

that the larger accounting departments will be attracted to a computer bureau because of the wide range of programs and facilities that such a system can offer, while Philips hopes to persuade larger companies to split up their departments into smaller and more self-contained units. The cost of a P350 computer will be much less than that of renting time at a bureau, and many companies satisfied with a modest range of accounting facilities will eye the Philips series with keen interest.

An impressive aspect of the new computers is the speed of printing. By making the printer move instead of the carriage, a print-out rate of 22.5 characters a second has been achieved—about three times the normal rate. For multiple small calculations as are carried out in accounting, the time of operation is due almost entirely to the time taken to print out the results, giving this speed particular significance.

ANALYTICAL CHEMISTRY

Mail Order Analysis

THE UK Atomic Energy Authority and the Science Research Council have set up a small Physico-Chemical Measurement Unit to provide industry and the universities with a mail order service for the refined analysis of organic chemicals. The unit will operate from the Atomic Energy Research Establishment, Harwell, and the Atomic Weapons Research Establishment, Aldermaston, and will be primarily concerned with the spectral and structural analysis of such chemicals as pharmaceuticals, polymers, oils, pesticides, waxes and plastics. The unit will be equipped for infrared absorption spectroscopy, nuclear magnetic resonance spectrometry and organic mass spectrometry.

The formation of the unit was prompted by the recommendation of a committee under Professor G. Porter, Director of the Royal Institution, set up to determine the best way of making modern analytic instruments available to industrial, university and government laboratories. Although no more than twenty people will be involved, the unit represents a further diversification of activities at Harwell. It will operate on a normal commercial basis, charging between £10 and £20 an hour for obtaining spectral data and a further fee for interpretation. This scheme follows closely the pattern of the Analytical Research and Development Unit established at Harwell in June 1968 to undertake research and development under contract to industry, and the two units are intended to keep in close touch. For the time being, the SRC intends to foot the running costs of the unit for work carried out on behalf of the universities and other SRC users. Industry will be charged for the service directly by the Atomic Energy Authority.

INTERNATIONAL MEETINGS

FEBS Undaunted

POLITICS are outwardly somewhat quieter in Spain just now. The University of Madrid has reopened, and plans are going ahead for the sixth meeting of the Federation of European Biochemical Societies there in April. Some national societies had suggested cancelling the meeting and reconvening it in a more liberal climate. As reported last week, however, Professors H. R. V. Arnstein and S. P. Datta of FEBS visited

Madrid some days ago to see the lie of the land, and their opinion is that the meeting should go ahead.

They have now issued a report of their visit, for the benefit of their members and for the wider attention of scientific societies faced with the intrusion of politics into their affairs. As well as making specific comments on the current situation in the academic circles of Madrid, the report does two things. It stresses that FEBS is a non-political organization, with member societies in countries of very varied political complexion, from Portugal to Bulgaria to Israel. To allow purely political considerations to affect the location of meetings would, in Professor Arnstein's words, "set a very dangerous precedent" for the future health of the society.

Only the most committed political activists will quarrel with this statement, though even for them the ethics of the situation are not crystal clear. It is obviously an ambivalent tactic to protest against the politics of a country by excluding that country's scientists from the international commerce of ideas. It is much the same as not eating South African oranges or not taking holidays in Greece—your actions tend to harm most those you most want to help. A biochemist who is boycotting the FEBS meeting countered this piece of liberal revisionism earlier in the week by referring to the propaganda use the Hitler regime made of scientific meetings held in its territory.

The report's second concern is to frame criteria for the practicability of a scientific meeting in delicate political conditions. The report suggests the following principles as necessary and sufficient guarantees: (1) Freedom for all foreign participants to enter and leave the country; (2) complete freedom of speech on scientific matters at the meeting—political, religious or racial questions should not be discussed at official sessions; (3) freedom of movement in the city where the meeting is being held, both for foreigners and for participant citizens of the host country.

The Spanish authorities have apparently guaranteed these three conditions for the FEBS meeting, though a politically active German biochemist said this week that he had qualms about the safety of scientific visitors in Madrid just now. Foreigners have been arrested for expressing with some forthrightness in public even the mildest liberal sentiments.

On the surface, Spanish politics are calmer, and April is unlikely to see the elders of European biochemistry, convened in an island of calm in Madrid University, manfully running through the minutiae of their subject in the midst of a screaming mob. But there are signs of intense underground activity. Several academics at the Universities of Madrid and Barcelona have been imprisoned or exiled to remote parts of Spain. The case of one exiled Madrid intellectual is being taken up with the Spanish Embassy by Lord Robbins, Sir Karl Popper and Maurice Cranston of LSE.

It is difficult to assess the nature of the student activity that was the immediate cause of the closure of Madrid and Barcelona Universities. "Oh, trouble just like your LSE", said a gently regretful voice at the Spanish Embassy this week, though observers here find this unlikely. The Spanish authorities have perhaps most reason to be worried by the rapid growth of underground workers' committees in the industrial cities. Genuine trade unions have been illegal in Spain for thirty years and, whether in consequence or

not, the average per capita income in Spain is only about £270 in spite of a fairly fast economic growth for several years now. So far, the attempts to suppress these committees have served to unify their members, whose sympathies range from Christian socialism to Trotskyite communism and anarchism.

CONTINENTAL SHELVES

More Coast—More Sea Bed?

By eleven votes to six, the International Court of Justice at the Hague has recognized that West Germany's concave coastline puts her at a disadvantage compared with the Netherlands and Denmark when the North Sea continental shelf is divided up geometrically, according to principles defined at the 1958 Geneva Convention, and has ruled that the boundaries should be redrawn by agreement between the countries, taking into account factors such as the length of the coastlines.

The dispute between Germany and her neighbours has been simmering since 1958 when the Geneva Convention made a ruling that lines drawn perpendicular to the coast should delimit the areas of continental shelf belonging to each country. As the map shows, this kind of division is unfavourable to Germany, and the International Court, delivering judgment on Germany's claim for a bigger area, held that such geometrical division is not a rule of customary international law and that the area must be partitioned according to "equitable" principles. Each country has "an original right to those areas of the continental shelves which constitute the natural prolongation of each nation's territory into and under the sea", but other factors such as usage of the ocean and the capability of a country to exploit the sea bed should be considered.

As well as establishing an interesting legal precedent—this is the first case of its kind to be brought before the International Court—this decision may have industrial repercussions. International oil and gas exploration companies operating in the United Kingdom sector and with concessions in the Dutch area may be affected by the pending boundary changes. British Petroleum Ltd has two blocks almost on the median

line dividing the German and Dutch sectors, and this may cause some argument, although concessions that have already been granted in transferred areas are usually automatically recognized. The verdict is also likely to initiate litigation in other offshore oil and gas exploration areas, such as the Persian Gulf where the boundaries are in dispute.

Although the law of the continental shelf has to some extent been clarified by the Geneva Convention, which is intended to be a declaration of customary international law on the subject, it is still, like the law of outer space, somewhat breathlessly trying to keep pace with technology. The continental shelf, for example, has been defined as the sea bed adjacent to the coast to a depth of 200 metres or "to where the depth of the superadjacent water admits the exploitation of the natural resources of such areas" so that lawyers are now trying to get international agreement on a law for the exploitation of the deep seas to avoid a situation where the world's oceans are divided up between countries with the technological expertise to explore the sea bed at progressively deeper levels.

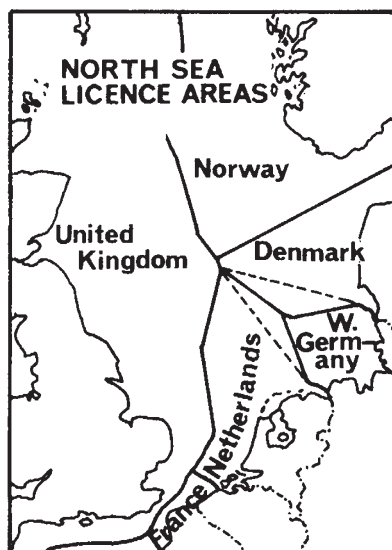
Since the General Assembly in 1967, when the Maltese delegation first suggested that the sea bed beyond the limits of national jurisdiction should be reserved for peaceful purposes and its resources used in the interests of all mankind, the United Nations has been considering the problems involved. A committee was set up in 1967 to consider whether the ocean floor should be reserved for peaceful activities and what exactly the resources of the ocean floor may be, and this reported to the General Assembly last year. A permanent committee has now been set up to consider the report and to discuss, among other things, the possibility of setting up a permanent international body with complete jurisdiction over the sea floor.

ENERGY

Last Hope for Coal

THE British coal industry has the very best of incentives for technological change. Without it, it is doomed to play the part of a poor relation, supplanted by the glamour of nuclear power, oil and even gas. One of the more substantial straws at which the industry has been clutching is provided by a new method of burning coal which is under development in a number of centres in Britain and the United States. The new method offers better heat efficiency at a much lower cost than conventional coal boilers, and it is by no means hard to see it as coal's last chance of retaining a part of the electricity generation market.

Instead of burning coal in a solid grate, the new method makes use of a bed of ash, turned into a fluid by air flowing upwards through it. (The principle is exactly that demonstrated to generations of schoolchildren at the Royal Institution by Sir Lawrence Bragg. A rubber duck is immersed in a barrel of sand, while a steel ball-bearing rests on the surface; air is blown through the sand, giving it the properties of a fluid, and the ball-bearing sinks while the duck floats to the surface.) Into the bed of ash is injected finely divided coal, which disperses rapidly through the bed as it burns in the stream of air. The heat generated is extracted by boiler tubes which pass through the bed itself, an arrangement which gives very high heat extraction rates and keeps the temperature down to



Dotted lines show possible extension of German zone.