IN BRIEF

Instant data

By 1979 experimental data should be travelling between four major European high energy physics laboratories almost as fast as it can be processed. Under a project called STELLA (Satellite Transmission Experiment Linking Laboratories), which will involve the UK's Rutherford Laboratory, DESY in Germany, Saclay in France and CERN in Geneva, the data will be transmitted via the Orbital Testing Satellite, the European Space Agency's communications satellite scheduled for launch on 8 September.

The project has recently won approval from the Council of Ministers of the European Economic Community for funding worth SF 1.2 million, which will be spent on building a small satellite earth station and associated computer at CERN. It should demonstrate to industry and Europe's posts and telecommunications organisations, the value of using the new design of European satellite for transmitting data almost instantaneously at very low error rates.

Spacelab selection

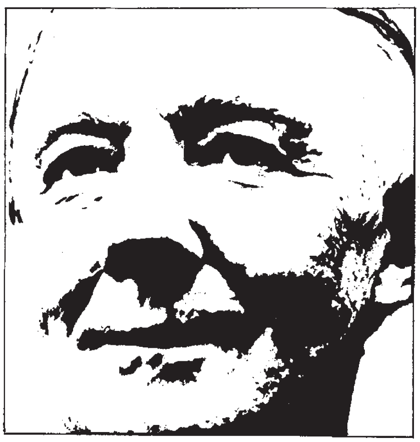
Last week, 12 European countries put forward 53 candidates for selection as Europe's first astronaut. Whoever is chosen will travel with one American on the first mission of the European Space Agency's (ESA) Spacelab, a reusable space laboratory which will be put into earth orbit in 1980 by NASA's Space Shuttle.

By the end of this year the 53 candidates will have been whittled down to six who will undergo further tests by NASA and ESA. Before the middle of next year, three will have been chosen for intensive training for the first Spacelab mission. A few months before the launch, one will be finally selected to travel in Spacelab while the other two work on ground-based activities.

The UK has put forward five candidates, the maximum number any member country of ESA was allowed to submit. They are William Grut from Surrey University, Geoffrey Firmin from Associated Nuclear Services Ltd, Arthur Ince from East Birmingham Hospital, Keith Mason from the Mullard Space Science Laboratory and M. J. Rycroft from Southampton University.

Whilst Europe has been selecting candidates for Spacelab, NASA has been working out how much to charge customers for flights on the Space Shuttle. The cheapest fare, at $10,000, is likely to be for payloads involving research, weighing less than 200 pounds and with a volume less than five cubic feet. The maximum fare will be around $21 million for full use of the Shuttle by non-US government customers. NASA already has 40 payloads for 1980, the first year of the Shuttle's operation. Spacelab is due to go up on Space Shuttle flight 11 for a fare somewhere in the middle of the price range.

Food for energy



KENNETH MELLANBY

AGRICULTURAL productivity throughout the world is increasingly dependent on the liberal use of chemical fertilisers, particularly those containing nitrogen. This is true of the sophisticated farming systems in Europe and North America, and where the 'green revolution' is successful in developing countries. A substantial amount of energy and oil goes to produce these fertilisers, and therefore many people are doubtful whether their continued and increasing use will be possible in an energy-hungry world in the twenty first century.

As I showed on 25 August, oil-hungry tractors actually use less energy than horses on the farm. Chemical fertilisers may, on balance, increase the amount of energy available to the farmer and to the population he serves. Returning to our Kalahari bushman, so idolised by some ecologists for his allegedly-economical use of energy; he certainly extracts many more calories than he puts into the system, but he only obtains enough food from a square mile or more of territory to feed himself. The modern arable farmer feeds several people on the produce of a single acre. He puts more into the system, but he takes a great deal more out. The difference between his energy expenditure, in cultivation, spraying and harvesting, and that stored in his crops, is several hundred times that of the bushman's total productivity per unit area.

In the UK we use less than a million tons of oil to produce over a million tons of nitrogenous fertiliser. Only a part of this is used on cereal crops which now yield annually some fifteen million tons of grain and ten or more million tons of straw. Without the fertiliser the yields would be reduced by a factor of two or even three. The energy wasted by burning some three million tons of unwanted wheat straw could, in theory, power all our tractors and the factories making our manures.

Unfortunately we cannot, at present, use the straw in this way, but we should surely try. To turn straw, readily available on the surface of the ground, into useable fuel should be a simple problem for our research workers to solve. A fraction of the money used for more esoteric agricultural research would be well invested to this end.

Although arable farming uses energy efficiently, further improvement is desirable, if only to reduce costs. In Britain we waste a substantial amount of organic manure which would save synthetic chemicals and might improve soil structure, but which, when fuels are cheap, is expensive to use. As fuel prices rise, this waste will be avoided. Cultivation may be further reduced when weeds are controlled by modern herbicides. Though it will probably be a long time before research to make it possible for cereals to fix atmospheric nitrogen gives positive results, we now make too little use of the ability of leguminous crops to perform this function. World phosphate supplies are limited, but fungal mycorrhizae may be increasingly used to mobilise insoluble compounds in the soil. All the indications are that in future agriculture will use less and not more energy, without any loss in productivity.

Thus though we may face a global energy shortage in the next twenty five or thirty years, so that the extravagant use of cars and aeroplanes may have to be restricted, and we may have to stop overheating our houses and offices, we should, with a rational system of priorities, have plenty of energy to produce our food.