

University News:

London

THE title of professor of naval architecture has been conferred on Mr L. J. Rydill in respect of his post at University College.

Salford

THE university and the Shirley Institute are planning to undertake co-operative research projects which will be both of good academic research character and also provide results of direct significance to technical and industrial processes. One of the first projects selected deals with the use of high-energy irradiation to initiate grafting of polymers on to fibres, films and fabrics.

Appointments

THE Hon. J. J. Astor has been appointed chairman of the Agricultural Research Council in succession to the Duke of Northumberland, who is to relinquish the position on June 30, 1968.

Announcements

THE current list of reprints available from the Ministry of Technology's Forest Products Research Laboratory has now been published and is available on request from the Director, Forest Products Research Laboratory, Princes Risborough, Aylesbury, Bucks.

CORRIGENDUM. In the article "Surface Topography of Ice Sheets" by G. de Q. Robin, which appears on page 1029 of this issue of *Nature*, the first symbol of equation 2 on page 1030 should be the Greek letter rho and not alpha.

CORRESPONDENCE

Computers for Scientific Research

SIR,—During the past few years a revolution has occurred in the pattern of spending needed to support basic scientific research. In practically every scientific field, as in technology and business, computers have now become a necessity without which it is often impossible to keep in the front line. It is my purpose to point out that there is evidence of a serious failure by the British Government to provide adequate funds to keep up with this revolution and to suggest that a major revision of policy on expenditure on scientific research is needed in order to build up the computing power needed in all branches of scientific research.

Minimum expenditure on computers for scientific research in this country recommended for the current year by the Flowers committee was about £4.5 million, with a further £1 million for installation and running costs. This was expected to rise to a total of about £8 million by 1969. This sort of money has to be scaled against a total budget for all fields of research provided through the Department of Education and Science to the research councils and the University Grants Committee of about £100 million in the current year.

Unfortunately, even before the computer investment programme recommended by the Flowers committee was initiated, the rate of investment in computing facilities was cut back to a total of £3 million a year for the first three years (1966–69). Moreover, the implementation of this reduced programme of spending was severely delayed despite the emphasis of the Flowers committee report on the need to make up for the very late start in Britain in

getting under way on investment in computers for basic scientific research. There is no doubt that this cut-back and delay on the minimum rate of investment in computers is bound to have serious repercussions on progress in Britain in practically every field of scientific research.

It is instructive to contrast the Government's investment policy on this very basic and essential general research facility with the policy on investment in the largest single item, in a sense a luxury item, in our scientific budget: high energy nuclear physics. Britain is spending £12 million on high energy physics in the current year. And there are signs that there will be strong pressures to increase this. For instance, the mammoth high energy machine recently proposed for CERN will cost in the region of £150 million, of which Britain's share would be in the region of £33 million (see also *Nature*, 214, 1283; 1967). The contrast between investment in computers and that in high energy physics is the more striking in that an increasing proportion of the high energy physics budget is being spent on providing computing facilities exclusively for high energy physics research. An example of this is the recent purchase by the Science Research Council of two large (by British standards) American computers, one sited in Oxford and one in London, specifically for the purpose of processing data from high energy physics experiments. These computers, at a cost of £0.25 million each, are each more powerful (though with slightly less peripheral equipment) than most of the computers at present serving the needs of entire universities in Britain (if they are lucky enough to have one at all). For instance, the University of Sussex was only able to spend about half the cost of one of these computers on the computer they recently installed to serve the needs of the entire university.

One of the problems facing scientists in other fields is that they have no direct way of applying pressure for support for computing needs. High energy physics, on the other hand, by the very nature of the large funds already committed to it, is in a strong position to get still further support for its computing needs: if you are spending £12 million a year to gather data, then it is eminently reasonable to spend a further £0.5 million to process some of it. But the frustration of scientists starved of computer access who see thousands of pounds worth of computer time going unused during the development period of these specialized computer experiments is not to be under-estimated. The expenditure of these large sums when essential needs are being under-supported should not be allowed to continue without question.

What is to be done about this? The high energy physics lobby is very well organized. Individual computer users are not. As presently organized, university computer policy is organized from on high, and computer time is simply handed out when available. One possibility might be to make all computer users pay for computer time with money awarded to them in the form of research contracts as is the practice in the United States. This would both encourage economy and enable individual users to put pressure on the Government directly on the basis of the merits of their research proposals. It would also allow individual scientists to go to commercial companies for facilities, such as on line programming, which are not at present provided by university computer services.

Whatever happens, it is vital that the training of our scientists and the morale of research workers in all fields of basic research should not be undermined through an unwillingness to change established patterns of research spending. Britain's future depends on our ability to face the computer age fairly and squarely.

Yours sincerely,

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