

purpose is to comply with the requirements of the European Monetary Union planned for some time soon, but globalization would have left him no alternative. Britain's Chancellor of the Exchequer will be doing much the same later this month (although he will have to say that his purpose is to reduce taxes, for his party does not like to think that it is a pawn in the hands of foreigners).

The danger in this new but inescapable fashion for reduced government spending is that, without an open understanding of why it is necessary, it can do more harm than good. Governments like that of the United States have been brooding about 'competitiveness' for a quarter of a century, wringing their hands over the rundown of once thriving industries such as shipbuilding and shoe manufacture. They have migrated elsewhere, and will not come back. But the United States remains as competitive as anybody could ask in fields such as those represented by Intel, Microsoft and AT&T. The immediate problem is to create the conditions in which employment in those fields will grow substantially, which means high-level training. Further ahead is the need to capture the next wave of innovation, which means research. But both of those are causes covered by discretionary spending, which can and probably will be cut. And what is true for the United States is true almost everywhere else. As might be expected, globalization works everywhere. □

Europe's black sheep

EU member states spending too little on research and development need carrots as well as sticks.

ANTONIO Ruberti, the member of the European Commission responsible for research until the end of last year, has a good idea (see page 226): let European governments wishing to join international European collaborations first put their own houses in order by demonstrating that they are already investing enough in research to benefit from the collaboration they wish to join. The idea is a good one because there is an urgent need to bring about a more uniform pattern of spending on research in the member states of the European Union (EU). As things are, Greece (where Aristotle used to live) is at the bottom of all lists; total spending on research and development runs at about 0.5 per cent of gross domestic product. Portugal (0.7 per cent) is hardly better, Ireland (1.1 per cent) is next from the bottom.

Membership in itself evidently does not create the climate in which all governments pull their weight in research. Of course, comparisons between the performances of the three black sheep with those of the larger member states are to some degree unfair. Both Britain and France, for example, spend substantial sums on military research, while Germany and France spend substantially on space research in various ways — activities that would not make sense in the smaller European states. But that is only a partial defence of the neglect of science

by the EU's smaller members. For one thing, it denies the broader community the potential benefits of their talent, while in the long run it will impoverish their own people by robbing them of modern skills.

Ruberti's condition for collaboration is therefore something like a stick with which the three black sheep might be beaten. Although it is unlikely that Ireland will ever be an enthusiastic member of the European Space Agency, or of CERN, there is ample reason to expect that young men and women from all three countries would (given a start) find their way to Heidelberg (and the European Molecular Biology Laboratory, whose current director is Greek) or Munich (the headquarters of the European Southern Observatory). It makes sense to ask that the black sheep governments should provide the means by which the people concerned can be trained in the first place and then can be enabled to spend their time productively at work when their collaboration is complete. Ruberti's device is therefore a little like a stick with which to beat the laggard governments, even if into pursuits that serve their own long-term interests.

But if there is to be a stick of some kind, there should also be a few carrots. What might those be? The example of Ireland suggests stratagems that could help. It is too easily forgotten that Ireland is where Schrödinger settled after the Second World War, when the Dublin Institute for Advanced Study was active in a variety of modern fields, cosmic rays for example. But all trace of that endeavour had vanished by the mid-1960s, submerged by Celtic studies of various kinds. Trinity College Dublin, now a constituent of the University of Ireland (where Fitzgerald of the Lorentz-Fitzgerald contraction worked), has kept at research on a broader front, but it is plainly difficult to build up large research groups when the intellectual hinterland is so thinly populated. Yet from Cork (with excellent chemistry) to Armagh (with its observatory), there is no reason to suppose that Ireland (a land of scholars) is indifferent to research. The need is for people.

That is the carrot the EU could help to provide. As things are, the Human Mobility Programme (whose rules have now been sensibly rewritten — see *Nature* 378, 118; 1995) will no doubt help many young people from the smaller countries to spend time at established laboratories elsewhere, only to find themselves at a loose end when their fellowships are up. Ideally the movement should be in the opposite direction. But the European Commission was given a formal competence in education by the Maastricht Treaty. While all member-states hold firmly to the view that their own educational systems are near-perfect, and also jealously guard their right to subsidiarity, the commission is unlikely to be allowed to do much in the field. The creation of a few handfuls of European faculty posts at carefully chosen universities, coupled to research support, could lead to the emergence of research groups of distinction. And that could transform the climate, so that the black sheep were no longer black. Is that not worth a try? □