

several national economies concerned. Nor is one necessary.

The truth is that the impatience and chauvinism that mark governments' expectations in the wake of the Cold War are enemies of basic research. But the expectations are also misplaced because they discount the value of the most direct and immediate of its benefits for modern economies — the present value of the skilled people who emerge from a spell in basic research who are uniquely equipped to change the world in more practical ways. There are all kinds of unmade calculations to be made about the cost per head of training people in ways such as this; the outcome would amply justify what is spent on research. That is what governments must understand about the Cold War and the future. □

Freedom's end?

The US Congress should find out whether NASA has a real design for its space station — and then cancel it.

WITH the unfolding of the budget cycle in the US Congress, people have begun to suck their teeth again about the plan to build a space station, which survived last year's cycle only by a single vote in the House of Representatives. This year, it must be hoped, the Congress will be more resolute. Its best course would be to cancel the project. Otherwise, it must take steps to limit the damage its survival will cause to the more valuable parts of the US space programme.

At this stage, very little is required to establish that simple truth; the few benefits the space station would bring are not justified by its expected cost, while it cannot safely be afforded within the budget of the National Aeronautics and Space Administration (NASA) that the administration (with an eye on the federal deficit) has decreed acceptable between now and the end of the decade. Worse than that, far from being the technically superb counterpoise to the ex-Soviet space-station *Mir* planned a decade ago, space station *Freedom* has all the makings of a technical bungle on a grand scale. During the months ahead, the Congress should be particularly careful to enquire about the last point.

The chequered history of the project points clearly to the hazards, but does not reveal what *Freedom* will actually be like. To be sure, when almost anybody with access to a PC and a decent graphics program can run up a conceptual design, much has been said to suggest what it might be like: invariably, there is a kind of tank for housing people, docking stations at which visitors would be received and extended booms on which solar panels and other sensitive equipment would be mounted. But it is a far cry from such a specification to a design that has been tried and tested.

NASA itself is only partly to blame for this state of affairs. It has been required on several occasions in the past decade to cut its coat to suit the diminished cloth available. The most taxing of those occasions was last year when NASA was required to produce, within ten days, a range of three "cheaper" designs so that President Bill Clinton, seeking to avoid a budgetary showdown, could choose one of them. By all accounts, the computer-buffs were able marvellously to

exercise their graphics programs. What the congressional committees should insist on knowing is whether the design now chosen is indeed a design in the engineering sense. When those who make motorcars dare not put on the market products whose components have not been tested, NASA should be given firmly to understand that it cannot risk people's lives to equipment whose design is conceptual only.

There is also a political issue to be discounted. Last year, NASA agreed to collaborate with the ex-Soviet space programme in a variety of vaguely specified projects whose overall purpose is the training of those who will eventually occupy and operate space-station *Freedom*. Helping Russia is politically correct, so much so (in NASA's view) that the Congress will not dare demur. But to what end? To keep the now-Russian programme in being to serve as a potential competitor for prestige (and consequently higher budgets) at some stage in the future? Or does NASA reckon that it may yet get space-station *Freedom* by buying another *Mir* off the Russian shelf? What exactly does NASA have in mind?

The objective case for *Freedom* is something else again, and is insupportable. To be sure, it would be mildly interesting to have a stream of data about phenomena such as the crystallization of solids in nearly zero gravity, but nobody would pay for them at the expected cost, \$8 billion for the first set of hardware and several billion dollars a year for operations. But all that is established. The real worry is that NASA's budget ceiling of roughly \$14.5 billion a year (the arguments in the next few months will be about the odd \$100 million) is already tight, and will be tighter still when *Freedom's* declared cost begins to escalate. Then the squeeze will be transferred to NASA's exploration of the Solar System, 'Mission to Planet Earth' included. That would be a discreditable resolution. Better that the Congress should draw a ring-fence around the serious part of NASA's work (aeronautics as well as well as planetary science), saying that *Freedom* might be paid for out of the small change left over. □

Less advice is just fine

US budget office kills 284 federal advisory committees.

THAT which is created by government usually lasts forever, often long past its time. Therefore, word that the US Office of Management and Budget (OMB) has terminated 284 government advisory committees (and thereby saved an estimated \$17 million) comes as a breath of fresh air. Advice from duly chosen experts is, of course, a valuable thing. But there comes a point when the cost of advice exceeds its value.

Does the United States really need a Network Reliability Council, or a Technical Advisory Group for Cigarette Fire Safety? And, much as we care about pigs, is an Advisory Committee on Swine Health Protection really in their best interest? The OMB has judiciously said "*finis*" to these and other advisory groups including, one whose duty is to "Take Pride in America", and one that, since 1897, has been solemnly charged with sniffing imported tea. OMB should stoutly resist efforts to reincarnate them. □