

Swiss nuclear power

Sanctions bite

Zurich

There is growing concern in Switzerland about uranium supplies for the nuclear energy programme. Indigenous deposits are too small to reduce foreign dependence, and the efforts of the chief suppliers, Canada and the United States, to prevent nuclear proliferation have led to acts which the Swiss consider to verge on blackmail. Although the pro-nuclear lobby maintains that the long-term prospects are "not unfavourable" and that the present supply hitch is merely a temporary inconvenience, there are signs that the country's independence, self-determination and neutrality will be threatened if nuclear power becomes a major element in its energy mix — just as today they are threatened by an overwhelming dependence on imported oil.

The nuclear plan — yet to go through parliament — foresees a capacity of about 7,000 MWe in conventional nuclear reactors by the beginning of the next century. With an average reactor life of 30 years, total requirements of uranium will be around 40,000 tonnes. A laborious search for indigenous deposits over the past 20 years has turned up several occurrences of interest, none of them economically viable.

The highest grade mineralizations occur in the Vallorcine granite in the Vallée du Trient (Valais) with average uranium contents of 0.1 to 0.2 per cent. But extensive exploratory drilling and trial shafts revealed reserves of less than 2,000 tonnes. Larger reserves are suspected in the upper Rhine valley near Trun (Graubünden), but there the average grade is too small (0.02–0.1 per cent). An unpublished government report in 1977, after an initial exploration costing 6 million francs (£1 = SF 4.33), concluded that the deposits in the Alps can be regarded only as emergency reserves. Normally, Swiss reactors will be completely dependent on imported fuel. It is this dependence which is beginning to cause some alarm.

The present dispute with Canada illustrates the issues. Since 1958, Canada has been the main supplier of natural uranium under a bilateral treaty. In 1977, however, the Canadian government refused permission for the transfer of yellow cake to the fuel fabrication plants in the United States which the Swiss utilities had already paid for. Since then, almost 1,000 tonnes of uranium have been blocked, and the Swiss utilities have been forced to buy alternative supplies on the international market — at far higher prices.

The reason for the blockade is the reluctance of the Swiss government to give in to Canada's demand for inspection and control rights with respect to some Swiss exports. Since the explosion of an Indian nuclear device in 1974, Canada has insisted

that every effort must be made to prevent sensitive materials, goods and technologies of "essentially" Canadian origin from being passed on to third countries without Canadian permission.

The Swiss government is in an extremely awkward position. The Bundesrat is being pressured from all sides and is still vacillating. The utilities consider Canada as their main long-term supplier and want the Canadian demands to be met at once, with as little fuss as possible. In fact, they have already negotiated the required amendments to the treaty, with rather furtive government backing. But this document has been gathering dust since 1979 because of its political explosiveness. The opposition by industrialists and politicians to a treaty modified under duress is expected to be loud and strong. The former see it as a completely unwarranted interference in the free market and object to controls not governed by Swiss laws. The latter see the loss of sovereignty and capitulation to outside pressure as matters of principle. Jurists have even suggested that Canada's failure to supply is a breach of the treaty which should be taken to the international courts — an interpretation which the Bundesrat has vehemently denied. And anti-nuclear members insist on asking awkward questions in parliament.

The general public, which is already rather sceptical of the future of nuclear energy, is confused. Industry and government experts maintain that the situation is under control and that it is only an initial

difficulty which, once mastered, will be followed by long-term guarantees of fuel supply. International cooperation and the direct financial participation of the utilities in uranium exploration will, they say, ensure that future requirements will be met. But the signs are hardly encouraging.

Two tendencies suggest that uranium mining and export will become increasingly controversial issues in the internal politics of the producing countries — the inevitable exploitation of lower grade ores, resulting in greatly increased environmental impact, and the increasing concern about the spread of nuclear weapons. The rapid development of nuclear power elsewhere will keep the world uranium market under pressure — and minor users like Switzerland at a constant disadvantage. If Switzerland's uranium supply today is being adversely affected by the explosion of a bomb nine years ago on another continent, what next?

Geoff Milnes

Indian community health

Cure for all ills

Lucknow

The Indian government's target of "health for all" by the year 2000 will not be met unless present policies are radically changed, according to a study group set up by the Indian Council of Medical Research (ICMR) and the Indian Council of Social Science Research (ICSSR).

Their report stresses that health should be recognized as a function of the overall development of society. An "alternative health care model" is presented which includes programmes for national economic growth with the objective of doubling national income per capita by the year 2000, full-scale employment at reasonable wages, improvement in the status of women, adult education, elementary education for all children between 6 and 14, welfare of backward classes, rural electrification, housing and organization of the poor. The report also suggests setting up a National Population Commission with the objective of stabilizing the total population at 1,200 million by the year 2050.

The "alternative health care model" encompasses promotive, preventive and curative aspects and combines "the valuable elements in Indian culture and tradition with the best elements of the Western system".

The report suggests that a Medical and Health Commission should be set up to look after the quantitative and qualitative aspects of health education. It recommends that drug production should be correlated with disease patterns with a bias towards the economic production of basic and essential drugs. On the research side, the important areas are delineated as parasitic diseases, problems of environment, sanitation and indigenous medicine.

Zaka Imam

More interferon cloned

The interferon genes of α and β interferon, produced respectively by lymphocytes and fibroblasts, have been cloned successfully in *Escherichia coli* at the University of Warwick, according to an announcement this week from the university. The project, led by Professor D.C. Burke, has been under way for the past three years. The Wellcome Foundation, one of several sources of finance, is also collaborating technically.

Although the two interferon genes have been successfully cloned in a bacterial plasmid, the genes have not yet been incorporated at plasmid sites where they are expressed, so as to produce the protein interferons.

Although at least three other groups (Biogen, Genentech and G.D. Searle) have successfully cloned interferons, doubts about the patentability of the techniques imply that being fourth is not necessarily to be robbed of reward.

For cloners of interferon, however, the most obvious prize for the immediate future is the cloning of gamma-interferon, otherwise known as immune interferon, which may have more interesting physiological properties than the two now in clinical trials.