build, with running costs in the vicinity of £750,000 a year. For this money, the facility would provide the first such source in Britain dedicated to synchrotron work—present synchrotron users at Daresbury and elsewhere are very much aware of their status as 'parasites' on the high energy machines.

Ten beam lines, each capable of supporting two projects, would eventually be available but it would take some 10 years to work up to this fully operational capacity. The machine would operate at 2 GeV with an electron current of 1 A, the planned radius of the electron orbit being 15 m, the bending radius of the magnets 5.55 m, the magnetic flux 1.2 T (12,000 gauss) and the total radiated power 240 kW. All that is impressive enough, as is the list of possible experiments which could be carried out with such a facility. But is it the best way to spend the available money?

Many of the physicists present at Reading expressed doubts about this. The most crucial question, which is not yet answerable, is just when the facility could begin operations. Both for economic reasons and because of the community which has built up around Daresbury, the plan envisages that the new ring would be built inside the NINA hall. Inevitably, that means that there must be a delay between NINA closing down and the new machine becoming operational. The optimists suggested, in the SRC plan, that the delay might be a year or so, provided work begins on the project soon. But few, if any, of the synchrotron users believed this. B. Bleaney (University of Oxford) went so far as to say that he would bet on a gap of more like four or five years in which British synchrotron workers would have no major facility in this country; there were no takers prepared to accept his bet.

That raises the question of just how useful such a machine will be in the mid-1980s. Certainly everyone present at Reading would have been delighted to have such a facility now but fears were expressed that European and American machines now being planned and built might have tackled the most exciting problems before the new British machine got a look in. Of course, such machines will be extremely useful for the foreseeable future, just as conventional X-ray sources, for example, have not been rendered obsolete by synchrotron facilities. But it is one thing to build such a costly installation, do the exciting work and then continue using it into a productive middle age, and quite a different kettle of fish to build an expensive facility knowing that it will probably only ever be used for routine, if valuable, work.

There was also some confusion about just how much the costs would be, in terms of experiments using the facility.

It was put to the SRC representatives that although their plan did not spell out the financing in those terms, a generous interpretation of the running costs, together with the proposal that ten "new projects" might start up each year, meant that each project had to be "worth" £100,000. That is a lot of project—something like three or four times the cost of typical projects being run in universities in the areas of research expected to benefit from the new facility. Even allowing for Parkinson's laws, is it really sensible to plan for such growth?

But there are two points to be considered against this apparently large expenditure. First, if only 100 people are using the machine, then its running cost of £750,000 a year breaks down as £7,500 a person a year—more the sort of figure which the average person can understand and, it seems, not a sum to make the SRC blanch. Second, at present, experiments funded by the SRC in universities have invisible means of support—they do not have to pay for buildings, for electricity, for non-scientific staff to keep the buildings running and so on ("heat, light and sound", as a wag in the audience put it). And in the present economic climate it is best, perhaps for the SRC to be seen to stand on its own two feet.

This problem, although slightly out of the mainstream of the Reading meet-

ing, is an interesting and tricky one. For, if the SRC grasps the nettle firmly and says publicly that its expenditure plans are based on the assumption of less university support, such bodies as the University Grants Committee will surely take note and reduce their allocations accordingly. On the other hand, if the SRC assumes continued support of this kind at present levels then it will be severely embarrassed if such support is not forthcoming.

It is certainly good to see the SRC encouraging open discussion at the early stages of planning such projects as the new storage ring and it was clear that both the SRC and the physicists were able to learn about each others' difficulties and needs at Reading. The plan as originally envisaged seems unlikely to survive and a powerful case can be made for pressing ahead more vigorously with such a project, perhaps at a different site, if there is to be such a ring at all. It also remains to be seen how the need for such a large sum might inhibit other activities by the SRC's Physics Committee—it is not not difficult to think of ways of spending £2 million which would be at least as useful as building a synchrotron facility. But certainly there is less chance of ending up with an underused white elephant when the committee is taking such a receptive attitude to frank comments from the physics community.

Business report *Roger Woodham*

A HEALTHY increase in capital has been announced by Imperial Chemical Industries (ICI), following the publication of its annual report for 1973. The amount sanctioned is £250 million, 60% of it earmarked for the United Kingdom where the major project started in 1974 may well be a giant ethylene plant on Teesside producing 500,000 tons a year. This was originally to have been a three-way affair—Shell, ICI and BP—but Shell has now withdrawn for undisclosed reasons and a firm agreement has not yet been made between ICI and BP. Will intercompany squabbles spoil the attempts to avoid a recurrence of the plant overcapacity problems of recent years?

If all goes according to plan ICI will be livening up its investment in spite of Mr Healey's Budget. Just how things have ground almost to a halt recently is highlighted by figures in the 1973 report for fixed assets—plant, equipment, buildings and so on, the stuff of investment. In 1973 fixed assets increased from £1,160 million to just £1,185 million. By contrast, in 1964, 1965 and 1966 the assets in use were increasing by leaps and bounds, from £646 million to £760 million to £880 million.

The report also reveals some interest-

ing trends in ICI's sales, worth £2,166 million last year. Whereas in 1963 the United Kingdom accounted for 52% of the sales, in 1973 the proportion was down to 43%. Allowing for imports of raw materials and so on, ICI contributed positively to the British balance of payments by some £220 million.

●HELICOPTERS landing on oil rigs, and possibly ships entering estuary ports, may benefit in a few years from the improvements that continue to be made at the Mullard Research Laboratories, Redhill to its Microwave Aircraft Digital Guidance Equipment (MADGE). The basic system has NATO's blessing and is being manufactured commercially.

A substantial proportion of one of MRL's four divisions, which between them spend £3 million a year, is engaged on work of broadly this kind, sophisticated radar. The beauty of MADGE is that the stationary part of the system, which is 'interrogated' by a microwave signal from an aircraft (or ship) can be set up in only 15 minutes or so. Ideal, as NATO evidently thinks, for landing and takeoff near the front line, but also a good bet for civil aviation.