Bush spins tall tale of technology transfer

Washington. When the US president, George Bush, sought to emphasize the unexpected benefits from basic research during a recent visit to the Superconducting Super Collider (SSC) laboratory in Texas (see *Nature* **358**, 441; 1992), he cited an unnamed government scientist who, while "trying to purify liquid hydrogen . . . ended up figuring out a way to make artificial kidneys for $15 apiece". The example was meant to suggest that the $8.25-billion accelerator might generate untold benefits to society apart from its mission to find the top quark and advance elementary particle physics. More's the pity, then, that the president did not have his facts right.

Finley Markley with his dialyser, *circa* 1968.

There was no project to purify liquid hydrogen, says the scientist in question, physicist Finley Markley, who at the time directed a team of engineers and applied physics within the engineering division at Argonne National Laboratory outside Chicago. There is no $15 artificial kidney. And the history of Markley's invention is a 25-year saga that, if anything, illustrates how difficult it is to turn an idea into a successful product.

Markley, who for the past 13 years has worked at Fermi National Laboratory after a stint in private industry, has spent his career finding practical applications for various polymers and adhesives. So it was to him that Argonne officials turned when a physician from the local veterans' hospital called the laboratory in the mid-1960s for help in developing an artificial kidney filtration unit, or dialyser. Markley threw himself into the project, attracting federal funding and publishing papers, and in 1968 he appeared at a press conference to extol the nonmilitary research conducted by the US Department of Energy, which runs Argonne.

Markley, a social activist, harboured dreams of forming a nonprofit, minority-owned company on the west side of Chicago to manufacture and sell his invention, an early version of the parallel plate dialysers now on the market. By 1973, however, Argonne was retrenching, so Markley left to join a start-up medical devices company in California, Galen Laboratories, that was interested in the dialyser. But Galen also fell on hard times, and within two years it was sold to Cobe Laboratories of Lakewood, Colorado.

"They told me they already had a vice president for research and that my services were not required", recalls Markley, who instead went to work for Medical Incorporated in Minneapolis. But that company ran into technical problems when it tried to scale-up his prototype, and in 1979 Markley returned to a national laboratory where today, older and wiser, he continues his work on polymers.

In the meantime, Cobe modified his invention so that it could be manufactured and produced a dialyser that sold for around $25. The product was discontinued in the mid-1980s after the company introduced a new line of dialysers and the technology was sold to a Yugoslav company.

It is difficult to measure the impact of Markley's work on those with chronic kidney disease. It is estimated that there are half-a-million patients worldwide on thrice-weekly kidney dialysis, but reusable dialysers have reduced demand and the technology has changed only incrementally since the late 1960s. "We're still a long way from knowing how to make an artificial kidney that can do everything a live kidney can do", points out Ira Grifer, medical director for the National Kidney Foundation. "A dialysis machine is not a kidney."

Supporters of the SSC predict that the 54-mile-long accelerator, if built, will lead to technical as well as scientific innovations. If they are right, a future US president may have a better example of the unexpected benefits from basic research than the incumbent, Mr Bush.

Jeffrey Mervis

Japan 'loses' new funds for research infrastructure

Tokyo. A new pot of money for Japanese government scientists has disappeared thanks to creative bookkeeping by the Ministry of Finance.

In June, a science pressure group of the ruling Liberal Democratic Party (LDP) declared victory in its effort to persuade the powerful finance ministry to spend ¥1,100 billion (US$900 million) to repair the rapidly deteriorating infrastructure of Japan's government research (see *Nature* **357**, 616; 1992). The new, permanent fund would have added about 5 per cent each year to the country's general operating budget.

However, government officials in the science-related ministries and agencies now say that the money has vanished. In recent negotiations with the finance ministry over budget proposals for next fiscal year, they learned that the ministry has applied the money to an annual exercise in which it must shrink the general operating budget by 10 per cent. Officials have told their colleagues in the science-related ministries and agencies that with the new fund they will have to shrink the budget by only half as much, or 5 per cent.

But a government official says that it is standard practice every year for ministries to negotiate with the finance ministry and win approval for budget cuts totalling only about 5 per cent. Thus, the finance ministry is achieving next year's budget reduction painlessly by spending money it never really had. The only beneficiaries are the Liberal Democratic Party politicians, headed by Kishiro Nakamura, who were applauded for appearing to put money into science just before the elections last month for the upper house of the Japanese Diet.

Government science officials say their only remaining hope for more money is to win a portion of a forthcoming supplementary budget of ¥6,000 billion that the ruling party has promised as a way to strengthen Japan's flagging economy. They say science can expect to receive about ¥100 billion spread among all the science-related ministries. Unlike the earlier fund, however, this money will be available only for one year.

A similar thing happened in 1987 as a result of a large supplementary budget. Most national laboratories and universities can boast of a new building or supercomputer from that windfall. But the finance ministry's sleight-of-hand has dashed hopes of a long-term solution to the steadily deteriorating infrastructure of Japan's government research.

David Swinbanks