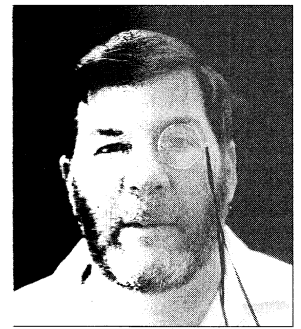


Moffat's Madhouse...

by TOM MOFFAT



Tesla Updates, and Other Oddities...

Isn't it interesting what gluttons for punishment we humans are? You get abused, reviled and chastised for something, and then come back for a second dose. You'd think that after stirring up a hornet's nest once, and getting stung many times over, we'd give up. But oh, no... here we go again.

You may remember some time ago in *Electronics Australia*, an article about the life and times of one Nikola Tesla. This gentleman was known as possibly the world's most gifted scientist and inventor by some people. But among others, he was the world's greatest crackpot.

People in the 'crackpot' camp are the most passionate believers in their views, and they are the ones who were inspired to write so many abusive letters to the author of the Tesla article — me — as well as the usual letters to *EA* editor Jim Rowe demanding that I be fired for writing such drivel.

Tesla was best known for his inventions involving electricity; he was the originator of the spectacular Tesla Coil seen resurrecting monsters in Frankenstein movies. But his use for the coil was somewhat more practical — transmitting electric power from one place to another without the use of wires. It wasn't a pie-in-the-sky scheme; it did work, in Colorado.

But the technology was never exploited, most likely because commercial power transmission interests wanted to keep wires. This was because wires fed through electric meters, allowing them to charge people for electricity. Tesla's scheme would have given power users the charge without the money, if you get my drift.

Less well known was Tesla's work into mechanical engineering and hydraulics. He designed some rather unique pumps that people nowadays would call 'impossible'. But again, they did work. Tesla's pump-building career started when most kids are still

sucking their thumbs, as described in my Tesla article:

It took all of five years (from his birth) before little Nikola came up with his first invention, a waterwheel featuring a turbine without blades. This gadget later matured into a remarkable uncloggable pump which is now in commercial production in the USA.

I saw a working model of this pump, made of clear plastic, in the Tesla Museum in Colorado Springs. It was set up to pump water around in a circle, from the output, through plastic pipes and a valve, and back to the input. The water had been dosed with lots of styrofoam beads which flowed around with it.

If you slowly closed the valve, the water would still get past but the beads would get trapped, backing right up to within the pump itself. But when the valve was opened again, the beads, and water, all flowed smoothly. This kind of treatment would have wrecked an ordinary pump.

Tesla kept working away at his pump projects, finally coming up with a version that used no moving parts at all. He took out a patent on it, 75 years ago, amidst the usual cries of 'crackpot' and 'drivel'.

Well, drivel it may have been, but not to some researchers at the University of Washington in Seattle. They have been working on the 'Tesla Pump' as described in the 1920 patent document, refining it, and miniaturising it down to near-microscopic size. It appears that the main application will be in medicine, as an infusion pump for moving small amounts of fluids for a very long time. Such a pump could be implanted in a person's body, and since there are no moving parts, it would never wear out. It would remain in service forever — for life.

The modern Tesla Pump works on a kind of 'leaky valve' principle. The fluid follows a complicated path of loops which result in it being easier for it to

flow in **one direction** than in the other. So the **overall result** is the fluid flowing — being **pumped** — in one direction.

Engineers were able to re-create Tesla's **original design** by etching the fluid paths **into wafers** of silicon, exactly as is **done to create** integrated circuits for **electronics**. The result looks like a series of **pretzel-like loops** on either side of **the pump chamber**. The pump's **inlet and outlet valves** are about the **width of a human hair**. The pump chamber itself is about 6mm in diameter and 0.1mm thick.

The pump **'pumps'** because of an alternating **current charge** at an audio frequency **which is applied** across the pump chamber. The charge makes the walls of the **chamber flex** in and out, squishing the **fluid in** the loops back and forth. **But since** the fluid moves more easily in **one direction** than the other, there is a **constant one-way flow** through the **pump**. It's not very efficient, but if it lasts forever, who cares?

This Tesla project is being taken very seriously at the University of Washington. So far more than \$200,000 in public and private funding has been spent developing the Tesla Pump. A team of engineers has been assigned full-time to perfect it. And according to a UW spokesman, "We expect miniaturized fluid systems to be a major breakthrough in new technologies". All this due to the work of a crackpot...

But to borrow a phrase, you ain't heard nothin' yet. It was strongly believed that Tesla had succeeded in developing a death ray that could destroy men and machinery 'to a distance of 250 miles'. This was mentioned briefly in my *EA* Tesla article, in connection with some alleged nefarious activities of the United States government:

As for Tesla's 'disappearing' research notes, papers associated with such things as the death ray project

are now said to be held within a top security US government vault, where they remain to this very day. Public information about Tesla's death ray is very sketchy, but it is definitely known that the device was based on a particle-beam principle. It just so happens that a particle-beam weapon was a main feature of the United States' 'Star Wars' program that was under development right up until the end of the Cold War.

Further research suggests Tesla also had a much more sophisticated death ray, and he may have in fact developed a laser-like device. Apparently his early death rays simply directed lots of radiant energy at a target. One model was able to explode a charge of gunpowder or light the wick of an oil lamp at a distance of 10 metres.

This concept sounds exactly like a gadget being developed at the University of Tasmania several years ago to ignite 'controlled burn' bushfires from a distance. It was a powerful laser, connected to shoot backwards through a large reflecting astronomical telescope, the whole works mounted on the back of a truck. The telescope could be aimed in any direction to fire a charge into a forest, starting a carefully placed fire.

Ionised a path

But Tesla's first death ray was small beans compared with what was to come later. The most successful design used a laser-like light source operating on ultraviolet wavelengths to ionize a path through the air along the beam, making it electrically conductive. Then all Tesla had to do was connect the beam to one of his enormous electrical generators to electrocute the target on the far end of the beam.

And only this week there was an announcement of a new United States government project — an aircraft-mounted death ray. This weapon is to fly around, keeping an eye open for missile launches. When a launch is detected the aircraft immediately shoots out a death ray, instantly annihilating the missile just as it clears the launch pad. The remains of the missile fall back to earth, instantly annihilating the baddies who set it off in the first place.

The announcement of this weapon was somewhat vague in detail, but the word 'laser' was mentioned. And footage of the test model was shown on television — a Boeing 747 jetliner, and inside, the whole aircraft was filled with something that looked like

an enormous white trombone, with its business end pointing out the nose of the aircraft. Could this have been some kind of a 'folded' laser? Are such things possible? The world's biggest fibre-optic thing? Even more interesting would be to know if this device operates on ultraviolet frequencies. Apparently the range is specified as 250 miles.

Since we are stirring up trouble today, let's rattle another cage: cellular phones and cancer. This topic was the subject of a major research effort that lead to a rather controversial article in *EA*, an interview on the Derryn Hinch radio program, lots of action in 'Forum', and some memorable fan mail for the article's author (guess who), such as the following:

Apart from the glaring factual errors, Moffat's article on E-M radiation was typical of the puerile, badly researched empty waffle, that is his trademark... While ever you continue to print such rubbish, you are hurting the reputation of a magazine which for many decades has been careful with its facts, and generally researched its articles well.

A Seattle television station recently took up the very same story, along the same lines as that puerile, badly researched empty waffle in *EA*. They even managed to nail an on-camera interview with Dr Louis Slesin, one of the main sources I quoted in the article.

The general thrust of the TV story was that using cellular phones can cause headaches. This was accompanied by footage of people walking the streets of Seattle yapping into their cellphones as the antennas slowly frazzled their brains. There were suggestions about how to minimise the danger, and other details which slip my non-cellphone affected mind at the moment. Because the real kicker came at the end of the story.

After Dr Slesin said his bit, the TV station actually got someone from the cellular phone industry to respond on-camera. The story featured an interview with the PR lady from one of the local cellphone companies, who of course said there was no danger at all in using her company's products.

Then the reporter asked, "But what about Dr Slesin's claim that cellphones can and do cause cancer?" The PR lady was quick on her feet: "That may be true, but only in Europe and other overseas areas where they use the digital GSM system. That system is not currently in use in the United States so we have no danger of cancer."

Ooohhh Boy! Did she really say that? Yes, she did say that. I heard her say that. Did I say that? No. I did not say that. I am only reporting the PR lady saying that. Yes. I am a lowly reporter. I need my job. So please, don't any of you write in and demand that I be sacked!

I guess that's enough 'stirring the possum' for one day. I was going to tell you some more Tesla stuff — that some people believe he has travelled to Mars and may be responsible for those strange faces that appear there. I was going to tell you that Tesla was best mates with a guy named Guglielmo Marconi, and that he helped Marconi set up a secret underground city in the Andes where 98 scientists worked on projects to develop free-energy devices and discoid aircraft (flying saucers to you!)...

But no, that's promoting a crackpot, and we wouldn't want to do that. Instead, permit me to refer you to an interesting book to be found in the Port Townsend Public Library, and probably your own library as well: *The Fantastic Inventions of Nikola Tesla*, written by none other than — who else? — Nikola Tesla. See you! ♦