Ask the pilot

Why stop in Anchorage on the way from Tahiti to Paris? Plus, the mysteries of the Muslim qibla.

By Patrick Smith

Mar. 07, 2003 | A paragraph of some controversy from my Terminal One story a couple of weeks ago...

"I near a bank of payphones where, on the floor, three African Muslims are crouched toward Mecca. Actually, they are crouched more toward Bridgeport, Connecticut. Being a pilot I tend to have a reflexive (conditioned, if not natural) awareness of compass points and things geographical, and I notice they are facing the wrong direction. I choose to tell them, and when I do they are surprised."

Hopefully my geographical awareness is not always so badly construed, lest I haplessly deliver a plane full of people to, say, Minneapolis instead of Chicago. For as an annoyed, astute and completely humorless reader points out, I have led the poor Africans astray, failing to account for the spherical reality of our planet.

The implications here are important and interesting. To explain:

Thanks to the hard work of imperialist European explorers, and later confirmed by NASA photography, we have determined that the earth is round. (Technically it's not a sphere but a geoid, but we're not going there.) OK, we can live with that. But are we, in our attempts to decorate our offices and educate our kids, giving ourselves a false impression of the oceans and continents?

When the earth is crushed from its natural (round) state into a strictly horizontal one, it becomes distorted as the divisions of latitude and longitude stretch apart. Depending on the layout used -- something cartographers call "projection" -- the distortion can be grotesque. Many of us have grown up believing, for instance, that Greenland is about

ten times larger than it really is, thanks to the preposterous polar dimensions of the commonly used Mercator projection. Some people call this "the Rand McNally Syndrome."

What this all means to navigation is that accurately surmising a long-distance, point-to-point course on a globe is very different from measuring one on a flat map. Try it yourself. Go and fetch three items: a globe, a typical atlas, and a length of dental floss. (We'll assume your atlas is one of those Americentric maps with North America in the center.)

With your gear in hand, let's travel now between New York City and Hong Kong.

First, lay out the shortest distance using only the atlas. The floss will point southwest from New York. It will pass over San Francisco, across the center of the Pacific Ocean near Midway Island, then south of Japan before finally reaching China. A very long distance.

Indeed it is. But now, floss your way to Hong Kong using the globe. Almost at once you will realize how lavishly impractical the above routing would be. For it's much less circuitous simply to bend your string *over the top* of the planet. And if you're taking one of Continental Airlines' 777s on this very flight, don't be baffled when you see the frozen Hudson Bay and Siberian tundra passing beneath you, rather than the Golden Gate Bridge and warm Pacific seas. The shortest distance between New York and Hong Kong is not southwesterly, it's almost due north.

That's the extreme, but the principle applies to many other long-range pairings. Traveling between continents, airplanes do not fly the straight lines evident on your atlas or wall map, but instead follow what are called Great Circle routes, the leanest mileage totals between cities, which we've mimicked with the floss test. (Calculating the precise arc of a Great Circle gets into spherical trigonometry, which I know nothing about and will not attempt to elaborate on.)

As things tend to go, real-life operations aren't so cleanly theoretical. Flights over the North Atlantic adhere to predetermined paths called "tracks," for example, and geopolitical frictions mandate various zigzags. But these are still in keeping, overall, with Great Circle courses.

And this is why passengers en route from America to Europe frequently find themselves not just high *up,* but high up, occasionally into the icy realm of "60 north," the latitude almost scraping the tip of Greenland. And in the Southern Hemisphere -- between Australia and South America, to cite one instance -- the same thing happens, except, as it were, upside down.

One French airline used to offer service between Tahiti, deep in the South Pacific, and

Paris. Where would you guess that flight stopped for fuel? Would you believe Anchorage, Alaska? Using a regular map for reference, you'd be tempted to think the French pilots had done too much drinking on those Tahitian layovers, but when measured on the circular globe it makes perfect sense.

Which brings us back to our bewildered Muslims. By the same token, the most efficient routing between New York and Mecca is not toward the southeast, as I erroneously directed them, but *northeast.*

Required to periodically align themselves with a point so many thousands of miles away, many Muslims know how this works. To face the holy Kaaba at Mecca, Muslims employ the qibla, which is the shortest distance from where they're standing (or kneeling) -- a kind of Islamic Great Circle. Mohammed, it is said, could instantly determine the qibla without the aid of scientific instruments. My friends at Kennedy were searching for their qibla, only to find quibble instead with an itinerant pilot who didn't know what he was talking about. He was thinking flat when he should have been thinking round.

For what it's worth, however, my anecdote was something of a fuzzy reconstruction. I don't remember, exactly, which way the Muslims were facing when I found them. They may have been spinning about in a state of confusion beneath the blinding white lights of Terminal One, without sun, stars or compass for guidance. I chose "Bridgeport" because it sounded funny, and which, in fact, would have been the correct direction. Alas, I sent them southeasterly.

Passengers aboard Saudi Arabian Airlines, by the way, can avoid such disorientation thanks to the airline's satellite-aided "qibla compass." Some of the carrier's 747s and 777s also have prayer rooms in the aft coach section. Saudi pilots, though, as well as pilgrims on the Hajj, are probably just as interested in the shortest distance to the Red Sea port of Jeddah, about 40 miles west of Mecca. Jeddah is where the airport is.

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-- By Patrick Smith