

Fiat Lux – et facta est lux

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The virtuous are early to bed and early to rise not wishing to waste the daylight. The less virtuous party on under the glow of artificial light. A poor light, though, compared to the sun but better than nothing. First there was firelight then candles and lamps and then in historically recent times the gas lamp until this in its turn gave way to devices powered by electricity. Maybe that's the end of an energy road, changing from one type to another – maybe not, crystal ball gazing is notoriously inaccurate. It's probably safe to say that electricity is here to stay, or at least for a very long time. Even the most way out futurologists surmise only that the future will be lit by electric light. Where the electricity comes from will change and how it is used will change but the one will still beget the other.

It started a while ago but nothing useful could happen until a stable source of electricity was available and in 1800 Alessandro Volta, invented the voltaic pile which would produce a steady electric current from two dissimilar metals immersed in a conducting solution. Within 10 years the English chemist, Sir Humphry Davy connected a charcoal strip across such a device and demonstrated “electric luminosity.” This was the first glowing lamp, albeit probably very short lived.

The first experiments to produce commercially viable “electric light” were in 1820 when Warren De la Rue, son of Thomas De la Rue, the founder of the firm of stationers, enclosed a platinum coil in an evacuated tube and passed an electric current through it. This worked, but then as now, platinum was too expensive to develop the idea. Many others tried using cheaper materials, often based on a carbonized natural material, but the pumps

available could not produce a “hard” enough vacuum to stop the filaments burning up. It was not until 1875 when Herman Sprengel invented the mercury vacuum pump that it became possible to develop a practical electric light bulb. In the same year a patent for such a device was granted and shortly after this was sold to Thomas Edison and the rest is history. By 1879, using lower current electricity, a small carbonized filament, and an improved vacuum inside the bulb Edison was able to produce a reliable, long-lasting source of light. Another 20 or 30 years later tungsten filaments were introduced instead of carbon and, further development followed further development until we reach where we are today.

Of course that is not the whole story; even in the early days there were arc lamps and vapour lamps these in time became fluorescent lamps. All these ways of producing light had their particular uses and any improvements were driven by need. But now things are changing, the lights are fine but there is fear that the electricity to run them is running out. The incandescent bulbs which have served us well for over a century may have run their course. They use too much electricity. Australia was the first country to announce an outright ban on these bulbs by 2010. Now Europe and the US have jumped in with their proposals and bans. We have to wait and see what will happen since the manufacturers are not giving in easily. There may still be life in the old incandescent bulb. The General Electric Co. (think back to 1890 and its origins as the Edison General Electric Company and realize the wheel has turned full circle) has said that by 2010 it would make an incandescent bulb twice as efficient as today's – and by 2012 produce one that

is four times more efficient, on a par with the compact fluorescent lamps (CFLs), promoted so heavily today.

So, it's good news, technology has been kicked into action. Cheaper light sounds good. Of course there are problems; CFLs, like fluorescent tubes, contain mercury. The amount is small, about 5 mg, but that's enough to make the regulators tremble. They may require end-of-life bulbs to be disposed of at a recycling center – I think that one will fall at the first fence. We must wait and see. And of course there are way over the top instructions for a broken bulb which show that regulators do not understand that the danger from a broken bulb is broken glass. Their single track minds can only focus on the mercury.

But mercury will not always be a vital component for some lamps. Technology is on the march. Life in the future will almost certainly be lit by light emitting diodes rigged and jumbled together in many fancy ways. They are already in many homes as supplementary lighting but not really yet as the principal supply of white light. LEDs are the newest forms of light, a laboratory curiosity over much of the last century they became a viable light source in the 1960s. Initially just small red dots of light but over time they were produced in a range of colors and now as white light. The energy crunch may be just the boost they need to develop them from fancy and specialist items to major items in domestic lighting.