

The skippers and mates are paid wholly on a share of the catch basis, while the remainder of the crew receive a basic wage and a bonus, between 50–70 per cent of the total wage, based on the catch. As a result, the newest boats with the most skilful or lucky captains are manned by the cream of the deckhands. The older or less skilled captains and men end up in the older boats. And, because wages depend on catches, men are reluctant to report sick or to stop working because of injury. The wages of their shipmates as well as their own money are at stake. Equally, skippers have to balance the risks of continued fishing in bad weather against loss of money if they stop fishing, and they may be reluctant to sail a sick crew member to port when they are making big catches; even so, in 1963, 165 of the 2,469 trawlermen were so ill that they had to be put ashore at the nearest port. For the skipper, who can earn up to £5,000 a year, the risks may seem worthwhile, but even with overtime rates the deckhands average as little as 3s 6d an hour for their pains.

A change in the structure and attitudes of the industry as well as Government legislation on minimum safety requirements are long overdue. Increasing the basic pay rates and reducing the catch bonus might remove some, if not all, of the pressures to continue fishing at the risk of life or limb. Incentives to owners to introduce stern trawlers instead of the traditional side trawlers, which capsize much more easily, would reduce the risk of accidents and sinkings. The only way to reduce hours of work, of course, is to increase ships' complements and bring them into line with those of other countries. Polish distant water trawlers, for example, have crews of twenty-eight, whereas comparable British vessels have only twenty men. And the Polish fleet has no side trawlers.

As for statutory safety requirements, there are more regulations for the frying than for the catching of fish. Boats are required to carry life-saving and fire-fighting appliances and there are two recommendations on the use of lifelines and winches, but there is no system of inspection such as that which covers factories, mines or quarries. And, as things stand, there is nothing to stop unfit fishermen, even those certified unfit by a medical officer, from going to sea, and they often do so regardless of their own safety and that of their colleagues. Once at sea, they are at the mercy of *The Ship Captain's Medical Guide* and whatever is in the medicine chest until they can be put ashore or taken on board a naval fisheries protection vessel.

Admittedly it is difficult enough to enforce safety regulations in factories and down mines, especially if there is a suspicion that they slow down production and cut earnings, but that is no excuse for not attempting to control what goes on in a small boat at sea. There is no reason why machinery in a boat should not be as adequately protected as machinery in a factory and inspected as often when the boats are in port. And an occupational health service, which was proposed by an ILO convention in 1959 which Britain has never ratified, might at least ensure that men who are unfit do not put to sea. In a survey of 38 Grimsby trawler-

men, Dr Moore found that eighteen were not registered with a general practitioner. An occupational health service is therefore especially important in an industry where the men apparently only seek medical advice ashore when injury or illness overtakes them.

## PLASTICS

### Is There a Gap?

THE latest report from the OECD on disparities in technology between member states—which of course boils down to differences between Europe and the United States—is devoted to plastics (*Gaps in Technology—Plastics*, OECD, \$3, 21s). It paints a less bleak picture than its two predecessors on scientific instruments (*Nature*, 221, 300; 1969) and electronic components (*Nature*, 221, 1182; 1969). In the field of bulk plastics, the report concludes, there is no general technological or production gap between Europe and the United States. This is because several European countries (the report cites Germany, Italy and Britain) have strong technological and market positions in this field. The brisk exchange of basic scientific information on plastics between countries also has a levelling influence.

There is a fly in the ointment, however. The United States has a definite lead over Europe in the innovation of new plastics with specialized applications, which has come about chiefly as a by-product of military and space research. At present the gap hardly matters from a commercial point of view—none of the new plastics has had more than a limited application and some of them have not yet been exploited. Nevertheless, the report says, there exists a definite gap in technology which might at a later stage have significant market implications. Whether this is likely to happen is another matter. The plastics experts who wrote the report could not see the new developments replacing any of the popular plastics, but, all the same, they thought they could become very profitable. But the report does have a grain of comfort for countries not indulging in ambitious space and military research programmes. Research on the existing families of plastics is going on at more or less the same level in all the chief plastic-producing countries, and is producing commercially important new materials.

On the question of the money which member states are making out of plastics, there is an echo of the report on scientific instruments. In both fields the Americans seem better able to profit from their efforts than do Europeans. There are no figures referring only to plastics production, but the net profits of the chemical industry as a whole give a guide to what is probably happening. Expressed as a percentage of turnover, the net profit of the chemical industry in the United States was 13.0 between 1961 and 1964, compared with 7.0 in Britain and even less in other European countries. And, the report says, the lowest return on assets shown by a United States company is higher than the return of any non-United States company. What are the reasons for this sobering disparity, which could develop into a full-blown technology gap with less profitable companies finding it harder to finance expansion? The smaller size of the European market is one factor; others are tariff barriers of up to 20 per cent or more between European countries, the 40 per cent duties

which the United States levies on imported plastics, international differences in standards and patent systems, lower capital costs and larger differences between raw material prices and selling prices in the United States, and the familiar bog of Europe's inferior management. Not all these problems have quick solutions, but European companies can draw at least some cheer from the rumours that the profit rates of American plastics firms are falling.

The report makes some recommendations for strengthening European research and development. One of these is the creation of larger university departments of chemistry, chemical engineering and physics on the American pattern. The report also recognizes the need for closer links between academic and industrial research, and for government support for long-term programmes.

#### ENGINEERING

### Pressure Vessels Research

THE second volume of the *Report of the Committee of Enquiry on Pressure Vessels* (HMSO, 35s) contains the evidence behind the recommendations which were published earlier this year (*Nature*, 221, 403; 1969). The committee was set up in 1966 when demand for pressure vessels was high but was not being met by British industry. The committee was charged with recommending ways of improving pressure vessel technology, including standards, design and manufacture, and its brief covered structures such as heat exchangers and boilers but excluded the special case of nuclear reactor vessels. After 1966, however, demand fell and the British pressure vessel industry was better able to cope, but nevertheless the committee believes that urgent action is necessary if the industry is to maintain its position. The committee's most important recommendation, which the Ministry of Technology is asking the manufacturers to consider, is the setting up of a Pressure Vessel Authority to coordinate research and development and to keep an eye on standards and inspection methods. The second volume of the report provides the documentary evidence backing the conclusions published in January. It contains comparisons between British and foreign pressure vessel industries, surveys of the raw materials which are used, and details of the crucial inspection procedures.

Part of the volume is a summary of research and development, and the committee says the sum spent is satisfactory but adds that this does not imply approval of the way the money is used. For one thing, the committee criticizes the duplication of research effort which seems to be going on, and wants a collaborative research organization as part of the proposed Pressure Vessel Authority. According to the research and development summary (drawn up by the Reactor Materials Laboratory of the UKAEA and based on a questionnaire completed by 268 organizations), much of the research effort is concerned with work on current contracts rather than future developments. The impression is that research and development in the industry is a haphazard affair. Very few organizations know whether they are getting their money's worth from their research expenditure, which for the industry as a whole averaged £3.5 million a year between 1962 and 1966. The collaborative research organization

which is proposed, and which would carry out large scale work beyond the capabilities of individual organizations, would be along the lines of the Pressure Vessel Research Committee in the United States, financed by government and industry. But the report's conclusion that hardly any firms are using the publications of the American Research Committee, and indeed that its very existence is unknown to many, does not promise well for the future of a British analogue. The solution could be to finance the British counterpart from the pressure vessel industry alone. In the words of a steelmaker quoted by the report, "the pressure vessel industry will take greatest cognizance of results for which it has had to pay".

#### LINNEAN SOCIETY

### Nearing the Target

THE Linnean Society seems to have met with a warm response to the appeal for funds to rehouse securely its valuable collections and modernize its rooms in Burlington House. A total of £27,000 has been received or promised, and when the promise of a generous anonymous donation has been fulfilled the society will be near to its target of £55,000. The anonymous gift was promised on the understanding that the balance would be raised by the society's own efforts. This has now been achieved, and the gift can be claimed. It is hoped that the name of the anonymous benefactor will be revealed at the anniversary meeting of the society on May 24.

Apart from more than £8,000 from fellows, foreign members, honorary fellows and associates, the rest of the money has come largely from other scientific organizations, industry and commerce. The Royal Society has given nearly £5,000 specifically for the care of the Linnean collection of plant and animal specimens; a trust which is anonymous at the moment has given £2,500 and the International Union of Biological Sciences is expected to give a similar sum. British Petroleum Ltd has given £1,000 and the world of commerce has contributed at least £1,500. There have also been donations from several overseas organizations including Sweden, the home of Linnæus. There are hopes now that with continued efforts the final sum collected could exceed £55,000, so that much of what needs to be done to improve the cramped library and to make the Burlington House rooms a suitable meeting place for biological societies in general might well be possible.

#### TECHNICIANS

### No Mood to Negotiate

WITH wage awards that conform to the British Government's Prices and Incomes Policy increasingly the exception rather than the rule, the Association of Scientific, Technical and Managerial Staffs, which represents university technicians, is to strike in support of the technicians' latest pay claim. The union, which claims to have 8,000 of the 10,000-12,000 university technicians among its 100,000 members, has announced a one-day strike on April 29. The technicians, who received a 4.4 per cent wage rise in February 1968, are now asking for an interim award of £2 a week and have