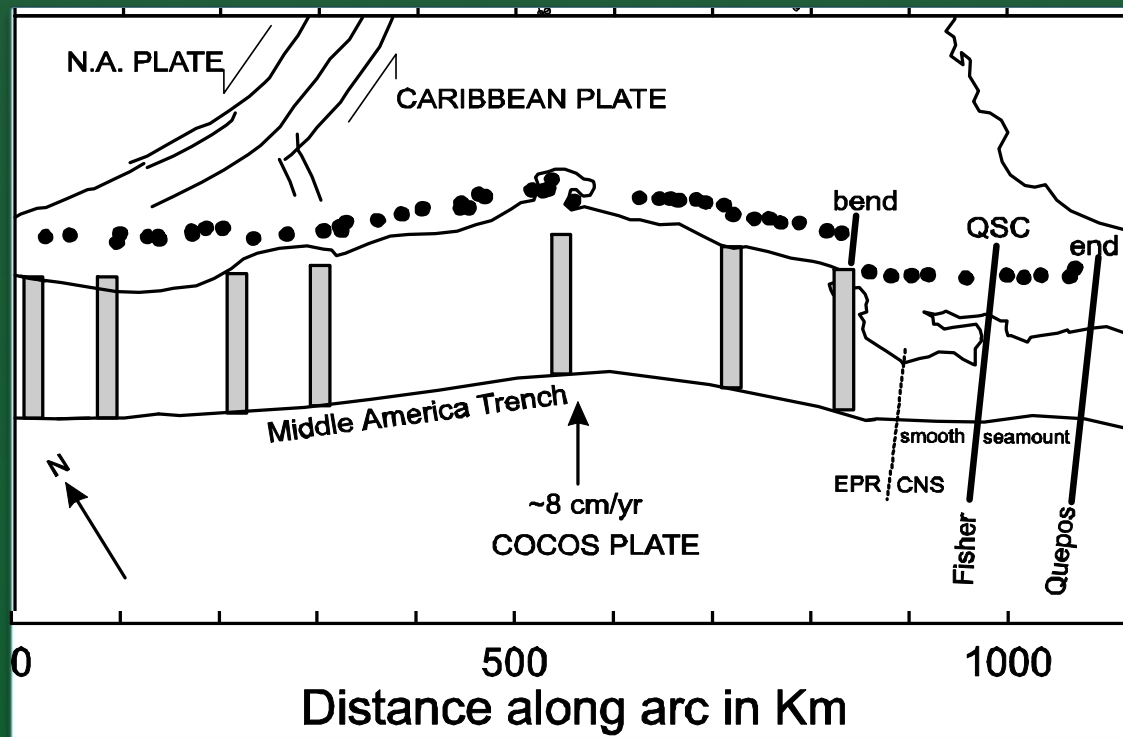
*Courtesy  
Tom Loucks '71 A73*

# Recognizing patterns

“Lyell’s excellent view of geology, of each formation being merely a page torn out of a history, & the geologists being obliged to fill up the gaps.” *Notebooks p 352*



Darwin recognized that different species of mockingbirds inhabited different Galapagos islands  
[www.hdouglaspratt.com](http://www.hdouglaspratt.com)



Carr et al., 2003

"Dick Stoiber taught me to look for patterns in nature. He felt that if patterns were recognized, we could always unravel the natural processes underlying the causality of the patterns. A wonderful example is his and Mike Carr's recognition of the pattern of segments in the volcanic chain, and the unique volcanic activity that occurred at the boundaries between segments, and derived the theory of segmentation that subsequently has been applied to subduction zones around the world." *John Hughes A81*

# Experimentation

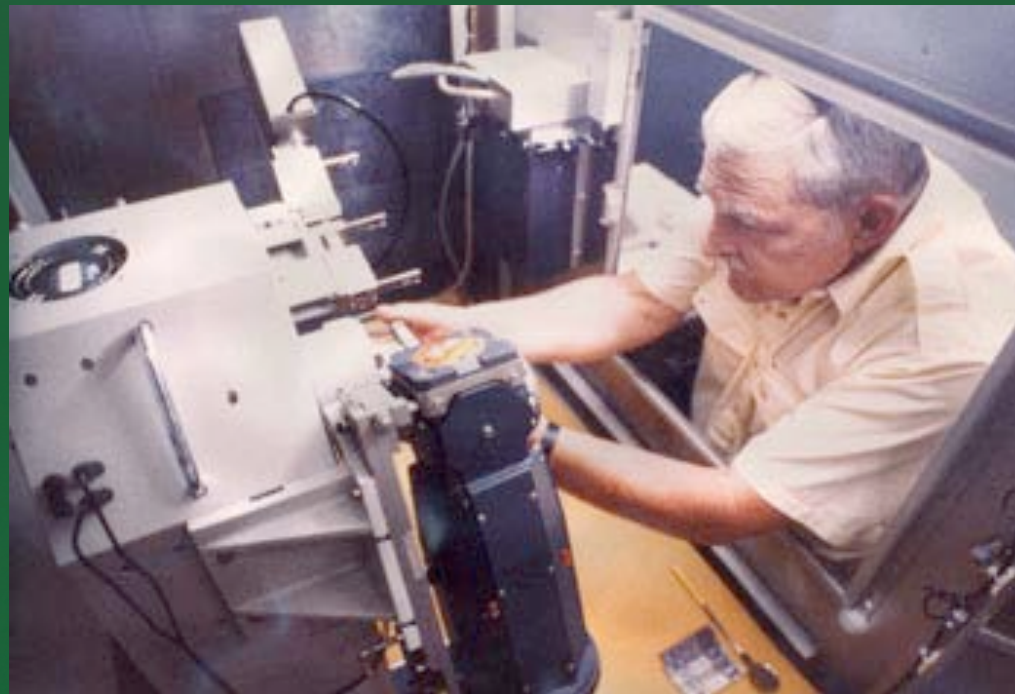
Darwin had to prove that it was possible for mainland species to be transported across oceans and to survive on nearby islands. In the 1850s he embarked on a series of experiments to demonstrate that a variety of cross-oceanic dispersal methods were possible.



Darwin himself bred pigeons in an effort to understand the process and the extent of variation under domestication



Pigeons and seeds in salt water  
[www.darwinproject.ac.uk](http://www.darwinproject.ac.uk)



*www.geo.dartmouth.edu*

"Doing powder XRD experiments with Bob Reynolds, I learned that any given technique has certain kinds of blinders to one's thinking, like the blind men feeling different parts of the elephant. Instead try to use lots of different techniques and information together." *Carrick Eggleston '83*

"Bob Reynolds was the most inventive and free-wheeling brain of our time. He let me build a liquid-nitrogen cell on the XRD so I could study ice at low temperatures. As Stoiber remarked, he's one fertile turtle." *Tony Morse '52*



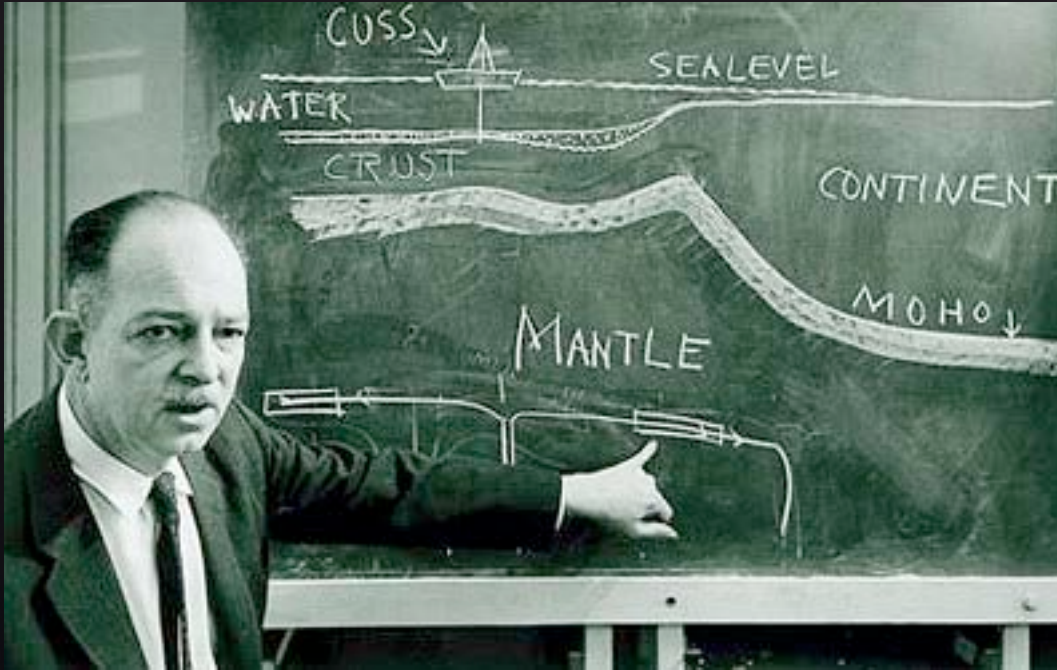
*Photo from Bob Lamarre '71*

Bob Lamarre and Tom Loucks on Pacaya  
*Photo from Tom Loucks '71 A73*



"Dick Stoiber had the idea of converting a battery-operated Swank vacuum cleaner to use for inhaling volcanic gases from fumaroles, then the gas would condense and drop into a bottle which could be taken home for sampling. The vacuum cleaner is depicted in this photo." *Tom Loucks '71 A73*

# Harry Hess



[www.mnh.si.edu](http://www.mnh.si.edu)

Hess once expressed the opinion that geologists made better intelligence analysts than did other physical scientists because they were accustomed to making decisions on faulty and incomplete information.

Moore and Vine, 1988,  
*GSA Bulletin*

"Geologists tend to be some of the most reasonable scientists. We do not get all fearful about global warming, global cooling, nuclear meltdowns, or running out of oil. I think part of the reason for this is that we have an amazing understanding of time and space." *Genet Ide Duke '78 A84*

Tho' round the girdled earth they roam,  
Her spell on them remains;  
They have the still North in their hearts,  
The hill winds in their veins,  
And the granite of New Hampshire  
In their muscles and their brains.

*Richard Hovey*

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