

should be run, and submitted these to the Select Committee in a detailed document setting out a number of radical proposals. Like the National Union of Students and the Association of University Teachers, the NUT wants to see an end to the binary system. The proposals call for a major restructuring of the whole sphere of higher education, the final result being a "comprehensive university". Colleges of education should be grouped together into schools of education, attached to a university, and the NUT argues that all education students should take a four year course leading eventually to a degree.

The NUT suggests that responsibility for financing all spheres of higher education should be vested in one body, on the lines suggested by the Select Committee itself in its report on student relations. Such a system would remove the present colleges of education from the financial control of the local authorities. If they were grouped together into schools of education and brought under the control of individual universities, the NUT argues that this would "avoid wasteful duplication of courses", and would facilitate coordination of entrance requirements for higher education to "relieve the pressures which result in unnecessary specialization in secondary schools".

As far as course content is concerned, the NUT argues that there should be no dichotomy between academic and professional matters. What matters is the nature of the knowledge acquired and the understanding of how to communicate this knowledge to different age groups. Placing the schools of education in a comprehensive university would give potential teachers the opportunity to mix with students from other disciplines and this would help them to gain maximum benefit from their education. But the NUT suggests that the best way to provide links between the academic and professional aspects of training would be to appoint teacher-tutors. These would be teachers on the staff of schools where teaching practice is carried out, who would be responsible for a few students, and would work closely with college tutors.

The NUT believes that the present three year courses are too short and that they should be lengthened to four years. The NUT also suggests that the "general recognition of the need for a four year course would be a major step towards the union's ultimate goal of an all-graduate profession". The union also suggests that schools of education could provide one year courses of education for students who are unable or do not wish to take a degree course in education. Such courses are at present virtually a monopoly of the universities.

#### DRAGON

## Now We are Ten

AN opportune moment has been chosen for the publication of the tenth annual report of the Dragon high temperature reactor project, released last week, but the future probably bodes less well for the steam generating heavy water reactor which the UKAEA has on its books. Dragon is just across the way from the SGHWR at Winfrith, but the Dragon reactor is a joint effort of twelve European states and run by the European Nuclear Energy Agency. The point about Dragon is that the metal fuel cans have been done away with so that much higher temperatures can be allowed in the core—up to 1,500°C. One of the

by-products of the project has been a boom in the technology of graphite which is used for the structure of the core and moderator. The high temperatures mean a high conversion efficiency in a compact reactor. Cooling is by helium gas, and one possibility which people have been talking about for this type of reactor is to use the helium to drive the turbines directly, thus cutting out the mandatory intermediate steam cycle with a further gain in efficiency.

Since the encouraging remarks about high temperature reactors made by Sir Stanley Brown at a conference in Zurich last year, the outlook has been bright for projects such as Dragon. Prototype reactors working on similar principles are in operation in Germany and the United States. Sir Stanley is chairman of the Central Electricity Generating Board, and he said that high temperature systems show an advantage of about £10 per kW over the advanced gas-cooled reactors (AGRs) such as arc being built for the board at present. The point seems to have been taken by the participants in Dragon, who recently agreed to extend the project for a further three years to March 31, 1973, within a total budget for the period of £38 million.

The view of the CEGB is that an enquiry for a 1,300 MW HTR station with two reactors is likely to be issued toward the end of 1970, with the first reactor intended to come into service in 1976. But there is not going to be a rapid transfer to HTR systems and the board is probably going to continue with AGR stations to the end of the decade. Instead, the first HTR will be what is being called a "leader" station, and its performance will be watched carefully before the board goes further. The way the 20 MW Dragon project has gone seems to have persuaded the board that there is no need for a bigger prototype reactor before the leader station.

One of the charms of HTR systems as far as the CEGB is concerned seems to be that they are likely to be better than AGRs at coping with the large daily fluctuations in demand which are a feature of the British power scene. Meanwhile, with Winfrith's Dragon in a happy state, negotiations are still going on with Greece to barter an SGHWR for a consignment of tobacco.

#### CB WEAPONS

## More Shocks from WHO

THE latest contribution of the World Health Organization to the debate about chemical and biological weapons is the most alarming so far (*Health Aspects of Chemical and Biological Weapons*, WHO agencies, £1.20). Together with a catalogue of the properties of some hitherto obscure agents, the document contains a detailed calculation of the potential effects of chemical and biological agents directed at hypothetical targets—mostly densely populated cities. The document is a by-product of the work of the eighteen member advisory committee which drafted the WHO advice to the United States, later embodied in the UN report on the subject published last year.

One of the most vivid of the examples of the effects of chemical and biological weapons assumes that the agent would be the bacterium responsible for tularaemia. Although human beings do not often come into contact with the insect vectors of the disease, it is