British Association for the Advancement of Science — Norwich

Accountability and the future

SIR Hans Kornberg's new blue-and-white insignia, whose glorious silver pendant marks him as next year's president of the British Association for the Advancement of Science, match his pyjamas. So, with glee, Sir Hans revealed to his neighbours at the British Association (BA) "science audit" last Friday. The pyjamas were not, however, on display.

The other delights at the University of East Anglia (Norwich) last week included a "Santa Claus machine", and the founder of the Open University proposing a £400,000 experiment to simulate a Martian colony on Earth and a delegation from China. There were also scientific submeetings galore, prizes, reviews of oncogenes and opiates, the first of Richard Gregory's exploratorium experiments, accounts of the environmental rape of the developing world and the terrors of future war. . . .

Fie to figures

At least one industry in Britain will be booming next year — the industry of research on research. The beginnings of the industry were on display at Norwich in the BA audit of science spending and in the forthcoming Annual Review of Research by the Cabinet Office, introduced by cabinet science advisor, Robin Nicholson.

Nicholson's figures were preliminary: a collation of departmental projections. But they confirm that there will be a real reduction of a few per cent in the British Government's science spending in the next few years. Sir Bruce Williams, director of the Technical Change Centre (whose researcher Ted Butler was lent to the BA for the audit) found Nicholson's figures "very disturbing". He was also disturbed by the present scale of British civil research and development spending which, when measured per capita, begins to look "very small indeed" (half that of Switzerland, two-thirds of West Germany).

The BA audit also shows that Britain's military spending, usually taken to be half the British research and development effort, is "considerably overstated". As for the universities, a little embarrassment could be detected at Norwich. The figures on university research revealed by the audit show reductions since 1980 "nowhere near as severe" (said Sir Bruce) as had been claimed earlier by the Advisory Board for the Research Councils (ABRC). In the fifteen years up to 1981, funds for British university research (including salaries) doubled in real buying power. From 1964 to 1983, university research and development rose from six per cent to ten per cent of total British research and development. (But the real resources of the research councils were static between 1976 and 1980, and fell about five per cent in the next three years.)

After that doubling, is there not dead wood to prune? Sir Keith Joseph, Secretary of State for Education and Science, keeps asking that. Research chums together, as at Norwich, know there is more to it than that; the doubling has been needed "to stand still", to keep up with techniques and instrumentation and to pay for entry into new branches of research. These costs could not have been covered by pruning old branches, said Sir Bruce. But yes, there is dead wood, admitted Sir Geoffrey Allen (ex-chairman of the Science and Engineering Research Council), chairman of the BA science audit for a second year.

The perception in the community is that things are much worse than the figures show. But there seems a dawning realization that university researchers must explain themselves more clearly. And it should be a major impetus for more research on research.

The Technical Change Centre would like to help with that, Sir Bruce Williams says, but its funds are limited. But Nicholson was more forthcoming; perhaps £250,000 a year would suffice in the medium term. The ABRC could find the money "within the errors" of counting the science budget, he said.

Taking measures

How to measure science? Notoriously, it is much easier to measure inputs (money) than outputs (science). But now ABRC chairman Sir David Phillips has been converted to the measurement of scientific output by citation indices suitably modified by interviews, peer ranking and other indicators.

Where from this light on the road to Damascus? The Science Policy Research Unit (SPRU) of the University of Sussex, where two social science renegades have charmed Sir David with their analysis of research in protein crystallography (his own field). Sir David has prodded the Royal Society to head a pilot study of the health of British science using the SPRU techniques. With £25,000 from ABRC and £15,000 from the Economic and Social Research Council, whose chairman Sir Douglas Hague is also a convert, the Royal Society is to assess the productivity of British geneticists, solid state physicists and chemists.

The two renegades now brought in from the cold are Ben Martin and John Irvine (who recently reviewed the work of the European centre for nuclear research, CERN — see *Nature* 6 September, p. 4). Royal Society officials were visiting them last week.

"Martin and Irvine", names that will soon be as familiarly linked as "Laurel and Hardy" in British science policy, first shook the world with a citation and peer-review attack on the Jodrell Bank radio

telescope at Manchester.

Future-watching

ONE of the more playful themes at Norwich was 2010, or 2050, or whatever: the distant future. There were plenty of predictions: a chip with numbers of components to match the number of neurones in the human brain by 2000 (Brian Oakley, director of Britain's information technology programme) and NATO (the North Atlantic Treaty Organization) turning from defence to offence in Europe in the next few years (Frank Barnaby, peace researcher). Barnaby said the future has lost its flavour because everybody is concentrating on getting through 1984 or 1985.

It was different 20 years ago, when broadcaster Nigel Calder was editor of the popular science magazine, *New Scientist*. He asked scientists to predict 20 years ahead (George Orwell's 1984) and, said Calder, on the whole they got it right. Nevertheless Werner von Braun erred on the optimistic side (nuclear-powered rockets and men on Mars) as did hovercraft inventor Christopher Cockerell (hovercraft everywhere). Others foresaw home video-recorders, optical cables and the new biotechnology.

What of our future now? Calder listed a few machines — the total information machine (everything accessible with a chip) and the Big Brother machine (total surveillance). A little further off may be the Santa Claus machine, "a large, self-governing device that eats rocks and excretes anything that human beings care to specify: coffee cups, Porsche cars, spaceships, or other Santa Claus machines".

Colonies on Mars

LORD Young (Michael Young) is also worried about the future. But he has plans. Founder of the Consumers' Association (publisher of *Which?*) and the Open University, he now aims to found something out of this world: a colony on Mars. He says it should be the goal of the European Space Agency and that, though a century or so off, the prospect of a Martian colony could raise the sights of mankind above our petty squabbles.

Meanwhile Lord Young is seeking £400,000 to build two domes. One dome would have a simulated Martian desert, permafrost and landscape to test the theory of atmospheric chemist James Lovelock that an injection of fluorocarbons into the Martian atmosphere could do a lot to make it more Earth-like, melt the permafrost and so on. The other dome would be a social experiment which smacks of nineteenth century idealists creating utopias in the Amazon: people would live there as if on Mars (with as little communication with Earthlings) and try to set up social democracy or whatever to prove to the rest of us that everyone can live in peace.

Lord Young will get his money, it was confidently predicted. **Robert Walgate**