Nuclear waste

Dump it here, please

THE British nuclear waste disposal agency, NIREX, is facing vocal opposition almost everywhere in Britain to its search for a new low and intermediate level disposal site. But its French equivalent, ANDRA, has had ten enquiries from the mayors of villages in central France inviting it to put its next site in their backyard.

The only problem is that although the French mayors are keen, for reasons of local development and employment, many of their people are not — for fear of the waste. Thus at one site, the village of Neuville-le-roi near Tours on the Loire, the mayor was strongly in favour of ANDRA disposing low and intermediate level waste in the clay subsoil nearby, but his 1,000 villagers mounted a campaign against him. The mayor called a referendum: 63 per cent said no, and ANDRA has now dropped Neuville-le-roi from its list.

However, still on the ANDRA list is Cholet, a town of 60,000 inhabitants south of Nantes and Angers, also near the Loire. Here the mayor is described as "very active" in attracting industry and employment, and the opposition is milder. "The behaviour at Cholet is very different from Neuville-le-roi" said an ANDRA spokesman. The opponents there "are people you can argue with".

One of the arguments is money. The French government, unlike the British, offers local authorities concerned with potential nuclear sites both cash incentives

and cut-price electricity. Thus Cholet stands to gain FF 30 million (£3 million) as a gift for housing and road improvements, and up to FF 1.5 million (£150,000) a year off local electricity bills, if ANDRA chooses it as a disposal site.

In Britain, however, the one named site — at Elstow near Bedford north of London — has met enormous opposition. Bedfordshire County Council has declared the area a "nuclear free zone" and written to the Secretary of State for the Environment, Patrick Jenkin, in strong terms, claiming Elstow "totally unsuitable as a site for a nuclear waste repository". Tempers rose further when the British government decided to allow NIREX to investigate the site by means of a "special development order" — a stratagem which avoids the need for a public inquiry.

The reaction to this British stick was perhaps predictable. The French style, offering a carrot, might have worked better, according to a study made for NIREX by Professor Terrence Lee of the University of Surrey. His survey figures show that 48 per cent of Britons would like monetary compensation (but paid to individuals rather than the council) for the building of a nuclear waste repository nearby, and a further 36 per cent would like compensation paid to the council for community benefit or some similar support — making a total of 84 per cent who say they could be bought off.

Robert Walgate.

Maritime museum plan scuttled

THE *Vityaz*, formerly the pride of the Soviet research fleet, which completed her last voyage in April 1979, is now anchored, a near-derelect with peeling paint and rotting woodwork, off Kaliningrad, *Pravda* reported recently. Plans to turn her into a floating museum have become bogged down in bureaucracy despite backing from ministerial and state bodies.

Vityaz, launched in April 1949, and the third Soviet vessel of her name (meaning "hero" or "champion"), spent most of her working life in the Pacific, carrying geological, ichthyological and meteorological expeditions. Her last, 65th voyage, however, ended with a triumphal tour of the major maritime states, including Italy, France, Spain, Portugal, the United Kingdom and Denmark, before she finally dropped anchor in Kaliningrad. It was originally hoped that the ship could go by canal to Moscow and a future as a museum. In the end, however, it was decided to leave her in Kaliningrad, the major fishing and commercial port of the Soviet Baltic coast. There was talk of a "Museum of the World Ocean" in the centre of the city, on the banks of the canal, with *Vityaz* as the prime exhibit.

But then, in the words of *Pravda*, "it all turned out strangely". *Vityaz*, which had successfully weathered hundreds of thousands of miles of ocean voyaging, somehow became stuck fast when it came to completing the last few metres to her final berth. Now, almost six years after the *Vityaz* dropped anchor in Kaliningrad, only about half the money needed even for the minimum cosmetic refit is available in Kaliningrad. Money has, however, been spent on other things. A special harbour wall for the "memorial ship" has been erected, two smallish pre-war buildings have been renovated for the planned museum, and the surrounding terrain has been artistically laid out. According to the regional Communist Party secretaries, Yu Malakin and P. Kaz'min, public opinion in Kaliningrad still supports the idea of the ship museum, but someone has to make the official decision to build the museum complex. Once it is built, says Mr A. Shkurko, Deputy Minister of Culture of the Russian SFSR, his ministry will be delighted to take it over as a branch of the provincial museum of local history. No one, however, seems willing to assume responsibility for the decision to build.

Vera Rich

Indian science

Gandhi backs research

New Delhi

THE government headed by Rajiv Gandhi, who has pledged to prepare India for the twenty-first century, has allocated the equivalent in rupees of £900 million, or about six per cent of the government's budget for 1985-86, for scientific research and development.

The allocation for science represents only a marginal increase over that for the previous year but it is significant for its emphasis on research and development in non-conventional energy sources, biotechnology, high-power lasers and thermonuclear fusion.

As in earlier years, the lion's share of the budget goes to the Department of Atomic Energy (DAE), which is to set up a new centre for advanced technology at Indore, in Madhya Pradesh. Besides housing a new facility for plasma research, the centre will develop lasers for isotope separation and high power neodymium-glass lasers for laser-induced fusion. DAE also intends to set up a synchrotron radiation source, build superconducting magnets for its heavy-ion

Budget allocations by sector (£ million)

Department of Atomic Energy	£210.0
Space	133.0
Industrial research	114.4
Defence research	104.0
Non-conventional energy	65.0
Agricultural research	55.5
Electronics	78.0
Oceanography	20.7
Meteorology	27.0
Other	93.0
Total	900.6

accelerator and establish a medical cyclotron for producing short-lived positron-emitting isotopes and radioactively labelled pharmaceutical preparations.

The Department of Ocean Development (DOD), which has assessed India's ocean thermal energy conversion (OTEC) potential at 50,000 MW, is planning to begin work this year on a 1-MW OTEC plant on the island of Lakshadweep. DOD will also place an order for an ice-breaker, estimated to cost £30 million, for undertaking expeditions to Antarctica. Previous expeditions were made in vessels chartered from Norway.

Electronics and biotechnology have been singled out as frontier areas. The government has abolished excise duty on computers and drastically reduced customs duty on their import. The Department of Electronics will launch this year a project to design a "fifth generation super-minicomputer incorporating inference and knowledge based management functions". The Ministry of Science and Technology has earmarked a sum of £5 million for a biotechnology centre in New Delhi, its con-

tribution to the UNIDO plan for twin international centres for genetic engineering and biotechnology at Trieste, Italy and in New Delhi.

The Department of Environment has allocated funds for setting up a chain of botanical gardens for building a germ-plasm bank of economic plants, and seed and pollen banks for the conservation of threatened species. The department will also initiate this year a five-year £180-million programme to clean up the polluted river Ganges.

The Department of Space, which gets the second biggest share in the budget, plans to set up five regional remote sensing service centres to facilitate use of aircraft and satellite-sensed data and to provide trained manpower. Images received from Landsat will be augmented with data to be obtained from the French SPOT satellite. The space department will also start work on a new launch-pad for orbiting satellites in polar orbits. The polar launch station is expected to become operational in 1992.

K.S. Jayaraman

UK embryo research

Voluntary authority set up

THE British Medical Research Council (MRC), in association with the Royal College of Obstetricians and Gynaecologists (RCOG), last week replied to the government's inquiry into human fertilization and embryology (the Warnock report). MRC endorses the inquiry's recommendation for a licensing authority for research in these fields, and, recognizing that legislation will take some time, has set up a voluntary licensing authority under the chairmanship of Dame Mary Donaldson and consisting of MRC and RCOG scientists and doctors as well as lay members. The authority would both license experiments and draw up a code of practice. Although agreeing with the Warnock committee's 14-day limit on experimentation on embryos, MRC prefers that the limit be set in terms of stage of embryo development rather than days after fertilization, because of variations in the rates of growth between embryos.

MRC also seeks to address wider issues than those covered by the Warnock report: to define the term "embryo" (a viable conceptus developed from a fertilized egg and not tissue or cell cultures) and that "research" should include "new and untried treatment", a concept excluded in the Warnock report.

Human embryo research was not financially supported at all by MRC before the first British "test-tube" baby was born. Since then, MRC has recognized that research can improve understanding of infertility, may prevent some inherited diseases and congenital abnormalities and may produce safer contraceptive methods. Possible lines of research include:

- Finding the best culture conditions for egg maturation, of help to people suffering recurrent miscarriages after normal conception.
- Tests on defective sperm function, involving egg penetration and subsequent limited development of the fertilized egg. (Up to 50 per cent of human infertility is due partly to male-related disorders.)
- Some 60 per cent of eggs fertilized *in vivo* do not develop beyond implantation because of fetal abnormalities and unknown factors.
- Some congenital abnormalities (for example, Down's syndrome, spina bifida)

probably occur during sperm and egg development.

- Better understanding of the development of chromosomal abnormalities.
- Investigation of infertility caused by production of antibodies to sperm in some women. Such research could lead to a contraceptive vaccine.

The MRC/RCOG report is one of many being submitted to the government. Eventually, legislation will result. But if the Powell bill (see *Nature* 21 February 1985, pp. 612 and 618) becomes law, considered reports such as the MRC statement will be so much wasted paper, for all research and development involving human embryos will be illegal. Techniques such as GIFT (gamete intrafallopian transfer), developed in Texas, where an unfertilized egg is removed from the ovary and immediately transferred to the fallopian tube where it can then be fertilized, would never be developed with such a bill operating. Later this month the first such baby will be born in Britain.

Maxine Clarke

Hazardous chemicals

Congress acts on clean air

Washington

IN the wake of the Bhopal disaster, pressure is mounting in the United States to enforce new limits on emissions of toxic substances from chemical plants.

The effort has been given a recent impetus by a series of revelations from Union Carbide (which operates a methyl isocyanate plant in West Virginia) and other chemical manufacturers concerning accidental and routine venting of hazardous substances. In responding to a survey conducted by the subcommittee on health and the environment under the chairmanship of Representative Henry Waxman (Democrat, California), 67 chemical companies acknowledged venting a total of some 204 chemical substances that the companies themselves identified as "hazardous". Many of the companies had been reluctant in the past to provide this data; Waxman approached the companies directly after

discovering that the Environmental Protection Agency (EPA) had failed to collect this information in connection with its existing programme of regulating hazardous air pollutants.

The subcommittee is still analysing the data and will not release a complete report for several weeks. But a preliminary survey shows that at least a few plants emit surprisingly large quantities of hazardous substances. Borg Warner, for example, reported that one of its plants in West Virginia releases some 8,000 pounds of acrylonitrile, a known human carcinogen, into the air each day.

The subcommittee also found striking variations in emissions between similar plants run by different companies, and even between plants in different states run by the same company.

Under current EPA regulations, only five chemicals are controlled as hazardous air pollutants: vinyl chloride, benzene, asbestos, beryllium and mercury. Congress's environment committees have complained for years about EPA foot-dragging; EPA has listed 27 substances as "suspected hazards" but has not yet decided whether to issue control regulations. Although the legislative history of the 1970 clean air act shows that Congress expected EPA to consider regulating at least 12 specific substances (including chlorine gas, hydrochloric acid, several heavy metals, pesticides and radioactive compounds), the law itself gives the agency broad discretion to decide what constitutes a hazardous air pollutant and what action to take to limit release of pollutants into the atmosphere.

EPA has further provoked Congress by recently proposing a relaxation of controls on emissions of vinyl chloride, a known human carcinogen. Under existing rules, plants that produce vinyl chloride may only vent the chemical through relief valves under emergency conditions. Each time a venting occurs, EPA investigates the incident to determine if it could have been prevented; if it was preventable, the company is subject to civil or criminal penalties. Yet EPA records show that "emergency" venting of vinyl chloride is almost routine; one million pounds was released into the air during the period 1977-80. EPA is now proposing to recognize the fact by allowing each plant four to seven "free" ventings per year; EPA would no longer investigate each incident.

Waxman's subcommittee is working on a bill that would require EPA to produce regulations on a specific list of chemicals and with deadlines incorporated into the legislation. Similar efforts (albeit milder) have been passed by various subsets of Congress as part of proposed revisions of the clean air act, but always to die as the act itself founders on unresolved differences over other issues, notably acid rain controls. Waxman will try to have his bill considered as a separate piece of legislation, not tied to the clean air act.

Stephen Budiansky