Letters

LET'S HAVE SOME HEALTHY SCEPTICISM

I would like to start a debate on the information we are fed on a day-to-day basis – information that we apparently accept without question. Example: why should I put a blanket on a hot water cylinder that is properly constructed? The metal casing of my cylinder is cool to the touch, which indicates to me that there is no heat loss from the appliance.

In my opinion, the heat loss occurs in the uninsulated pipes that carry the water to various points in the house. Surely a more effective saving would be in time control? After all, you don't keep your kettle boiling all day in anticipation of a cup of tea.

What about airbags in cars? The life of a pyrotechnic device is not infinite, and whereas I'm concerned about the risk of airbags deploying while I'm driving, I'm even more concerned about the possibility that they won't deploy when needed. The manufactures intend these vehicles to be changed (taken out of service) within a short time frame (5 years), yet for most of us in this country, a car is a 10-year investment.

Cellphone manufacturers would have us believe that the "microwave machines" we hold to our heads will have no side effects, yet in 40 years' time it will be a case of "Oops, sorry, we were wrong". The point: they cannot conduct a meaningful test over the short term, which means they are playing with people's health in the long term.

RONNIE MARCHANT
CAPE TOWN

ETYMOLOGY ALERT

In "Time machine" (January issue) you state that the word "technology" was not in the lexicon of 1902, when Popular Mechanics was founded. Are you sure about this? Admittedly, the Illinois Institute of Technology was not established until 1940, but when HH Windsor founded PM, surely he had heard of the Massachusetts Institute of Technology (MIT), which was founded in 1861?

Notwithstanding this, there is nothing

CAN BATTERIES CURE OUR OIL ADDICTION?

WINNING LETTER

The hydrogen economy will never happen. Not because the hurdles mentioned in your article ("Hydrogen power", December 2006 issue) are insurmountable – and you haven't even scratched the surface of the safety issue – but because the battery revolution has already started.

It's a bit like the story of the man who developed new technology to remove horse dung from the streets of London, just in time to find that horses had been replaced by cars. The great hurdles to the battery economy have never been energy production or distribution, because the infrastructure for this has always been in place (the electricity grid).

The real problems are energy density, recharge time and battery life. As Terry McClement pointed out in his letter (December 2006), apart from these problems, building an electric car is not rocket science.

Energy density: The workhorse battery of the automotive industry has always been the lead-acid battery, which has, by today's standards, a very low energy density of 30 Whr/kg. For this reason, electric cars have always been small and slow, with a limited range. In other words, the typical golf cart.

Recharge time: The typical battery car needs about six to eight hours of plug-in time before you can go another 30-40 km.

Battery life: Every battery has a finite number of charge-discharge cycles before it becomes useless. Replacing batteries every so often can be very expensive.

Safety: Lithium-ion batteries present real safety concerns. The graphite anode can react with the electrolyte and start a runaway thermal reaction.

However, these problems appear to have been solved by an American company called Altair Nanotechnologies. They replaced the graphite anode in the lithium-ion battery with lithium titanate nanoparticles that have a very large chemically active surface area. This not only increases its efficiency, but because the anode is practically inert, the danger of thermal runaway is eliminated. Charging time? About 10 to 15 minutes for 35 KWh, and because the nanoparticles do not deform during charging and discharging, the battery has an unheard-of lifespan.

Even the lowly lead-acid battery is emerging as a possible petrol engine-killer. The theoretical energy density of lead-acid chemistry is about seven times that achieved by existing lead-acid batteries.

Another American company that has sparked a lot of speculation is EEStor. Although they're tightlipped about their product, rumour has it that they have built an ultracapacitor with about 10 times the energy density of a standard lead-acid battery at half the cost, and with a virtually unlimited lifespan.

If this product really exists, and works as we're told, the implications would be staggering: cheap, high-density energy storage that can be recharged in minutes. This would kill the internal combustion engine. I think it sounds far more probable than the hydrogen economy.

WYNAND LOUW
VIA E-MAIL

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