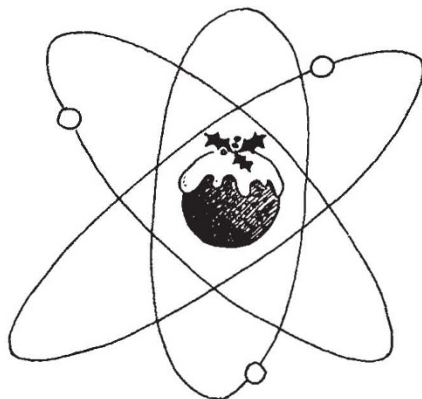


Surprise Christmas present for British science

AN unexpected Christmas bonus for British science was revealed this week by the Secretary of State for Education and Science, Mrs Shirley Williams, who announced that the country's science budget was to be increased by more than £47 million over the next four years. More than 70% of this money is to go to the Science Research Council and the remainder is to be divided between the Agricultural Research Council, the Medical Research Council, and the Natural Environment Research Council. Only the Social Science Research Council budget remains static.

The budget increase represents a significant Cabinet victory for Mrs Williams who has been arguing strongly all year for increases in funds for basic scientific research—which, she said, had suffered too severely at the expense of applied research. Now the science budget is to be increased by £10 million in 1979-80; £10 million in 1980-81; £12 million in 1981-82 and £15 million in 1982-83. The move will increase next year's budget to £274 million of which £149.7 million will go to the SRC.

The increase reflected a change in world opinion which was now swinging back to a more favourable view of basic research, said Sir Frederick Stewart, chairman of the Advisory Board for the Research Councils, the body responsible for dispersing the science budget among the five research councils. He quoted recent developments in the United States and France where there had been increases in



money for fundamental research.

Mrs Williams said Britain had insufficiently recognised the achievements of its basic science which was regarded highly elsewhere in the world. This extra cash would attempt to remedy this and would also be used to create new research positions for able young students who were now suffering severe problems in finding posts.

Predictably the happiest research council chairman was Professor

Geoffrey Allen of the SRC who described himself as "delighted" with his cash allocation. Last month he announced at the publication of his council's annual report that the SRC needed only £20-£30 million to carry out a full but realistic programme of research over the next four years. In fact, the budget increase means he will now have slightly more than £30 million for this programme, of which £4 million will become available next year.

Initially much of this money will go to restoring the SRC's construction programme to previous levels, including the speedy completion of synchrotron radiation, laser and electron beam lithography facilities at the SRC's laboratories, and also in setting up research programmes in computer and microprocessor technology. It is also hoped that Britain will get a new space programme involving participation in the United States' MMS re-usable satellite project.

As for the other research councils, it is likely that the extra cash will be used on projects including increased research into cancer and its treatment and also to set up a new unit of environmental epidemiology for the Medical Research Council; to improve geological work in deep drilling and mapping for the Natural Environment Research Council; and to support work for the Agricultural Council which would involve developing crops which could fix their own atmospheric nitrogen.

Robin McKie

Research allocations

	1979-80	1980-81	1981-82	1982-83
	£m	%	%	%
ARC	24.7	+1.9	+1.1	+1.0
MRC	46.5	+1.6	+0.9	+1.0
NERC	31.1	+2.5	+1.5	+1.0
SRC	149.7	-1.0	-0.5	+1.0
SSRC	14.8	0.0	0.0	0.0
BM(NH)	4.6	+0.5	+0.5	+1.0
Royal Soc	2.6	+1.0	+1.0	+1.0
	<u>274.0</u>			

Blind man's buff at GMAG

ON 31 December, the two-year term of office for members of the UK's Genetic Manipulation Advisory Group (GMAG) will come to an end; some members will be leaving and new people appointed in their place. But the criteria used to decide who will stay on and who will leave are a deepening mystery.

The only official information that has been made public about the changes is that Sir William Henderson (until recently Secretary to the Agricultural Research Council) will succeed Sir Gordon Wolstenholme as chairman. A spokesman at the Department of Education and Science told *Nature* last week that in the interest of "balance and continuity", the four sectors represented on GMAG (science, industry, the unions and the public) would continue to be represented and that not all the members of the existing GMAG would be asked to stand down.

According to John Morris, GMAG secretary at the Medical Research Council, however, that does not mean that "some members who may wish to stay on will not be sacked".

At least one member of the group, Dr J. R. Ravetz, a public interest representative, can testify to this. Three months ago all members of GMAG were sent a letter asking if they wished to continue. Dr Ravetz, a reader in the history and philosophy of science at the University of Leeds, had played a particularly active role in GMAG and did not wish to leave, but was sent a letter asking him to stand down. He was given no reason other than that new appointments "are necessary to ensure the balance and continuity of the group".

However, two of the three other public interest representatives have indicated that they wish to stand down for personal reasons. Continuity in the

public interest sector, Ravetz argues, is therefore being carried on the shoulders of the only remaining public representative, John Maddox. Mr Maddox was unaware that two of the public representatives were leaving voluntarily until contacted by *Nature* last week.

What then are the criteria used to decide which representatives should be removed, and who is responsible for making these changes? For the union and industry representatives, the situation is clear. They are nominated or recommended to stand down by their respective organisations and these recommendations are generally accepted by the DES. The Trades Union Congress (TUC) has asked to be represented on the new GMAG by its four original representatives and by one new member. The four serving TUC members have been reappointed by the DES, but there is no word yet about

the request for a fifth representative. The Confederation of British Industry has requested that its representative Mr John Gilby, be renominated and is awaiting a reply.

The situation of the science and public interest representatives is, however, considerably less clear. They are directly appointed by the DES but there appears to be no set procedure governing these appointments beyond "usefulness to the group". Ravetz has certainly been useful, but he has also not shrunk from expressing his opinions, and he may have been seen by some close to GMAG to be 'rocking the boat'.

According to one DES spokesman, the public interest representatives are the ones most likely to change "because

the scientific specialists are a small group to choose from", but he expects that the overall "mixture of representatives" will remain the same—except that possibly a lawyer will be included on GMAG for the first time. As to who at the DES is responsible for the changes on GMAG, several sources indicate that Shirley Williams, the Education Secretary, is taking a direct and personal interest in the new appointments. However, her advisers on GMAG remain in the shadows and do not appear to include GMAG's existing members.

All this might be unimportant if it were not symptomatic of how GMAG handles its external relations. And external relations are important to a body whose decisions can affect the

competitiveness of British biotechnology industry overseas. In this context, it is obviously desirable to get GMAG's standards accepted and applied by other countries. Unfortunately GMAG does not appear to communicate effectively with foreign scientific organisations. There is a strong feeling among some European scientists that GMAG could provide greater leadership in Europe by revealing more details of its work. As Dr Ravetz argues: "in about a year an American GMAG could be established that would operate in public and be easily accessible to foreign scientists. If that happens, the British GMAG would probably be ignored rather than be viewed as a model for all the world".

A. J. McClelland

Difficulties at PETRA worry designers of Europe's next accelerator

PETRA, the world's biggest storage ring for colliding electrons with positrons, is not behaving quite as expected, writes Konrad Guettler

THE European Committee for Future Accelerators (ECFA) convened its technical panel on the design of LEP—Europe's proposal for a 70 to 100 GeV electron and positron storage ring—in Rome recently, only to hear that the machine of which much LEP design has been based (West Germany's 19 GeV PETRA) is encountering difficulties.

Although PETRA started up very smoothly, ahead of schedule, and soon achieved beams of long lifetime, its luminosity (which determines the rate at which experiments can be done) is at present a factor of 100 or so below design. The profound worry is that the scaling up of parameters from lower energy machines, such as the 10 GeV DORIS and SPEAR, to the very much higher energies of PETRA or LEP may in fact not be straightforward, or indeed possible at all. It is still early days for PETRA but a large investigation program on both the technical and the theoretical side has now been launched both at DESY and by ECFA.

Nicola Cabibbo, a particle theorist at Rome University, and CERN are directing the attempts at increasing theoretical understanding of the observed beam properties. The main effects are the following:

- the maximum beam-beam tune shift ' ΔQ ' is much less than its design value. ΔQ is the major factor, apart from the stored particle current, determining the machine luminosity, ie the number of interactions that take place at an intersection in unit time. The tune

shift is a measure of the non-linear transverse forces between colliding bunches. All the existing machines turned out to have the same limiting value; and this ΔQ had also been assumed for PETRA and for LEP.

- Fast beam instabilities occur at various stored currents and appear to depend on the accelerating radio-frequency voltage. The circulating beams induce currents in the vacuum chamber walls and these wall currents create fields which interact directly with the beam. They can alter the normal betatron and synchrotron frequencies of the beam and thus cause instabilities.

- The accelerated bunches are larger than expected. (This affects the long-term beam stability.) Bunch lengthening is again due to the short-range fields induced by the bunch in the wall. It leads to a wider energy spread within the bunch and can lead to head-tail instabilities.

There was a lot of concern at Rome that there was inadequate knowledge

of beam dynamics at high energies. But a lot of experience is accumulating about high energy electron-positron machines and there was a widespread hope that while machine physicists have encountered very tricky problems indeed, they are unlikely to lead to profound revisions in the approach to LEP.

Since ECFA's Rome meeting, PETRA has run continuously and machine physicists have now pushed the beam current to a maximum of 18mA per bunch, almost up to the 20mA limitation design value. The previous current limitations have been overcome by changing the injection optics to the type also proposed for LEP. The present aim is for fast injection and a high beam intensity, and only later will PETRA go for higher energy, and hopefully, higher luminosity. The latest machine runs at a centre-of-mass energy of 16 GeV have yielded 1-2 hadronic events per nanobarn cross-section per day—which can be compared with 20-100 events at DORIS. This is not a very high luminosity; but the DESY machine physicists are confident about increasing it. Higher energies have to wait till next year when additional accelerating cavities will be switched in. □

Keeping down the cost of LEP

HIGH-ENERGY physicists have become very aware of current financial constraints, and are paying a great deal of attention to reducing the cost of LEP, without diminishing its physics potential. CERN has estimated the construction cost of a 70 GeV LEP to be a little over 1,000 MSF, which is almost the same as the SPS proton accelerator built at CERN a few years ago. No

decision about the project has been taken, but ECFA hopes to present a detailed design study to the CERN Council by the end of 1979.

The physics interest in LEP is focussed on the maximum energy of the machine. Lepton physics at high energies centres around the role of the intermediate vector bosons, the charged W^+ or W^- and the neutral Z^0 .