

which was organized in 1967. The AEC and WASP are to explode a nuclear device in the 50 kiloton range at a depth of 11,500 feet in the sandstones of the Merna region of south-western Wyoming.

Both project Rusilon, which is scheduled to be exploded at the end of May, and the Wyoming project, which is still in the early stages of planning, are modelled on Gasbuggy; their aim is to produce a chimney reservoir and fractures in the gas bearing but relatively impervious rock, which should make it more porous. These new projects are more ambitious than Gasbuggy, which was jointly financed by the AEC and the El Paso Natural Gas Company and which involved exploding a 26 kiloton device at a depth of 4,240 feet in north-western New Mexico.

Project Gasbuggy itself seems so far to have gone off without a hitch and to have fulfilled all the predictions made for it. The project has now reached the stage of six month production tests, and the results of a series of three 30 day production tests, which the AEC announced recently, are most encouraging. So far the Gasbuggy project has yielded 167 million cubic feet of gas, 109 million cubic feet of which were obtained during the three 30 day tests. By comparison a conventional well only 400 feet from the site of the Gasbuggy explosion has produced only 85 million cubic feet during nine months continuous operation.

Equally important, the quality of the gas has improved. During the 30 day tests, the hydrocarbon content of the gas increased by a third to 82 per cent, while the carbon dioxide content fell by a half to 12 per cent, as the reservoir of carbon dioxide produced when rocks were vaporized in the explosion was depleted. Hydrogen and other gases account for the other six per cent. The AEC also reported that the

#### PLANNING

### Trust Battle Won



The British Government recently refused to give the Bath City Council permission to compulsorily purchase Rainbow Wood Farm from the National Trust. The Trust is delighted with the decision, but Bath University of Technology has suffered. The council is now withholding part of the land it promised the university, so delaying its development.

gas does not contain hazardous amounts of radioactive debris. But the commission says that the results so far, though encouraging, are too preliminary to allow a final assessment of the commercial feasibility of the technique and the crucial six month production tests have yet to be started, but the fact that two more private groups have decided to risk the cost of projects like Gasbuggy are straws showing which way the wind is blowing.

#### NUTRITION

### Americans and Englishmen

THE American Institute of Nutrition has honoured the work of two men of British extraction at its annual meeting in Atlantic City. Professor Hamish N. Munro of MIT received the 1969 Osborne and Mendel award, which is worth \$1,000. Professor Munro is distinguished for his work on protein metabolism. At the same meeting, Dr S. K. Kon of Reading University was nominated a fellow of the American Institute of Nutrition. He was one of the first to recognize the part played by vitamin A in the visual process.

#### ARCHITECTURE

### Watch on High Buildings

THE Royal Fine Art Commission, the watchdog of public amenity in England and Wales, would like to see a firm policy for the control of high buildings in London. The commissioners, who include Mr John Betjeman, Sir Hugh Casson, Lord Llewelyn-Davies and Sir Basil Spence, say in their latest progress report (HMSO, 3s 6d) that there are increasing pressures on the local authorities in London for planning consent for buildings above what used to be considered normal height limits, and there has been a failure so far to establish any firm policy for Greater London on such consents. But they believe that there is an opportunity to do so, now that there is one authority (the Greater London Council) covering almost the whole area. They hope that definite guidelines will soon be agreed between the GLC and the borough councils. In some areas, the commissioners recommend that buildings above a certain height should be banned altogether. "They should indeed have been banned already in such areas as the surroundings of the central parks, St Paul's and Westminster Abbey, and the river bank between them." They regret the building of the three tall buildings around Hyde Park—at Marble Arch, in Park Lane, and at Lancaster Gate—and they say that unless there is a stronger expression of public opinion on this issue, there may be more. "This will result in a gradual hemming in of parks by a wall of high buildings such as can be seen around Central Park, New York, which consequently looks half the size it really is."

Along the front of the River Thames, the commissioners suggest that development be kept not only low, but also small enough in scale not to diminish the sense of space provided by the river, and they criticize the decision of the governors of St Thomas's Hospital to build an immense ward block immediately across the river from the Palace of Westminster. Although they say they were not in a position to dispute the technical reasons for rebuilding London Bridge at the

time the plans were released, they are disappointed that a decision was made by the City Corporation to demolish and replace the bridge without regard to the future planning of the roads in central London. They also imply criticism of the design of the new bridge, and of the failure to provide weather protection for commuters who cross the bridge on foot each day to and from London Bridge Station. They complain that "the machinery for consultation on a prime matter of national interest has not been properly used".

#### RESEARCH ASSOCIATIONS

### Uniting for Survival

AFTER twenty-five years in the shadows, the Committee of Directors of Industrial Research Associations (CDRA) will at last be able to represent officially the research associations and their parent industries. In conjunction with the Confederation of British Industries, CDRA has set up a Conference of Industrial Research Associations (CIRA) with the joint aims of providing a forum for the industrial research associations and similar organizations and of creating an effective lobby for the views of the research associations as a whole.

Research associations are sponsored jointly by industry and the Government, and are cooperative bodies tackling problems not ordinarily dealt with by individual industries. CDRA has in the past provided the common ground for discussion between directors of research of the member associations. But this purely informal body could not speak officially for the research associations or the industries they represented; it could express only the personal views of the directors.

The need for a more effective voice in industry and government has been underlined by a considerable hardening in the Government's attitude towards research associations in recent years. The Government's new policy seems to be that more research should be sponsored or undertaken by industrial companies themselves, and that research groups should be self-supporting as far as possible. Research centres and industrial liaison offices have recently been established in universities in line with this policy and the research associations have only themselves to blame if they are left out of the picture. The director-general of one of the more productive associations said he felt that they had been for too long concerned with research for its own sake; they had enjoyed the security of a guaranteed income without being sufficiently tied to the needs of the industry they were supposed to serve.

The role of the research associations seems certain to change in the next few years and in some cases this process has already started. The British Coal Utilization Research Association (BCURA) will cease to have Government support in two years time and will then be run by the National Coal Board as a wholly owned subsidiary, undertaking contracts for industry at large in addition to its own research. This may well become the model for many of the larger research associations. Dr L. C. F. Blackman, BCURA's director-general, said that his staff are now enthusiastic about the new challenge; they have passed the initial stage of apprehension. Many associations already receive commissions from industry, and this will be

encouraged; the Electrical Research Association, for example, is supported by the GPO and the BBC in its work on wind pressure and high buildings. Further evidence of rationalization within the associations is demonstrated by the merging of associations with similar research interests, such as the Flour Milling and Baking Research Association.

Dr R. Weck of the British Welders Research Association, which has declined to join CIRA, was pessimistic about the future of the research associations in view of declining industrial and governmental interest, but felt there was a real need for research in areas that would not show an immediate return in profit or innovation. It is possible that sponsorship will soon be available only to those engaged in research which a commercial organization would feel no need to undertake; the work being done by the British Launderers Research Association on effluent control and water conservation is an example. With the future full of uncertainty most of the research associations seem to welcome CIRA as a valuable and much needed innovation. It may be more than that: it may be their last chance to stay in business.

#### FOREIGN STUDENTS

### Less by Definition

WHEN the British Government decided to charge overseas students discriminatory higher fees at the start of the academic year for 1967-68, it redefined what constitutes an overseas student. As a result, it upset the book-keeping of the Association of Commonwealth Universities, for the new definition, which the association will adopt exclusively in the future, differs from that which the association has customarily used when drawing up returns for overseas students. According to the latest statistics, covering 1967-68, the new definition reduced the tally. By the legal definition, there were 16,045 full-time students (13,582 men and 2,463 women) of whom 8,558 came from the Commonwealth. By the old definition, there were 17,835 students compared with 17,659 in 1966-67. But the league tables of countries sending the largest contingents and the distribution of students among the various disciplines were not significantly altered by legal niceties.

Of the legally defined overseas students, 8,108 held awards of one sort or another and 9,052 were studying at the postgraduate level. The postgraduates and undergraduates were more or less equally distributed among the various disciplines. Only 5,037 of the 16,045, however, managed to find accommodation in colleges or halls of residence—the rest were in lodgings or with friends or relatives. Apart from London University, which had 5,210 overseas students, the most popular

Table 1. COUNTRIES SENDING THE LARGEST NUMBER OF OVERSEAS FULL-TIME STUDENTS

Country	Number of full-time students
USA	2,018
India	1,429
Pakistan	899
Canada	784
Norway	678
Nigeria	641