

OPUNTIA

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TAKEN AT THE FLOOD

by Dale Speirs

Introduction.

Living as I do more than a kilometre above sea level, I am fascinated by giant waves, secure in the knowledge that whatever other problems Calgary experiences, those will not be among them. People who live in Vancouver or along the Pacific Ring of Fire are advised not to rent ground floor apartments unless high up on a mountain slope. Don't take my word for it; ask the Japanese.

There are several types of giant waves, of which the tsunami is the most spectacular. Often mistakenly called a tidal wave, it has nothing to do with tides but is triggered by an undersea earthquake which bumps the water upward and sets it in motion. Tsunamis are not visible out in the ocean because the ocean is deeper than the wave, so it sinks down. As the wave approaches land, it stands up in the shallows. Its harbinger is the sudden drainage of water from the shore, followed by the wall of water.

In more recent years, tsunamis have become popular with Hollywood as computer special effects improve. There are older shows and movies that use them, although the special effects are mostly stock shots of Hawaiian beach waves or water sloshing in a tank.

The Water Is Wide.

TIDAL WAVE (2009) is a Korean movie, which despite the incorrect title, is a well-done special effects movie about a megatsunami wasting the city of Haeundae on the South Korean shoreline. The sub-plots are quickly introduced: the romantic episode with a young couple who are fisher folk, the wealthy businessmen who want to redevelop the waterfront into a tourist hotel complex, a trio of young women looking for a good time, a team of search-and-rescue men who will be very busy in the second half of the movie, and Professor Kim lecturing his fellow scientists about a megatsunami. Kim also has to deal with his ex-wife who has remarried and their young daughter. His wife is working for an international exhibition which begins, as the viewer easily sees, on the day that the megatsunami will arrive.

Eventually all the sub-plots are lined up and sent on their way. The first ominous forebodings show up, as giant flocks of birds suddenly start migrating inland. Since the trigger for the megatsunami was an earthquake far, far out to sea, this makes no sense. The belief that animals can sense impending earthquakes has been shown by scientific studies to be ex post facto folklore. People remember when their livestock were restless just before a shake but one never hears of the many times when the cows continued to chew their cud peacefully and the birds roosted quietly in the trees.

Professor Kim can't convince his bosses to take action. -2-
He wants to evacuate a million people out of the city on ten minute's warning on the possibility that an earthquake might generate a tsunami. Not unreasonably, Mr. Big points out that the thing can't be done; even to move a million people over a couple days would be a nightmare.

But finally the big shake comes. Out in the Sea of Japan, a small island collapses into the water and sends the megatsunami on its way. The evacuation order is issued, soon to be followed by the shouting and yelling. The harbour effects were very realistic, as the advancing megatsunami sucks it dry just before its arrival. Thousands of extras running screaming from the beach into the city, in what will prove to be a futile effort to escape becoming a statistic. The wave washes over, and through, the skyscrapers and floods the city. There is the usual chaos, including scenes where stunt drivers crash their cars for no apparent reason. (I've seen many car accidents and one police chase in my life, and never once did anyone loop-the-loop.) As the powerlines topple into the flood, those treading water are crispy-fried by electricity.

The wave also throws a container ship onto the upper rigging of a suspension bridge. The motorists who weren't washed away find themselves playing dodge-em as the containers start falling onto the bridge deck. The leaking fuel tanks of the ship ignite and blow it apart, hurling containers across the harbour into the city

skyscrapers. A very novel special effect, albeit not that believable because ocean freighters burn bunker oil, which does not explode like dynamite.

The remainder of the movie is devoted to the rescue scenes, mostly of people splashing about in the water in various predicaments. Some of the supporting actors are despatched into the next world, but most make it through, soggy and battered but alive. Once all the action has been wrung out of the sub-plots, another wave shows up to thin out the population a bit more. That seems rather pointless, as no further time is spent on its aftereffects, and the movie jumps to the epilogue, with lots of tearful scenes among the survivors. All told, the movie was well done for its genre.

Rift The Hills And Roll The Waters.

Why wait for nature to randomly generate tsunamis? You can build a machine to target them for whatever evil purposes your organization desires.

“The Yo Ho Ho And A Bottle Of Rum Affair” is a 1967 MAN FROM UNCLE episode from the third season, about THRUSH using a machine to generate tsunamis. They intend to demand \$50 billion in various currencies or else they will flood all the coastal cities. Nowadays that amount would be paid out of petty

cash by governments, but this was back in the 1960s when it was gold-backed money, not paper fiat currency.

UNCLE investigates, with Ilya Kuryakin infiltrating a ship carrying the tsunami machine, while Napoleon Solo stays ashore and romances a THRUSH agent who apparently has something to do with it. Kuryakin has the worst of it, having been discovered as a stowaway and put to work by the captain, a drunken reprobate who has sunk to doing charter trips for THRUSH. The agents on board want him summarily killed but the captain insists on following maritime law. For his kindness in saving Kuryakin, the latter arranges a mutiny to stop the tsunami machine from being used. Meanwhile, Solo is captured.

While the mutiny is being fought out on the decks, Solo is transported by private airplane, which overflies the ship. This follows the time-honoured tradition of spy movies that instead of just putting a bullet into the hero's head, he is taken to the scene of the crime so that the villain can gloat. Solo gets loose on the plane, there is a desperate fight in the cockpit, and the pilot loses control. What follows is an intercutting sequence of fists flying inside the cabin and stock footage of a WW2 fighter plane on fire as it dives into the water. Since the plane that Solo is on had no apparent reason to burst into flames in midair, we can only attribute this to the producer getting the stock footage for free and to hell with continuity.

Solo is the only survivor of the plane crash. He is picked up by Kuryakin and the mutinous crew, the THRUSH agents have justice meted out to them, and we never get to see any tsunami stock footage.

Four decades later, the tsunami business is revived with KILLER WAVE. It is a 2006 movie about a series of tsunamis striking the eastern coast of the USA, too many to be believable as natural events. The movie begins with a bang, or a slosh as the case may be, with a beach party being wiped out because they were too dumb to know what it meant when the water suddenly receded far out to sea. Natural selection in action once more. The cable news of the disaster wiping out coastal New Jersey intercuts with the start-up of the sub-plots and continues through the movie. There is the disgruntled scientist (he's not really mad, just unhappy) John McAdams, who is the only man who might know what is going on. He is rounded up by the FBI and put to work at the Oceanographic Institute figuring out what it might be.

The bad guy shows up soon enough, in the guise of Victor Bannister of the Camtrell Corporation. He is a man with a plan to save the eastern seaboard by building early-warning systems and seawalls, for a profit, of course. McAdams is framed for murder and has to go on the run with faithful girlfriend Sophie. The real mad scientist, Stanley Schiff, faithful employee of Camtrell, appears. He is triggering the tsunamis for Bannister by using

underwater explosions. From there, the rest of the plot is predictable, with chase scenes, conspiracy theories thrown about like sand, underground laboratories, and the final comeuppance. The ending has a neat twist; the last rouge tsunamis, aimed at Boston, is cancelled by the good guys by generating a second tsunami out of phase with the first. That good old reversing-the-polarity trick works every time.

The characters spend entirely too much time talking to each other on cellphones and explaining what is happening. This saves money for the producers, who don't have to set up the scenes actually showing something. The special effects are good, if somewhat sparse. The tsunamis are believable, but re-used more than once in the movie to save on the computer SFX budget.

The Hollow Ocean Ridges Roaring Into Cataracts.

FLOOD is a 2009 television movie about a giant storm surge (not a tsunami) coinciding with high tides along the east side of Britain. After first stopping to take out a few selected Scottish villages, the storm surge moves south and gives the Thames Barrier of London a good run for its money. It all begins with a disaster-services centre in London monitoring a North Sea storm. Even as the opening credits are still rolling, the fishing village of Wick, Scotland, is taken out by a 15-metre wave. Other bit-part characters are also dispatched to various watery graves.

Next the various sub-plots are launched. The head meteorologist has to brief the Deputy Prime Minister about why they missed the Scottish disaster. A sulky teenaged girl is squabbling with her parents. A bright young thing is in command of the Thames Barrier. Grizzled meteorologists are agonizing about which way the storm will turn. The meteorologists in this movie use impossibly high-tech everything which I'm sure made the real-life Met Office envious. As always, there is the rouge scientist who knows the truth if only someone would listen.

Finally everyone is aware of the impending doom, and the first-responders brace themselves. The Thames Barrier will be breached and London flooded up the length of the river. The Underground rail lines will be flooded as well. Cue the disposable maintenance men who are working in a service tunnel and don't hear the klaxons or answer their cellphones. The disaster people have three hours to clear 1.5 million citizens out of the way. The Barrier is closed and the special effects begin, along with mass panic in the streets as crowd extras prepare to meet their doom. The initial disaster takes out its share of landmarks such as the Millennium Dome, Tower Bridge, and that big ferris wheel. The flood roars through the streets of inner London, and all the leading characters have a good splash.

The second half of the movie deals with the reverse scenario. Since the Thames River is still flowing, and all that flood water

needs to be drained out once the surge fades away, the Barrier must be lowered. But there is a glitch in the mechanism, a last-minute attempt to blow open the Barrier with air-launched missiles, and all the mopping up.

The director of this movie loves his jump cuts and fast-slow camera panning. The movie is, however, a refreshing change of pace from all the American disaster movies. No scenes in the White House, no cowboys breaking all the rules, and different scenery than all those California back lots. All told, time well wasted, and for my readers who live in London, I hope you live on the heights, not the valley floodplain.

ONE STEP TOO FAR

by Dale Speirs

Introduction.

There are still many who deny Peak Oil or misunderstand it. One of the clearest proofs that we are running out is the fact that oil companies are going to the Arctic in search of it, digging tar out of the ground in the Athabasca district of remote northern Alberta, horizontally drilling oil shales such as the Bakken field at great cost, and going out into deep ocean waters

where the drill pipe must first dangle through kilometres of ocean water, then down even further through bedrock. It is an act of desperation to replace the steady decline of conventional reserves. No CEO of any oil company would do these things if there were still large conventional oil fields to be found on land. None have been discovered in decades.

The earliest offshore drilling rigs were simply rigs built on pilings that reached down to the seabed. Long since though, the rigs have become floating rigs, specialized ships really, dropping their pipe down through deep water before the drill bit even hits the seabed. The Macondo field adjacent to the underwater Mississippi River Canyon was one such desperate play. This was where the ill-fated Deepwater Horizon rig met its end in 2010.

In this context, the Deepwater Horizon disaster of 2010 becomes more understandable. There are a plethora of books already published about this event and no doubt more to come. I will review only three, picked because they emphasize different aspects of the disaster.

Fish Rot From The Head.

DROWNING IN OIL (2011, hardcover) is by Loren Steffy, a Houston, Texas, business reporter. He first began covering British Petroleum in 2005, after its Texas City refinery blew up, killing

15 and injuring hundreds. I almost quit reading the book on page 2 where Steffy wrote about Deepwater Horizon drilling: "*The bit had ground its way through almost two and a half miles of earth until it struck an ancient graveyard of dinosaurs that had long since decomposed into a massive underground pool of petroleum.*" Oil comes from decomposed algae and single-cell plankton, not dinosaurs. It is not found in pools or underground caverns as many imagine, but in porous sedimentary bedrock that acts like a sponge. Further, the Macondo field in which the rig was drilling is relatively young, of Miocene age, formed 10 to 20 megayears ago, long after the dinosaurs became extinct. I hope Steffy meant it as some sort of metaphor. He does seem to be in safer territory interviewing rig workers than writing as a geologist.

Deepwater Horizon was a \$500 million drilling rig stationed over the Macondo Formation. It was owned by Transocean Ltd, had a platform the size of two football fields, and the derrick was 20 stories above the main deck. Prior to the April 20, 2010, catastrophe, there had been several drilling problems. Drilling mud, \$10 million worth (it's not ordinary mud), kept disappearing in the borehole instead of being re-circulated back up. This meant that somewhere along the hole the strata was fractured, and the mud was going sideways into the rocks instead of down the pipe and back up in the gap between the casing and the bedrock. Drilling mud is heavy, enough to weigh down oil and gas to keep

it down at the bottom, and thereby preventing a blowout. It also cools the drill bit and lubricates it. The drill bit occasionally kicked back hard enough to shake the rig, indicating that it was hitting pockets of high-pressure gas and there wasn't enough mud to keep it in check.

Someone was in a hurry (everyone blamed the dead guy) and decided to switch the drilling mud out and replace it with seawater before capping the well for future production. Deepwater Horizon was a drilling rig, not a production platform. If events had been normal, it would have set valves on top of the completed well and then moved off to the next job. A production platform would have then been installed, which would collect the oil and send it to shore via an underwater pipeline. Seawater is heavy but not as heavy as drilling mud. The reason for the switch is that seawater is cleaner and doesn't plug up the production gear when the oil begins to flow and first displaces the seawater. It is no substitute for mud when the well hasn't yet been capped for production, as was the case for this well. This was the fatal error, taking a shortcut.

The survivors among the 126 crew members reported hearing loud hissing sounds. The control computers went berserk, sounding alarms as the high-pressure gas blew its way up the pipe. The blowout preventer, a five-story high collection of hydraulic rams and valves failed to do its job, the only thing it was built for. Post-

disaster study showed that the gas blew the downhole pipe up into the preventer, jamming it with three sections of pipes. The hydraulic rams had only strength to cut through one pipe's thickness. Explosions followed, and the rig became a giant blowtorch. Eleven men died and many others were injured as they struggled to the lifeboats.

At this point, the book steps back and goes into a history of British Petroleum. It developed in the early 1900s as an Iranian oil play, and after several mergers and re-organizations became today's entity. In 1997, then-CEO John Browne redefined BP as moving into alternative energy and re-branded it as "Beyond Petroleum". That phrase would come back to haunt him. Browne was a showboater who loved to lecture other petro-executives on how it is done, which earned him and BP the loathing of the rest of the industry. When he and BP went down after Deepwater Horizon there was not a little schadenfreude in the industry.

Browne was more concerned with financial results than production quality. The constant cost-cutting by micro-managing executives meant that safety was job #9. That was the actual written priority. Profitability was listed as #1 in its company policy manual, which was entered into evidence at the coroner's hearing after the Texas City refinery disaster.

There was a long litany of failures. In 2005, BP's drilling rig Thunder Horse toppled in the Gulf of Mexico after a hurricane brushed it slightly. The rig should have easily withstood the storm and others of its type did so. Instead, it fell on its side and almost sank because a one-way ballast valve had been installed backwards. Instead of pumping the flotation chambers on the port side dry, the pumps actually filled them with water, tipping the rig over.

That same year, a BP pipeline in northern Alaska broke open because of corrosion. The company had been too cheap to spend money on inspections. The following summer, when it was forced by the government to do a proper job, 16 major corrosion points were discovered. The pipeline was shut for repairs for weeks, causing oil to spike \$3 per barrel the day after the announcement was made.

By this point in the narrative, Steffy has demonstrated that Deepwater Horizon was not an unexpected black swan event but just the latest failure because of BP's corporate culture. Browne had to resign in 2007 not because of the disasters but because he had been convicted of perjury in a court dispute with his ex-boyfriend. Tony Hayward became the new CEO and found himself in a nightmare. The Browne legacy remained, and BP's corporate culture only changed slowly. The book then returns to the Deepwater Horizon and the aftermath.

Initially everyone blamed everyone else. As on any large project, there were subcontractors working on the rig, but ultimately the prime contractor, BP, had to shoulder the blame. The company then staggered into another public relations disaster when it said only 1,000 barrels per day were leaking from the borehole. This sounds like a lot but in relation to the size of the Gulf of Mexico it was minuscule. A lot more oil and chemicals are spilled daily into the Mississippi River and the Gulf from pleasure and fishing boats and urban run-off. Natural seeps of oil and gas contribute 500,000 barrels per year, spread out through the Gulf and quickly diluted. As the oil slicks built up, the company was forced to keep revising upwards the rate of flow, finally admitting to 56,000 barrels per day. This meant it wasn't a spill, it was an uncontrolled gusher. It wasn't until September 19 that a relief well intercepted the borehole and pumped it full of concrete. Hayward suffered through a string of bad public relations and legislative hearings. He finally lost his job after taking time off in the middle of the crisis to go sailing at the Isle of Man.

The story of Deepwater Horizon, as Steffy writes it, is not a blow-by-blow account of the disaster. It is, as he emphasizes, a story of corporate culture gone wrong. It was not a matter of a single out-of-character lapse of judgement, it was pervasive and continuous in BP's operations throughout the world. ExxonMobil learned from the wreck of the Exxon Valdez and improved its safety

record immensely. Steffy points out an ominous foreboding; the first responder to that shipwreck was BP, who had to be replaced because they muffed the initial clean-up.

Safety Last.

FIRE ON THE HORIZON (2011, hardcover) by John Konrad (an oil-rig captain) and Tom Shroder (journalist) is a more detailed account of the Deepwater Horizon in itself, from its birth in a South Korean shipyard in 2000 to its fiery death a decade later. The book begins with a brief history of offshore drilling, first from piers, then from single-use platforms, and then floating platforms that could travel from one site to another. Deepwater Horizon was completed in February 2001 as a fifth-generation drilling rig, almost completely computer controlled. It floated on two giant pontoons, each twice the size of a Boeing jet fuselage, and its giant legs could be partially submersed for greater stability. Life on the rigs is harsh. The workers are highly paid but they earn it.

Transocean, the owner of the rig, had as its motto “We’re never out of our depth.” By 2010, Deepwater Horizon had drilled more than thirty wells. It was considered a middle-aged rig with ever increasing maintenance requirements as pipes rusted and valves wore out. The computer software dated from the late 1990s and was originally written for building management. In 2008, the rig

almost sank when a mechanic left a valve open and it partly flooded before someone isolated the problem.

The Macondo site had been originally assigned to another rig but it was heavily damaged by a hurricane and had to be towed into drydock for repairs. Deepwater Horizon was assigned to finish the borehole. From the rig’s moon pool (the open centre of the platform where the drill pipe descends from) to the seabed was a depth of 1,535 metres, then another 5,560 metres through the bedrock to the oil-bearing strata. For comparison, the now-fallen Twin Towers of the World Trade Centre were 110 stories tall or 405 metres in height. Deepwater Horizon soon experienced problems such as high-pressure natural gas kicking the pipe, hydraulic leaks on the blowout preventer valves, and loss of drilling mud, all explained in detail. Finally the blowout preventer control panel failed. In other words, the fail-safe failed. Would you drive a car with no brakes? BP executives on-shore, who micro-managed the rig by telephone and e-mails, did.

The book closely examines the final problem faced by Deepwater Horizon, that of the fractured bedrock that was swallowing up the drilling mud. BP had to seal it to prevent high-pressure natural gas from bypassing the pipe and traveling up the gap between the casing and the bedrock. The gap is called an annulus. They didn’t want to spend too much money doing it because, contrary to mass-media reports, the Macondo field is not a giant one. -9-

Too much money spent on it would make it uneconomical to drain. Concrete was pumped down the inside of the pipe, out the bottom, and back up the outside through the annulus to seal the bedrock. The bottom of the borehole was then plugged with a concrete cap, which would be later drilled through when the production platform took over. Laboratory tests showed the concrete needed 48 hours to set, but after 11 hours, BP officials ordered a high-pressure test on the line. The sooner tested, the sooner the hole could be completed, and time was money. It was April 20, 2010. You do not need to be a qualified engineer to guess what high pressures would do to partially set concrete. The drilling mud was then pumped out and replaced by seawater. The mud is expensive and it would be recycled for the next drill site. Just after 21h45, a fountain of seawater suddenly erupted out of the drill string and soared above the moon pool, followed by a loud hissing noise. The rest you know.

The Pelican Seen Round The World.

A HOLE AT THE BOTTOM OF THE SEA (2011, hardcover) is by Joel Achenbach and covers what happened after the blowout, a nice complement to the two previous books. He writes in the foreword: "*Macondo was Apollo 13 on steroids, except when it was Apollo 13 on tranquilizers.*" What he meant was that like Apollo 13, no one anywhere had any experience in dealing with the emergency. There had been some offshore rig blowouts in

shallow waters, but not at such a depth that the problems multiplied exponentially with each metre. After a brief summary of the drilling and subsequent explosion, this book concentrates on the aftermath, the mad scramble to stop the gushing. It was a scramble; the few contingency plans that existed said nothing about what to do if the blowout preventer failed. Every subsequent idea to stop the gushing was ad hoc, and everyone involved was making it up as they went along.

The 126 personnel on board evacuated as the rig turned into a giant blowtorch, but 11 of them failed to make it to the lifeboats. The Company Man (an actual job title, the representative of the company drilling the well) had ultimate responsibility in the same manner that if a sailor slips and falls on the deck of a freighter then the captain is blamed. The Company Man ordered the emergency disconnect system on the blowout preventer to be activated. The engineer hit the big red button, and it really is a big red button, that would activate the 450-ton, 5-story-tall blowout preventer. It had seven independent valves and hydraulic rams, including a dead-hand switch that should have automatically cut loose the 1.5 km long string of drill pipe descending to the seabed.

At sunrise the next morning, as Coast Guard and fireboats circled the flaming rig, everyone watched the movement of the rig. Had the long drill string been cut loose by the blowout preventer and the valves closed, the flames should be dying down and the rig

drifting with the current. Instead, the rig moved in a small circle, its blowtorch undiminished, indicating that it was not only still tethered to the drill string but the pipe was feeding natural gas and crude oil to the surface.

There was chaos around the rig and onshore. Nobody knew anything about anything, and rumours ran unchecked. Different government and company groups worked without reference to each other and gave out conflicting reports. Some said there was a spill but it was minor. Everyone please move along, nothing to see here. Contradictory information went out to the mass media. The leak was 1,000 barrels per day. No, it was 5,000. Maybe 14,000, or perhaps it was 26,000.

There never was any central command, but two different federal commands, BP's emergency command, and a hundred different self-appointed groups ranging from local sheriff's departments to university research teams. Every company and government agency had different proprietary computer software, so they couldn't exchange large data files between themselves. Files attached to e-mails, such as how to operate the ROV or the blowout preventer blueprints, were too large to send and had to be broken apart into smaller sections.

Then came the next problem. BP tried to get a remotely-operated vehicle (ROV) to the wellhead to find out why the pipe hadn't

separated. Blowout preventers and ROVs are not standardized; every one is custom built for each rig, with different types of valve handles or ROV arms. The Deepwater Horizon's ROV had been on deck and was now a lump of molten metal. Only after much telephoning around could BP officials borrow an ROV from another rig that had the same type of equipment. Finally the ROV descended 1.5 km to the wellhead, a ninety-minute trip. It tried to manually close a valve on the blowout preventer but didn't have sufficient hydraulic pressure to move the valve. It was like using a garden hose instead of a fire hose. Then they tried to cut a release pin that was holding open a valve. The grinder was too small, like using scissors instead of a bolt cutter. After much work, they got one hydraulic ram to close on the blowout preventer. Nothing happened. The oil and gas kept gushing.

On April 23rd, the fourth day of the disaster, the half-melted rig toppled and sank. The drill string broke loose, and a gusher began flowing from the seabed where the twisted pipe cracked open. The drill string broke at the top from the rig, not the bottom at the blowout preventer. The drill string was turned into 1.5 km of steel pretzel piled on top of the wellhead.

It didn't take long for everyone to realize that this was President Obama's version of Shrub's Hurricane Katrina moment. Obama himself was the first to understand this. His difficulty was that the American government had no equipment

to even study the blowout, much less contain it. He had to rely on BP. As Achenbach writes: "*The federal government was stuck in a second-rate buddy movie in which the hero and the villain are chained together at the ankles.*" Obama's people went into overdrive to make it sound as if the feds were taking swift decisive action, and it was the others who were responding to them. The bureaucrats contradicted each other and constantly fed misleading information to the mass media, not from malice but from sheer ignorance.

Everyone and their second cousin threw in their two cents worth. One idea seriously considered was to nuke the well. The Soviet Union had done it once in Siberia, but their blowout was on land, and in firmer bedrock. They drilled an intercept well, slid a tactical nuke down the pipe, and detonated it, squeezing the blowout shut and compressing the surrounding bedrock. This idea was eventually abandoned because the Macondo formation was too fractured. A nuke might actually shatter all the bedrock instead of squeezing it tight. This would break open the oil field and produce the mother of all blowouts, one gigantic instantaneous burp that would heave the entire oil deposit up into the water and probably trigger a tsunami.

BP started drilling a relief well on May 2 that would angle down to the bottom of the blown-out well and then pump it full of concrete. It would take until September to reach its target, so at

the same time they prepared a cofferdam to sit on top of the wellhead. This was a giant four-story steel plate box with a conical top that had a pipe sticking out the top. Once in place, the oil would flow out the top into a pipe string that would take it up to a tanker ship. The cofferdam failed before it even got to the bottom. The engineers lowered it straight down onto the gusher. In the frigid waters, the rising plume chilled and then condensed inside the descending box, plugging it up with methane clathrates (frozen natural gas), fine sediment, and viscous crude oil. It was not their fault; no one had done the thing before and there was no precedent. It was realized too late that the cofferdam should have been lowered to one side of the gusher, then swung onto it at seabed level. The gusher was hot as it came out of the seabed, and this heat would be retained inside the box and pipe long enough to get it up to the top. The failed cofferdam was swung over to one side and left as scrap metal.

Next up were various attempts at "junk shots", trying to plug up the well by forcing into it at high pressure a melange of shredded car tires, golf balls, scrap metal fragments, and anything else lying around the shipyard that might fit. Nothing happened, so BP tried a top kill, pumping in drilling mud followed by concrete. 30,000 barrels of the stuff went down the hole but the spewing continued. A smaller cofferdam called a top hat was lowered, correctly this time, and managed to intercept some of the oil and pipe it up to a tanker. Better than nothing but the oil was still gushing.

July 10 came. A massive plume of oil was encroaching onto the Gulf beaches. A photograph of an oil-soaked pelican struggling in the black surf went around the world on the Internet and became the defining icon of the disaster. Doomsday forecasts were a dime a dozen; next the oil would reach Miami, then North Carolina, and finally someone upped the ante and said that it would reach Ireland. Back at the wellhead, the top hat was yanked off to one side, and then a new cap lowered and attached. Finally the Macondo well slowed and stopped on July 15. The relief well reached the blowout on September 19 and pumped it full of concrete from the bottom up. Finis.

The legacy is countless lawsuits and government hearings. The black mess on the beaches is slowly going away, just as previous oil spills did. As the general public stopped at service stations and filled their SUVs, they asked each other how it could have happened and who was ultimately to blame. To answer the latter question, they needed only to look in a mirror.

Epilogue: Recommended Reading.

If you would like to learn more about Peak Oil, I recommend the following books. They are all available from the usual on-line bookstores. I've reviewed them in past issues of OPUNTIA.

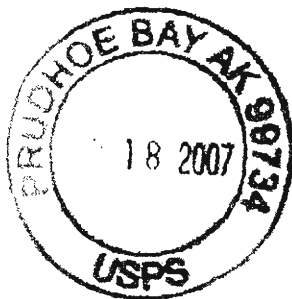
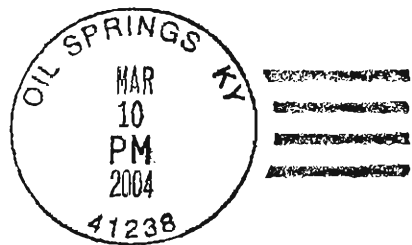
TWILIGHT IN THE DESERT by Matthew Simmons. This is the seminal book that first brought Peak Oil to public attention in 2005. It analyses the production reports of Saudi oil wells and comes to the conclusion that they are lying through their teeth about how much oil they produce. The sheiks and princes attacked Simmons bitterly but he was vindicated when Wikileaks released confidential documents showing the Saudis were in fact fudging their production data. Sadly, Simmons died in August 2010 and didn't live to see it.

A THOUSAND BARRELS A SECOND by Peter Tertzakian. A look at how Peak Oil is affecting us and what is to be done. It is not the end of the world, unless you absolutely must commute to work in an SUV.

BEYOND OIL: THE VIEW FROM HUBBERT'S PEAK by Kenneth Deffeyes. The author of this book was a student of Dr. Hubbert, who in 1956 correctly predicted that American oil production would peak in the early 1970s (actual year was 1970) and world production around 2000 (actual year was 2005). An account of Peak Oil by someone who was in the game early.

WHY YOUR WORLD IS ABOUT TO GET A WHOLE LOT SMALLER by Jeff Rubin looks at the long-term effects of Peak Oil, including the decline of globalization and rising inflation.

OIL 101 by Morgan Downey is not about Peak Oil per se but is a step-by-step textbook written for the general public on how the petroleum industry operates, from exploration to drilling to production to refining to distribution. Find out what a kelly operator does, why a mud logger is a university graduate, and how the crude oil is actually separated out into components such as gasoline, diesel, and kerosene (jet fuel).



MISCELLANEOUS BOOK REVIEWS

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by Dale Speirs

Nulla Dies Sine Linea.

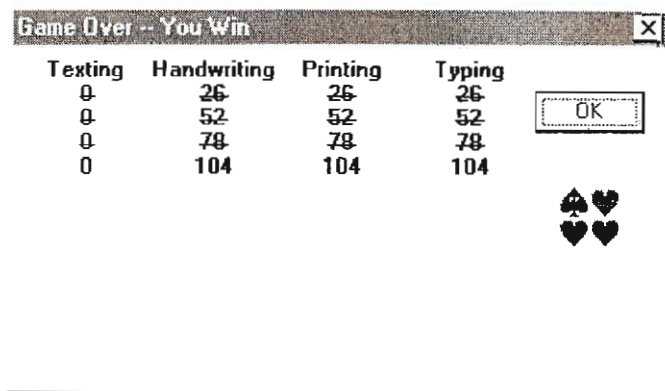
SCRIPT AND SCRIBBLE by Kitty Burns Florey (2009, hardcover) is an informal history of handwriting, mixed in with personal anecdotes about learning penmanship in a Catholic school with Sister Mary discipline. The author grew up in Syracuse, New York, and includes samples of her handwriting from Grade 1 to adulthood, along with a discussion of the methods she was taught. What struck me was how familiar all that seemed, as I was instructed in handwriting in the same manner and about the same time, but in rural central Alberta as a public school student. Like me, Florey is just old enough to remember the transition from ink wells and fountain pens to grudging acceptance by the school boards of ballpoint pens. That was when school desks had a hole cut in one corner to hold the ink well, and we were taught not to press down too hard on the nib because it would create blobs.

Ancient handwriting began with the Sumerians, and for millennia used the stylus, which was then displaced by the quill, but later made a comeback in our modern age with PDAs and credit card terminals where you sign your name on a screen. Handwriting styles have changed as often as typefaces, from the Roman letters to Spencerian script of the 1800s. Spencerian is still used by the

Coca-Cola company on their cans; the flowing letters of the name are one of the last few common uses of the script extant. The Palmer method then took over. Today the modern trend is to hand print instead of using flowing cursive letters; studies have shown it is just as fast and certainly more legible if learned properly. Calligraphy has become an art form detached from the real world except for wedding invitations and diplomas.

Graphology and forensic analysis get a look in. They are not the same thing. Graphology claims to divine the writer's personality from the way the letters are formed, but scientific studies have shown there is no more basis for this than for astrology, aromatherapy, or iridology. Forensic analysis is used for questioned documents suspected of being forgeries, and makes no attempt at psychoanalysis. It simply tries to determine if a piece of handwriting is the real thing of the writer or a fake by looking at how the letters are formed, pressure imprints on the paper, ink authenticity, and habitual words and phrases used.

The author finishes up fretting over the advent of laptops and texting and their adverse effect on handwriting skills. She is honest enough to point out that the same sort of fuss was kicked up about the typewriter a century ago. I don't get upset myself, for what is important is the content, not the font.



The Road To \$5,000 Gold.

Which is the subtitle of DUBAI SABBATICAL by Peter John Cooper (2009, trade paperback), but fear not, I am not reviewing another book on gold investing. Rather it is an autobiography of a sabbatical year he took in 2007 with his wife Svetlana. Many people were rich on paper during the dot.com boom, but few cashed out in time as did Cooper, leaving him with both money and time on his hands. Notwithstanding his wealth, he got himself a position as a travel writer to ease his entry into various countries as a VIP professional rather than a lumpen tourist.

The book starts out with a travelogue heavy on the details of flying business-class around the world, with one side trip back to his native England, where his mother was the Mayor of Salisbury. Cooper and his wife toddle around Hong Kong, South Africa, Australia, Italy, and her native Russia, mostly freeloading as a travel writer subsidized by tourist agencies. He gets indignant when the comps don't come his way, or, on one occasion, has to fly coach instead of business class. His tourism commentary and advice is aimed at an audience who are accustomed to two-bedroom suites at posh hotels and champagne breakfasts. Cooper spends enough time detailing all the wines he drank to confirm the North American suspicion that all Englishmen must be alcoholics because they insist on a drink before noon.

The Coopers make their way back to England in time for the collapse in real estate prices. Spending time in Hampstead touring stately piles convinces them that if they had to be at loose ends, somewhere warm would be appreciated. Cooper knew then, while most of his countrymen were in denial, that the Great Recession was beginning, and decided to sit it out in Dubai.

While in Australia, he had visited the Perth Mint and first thought of buying gold. In Dubai, his interest grew, especially after the Panic of 2008. Cooper met up with various gold bugs, and got the Arabian and Asian point of view. In the Old World, where countries and currencies have fallen many times, people have

learned the value of owning some gold. North Americans are still complacent and only about 1% of them own bullion. What Cooper emphasizes is that currency collapses, like the Panic of 2008, hit faster than the average person can react to it. After the event, many pundits announced they saw it coming, while ordinary citizens angrily wondered why no one told them.

