**Engineering Odysseys**
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# Engineering Odysseys

Finish your summer book list? Mine included *The Travels of Ibn Battuta (1325-1354),* translated by H.A.R. Gibb; *The Voyage of the H.M.S. Beagle,* by Charles Darwin; and a pair of books by Boston's most enduring and adoring couple, Brad and Barbara Washburn *(The Accidental Adventurer: Memoir of the First Woman to Climb Mt. McKinley,* by Barbara; and *Exploring the Unknown: Historic Diaries of Bradford Washburn's Alaska/Yukon Expeditions).*

The pattern is obvious. I'm a bit of a *Fernschmecker*. Burning with wanderlust, having O.D.'ed on in-flight magazines, I've gone to the primary sources in search of a fix.

This may seem odd. For the last decade, I've schlepped around the world, visiting every state, about half the world's countries, and every continent but Antarctica. One might think I'd long for homey books by Bob Vila or Martha Stewart. Instead, I am following the footsteps of many other curiosity seekers. And since science is essentially a curiosity-seeking business, it isn't surprising that so many scientists have wandered out of the laboratory and into faraway places. Arduous, ambitious trips don't just build character. They jar your thinking. They spur new ideas. Many a creative work, whether in science or the arts, begins with a boondoggle. Sometimes just going someplace far away, to blow the stink off, is what you need.

## Of Alps, Incas, Tuvans, Galapagos, Atlantis . . .

Think of Robert Millikan, who chased electrons and cosmic rays with balloons in the Swiss Alps — something about the air being thinner and better suited to

those famous oil-drop experiments that determined the charge of an electron. Alexander Graham Bell had a seminal role in the National Geographic Society. Yale anthropologist Hiram Bingham used to salivate over the blank spots in the map (there still were some in the 1920s). He could have been the real-life model of Indiana Jones: on one typical quest into the jungles of Peru he stumbled upon the lost city of Machu Picchu. Richard Feynman maintained a quixotic fixation on Tannu Tuva. Nobel physicist Murray Gell-Mann seems to have been everywhere in search of complexity. Ask him about Bhutan. He may reply in Dzongka.

Darwin's five-year, round-the-world voyage on the *Beagle* is the sort of intellectual and geographical epic that scientific legends are made of. Three years into the journey, green and puking with seasickness nearly every day, he reached the Galapagos islands west of Ecuador. There, he saw with his own eyes a startling pencil sketch of evolution in action. It blew his mind. But think about this. If Darwin hadn't gone on that trip, he most likely would have wound up in divinity school, as a career pastor. Charles Darwin: a *creationist?*

A friend of mine was an MIT UROP student of strobe-light inventor Doc Edgerton, who dragged him to the Bahamas and the Scottish highlands, ostensibly to try underwater gadgets in search of Atlantis and the Loch Ness monster. Now, IÕd assumed Atlantis was on Santorini in Greece (site of the largest volcanic explosion known on earth), not the Bahamas, and that Nessie-spotting could only be done after a thorough tour of regional single malts. But on those trips, they debugged things like sonar, hydrophones and Doc's underwater cameras. Anyone who has taken a picture with a Nikonos owes a debt of gratitude to intrepid souls like Edgerton and his dive buddy Jacques Cousteau. Their cameras were worth far more than the sea monsters they never saw.

## Those Wanderlusty Musicians, Writers, Politicos, and Digerati

Scientists aren't the only ones with wanderlust. Johann Sebastian Bach

crisscrossed Germany on foot: ambitious hikes for a man with a Sunday church job and a stable full of kids. Franz Liszt played concerts from Paris to Baghdad to Kiev; had he never written a note of music, he would have gone down as one of history's great travelers. Bela Bartok loved to hike in the Hungarian countryside, collecting folk tunes — as did Alan Lomax, who toured Appalachia in a pickup truck with a young Jerry Wiesner, collecting American country music in the 1930's. The incomparably charismatic Leonard Bernstein was a travel agent's dream, a man who took his musical passions all over the globe, to nearly every major concert hall on earth. He was the first conductor to travel as a star on television.

Think of Teddy Roosevelt, not just a president, but a serious bushwhacker who almost single-handedly kept Willis & Geiger in the safari jacket business for fifty years. Or Ben Franklin, who pioneered shuttle diplomacy and earned frequent sailor miles with his work in Paris. If it really is true that more than half the US congressmen and women do not hold US passports, then perhaps we should revisit that job description. My own passport is green — not because of my Irish ancestors, but because it commemorates Franklin. He was our Minister to France during the Revolutionary War.

Writers and storytellers are impelled to travel. There was Hemingway. Or Mark Twain (did you know he took a four-month trip to Hawaii and wrote a book about it?) or Michael Crichton, whose life has been a grand odyssey (his book, *Travels*, is a clue). I once checked in at the Galle Face hotel in Colombo, Sri Lanka, and noticed that filmmakers Sir David Lean and Steven Spielberg had signed the registry before me. So had Crichton. And Arthur C. Clarke. Coincidence?

While I was there, I recalled that the giant bats in *Indiana Jones and the Temple of Doom* were the same Sri Lankan bats Lean had used in *The Bridge on the River Kwai*. Sir David spent long fallow periods between films on journeys of his own. Films like *Doctor Zhivago, Lawrence of Arabia*, and *A Passage to India* all share an interesting feature: a magnificent steam-driven train chugs through some exotic land. It is a symbol of epic lives.

Somehow, planes have never quite matched that cachet. Orson Welles was

TWA's most frequent flier in 1938: 300,000 miles in one year — on propeller driven puddle jumpers that took 24 hours to cross the US. Sleeper seats weren't on those planes.

Still, the travel bug infects us for good reason. Of course, it hits some worse than others. To think I thought when I joined the faculty at MIT that I'd be wiping the chalk off my coat. Ha. It soon became obvious why Media Lab faculty were among the worldÕs most frequent fliers. Computers and networks spread digital technology everywhere, so even more than usual, MIT professors began receiving lecture requests from every corner of the globe. And it happened precisely when technology was turning the travel industry on its ear.

## Travel got easy, but getting away is getting hard

Suddenly you could book a whole trip with an e-mail or two. Paper tickets vanished into e-land. Behind the scenes, invisible travel databases swung into gear. And while you were away, email, phones, and video links could keep you in close touch with students. I used to amuse myself by bringing a tiny (and at the time, super advanced) global positioning system device on planes. I would tuck the antenna under the windowshade. (When stewardesses asked what it was, I'd tell them it was a solar charger for my laptop!) I watched the atlas on my laptop glide by, a little like being in a glass bottom boat. My e-mail was stamped with a lat/lon to show where I was when I sent it. Then the airplanes began showing the same video maps. And the European guide to *Relais and Chateaux* began listing GPS coordinates for each country inn. So I began dragging students with me instead. Each trip became a mini education for us.

Technology has made travel so easy, that actually getting away is getting hard. Airports have morphed into a maze of indistinguishable shopping malls. Used to be you'd travel to go someplace different. But often when you arrive it feels like you never left. It's a strange trend. *Real* travel experiences seem to have succumbed to a kind of global Disneyfication. Blank spots have been scrubbed from the map. Journeys are canned and packaged. Wherever you go, TVs are tuned to CNN, Internet browsers are set to My Yahoo, and cell phones ring. Shopping malls sell the same Godiva. The traveler sails through a veneer of

reality on a magic carpet of databases and global brands.

With effort it is still is possible to get a taste of different realities. And young scientists will always need to be trailblazers. They benefit from being led astray, into the unknown, once in awhile. We all do.

## Thinking — and Being — out of the Box

One of MIT's great educational movements took place in the 1970s, when Edwin Land and MIT President Jerry Wiesner helped launch the UROP program, along with Margaret MacVicar who really shepherded it into existence. UROP—which stands for undergraduate research opportunities—gave students a chance to get out of classes and work side-by-side with great scientists on the most rousing, thrilling questions of all: questions nobody knew the answer to.

With MIT's endless industrial ties, labs extended readily through corporate arms. And now, like never before, the world is our laboratory. There are opportunities for young scientists to get way out of the box and do extraordinary things. The Media Lab is breaking ground in Europe, India and Asia. My own undergraduates have been to Everest and Greenland for geology; to Singapore and Japan for infrastructure. They've skied across the top of Norway, trekked into Iceland in the dead of winter, and scrambled around the craters of Kilauea on Hawaii while studying very rare plants. They've taught English in rural China. This fall, several of them will attend Cambridge University, part of MIT's new exchange program, where they may finally learn *English!* It makes my head spin.

## Ibn *who?*

At this point, the astute reader is wondering: who in the heck was Ibn Battuta, anyway? I've recently been reading volume four of his *Travels*. Now, I realize many of you alert readers may not have been aware of volumes one, two and three, nor are you members of the "Hakluyt Society" in Britain which republished them. So here are some facts. In 1325, Ibn Battuta was a young man, about 20, living with his family in Marrakesh. He set forth on his *hajj*—the

pilgrimage to Mecca that was (and still is) part of every Muslim's coming of age. It marked the end of one's schooling—and the start of a real education. But: *it's 3,014 miles from Marrakesh to Mecca.*

Now in those days, this was an extremely perilous journey, not to mention just one hell of long way to walk. If you dozed off on a camel and fell from your seat and broke a leg, you were probably a goner. Many died en route, or just got lost. There were no Michelin guides. Some acquired wives and sprouted families en route, which usually slowed them down. Well, Ibn Battuta made it. And after reaching the holy of holies, he more or less shrugged and kept on going: he literally walked around the world for about 30 years. He walked across China. Around India. Took a lap around Ceylon. Saw the middle east. The Maldives. Covered Africa. That man saw a more fantastic spectrum of intensely different cultures than perhaps any other traveler before or since. And he lived to tell about it. It's hard to imagine the reaction of his family when he walked back in the front door of his house in Marrakesh 30 years later. The stories he told were almost too fantastic to believe; they must have seemed like a cross between *1001 Arabian Nights* and *Survivor*. And his memoirs of these trips are an extraordinary, precious snapshot of our world, pregnant and ready to bloom into the Renaissance. His motto: "Never the same road twice."

That's the innate way of science, too.

In a world where the beaten path through the global village is so well paved that it takes work to get off it, I love getting advice from tireless Brad Washburn. Brad, a man who nowadays measures his age in geological epochs, and who might have dated Amelia Earhart (but was smart enough to land Barbara), founded the Boston Museum of Science and is truly one of the world's great explorers. He loves to recite his favorite line from Goethe (who I think was a classmate of Brad's at Harvard a few centuries ago). It's a wonderful tip for any young scientist:

*Whatever you can do, or even dream you can, begin it.*
*Boldness has genius, power and magic in it.*

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