BRITAIN

● Public fears in the developed world about nuclear power as no less real for the fact that the hazards of overeating, alcohol, cigarettes and automobiles may be greater. Among those fears the horror of radiation looms large, and if the risk posed by nuclear war is discounted, a nuclear reactor accident must be a favourite worry. The UK National Radiological Protection Board (NRPB) has reviewed the data describing the effects of radiation exposure on a population precisely in order to assess the biological consequences of the accidental release of radioactivity from a reactor. It published the findings last week*.

Information on the effects of radiation in man was derived from various studies—of individuals exposed to the atom bombs dropped on Hiroshima and Nagasaki, of Marshall Islanders contaminated with fall-out, of accident cases in the nuclear industry, and of patients treated by radiotherapy. This was supplemented with data obtained from experiments on animals. Exposure to radiation was presumed to occur in various ways: acute external exposure of the body, whether from the passing cloud or from contaminated ground; inhalation of activity from the cloud and ground and from contaminated food and water; and relocation of incorporated radionuclides within the body.

Depending on the radiation dose, an exposed population is expected to suffer both early ("acute") and late physical damage. Acute effects are minimal below a certain threshold dose. Above that dose, cell membrane damage allows fluids and electrolytes to leak out of the vascular system, and stem cells lose their reproductive capacity, meaning that normal functions can be impaired. The main late effect, cancer, has no threshold; damage to blood vessel linings, hyperthyroidism, cataracts and sterility may also occur.

The report suggests a threshold of about 200 rads (low LET), below which no deaths would occur, for irradiation of the bone marrow. For the lower large intestine a threshold of about 2,000 rads (low LET) is accepted, where the dose is received in the first seven days after exposure and the probability of death covers a one-year period. Pulmonary morbidity is not expected below a threshold dose over one year of 2,500 rads (low LET).

The report also details estimates concerning late effects. For death from leukaemia it gives a risk coefficient, in cancer deaths per 10^6 man rads (low LET), of 20. Other figures are: cancer of the lung, 20; bone, 10; liver, 10; gastrointestinal tract, 20; breast, 20; thyroid, 5; and all other cancers, 20. The total risk coefficient is 125. The estimates, the report says, are "considered adequate". As for hereditary disease, the report predicts

a total of 57 serious cases per 10^6 man rads (low LET), of which 15 and 9 would appear in the first and second generations respectively.

● Britain and the USA are to collaborate on coal research. The chairmen of the UK's National Coal Board (NCB) and the USA's General Electric Company agreed last week to exchange technical information on ways of using coal more efficiently, particularly as an energy source. It is hoped that exchanges on coal gasification, liqueaction, fluidised combustion and the production of metallurgical fuel will eventually lead to jointly run research projects.

British technology is already being used in one US coal gasification project. Work on a gasification process, done at the NCB Utilisation Research Laboratories in Surrey in 1972, is to be incorporated into a recently-approved $24-million design project which should eventually lead to a $334-million plant for Illinois to extract gas and low sulphur oil from coal. The Canadians too are using British expertise in coal. The British partnership of the NCB and Woodall-Duckham Ltd is under contract from British Colombia Hydro and Power Company in Vancouver, Canada, to study the feasibility of designing a demonstration plant for cleanly and efficiently producing electricity and gas from Canadian coal.

Coal, of course, is the less controversial key to Britain's plans to bridge the so-called 'energy gap' in the 1990s (the more controversial one is nuclear power). But last week the chairman of British Gas, Sir Denis Rooke, injected his own element of controversy by dismissing suggestions that there will even be an energy gap at that time. The technologies were being developed, he said, to make substitute natural gas from coal or oil. The energy minister with responsibilities for gas said Britain was already looking to the time when it would have to rely on SNG.

● It is a commonly expressed view that Britain has not been making the most of its professional engineers over the past few years, and that little has been achieved in improving the engineer's lot, especially in manufacturing industry. Now the government has announced a Committee of Inquiry into the engineering profession. Sir Monty Finniston, formerly at the British Steel Corporation, will chair it.

The committee will look at how British industry could better use engineers of varying educational achievement. It will also examine the part engineering institutions could play in relation to the education and qualification of engineers at professional and technician level; the possibility of statutory registration and licencing of engineers in the UK; and the engineering profession in other countries, especially in the EEC. The committee's fifteen or so members have yet to be chosen, but they are expected to convene by the autumn.

Critics have said the inquiry might delay urgently needed changes. But the Secretary of State for Industry, Mr Varley, hopes that the inquiry will not be "unduly prolonged" (it is expected to last 18 months). And if the committee feels that some of its findings deserve urgent attention, it will probably be able to produce interim reports. One question is whether the committee will recommend the establishment of a body to control academic standards and entry to the profession. Professional engineers would then be organised in a similar way to the medical profession, and the new body would be analogous to the General Medical Council.

* H. Smith and J. W. Stather, *Human Exposure to Radiation following the Release of Radioactivity from a Reactor Accident: a Quantitative Assessment of the Biological Consequences* (NRPB-R52, HMSO, 50p).