research assistants, rather than overall productivity.

Rossi-Bernardi, however, defends the idea of focusing the CNR's research support on centers of excellence that can provide "a critical mass of good people"—even if this means diverting resources to help Italian scientists now working in the United States and elsewhere "to return to Italy for short periods to help us formulate quality control on our programs."

Rubbia, who teaches at Harvard University and carries out most of his research at the European Laboratory for Particle Physics (CERN), but visits Italy regularly, serves as a useful role model. "The Nobel Prize was a very important demonstration that we have to build up centers of excellence to attract people like him," says Rossi-Bernardi.

At the same time, both Rubbia's success and the heavy emphasis placed on high energy physics within the research budget also demonstrates another key fact of Italian science, namely, that international collaboration—both on research projects and on the construction of major research facilities—is more important and more enthusiastically supported than in any other large country in Europe. The reasons for this are not merely financial. The creation of CERN, for example, in which Italian physicists such as Eduardo Amaldi played a key role, found political support in both Europe and the United States in the postwar years partly because of its value as a symbol of a united, Westward-looking continent.

Indeed some politically active scientists, such as physicist Marcello Cini,

Slowdown Urged in High Energy Physics

Western nations should agree to slow down the speed at which high energy physics is developing in order to free up more resources for other fields of science, according to a top-level British scientific committee set up to consider whether the United Kingdom should withdraw from the Geneva-based European Laboratory for Particle Physics (CERN).

Given the overall financial pressures on the science budget, the current level of expenditure on particle physics in Britain "cannot be justified and should be reduced as soon as possible," says the committee in a report to the Minister of Education and Science, Sir Keith Joseph, which was published in London on 18 June.

As far as the international picture is concerned, it adds, the present growth of particle physics is also too high and should be reduced not only at CERN but world-wide—presumably including the United States.

The committee was chaired by the molecular biologist Sir John Kendrew, a former director of the European Molecular Biology Laboratory. It recommends against complete withdrawal from CERN—at least not before 1989, the date when CERN's latest accelerator, the 27-kilometer circumference Large Electron Positron (LEP) collider, should be completed (*Science*, 24 May, p. 968).

However, the committee adds that membership after this date should only be continued if it can be achieved "at a significantly lower cost." And it suggests that Britain should immediately give notice to the other 11 member states of the organization that it wants to negotiate reducing its contribution (currently about $40 million a year) by a series of steps, starting with a 5 percent reduction in 1988–89 and leading to a 25 percent reduction by 1991–92.

Since all CERN subscriptions are calculated on a pro rata basis, this would imply that other member states should lower their subscriptions by a similar proportion. Furthermore, suggests the committee, funding of domestic activities in particle physics in Britain should be reduced even more drastically, to 75 percent of its current level of $6.25 million a year by 1990–91.

The committee was established last year in response to widespread criticism of the distortive effect of the CERN contribution on the other areas of British science, particularly since the contribution is paid in Swiss francs, which have been rising sharply in recent years against the pound (*Science*, 20 April 1984, p. 266).

Hoping to head off anticipated criticism from other CERN member states that a significant reduction in contributions would inflict a highly damaging, perhaps even fatal, blow to the organization, the committee sets out various proposals for achieving a 25 percent cut in the laboratory's budget. The main money saver would be a decision to delay the planned upgrading of LEP from a 50 × 50 GeV to a 100 × 100 GeV electron/positron collider. The committee admits that reductions in CERN's budget of the order of magnitude it is proposing "cannot be achieved easily" but suggests that they are "feasible" and represent the "minimum" that is required.

The committee's proposals about how CERN might absorb the cuts have already been fiercely contested by several British physicists, such as Christopher Llewellyn Smith of the University of Oxford, who argues that a 25 percent cut in Britain's contribution after 1991–92 would result in a situation for CERN that would be managerially impossible. Llewellyn Smith, who acted as a scientific adviser to the committee and was the only particle physicist directly involved in its deliberations, suggests that it would have been more honest of the Kendrew committee to have recommended a straight withdrawal.

It is generally accepted in Europe, however, that such a suggestion would have carried a high political cost, particularly as politicians in other member states might have used it as an excuse to follow Britain's lead and recommend that their country withdraw from CERN as well.

In contrast, although even the proposals for a stretched-out program in the 1990's will inevitably raise strong protests from other countries, at a less public level it may be possible to build a consensus around some form of the British proposals, even if it is not the full 25 percent budget reduction.

Almost every other European member country—including France, West Germany, and even Italy, which currently spends about twice as much as Britain on the field (see article page 1508)—is already under pressure from other scientific fields to reduce its funding for particle physics. Rival projects for limited research funding include plans for the new European Synchrotron Radiation Facility, the recently expanded research program of the European Space Agency, and the various projects being proposed by France for the European Research Co-ordination Agency (EUREKA). —**DAVID DICKSON**