IN BRIEF

JET suffering

The European Community's Joint European Torus (JET) fusion project, now costed at almost £100 million at January 1977 prices, is "overdue" and "suffering from serious lack of decision on vital matters", according to Bas Pease, the director of the Culham Laboratory near Oxford, where the JET design team is based. Writing in the laboratory's 1976 annual report, Dr Pease says that prospects of future European international cooperation depend on confidence that technically sound projects like JET can be carried out. The report also says that uncertainties over the site have made it difficult to plan certain work on JET.

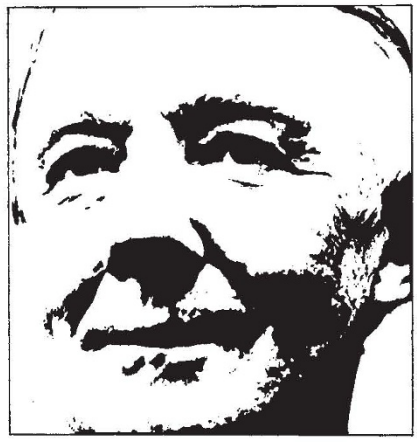
Marine responsibilities

Those who believe that very few subjects are the specific responsibility of a single government department in Britain are vindicated by the contents of a publication prepared by the UK Government's Interdepartmental Committee on Marine Safety. Entitled *Marine Activities: Guide to the responsibilities of government departments and agencies*, the booklet shows, that marine pollution involving oil discharges, is the responsibility of the Department of the Environment when the discharges are from land or offshore installations within the 3-mile limit, but fall under the Department of Energy outside that limit. Occupational health and safety are the responsibility of the Health and Safety Commission. The booklet is published by the Department of Trade.

IAEA's report

The growing uncertainty over the future of nuclear power in some industrialised countries is reflected in the International Atomic Energy Agency's annual report for 1976. It was partly responsible, the report claims, for orders for new nuclear plant falling from 53,000 MW in 1974 to 11,000 MW in 1976. The IAEA's total estimated regular budget for 1978 is $48.8 million (£1=$1.74). Expansion is planned for some areas of its work.

Frugal farming?



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WITH the possibility of a world shortage of energy within the next twenty five years, many people are concerned lest this should jeopardise our food supplies. They are told that modern farming is 'energy intensive', producing fewer calories to eat than are expended in their production—in cultivations, manuring and harvesting —notwithstanding the stored solar energy obtained by photosynthesis.

It is sometimes therefore suggested, particularly by some who call themselves 'ecologists', that we should return to more primitive farming systems, or even to the practices of the pre-agricultural hunter and gatherer. The bushmen of the Kalahari desert in South Africa are often cited as examples of global frugality, living with the minimum disruption of the natural ecosystem, and taking out much more energy than they put into it. It is generally forgotten that this type of life is only possible with small and sparse populations; it is thought that the whole of Britain could only feed some five thousand people before the introduction of arable farming. The whole world might support about a million.

Without going so far back, it is perhaps worth looking at some of the farming methods used fifty or a hundred years ago. Thus if oil is getting scarce, it may be logical to use more horses. An analysis of the effect of such a change gives the surprising result that there would be an increase, not a decrease, in energy consumption.

In Britain today all the tractors, combine harvesters and other farm machinery use about 1% of our total oil consumption (under one million tons coal equivalent), even allowing for the fuel consumed in the factories making the machines. In 1939 we had about a million working horses on our farms, but we would need at least double that number to harvest the vastly greater crops grown today. These horses would need to be fed every day of the year, not (like a tractor) only when they were working. It used to be said that a horse needed three acres of land for its support, but much of this was probably rough grazing. Nevertheless they would need some grass, and possibly as much as two tons of oats, or its equivalent in other grain, per horse per year. This would mean that more than two million acres of the best farm land would be needed to support the horses, and so would be lost for the production of human food.

The energy equation is equally disastrous. The calorific value of the horses' food would be at least four times that of the fuel powering the modern tractors, which do the work so much more quickly, and so enable the farmers to take advantage of Britain's changeable weather. In a bad year it is likely that, working with horses, much of the harvest would never be gathered in, and the land would seldom be cultivated in time for the next sowing.

Then if we went back to horse power, the human workforce would need to be doubled or trebled. Some people would welcome this, believing that it might decrease unemployment and reinvigorate village life. But are we prepared to pay all these farm workers the sort of wages they would expect from industry, when there would be a fall, rather than an increase, in food production? And where would they live? We have virtually abolished the 'tied cottage' reserved for farm workers; the houses are occupied by commuters, the retired and weekend visitors. On a purely arable farm the employees can travel to work, but where animals, including horses, are kept, the staff must live close at hand.

The main reason modern farming appears to use so much energy is not its machinery, but the inefficient food conversion of its intensively kept livestock, which waste over 90% of the food they eat. Our farm animals consume about forty times the energy used by our tractors. Horses, like other animals, are poor converters of energy. The surprising thing is that our highly mechanised farming techniques in Britain use only some 3% of our total energy budget. If yields are to be maintained, a return to old techniques and to the use of horses would greatly increase the input of energy down on the farm.