

Towards Self Sufficiency

INDIA and Pakistan have good reason to feel euphoric about the 1967-68 food grain harvests. They are going to exceed by far the all time record harvests of 1964-65. In India the yield of all food grains in 1964-65 was 89 million tons, but this year's harvest will certainly reach 95 million tons and some estimates put it as high as 100-105 million tons. Likewise, in Pakistan the 1964-65 harvest of wheat was 4.5 million tons and 11.7 million tons of rice. Last year, the yields dropped to 4.3 million tons and 10.7 million tons respectively, but this year the wheat harvest should be well in excess of 6 million tons and the rice harvest should exceed 12 million tons.

How have these remarkable increases in cereal production been achieved? Three factors can reasonably be eliminated. The weather this year has been good but not distinctively better than in 1964-65. With so many unemployed in both countries, it is difficult to believe that the record harvests have resulted from more manpower on the farms and, although irrigation has been increasing steadily, irrigation, of course, makes its greatest impact in bad, not good, seasons. Fertilizers, improved seed strains and possibly improved plant protection seem to be the answer. Both India and Pakistan have imported Mexipac wheat from Mexico (*Nature*, 218, 214; 1968) and Pakistan has Irri rice from Japan, but new strains alone cannot be the answer because Mexipac needs quite large applications of fertilizers and without them it is probably less successful than the strains grown previously. The fact that the greatest increases of production have been achieved on the larger and better managed farms, usually owned by the rich and politically powerful, who stand a better chance of getting new seeds and fertilizers, which are both in short supply, supports this conclusion.

Ironically the prospect of a record harvest is presenting the Indian and Pakistan Governments with economic problems. In India, for example, if the harvest, in fact, turns out to be 10 million tons above the previous record the Indian farmers will have generated, at the cereal prices fixed by the Government, the equivalent of about £400 million of new wealth. Much of this will clearly literally be eaten on the farms rather than converted into cash, but there is the very real problem that the farmers will spend the extra rupees in their pockets on imported goods such as fertilizers and agricultural machinery, and this will worsen the country's balance of payments. Furthermore, the United States sells wheat to India for rupees and then gives the rupees to the Indian Government. Should the United States decide, in view of the record harvest, to reduce wheat supplies the Indian Government will lose this subsidy and, at the same time, have to buy more wheat from its own farmers at prices that it guarantees.

Staff Power

THE Education Bill which came before the Second Reading Committee of the House of Commons in February provided for the articles of government of teacher training colleges to be ratified by the Secretary of State for Education and Science. Following discussion in that committee, and after deputations from

bodies such as the Association of Teachers in Colleges and Departments of Education, an amendment to the Bill has now been made, to the effect that the instruments of government must also be approved by the Secretary of State. Until now the government of these colleges has been in the hands of local education authorities, often through sub-committees on which the academic staff of the colleges were either not represented or did not have full voting powers.

The recommendations of the Robbins report in 1964 that colleges of education should be linked with universities was not accepted, and instead a committee under Mr T. R. Weaver was set up to discuss the liberalization of the government of these colleges. The recommendations of the Weaver report formed the basis of the Education Bill, which, with its new amendments, is welcomed by the academic staff concerned. The article of government which deals with all aspects of the relationships between students and the colleges was the original candidate for ratification by the ministry, and the amendment has now calmed the fears that local power groups could still keep the academic staff out of the government of the colleges if the instruments of government, fundamentally the constitutions of the college, were not subject to ministerial approval. Aware of the attitudes of the Department of Education and Science, most of the governing bodies of the colleges are submitting instruments and articles which provide some say for the academic staff in the running of the college, and those which are not approved are returned to the governors for reconsideration. After the successful first step of putting the teachers in control of the colleges, there then follows the question of how much students should participate in government. It seems that student participation is not a rigid requirement of the department, but recognized channels for close consultation are thought to be essential. Until now there has been the right of appeal to the department in cases of students being disciplined or sent down, but it is thought that approved articles must include provision for students to be able to appeal in the first instance to the governing body of the college.

Italian Research under Fire

THE reports on science policy produced by the Organization for Economic Development and Co-operation have so far proved worthy but unprovocative documents. But the most recent report, still officially unpublished, has caused a political stir in Italy, the country it describes. The report was written almost a year ago, and was sent to interested parties in Italy before publication—the normal practice. Since then the report has shuttled around Italian Government offices, but it appeared again last week, when a few copies were handed out by dissident research workers at the headquarters of the National Council of Research. The research workers, who had been occupying the headquarters for four days as a protest against the state of research in Italy, distributed the report as a political move designed to force the Italian Government's hand.

The report, written by three examiners (M. Jacques Spaey from Belgium, Professor Harvey Brooks from Harvard, and Professor Ourisson from Strasbourg), should have been discussed at a confrontation meeting

in Paris more than six months ago. But because it is so strongly critical, it has been impossible to persuade the Italian authorities to turn up for the meeting. The situation has undoubtedly been further complicated by the present election campaign in Italy, and the staff at OECD are now resigned to waiting at least until the election is over before the report can be discussed.

The principal criticism seems to have been directed at the university system in Italy—rigid, hierarchical and inflexible, as an OECD executive described it this week. (With the hindsight of the last two weeks, this is a criticism which might have been directed equally accurately at the rest of Europe as well.) These criticisms echo those of Professor Joseph Ben-David, in his report *Fundamental Research and the Universities*, prepared some months ago for the OECD. The rigidity of the system—one professor, one chair and one faculty for each subject—combined with a lack of mobility among research workers, has meant, according to Professor Ben-David, that universities in Europe have fallen behind those in the United States, either as centres of scientific discovery or as generators of industrial change.

The report also criticizes the organization and scale of research and development in Italian industry. Figures already published by the OECD provide the basis for this charge. In 1963, Italy spent only 0.6 per cent of its GNP on research and development, against 2.3 per cent for the UK, 3.4 per cent for the USA, 1.9 per cent for the Netherlands and 1.5 per cent for Sweden. Even Ireland, not generally thought of as an industrialized country, spent nearly as much as a proportion of GNP as Italy. In fundamental research, Italy spent less than a third as much as France (\$70.6 million against \$221 million), and less than the Netherlands (\$81.5 million). This in turn is reflected by a greater tendency to import technology. Italy's bill for patents, licences and technological know-how imported from abroad was \$135 million in 1963, against \$130 million for Japan. It was exceeded only by West Germany, with \$150.9 million (a 1964 figure).

But it is in the production of qualified manpower that the comparison is least favourable to Italy. First degree graduates in technology represent only 0.4 per cent of the age group between 20 and 24, and only another 0.5 per cent of the age group qualify as scientists. The comparable figures for the United Kingdom (which did surprisingly well in the survey) were 2.9 and 1.7 per cent, and for France the figures were 1.5 and 2.4 per cent. Graduates in all subjects represent 3.5 per cent of the age group in Italy, 21 per cent in the United States, and 10.5 per cent in the UK.

The Italian authorities have complained that the report makes use of old statistics, collected in 1963. But it is unlikely that newer figures, which may be incorporated into the final report, would make the situation look any happier. What is most surprising is that, despite Italy's neglect of higher education and scientific research, the Italian economy has had a more successful time than that of, say, Britain. What has to be remembered is that Italy is itself divided almost as sharply between an industrialized north and an underdeveloped south as it is from other countries in Europe. This makes the figures more easy to understand, although it does not remove the need for concern. The workers at the CNR did well to turn it into a political issue.

More Negotiation for Intelsat

CETS (the European Conference for Satellite Communications), which was formed in 1963 to provide a united European front at the negotiations with the United States leading to the 5-year interim world communications satellite agreement (Intelsat) which was finally signed in 1964, is now engaged in formulating its position for next year's negotiations for a new deal for Intelsat. Next year's revised arrangements are intended to produce a permanent organization and a plan for long-term operations—the working of the present agreement is far from satisfactory. There are three main negotiation objectives for CETS. First, Intelsat is effectively an American monopoly; it is hoped to change this. Second, Comsat, the American Communications Satellite Corporation, is in an anomalous position, being at the same time the managing body for Intelsat and an American commercial company; the object is to obtain genuine internationalization of Intelsat management. Third, there is room for a much better contract position for European firms than at present, and CETS wants to get it.

The European countries together shoulder about 30 per cent of Intelsat costs, yet their share of the international contracts placed by the organization amounts to only 4 per cent. Contracts in the so-called "space sector" alone are open to international competition; ground installations are the responsibility of the individual countries where they are located. It is precisely in the field of satellite construction, satellite sub-systems, onboard power supplies and such things that European tenders have done badly, in part, of course, because they lack the experience of their American competitors. It is a cogent argument of CETS advisers that the inequality will not be rectified without more direct European participation in the launching and designing of satellites. This was an attraction of the CETS project for the Eurovision satellite (*Nature*, 217, 1089; 1968) which the British Government has now rejected—apart from its promise of an independent alternative to the Intelsat service which may not fully accommodate Europe's specifically regional needs.

The CETS committee of deputies held a meeting in London on May 16 and 17 to hammer out the lines of approach for next year's Intelsat negotiations (CETS deputies are junior government ministers). Although a coherent joint policy document is required by the end of the year, they found themselves unable to make progress in the face of the British Government's negative statement on the CETS proposal. The resulting disarray has caused a postponement of the Bonn meeting of the European Space Conference from July till October or so.

Britain's views of ELDO's future usefulness and the virtue of the Eurovision satellite are in a minority, but if the other leading European space nations led by France and Germany go on without Britain, as they are inclined to do, there are a number of points to be settled and agreed. These include the cost of the Blue Streak booster which is the basis of the ELDO launcher and which is understood to be available without British participation; the cost of using the Spadeadam test facilities which "prove" individual Blue Streaks before shipment for launching, and various other pieces of information on which policy decisions involving finance must rest.