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BOOK REVIEWS
by Dale Speirs

URANIUM: WAR, ENERGY, AND THE ROCK THAT SHAPED THE WORLD by Tom Zoellner (2009, hardcover) looks at the history of uranium. He begins with a present-day tour of the Shinkolobwe mine in the Congo, a treasure trove of minerals that supplied the Manhattan Project with uranium for the first atomic bomb. The miners who dug out the ore never met the Japanese victims who died from its refined isotopes. The post-war history of the Congo is one of breathtaking corruption and warlordism. The mine has supposedly been closed for decades, but is still being worked by hundreds of illegal pick-and-shovel miners who load pieces of ore into pickup trucks or car trunks and run to the border. The uranium is smuggled out to the underworld.

From there, Zoellner backs up to the beginning of the history of uranium. It was first identified in the 1500s as an undesirable byproduct of silver mines in the Czech town of St. Joachimsthal. The baron who controlled the valley minted the silver into large coins, whose popularity spread because of their quality. The coins were widespread and became known as thalers, or in English, dollars. After the silver mines had been running a few years, it was noticed that scavengers who worked over the waste piles for missed tidbits of silver were subject to a strange wasting disease, but physicians could never figure out what caused it.

The history moves on to the Curies, the use of radium as a cure for cancer, Rutherford figuring out the internal structure of the atom, the discovery of the neutron, Geiger and his counter, and the mad rush to the atomic bomb. Shinkolobwe became of strategic importance during World War Two, and much of its ore was stockpiled on Staten Island in New York City until it was moved to Tennessee for refining. Hiroshima and Nagasaki changed everything. The atomic bomb was so far out of the ordinary that from then on it was only necessary to write "the Bomb" with a capital B, and everyone understood what was meant.

Zoellner takes a chapter to look at how societies everywhere considered the Bomb as a sign of the impending apocalypse. Cultures around the world have myths or religions predicting the end of the world by fire. After the Japanese bombings, the public went into an eschatological mode. It was not a coincidence that the 1950s saw the rise of monster movies like never before or since. Post-catastrophe SF novels became a cliche in the 1960s during the height of the Cold War.

Simultaneously and in contradiction, the word "atomic" became both a fear of the death of civilization and a trendy fad for being up-to-date. Just as manufacturers now add "i" or "e" to the beginning of their product name to make it seem advanced, so it was during the 1950s that trendy products became atomic this and atomic that.

Political boundaries changed massively post-war, as the old European empires slowly fell apart and were replaced by two new empires, the USA and the USSR. No matter what those two did, they could not put the genie back into the bottle. Israel developed its atomic bomb as insurance against extermination by the Arabs. Pakistan and India, fearing each other, hurried to get their own bombs. There was nuclear proliferation, with international inspection agencies trying unsuccessfully to constrain the wannabes.

A worldwide mining boom was triggered. Uranium had previously been thought to be scarce, but that was because no one had been looking for it. Those mines that had found it, tossed aside the ore as useless filler. In Canada and the USA, prospectors with Geiger counters roamed the deserts and mountains. In the Soviet Union and the Warsaw Pact, Russian overlords imported huge numbers of slave labourers to the uranium mines of Czechoslovakia and East Germany (including St. Joachimsthal). Australia's uranium rush ran into problems with race relations, because one of the best mines was also holy ground for the Aborigines.

Zoellner covers the Wild West era of post-Soviet uranium smuggling. One cheerful note is that fraud artists dominate the underground trade in uranium. More than 95% of those claiming to have uranium or the technology to build atomic bombs are

peddling useless low-grade ore that can't be refined, fake machinery or bomb components, and cinnabar (red mercury) passing for purified isotopes. Osama bin Laden once paid $1.5 million for fake uranium, and then decided it would be easier to highjack passenger jets.

Other uranium bandits put on a suit and tie, and roamed the Vancouver Stock Exchange, which once made casinos look respectable. It has since been tamed and mostly cleaned up, mainly because mining promoters discovered it was easier to shill than cheat. There are thousands of junior mining stocks listed today, few of which provide anything more than a tax loss on stocks that went to zero. What investors seldom realize is that uranium deposits are fairly common, but most are not economical due to low-grade ore that would cost too much to refine, lack of cheap bulk transport for remote locations, or too small of an ore body to pay for the cost of building the mine. Today outright fraud is rare, but hundreds of juniors use up investors' money drilling and drilling and drilling but never actually establishing an operating mine. Just as casinos love gamblers who have a system to beat the cards, so is it that mine promoters love investors who are self-taught in geology but not mine economics.

Zoellner's book peters out in miscellaneous travelogues about mines that seem to have been inserted into the book to pad it out and justify his trips as tax deductions. However, the book is an easy read and gives a nice capsule summary of the history of uranium. If you are looking for general background information on uranium, then this is a good place to start.

Monetary Terror.

FIAT MONEY INFLATION IN FRANCE was first published in 1912 by Andrew Dickson White and revised in 1933. It is a study of hyperinflation in the aftermath of the French Revolution. The government was running a deficit but instead of cutting back on spending, it printed an extra batch of money, promising the public that it would be a one-time event. When the first batch didn't work, they tried a bigger batch, and then more, and more yet. Inflation ran wild, speculators caused the stock market to soar, and the average citizen lost their savings.

In 1789, faced with chaotic economic conditions, a massive debt, and a large deficit, the new revolutionary government of France was at loose ends. As White remarked: "*Statesmanlike measures, careful watching and wise management would, doubtless, have ere long led to a return of confidence, a reappearance of money and a resumption of business; but these involved patience and self-denial, and, thus far in human history, these are the rarest products of political wisdom.*" Because of the disorder and unrest, real money in the form of gold and silver coins was hoarded and used only when necessary.

Without the free circulation of currency, the economy shrank. The politicians of the National Assembly called for printing sufficient paper currency which would stimulate the economy, but had trouble getting the idea implemented. Many Frenchmen remembered the previous debacle of hyperinflation under John Law seventy years earlier, and had heard the stories from their parents and grandparents, just as Baby Boomers of today heard the stories of the Great Depression from their parents and grandparents.

The government persevered, and in answer to critics of unbacked currency, called fiat currency, decided to seize the property of the Roman Catholic Church in April 1790. In those days, the Church had accumulated vast properties over 1,500 years, not only buildings but farms and manorial estates. The government valued the properties at 400,000,000 livres, and issued paper currency for that amount called assignats. The general public resented the fat clergymen enjoying the good life and constantly interfering with the commoners in the guise of preaching religion, so the government had no difficulty in making the seizure. The assignats were to pay 3% interest from the income of the property, and thus were readily accepted by the public.

The issue of assignats did indeed provide a stimulus to the economy, and business briefly picked up. The government did not control its expenses though, and by autumn the economy was drooping again. Five months after the assignats were issued, the effect had dissipated. There was much speech-making and debate, but the end result was that at the end of September 1790, another 800,000,000 livres of assignats were issued, albeit they did not pay interest. They were, however, the only form of payment that would be accepted by the government from people buying church lands and for taxes and debts owed to the government. The new assignats were to be burned by the government as they came back to the public treasury so as to contract the currency supply and insure inflation did not ignite. The National Assembly also decreed a limit to assignats of 1,200 million livres, the total amount issued to date.

The supply of specie and copper coins for small transactions continued to dwindle despite the assignats. The government received back 160 million livres of assignats and duly burned them, but on the pretext that there was a shortage of small change, began reissuing the redeemed assignats as smaller amounts suitable for daily business. Accordingly, in November 1790, the Assembly issued 100 million livres worth of assignats in small denominations, some down to a single sou. This did not solve the problem, and in June 1791, another 600 million livres was authorized.

Strangely, each issue of currency had less and less effect in stimulating the economy. Factories began closing anyway and

unemployment soared. Everyone had an opinion as to why the economy was collapsing, but none of them recognized or at least would admit to the true cause, that of too much fiat currency. It was the perfidious Anglais, said some. Others blamed hoarding; those who conserved gold or food should be made to share it with others. The rich had too much money and should be taxed at a high rate.

The ordinary merchant and his customers could all see that prices were rising and the assignats were depreciating. Those who could, bought land, gold, or foreign currency with their assignats, thereby converting paper into something of more value. Stock markets were in their infancy in the 1700s, but many Frenchmen began buying shares as the market soared. It wasn't that stocks were a good hedge against inflation, but the market increase was enough to stave off disaster. Speculators made big money without having to toil on the farm or in a factory. The public mentality shifted from thrift and hard work to get-rich-quick schemes. This was to end in tears though, because while the speculators were rich on paper, they found that when they sold their stocks the paper currency would not buy them anything of real value.

The poor suffered, as they could not earn enough from honest toil to live. Even the most hardened speculator had to agree that there wasn't enough to go around. Therefore, the logic went, if the poor didn't have enough cash, then more must be printed for them. This is one of the characteristics of hyperinflation, where the powers that be consider the problem is too little currency in circulation, what is referred to today as lack of liquidity. To insure increased liquidity and greater capital reserves, more currency is produced, each time said to be the final installment.

Something must be done, said the French politicians, and something was done. In December 1791, 2,100 million new livres were issued, more than doubling the currency supply in one go. 300 million livres were added in April 1792, on the grounds there wasn't enough currency to keep the economy flowing. In July, another 300 million livres were printed. Issues of assignats became too frequent to list individually, but by December of that year, 2,800 million livres had been added.

When 1793 began, hyperinflation was well underway. Unemployment had increased for a while but as the new year began, most of the idle workers had been absorbed into the army to fight foreign wars, thus removing surplus labour from the market. Food riots began, and mobs ransacked shops for bread and meat. The government imposed forced loans, as they called them, on the rich, but since most of the rich had fled the country or hidden their wealth as gold or silver coins, the new tax brought in little. The forced loans were therefore extended downward to the middle class, and later to the lower classes.

On September 29, 1793, the Law of the Maximum was imposed, a set of draconian price controls that fixed the prices of goods so low that no one could afford to sell them. The death penalty was imposed for such traffickers as farmers who held back crops, merchants who closed their stores instead of stocking the shelves, anyone who owned anything made of gold or silver (not just coins, a wedding ring was guilt), or who bartered and did not accept assignats. The Terror had begun. Those who had mortgages found their debts easily discharged by paying them off in inflated money. Those who worked for hourly wages and did not immediately re-invest their money in land, gold, or food, suffered immensely.

The revolutionary factions first guillotined all the Royalists, then Republicans, and then turned on each other. In 1795, the Directory came to power. Currencies came and went. Assignats in livres were replaced by mandats in francs. When converted to francs, the total amount of fiat currency issued since the start of the Revolution was estimated at 45 billion francs. For comparison, a pair of new shoes before the Revolution cost 5 francs. Assignats and mandats briefly circulated together. Both were supposedly based on government land confiscated from the Church and royalty, and both ceased circulating by the end of 1797 when they had been reduced to zero. That was a moot point, for by the middle of the previous year no one would accept any form of paper.

1797 was the final collapse of the French economy. Food and essentials could only be bought for specie and copper coin, or by bartering. Coins gradually came out of hiding and business slowly resumed. It took forty years for France to recover to the same level of economic activity as before the Revolution. Like other countries that suffered it, hyperinflation only lasted a few years, but the effects were felt for generations.

THAR SHE BLOWS !
by Dale Speirs

Volcanoes have long been a popular subject with Hollywood because of the great visuals. There is plenty of opportunity for a big buildup, as the volcano begins to grumble, then the day of judgement with special effects aplenty as people run about like headless chickens. Stock shots of Hawaiian lava flows and Italian volcanoes are cheap and easy to add into the mix.

West Coast Worries.

DANTE'S PEAK (1997) is basically what would have happened had Mount St. Helens been in an urbanized area when it blew its top in 1980. The movie is set in the Washington State town of Dante's Peak, sprawled under the presumed-dormant volcano of the same name.

The annual Pioneer Festival is underway, and the mayor, a single mother named Rachel Wando, doesn't want any trouble. Tough luck for her, as trouble shows up in the form of Harry Dalton, a handsome virile vulcanologist from the U.S. Geological Survey, come to see why the seismographs are going berserk.

There are the usual ominous forewarnings. A young couple skinny-dipping in hot springs on the slope are instantly barbecued by a belch of live steam. Squirrels are dropping dead out of trees from carbon dioxide flows. Lake waters are becoming more acid.

Wando and the town council are worried what all this might do to the tourist trade, not to mention attracting new industry. Dalton calls in the full USGS research team, including his boss. They land on the volcano's edge and send down a robot into the crater. Something goes wrong, and a vulcanologist ends up being helicoptered out by a med-evac. The earthquakes start coming faster and faster, but the boss doesn't want to cause a panic.

Dante's Peak settles down for a week and the USGS team prepares to leave. But suddenly the town's water supply turns brown and sulphuric. A town hall meeting is called. The meeting is adjourned when the volcano blows, which pretty much solves the question-and-answer session in progress. The panic-stricken crowd jams the only road out of town and the excitement gets underway.

Besides the usual scenes of terrified mobs pushing and shoving for the exit, there are the obligatory scenes of characters running into the danger to pick up Granny because she prefers to die in her cabin up on the slope instead of on the road. This has the advantage of allowing extra special effects because the heroes have to make two trips along the volcano, one to visit her and one to escape. Various scenes of natural selection in action are shown, such as people who think they can drive a car through a deep river to escape, or a mercenary helicopter pilot who for $15,000 is willing to fly out through a cloud of volcanic ash at treetop level. He almost makes it to the end of the street.

The second half of the movie is devoted to extras running back and forth, interspersed with lots of special effects. The heros dive into a mine shaft just ahead of the main pyroclastic cloud and wait it out to the end credits. The effects were well done and seemed reasonably accurate based on what I have read about volcanoes. (I have no practical experience in the subject; the last volcano in Alberta cut loose 63 megayears ago, so we don't have to carry extra coverage on our house insurance.)

Overall the movie was realistic in such details as the authorities dithering over whether to evacuate. It is easy to decide in black-and-white situations but the uncertainty of grey areas is a tougher judgement call.

VOLCANO (1997) is about a volcano erupting in the middle of Los Angeles, a geologically improbable event, but fair enough as the premise of this movie. Tommy Lee Jones plays Roark, a single father of a teenage daughter. He is the manager of the municipal Office of Emergency Management. There has been a 4.9 magnitude earthquake, and we are introduced to the lead characters, including the engineer in charge of a subway construction project, a hospital doctor whose husband just completed a 22-story skyscraper, and assorted hangers-on.

And away we go with the ominous forebodings. A sewer downhole crew is killed by hot sulphuric gases, supposedly because they hit a steam line. The La Brea Tar Pit starts bubbling. OEM ignores the USGS and brings in university geologist Amy Barnes as an adviser. Roark feuds with the local Dept. of Water and Power, the police chief, and the subway contractor because he wants to shut down everything in the area.

Barnes and a disposable bit player go downhole into the sewer to find out what's what. What it is, is another powerful earthquake that cracks open the sewer line where they are standing and sends the bit player falling to her death into magma. Up top, the city's power is out, there is a mysterious haze, and manhole covers are being blown into the air by steam. Roark and his daughter drive over to the Tar Pit just in time to see it turn into a lava fountain, with ash and pumice boulders falling from the sky.

The special effects kick into full gear, with flaming debris and burning buildings, as stunt drivers loop-the-loop their cars in intersections for no apparent reason. A subway train is stranded in a tunnel and hot gases and lava flow down the line. An heroic female doctor begins treating the wounded in the street with nothing more than a flashlight and some blankets. Roark and filly fight their way through streams of lava as buildings collapse around them.

The news spreads and the first responders go into action. Brave firefighters pour water onto lava. Someone makes a phone call and federal assistance arrives within the hour (this movie was made before hurricanes Katrina and Rita). Roark stays on the scene and organizes everyone to divert the lava into trenches and sewer tunnels and send it out to sea. Part of the diversion involves imploding the aforementioned newly-completed 22-story skyscraper into a giant rubble pile that will deflect the lava flow. Yes, that would work, although it is amazing how the firefighters managed to wire several hundred charges inside the building in five minutes with no advance notice to obtain the charges.

The plan succeeds and the lava flows down the sewer tunnels into the Pacific Ocean. Mount Wilshire, as the volcano is named in the epilogue, continues to grow and does its part for slum clearance. As a straightforward action-adventure, this movie works well, but don't get too hung up on the details. It does get into the action

and special effects a lot faster than most such movies, a good thing. Many such movies spend too much time on forebodings and character development while this one quickly cuts to the chase.

East Coast Worries.

DISASTER ZONE: VOLCANO IN NEW YORK (2006) is about a volcano erupting in Manhattan. Since you don't have to be geologist to know the city is not in a volcanic zone, the explanation provided is that there is a secret geothermal project hidden in a West Side warehouse. They have drilled seven miles below the surface in a quest to find rock hot enough to generate steam for electricity. That, by the way, would be a world record for drilling, which the mad scientist in charge of the project is quick to emphasize. He may be two crackers short of a boxful but he's not so far gone as to forget his share of the glory.

The movie opens with a tedious scene of sandhogs (tunneling labourers) assembling at the start of their shift as they prepare to go downhole on a water supply tunnel job. All the usual characters are gathered: the good-looking rookie, the big muscular black dude who won the Samuel Jackson lookalike contest, the cynical but wise leadhand, a sweet young thing for the feminist faction, and assorted bit players who will be killed off one by one during the movie.

Meanwhile, back at the geothermal project, things are not going smoothly. The project, which is secret because city funds are being illegally diverted to it, is behind schedule and over budget. Naturally the person chosen to head the high-stress operation is a mad scientist with a weight problem, living on antacids and heart pills, and one nervous tic away from insanity.

Over at the water tunnel, disaster strikes. Sandhogs are killed or maimed when what was supposedly a cooling-water line bursts open and sprays them with steam and caustic fluids. Others are electrocuted because something has dissolved the insulation on power lines. Then things get really exciting when a crack opens in the tunnel wall and lava starts flowing out. Up top, homeless people huddled around steam grates are asphyxiated by toxic gases, and boats in the harbour are blown up as magma bubbles up onto the sea floor.

The government responds as it always does. The FBI and the USGS both arrive and immediately get into a jurisdictional dispute. Never mind the lava, the important question is who has seniority. The sandhog leadhand and his ex-wife sneak around doing their own investigation, made easier because the FBI agents keep haring off after every incident in the city instead of sticking to the task at hand. Lava bursts out of houses (it was a gas main explosion, the press are told), and manhole covers are flung high into the air by live steam.

The geothermal project becomes a lava fountain and then a volcano, and the mad scientist flees the scene of the crime. Manhole covers continue to be fired up into the air, only now due to geysers of lava. The newborn volcano showers Manhattan with ash. City dwellers do their best imitations of headless chickens. Half of the extras run one way on the sidewalk and the other half run the opposite way, so one group must be wrong and running toward the lava flow. The cameras are continually shaken and extras fall down, so this means there are tremors from the volcano.

The sandhogs go down below to blast open connections between sewer tunnels and divert the magma into an underground route out to the harbour. Some more of the sandhog bit players are thinned out by magma, and the mad scientist finds his way down into the tunnel for who knows why. At the last minute, the connections are blown open and the magma is diverted into the harbour to add new shoreline to the south end of the island. All's well that ends well, except for the dead, maimed, and newly homeless.

The Big One.

Krakatau, also spelt Krakatoa, was the largest recorded volcanic eruption in the last millennium, destroying the island of that name on August 27, 1883. It featured in a 1966 episode of THE TIME TUNNEL titled "Crack Of Doom". This televison series starred two characters named Tony Newman and Doug Phillips who were endlessly flung about time and space, always arriving just before a significant event in history.

Just once I'd like to see a time travel story in which the heroes land at Pearl Harbor on December 7, 1066, or visit Lundy's Lane on July 25, 1492.

Be that as it may, Newman and Phillips are randomly flung through the time machine onto Krakatau, arriving August 26, 1883. They interrupt a native human sacrifice intended to appease the volcano god. Phillips happens to speak Malay, and the tribal headman speaks English, but the sub-plot of restless natives is nothing more than that, a sub-plot.

The main action is with Dr. Everett Holland, the resident mad scientist, and his beautiful daughter/assistant Eve. She dresses in the full Victorian-era skirts and jackets, leaving one to wonder why she isn't dead from heat prostration. The natives are only wearing loincloths and they are bathed in sweat. Newman and Phillips arouse Eve's suspicions, and she thinks they are trying to steal the credit for her father's work. This is a twist on the usual arrangement; it is the daughter who is mad and the father who is naive. Dr. Holland wants to stay until the last moment to collect sufficient data, thinking that he has plenty of time. Since the time travelers can only say "Trust us, get the hell out of here", the Hollands are not listening to them.

Meanwhile, back at the Time Tunnel lab, the engineers are worried about extracting the boys before the volcano blows. The time machine is unreliable, which is the whole premise of the series, and prone to electrical fires, no one having invented the circuit breaker in that universe. There are the usual alarums and excursions as everyone tries to finish off the plot. The Hollands are finally convinced to flee for Sumatra by outrigger canoe about five minutes before the volcano blows (the natives are good paddlers). The time travelers are snatched up and sent to ancient Greece just in time for the Trojan War, but that is another story for next week, same time, same channel.

This series was produced by Irwin Allen, a man who never let a stock shot go to waste when he could re-use it at least three times in one episode. We therefore see a steady mix of Hawaiian lava flows and Italian volcanoes erupting. There are also the standard earthquake shots where the cameras are shaken while the actors lurch about and fall down. The basic plot wasn't so bad actually, but the screenwriter couldn't overcome the low-budget sound stage tropical island visuals.

KRAKATOA: EAST OF JAVA is a 1969 movie more famous for its title than its content. Krakatoa is actually northwest of Java, but Hollywood never lets piddly little details like that get in the way. Being a professional horticulturist, I spotted one anachronism in the beginning of the movie, where the heroine carries about a potted plant of *Aechmea fasciata*. It is a South American bromeliad which today is common in cultivation worldwide as a houseplant, but in 1883 would not have been seen in Indonesia.

The basic plot is that Capt. Chris Hanson, of the steamship Batavia Queen, is seeking a fortune in rare pearls in a sunken ship near Krakatoa. He commands a crowded ship. In addition to the usual passengers and cargo, he has hired Filipino pearl divers, balloonists to do an aerial search for the wreck, deep-sea divers, and an inventor who wants to try out his new diving bell. There is also a young widow with whom Hanson had an affair while she was married to the captain of the wreck. Against Hanson's will, the colonial overlords have ordered him to take thirty prisoners to the island of Madura en route.

There are far too many subplots to detail, but a few of them are a deep-sea diver trying to rape one of the pearl divers, the convicts temporarily seizing control of the ship, and several different romances. The ominous forebodings show up in good order: violent eruptions of flames from the open sea, eerie banshee noises from beyond the horizon, thick sulphuric fogs, and unbearable heat unusual even for the tropics.

The ship anchors off Krakatoa where the wreck is said to be and the search begins. After some exciting scenes, mingled with coral reef stock footage, the wreck is located.

The spotter balloon is carried away and takes the grand tour of Krakatoa's crater before finally splashing down near the Batavia Queen. The safe is recovered from the wreck's strongroom but no pearls are found, only a logbook. Simultaneously, Krakatoa gets serious about erupting, and the Batavia Queen has to run the gauntlet of fire. Lava bombs rain down on the ship and assorted bit players are squashed, deep-fried, or both. Having cleared the immediate vicinity of the volcano, the Batavia Queen makes a run for safety, picking up survivors from a ragtag boat along the way.

Some of the supporting actors demand to be put ashore at the first port. Hanson warns them, correctly, that when Krakatoa blows, the tsunami will wipe out everyone ashore, while the ship has a good chance out on deep water where the tsunami will not be very high. Nonetheless they go ashore to demonstrate that natural selection is still working. The Batavia Queen rigs for storm, and the special effects go berserk as Krakatoa detonates and the tsunami rolls over the port. The ship rides out the giant wave, while on shore the villagers are cleansed from the face of the Earth.

Overall, the movie wasn't that bad. The special effects were good for their time (1969). The movie's main failing was too many subplots and characters. Had some of them been eliminated, the pacing would have been better.

MAGMA: VOLCANIC DISASTER (2006) starts off with a team of vulcanologists in Iceland studying a dormant volcano. They grumble about how there's nothing to do and wish for some excitement. In the few remaining minutes of their lives they learn that you should be careful what you ask for because you may get it. Cue the fair-to-good special effects of lava suddenly pouring out of the volcano and over them.

From there, a jump cut to Mount Raven University in Rochester, New York, where vulcanology professor Peter Shepard, perky grad student Brianna Chapman, and assorted bit players head out to Iceland to study another volcano. They pick a different dormant volcano to descend into but with no better luck. It, too, erupts but since the crew are lead characters they manage to outrun the lava flow with seconds to spare.

There was one scene inside the crater just before eruption that stuck in my craw. One of the grad students uncovers a fossil ammonite (an extinct shelled ancestor to squids). They are amazed at finding a perfectly preserved ammonite in pyroclastic rubble and so was I, because fossils are found in sedimentary rocks, not igneous ones. (And in case anyone writes in, the petrified trees in Arizona and the bodies at Pompeii are casts, not fossils.)

As the team flies back to the USA, they listen onboard to a newscast that blames the triggering of the volcanoes on offshore natural gas drilling in Iceland. Natural gas does not occur in volcanic rock any more than fossils, but I'll be generous and assume they meant methane clathrates, which are seabed deposits of natural gas frozen into ice water. No mention made in the movie as to whether the drilling rigs were operated by British Petroleum, whose safety record was notorious even then.

Back in New York State, Shepard visits his old mentor Oscar Vallian, who was recently dismissed from the U.S. Geological Survey for his hypothesis that all the volcanoes of the world are going to blow and envelope the Earth in clouds of ash. He calls it Exodus, and apparently it is a career killer at the USGS. He gives Shepard all his data as a farewell gift, then heads to Mount Fuji to await his death when it blows as he predicted. Vallian is accompanied by his own perky graduate student, and one wonders why she is so suicidal. He is short, dumpy, middle-aged, and in a wheelchair, so one hopes it is because she sees him as a father figure and not a lover.

Shepard goes off to Washington, D.C., to try to convince the bureaucrats that Exodus is real, with results about what you would expect. He explains that Exodus is caused by the Earth's core over-heating and expanding, thus squeezing magma out all the fault lines and volcanoes of the planet.

There is a romantic subplot to pad out the drama and special effects. Shepard is separated from his wife Natalie, who is a forest ranger at Yellowstone National Park. It happens that the park is a dormant supervolcano (true fact), and just in time for the plot it comes back to life. Chapman doesn't seem to know whether she should be an agony aunt to Shepard and talk him out of his separation, or take the traditional route of female grad students and have an affair. Possibly both, but as this was a PG movie, nothing more happens other than long talks.

Shepard, Chapman, and the team are off to Columbia for some more special effects down a mine shaft. This also helps to thin out some of the cast when they discover the mine tunnel they're in is actually a lava tube. Why a team of vulcanologists can't tell the difference between a hard-rock mine tunnel and lava tubes is not for us to notice.

The survivors then head to Washington, D.C., for more bureaucratic wars and get an audience with the President. We (and the President) now learn that Exodus was caused by all the toxins and radiation that humans have released, which somehow is responsible for heating up the core. Even the strongest proponents of global warming are only saying the Earth would warm up by five to ten degrees, hardly enough to heat the core by thousands of degrees. The screenwriters were definitely reaching on this point.

Shepard proposes a plan to relieve the pressure on terrestrial volcanoes and fault lines by blowing open fault lines under the ocean and letting the magma flow out onto the seabed in deep water where presumably it will do less damage. The explosions will be done with the planet's supply of nuclear bombs, which begs the question about toxins and radiation.

As the world's boomer submarines are mobilized, Natalie is busy outrunning lava in Yellowstone. The scenes alternate between submarine special effects and Yellowstone effects, while a voiceover from the President making an emergency broadcast inspires the people. The undersea faults are nuked in good order, and all the volcanoes around the world instantly stop erupting. The Yellowstone lava flows stop a few metres before they overrun Natalie. She is so relieved that she goes back to her estranged husband. Cue the orchestra and end credits.

How did we ever get along without nuclear bombs? Not only that, no one had to reverse the polarity of the doubletalk generator, the other standard method of world saving.

"The Cherry Blossom Affair" is a 1965 episode from the second season of THE MAN FROM U.N.C.L.E Napoleon Solo is assigned to meet Dr. Grayson, a defector from THRUSH. He carries with him a canister of film showing a device that can activate individual volcanoes from the other side of the globe, with obvious implications. In the arrivals lounge, he is interrupted by a young Japanese woman named Cricket Okasada, who asks him for a light for her cigarette. (For the benefit of the younger generation, in those days one could smoke in any building or carry film canisters on and off passenger jets without security inspecting them.) She happens to be carrying an identical film canister except that it contains an independently-made movie negative into which she has sunk her life savings. THRUSH assassins kill Grayson in the lounge but in the confusion grab the wrong film and take it to Japan.

The THRUSH high command is not pleased with the Japanese satrap, named Harada, for bungling the job. Not only that, the satrapy headquarters building is sweltering and Harada is having trouble getting a repairman for the air conditioner. Okasada heads back to Japan, followed by Solo and his trusty sidekick Ilya Kuryakin. While searching for her stolen film, Okasada winds up in the lion's den, or rather the thrush nest. The three of them, separately or together, get in and out of captivity over the next few scenes. They also face various deaths by impaling on punji sticks, the bamboo shoot torture, or life-size puppets, as Harada seems to suffer the usual inability of villains to just shoot his victims in the head and be done with it.

To be fair to him, he is having his own problems. Not only can he not get the damn air conditioner repaired, but his overlords are

complaining about his sloppy security around the volcanic activator, what with U.N.C.L.E. agents roaming the corridors and an annoying young woman who keeps demanding that they return her film. They want the volcanic activator demonstrated pronto, so Harada chooses Mount Kilo in Vulgaria as the first target (I would have suggested Krakatoa).

Everybody winds up back at Harada's headquarters for the denouement. Solo and Okasada are prisoners, and Kuryakin infiltrates the satrapy as an air conditioner repairman. None of the Japanese THRUSH agents recognize him despite having encountered him earlier in the show and him not disguising his face. Then again, probably all white men look alike to them.

The air conditioner is conveniently located in the volcanic activator control room next to the main panel. One can see the plot coming without psychic abilities, and just as the activator is powered up, everything is blown apart. Vulgaria is saved, so is the girl, and the producer didn't have to spend any money on stock shots of Hawaiian volcanoes erupting.

There is one noticeable loose thread left over. The air conditioner never does get repaired.

THE STATE OF ZINEDOM AS OF 2010-12-31

by Dale Speirs

The long slow decline continues after the initial fall off the cliff. My unscientific observation is that it is mostly due to the old soldiers fading away, with fewer new recruits to take their place. Those left seem to be publishing as much as they ever did, according to page counts. eAPA is an electronic apa that should have no limitation on page count; FAPA and POD are paper apas.

# of pages published			
Year	eAPA	FAPA	POD
1997		1,348	
1998		1,454	
1999		1,540	1,308
2000		1,463	1,533
2001		1,266	1,360
2002		1,389	712
2003		1,273	dropped
2004	n.a.	1,903	membership
2005	424	1,065	
2006	722	1,287	
2007	494	1,019	
2008	448	1,088	
2009	497	1,011	
2010	414	1,011	

The number of zines I receive annually is shown below. After a precipitous drop at the Millennium, the decline has settled into a long tail distribution. The Boomers are mostly in their 50s and 60s, still able to publish. Once they hit their late 70s and 80s and start pricing nursing homes, the decline in paper zines will speed up again.

I've scanned all the back issues of OPUNTIA and put them on disk. A few years from now I'll put them online but not just yet. It doesn't matter what I think about the virtues of the Papernet; future generations will only be reading this on a screen. But I'll stay with paper as long as I can.

Year	Australia	Canada	Britain	USA	Others	FAPA	Other apas	Totals
1998	23	31	39	244	7	155	10	509
1999	14	51	67	213	19	150	125	639
2000	7	55	55	161	29	140	90	537
2001	9	42	35	172	25	132	68	483
2002	10	40	42	184	31	102	42	451
2003	4	72	27	171	26	111	34	445
2004	1	33	19	172	34	135	53	447
2005	8	34	14	148	27	116	dropped	347
2006	5	10	32	130	18	120	all other	315
2007	5	32	12	139	10	105	apas	303
2008	5	28	10	136	7	115		301
2009	5	31	8	143	5	105		297
2010	6	26	5	138	8	98		281