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Material witness: Space myths

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Thank goodness for space exploration, which has given us that vital ingredient of modern life: the perfect fried egg.

Or has it? Never mind the bathos, what about the facts? The idea that DuPont's Teflon was a spin-off from research on space technology is one of the most pervasive myths about today's materials. But it was nothing of the sort.

Polytetrafluoroethylene was in fact the serendipitous offshoot of research on refrigerators. When Roy Plunkett and his co-workers stumbled across it in 1938, they were attempting to make a new CFC refrigerant. This white plastic that resisted water, acids, organic solvents and fungus clearly had something going for it, and DuPont patented it in 1941.

The real boost for applications of PTFE came from the Second World War, when it was used under the code-name K416 as a protective coating against corrosive uranium hexafluoride in isotope separation for the Manhattan Project, as well as in aircraft engines and explosives manufacture. Seeing its commercial potential, DuPont registered the Teflon trademark in 1944 and developed mass-production methods. By 1950 the company's Teflon plant in Virginia was producing a million pounds in weight of the material a year, used largely as an insulator and sealant. Non-stick cooking equipment followed soon after, although DuPont was cautious about introducing it for domestic use until its safety had been established. Teflon-coated pans were all the rage by the time Yuri Gagarin flew in space in 1961.

So although PTFE featured in the space suits, blankets, heat shields and insulation of the lunar module in which Neil Armstrong and colleagues landed on the moon in 1969, such space applications were a minor sideline in the burgeoning Teflon market.

And yet the myth continues. US senator Kay Bailey Hutchison claimed only last February in the *Dallas Morning News* that not only Teflon but also Velcro "were developed through our space programme".

Why does this notion persist? One can't blame an over-zealous NASA press agency; indeed, it gives the impression that it would be relieved not to have to keep denying the tale. "There was a guy last week who was assuring me that Teflon was a NASA product", said a NASA spokesman earlier this year, "and I kept saying to him 'Show me the documentation!'" The same is true of several other putative spin-offs, such as the instant fruit-drink Tang. "We didn't develop it", says the man from NASA, "we just bought it off the shelf like everyone else."

Partly this stems from a refusal to believe that wonderful modern materials can have such prosaic origins. But some banging of the spin-off drum is for propaganda purposes, as a way to revitalize the moribund and obsolete vision of manned spaceflight. Setting foot on Mars, claims Robert Zubrin of the Mars Society, would produce an even greater spin-off benefit than Teflon. If, in 30 years' time and after astronomical expenditure, that were to happen, I wonder what products we will be asked to thank it for — carbon nanotubes, perhaps?