

Ariane in space

What next?

Last week's failure of the fifth Ariane flight is bound to have repercussions on the launcher's commercial prospects. But officials at the European Space Agency (ESA) are still hopeful that the fault that caused the failure in the rocket's third stage will prove to be no more than a manufacturing error, thus reassuring customers of Ariane's basic soundness. Three previous successful flights are taken as testimony that the fault probably does not lie with the design.

ESA is keen to point out that the rocket's first and second stages worked perfectly. But the third stage, which was carrying two satellites into geostationary transfer orbit, suddenly lost power after about 4 seconds and brought the satellites back down to Earth. A preliminary analysis of telemetry data recorded at a station in north-east Brazil has revealed a sudden failure in a gear controlling the flow of cryogenic propellant from the liquid oxygen and liquid hydrogen pumps. Nobody yet knows, however, precisely what went wrong with the gear.

Whether the failure was due to a simple error or to a more ominous design fault, sorting it out is bound to delay the future Ariane launch programme. A lengthy delay could postpone the launch of Exosat, ESA's X-ray astronomy observatory, from its scheduled date of next November to June or July next year. Exosat can only be launched during specific launch windows around December and midsummer.

Although a delay to Exosat could upset Europe's hard-done-by X-ray astronomers, ESA is bound to be more worried about the effects of delay and uncertainty over Ariane's reliability on the launcher's potential commercial customers. Intelsat, the international owner of the Intelsat series of telecommunications satellites, for

example, is due to launch three of the Intelsat 5 series on Ariane next year. Although the organization has made little response yet to last week's failure it will be watching the next Ariane launch keenly before making any firm commitments.

Meanwhile, ESA is having to decide how to make amends for Marecs B and Sirio 2, the two satellites lost last week. Sirio 2, a telecommunications satellite of primarily Italian design was uninsured, but the insurance money from Marecs B could be used to assemble quickly Marecs C, possibly for launch at the end of 1983 or the beginning of 1984. Inmarsat, the International Maritime Satellite Organization which had planned to lease channels on Marecs B for maritime communications in the Pacific, says that it can continue its present service in the area with the US Marisat satellite. But it is likely to take up ESA's offer to assemble and launch as quickly as possible the Marecs C replacement.

Amendments to the launch programme could delay the transition of the Ariane programme from ESA's control to that of Arianespace arranged before last week for July or August next year. Arianespace seems likely to take longer than expected before earning money. The company's prospects also seem to depend more than it must have hoped on the success or otherwise of the space shuttle, due to make its fifth (and first operational) flight in November.

Judy Redfearn

Spina bifida

Trials ahead

The Medical Research Council (MRC) is soon to start trials to investigate the role of folic acid and other multivitamin supplements in the prevention of neural tube defects (NTD). The programme is controversial because of its ethical implications. Women invited to participate will already have conceived one spina bifida baby and are therefore at risk of conceiving another. In order to understand the effects of dietary supplements, women in the control group will not be given multivitamin and folate supplements.

The government is to give £300,000 for the first three years of the trials. Although many scientists and doctors believe that multivitamin supplementation is important in the reduction of NTD, MRC says that new trials are necessary because previous experiments have not provided strong enough evidence for such a link. Experiments on folate and multivitamin supplementation at the Universities of Cardiff and Leeds are considered not to have been properly randomized. The women who participated were mainly from the middle classes and therefore at lower risk anyway.

The MRC programme will involve 3,000 women at 20 centres. There will also be centres in Israel and Australia. The women

will be offered full antenatal screening facilities and the centres will have to be approved by local ethical councils. The volunteers, who are planning a pregnancy (pills are taken before and after conception), will be randomized and divided into four groups. The first will receive pills containing minerals plus multivitamins, the second minerals, multivitamins and folate, the third minerals and folate and the control group minerals only. This design will permit a comparison between the multivitamin effect and the folic acid effect.

The National Childbirth Trust has written to the Minister of Health, Mr Kenneth Clarke, expressing its worries about the trials. It says that there is already sufficient evidence to link folic acid deficiency with spina bifida and point out that the women participants will have a one in four chance of being in the control group and therefore at risk. In Britain one in 20 women who have already conceived an NTD baby conceive another.

Ethical worries about the trial's implications hang on how well the women will be briefed. The Association of Spina Bifida and Hydrocephalus (ASBAH) agrees that there is a need for more scientific evidence and that this cannot be done without further trials. Its support is qualified, however, by the proviso that the participants must be adequately briefed. At present MRC decides what information is given to women volunteers.

Dr Nicholas Wald of the Radcliffe Infirmary in Oxford, who is to coordinate the trials, stresses that the women will be invited to participate. But he points out that even if they were not fully briefed the trials would not necessarily be unethical. He argues that the trial is ethical primarily because there is a broad balance between the likely good of the treatment and the possible harm.

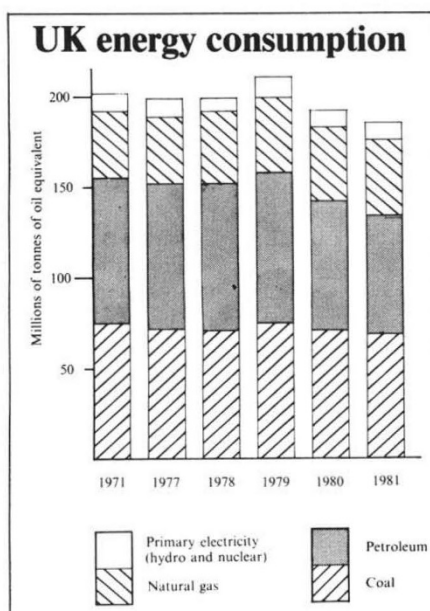
No one is willing to be explicit about what volunteers will be told. While women in the control group will not receive multivitamin or folate supplements, it should however be pointed out that such supplements would not necessarily be recommended by a general practitioner or by ASBAH in any case. ASBAH hopes that the MRC trials will establish what dietary advice should be given to women at risk who plan to become pregnant again.

Jane Wynn

Helsinki agreement

Monitoring stops

The formal disbanding, last week, of the Moscow "Helsinki Monitoring Group" is little more than an acknowledgement of a *fait accompli*. Since its foundation, six years ago, to monitor Soviet observance of the Helsinki Accords, the group has been subject to ever-increasing official pressure. In 1978, its founder and original chairman, Dr Yurii Orlov the physicist, was sentenced



to seven years in a labour camp, plus five years Siberian exile, for his part in the group's activities. Since Dr Orlov's conviction the active membership of the group has been whittled down by successive arrests to, effectively, two persons, Elena Bonner, the wife of Academician Andrei Sakharov, and Sofia Kallistratova, an elderly lawyer. It was apparently an official warning to Mrs Kallistratova last week that she might soon be arrested and charged with anti-Soviet activities that led to the disbanding.

The Moscow Helsinki group has not been the only victim of repression. Other Helsinki groups throughout the Soviet Union, and in particular the Ukrainian group founded by Mykola Rudenko the science fiction writer, have been similarly obliterated by the imprisonment of their members. So has the Moscow "Working Group for the Investigation of the Misuse of Psychiatry for Political Purposes". The founder members of SMOT, the "Inter-professional Free Trade Union", have all been either taken into custody or expelled from the Soviet Union. Since the arrest of Dr Viktor Brailovskii on the opening day of the Madrid "Helsinki Review" conference in November 1980, the Moscow Sunday Seminar for refusenik scientists has been able to meet only on very rare occasions, and regular participants have been subjected to harassment. Brailovskii himself is now eligible for early release from his exile in Beineu (Kazakhstan), but has so far been unable to obtain the necessary character reference from the local authorities, which, it is understood, want specific authorization from Moscow.

Some forms of grass-roots dissent do seem to have survived, however. Mrs Albina Yakoreva, a computer specialist and founder member of SMOT, who was put on a plane to Vienna last month, reported that the free trade union movement has decentralized, but that at least twenty-one grass-roots branches are active, their main object now being the building up of a climate of opinion that will accept such fundamental democratic concepts as worker self-management. In Byelorussia, which was relatively passive during the upsurge of dissent of the early 1970s, underground initiatives protesting against the russification of Byelorussian culture have been reported. The three Baltic republics, Lithuania, Latvia and Estonia, which have developed their own traditions of dissent (the *Chronicle of the Lithuanian Catholic Church* has long been one of the most prestigious underground Soviet journals, while Estonia has staged protest marches and token strikes) have, in the past year, begun to coordinate their efforts on fundamental issues. Their most significant effort so far is a letter to the governments of the Nordic and Baltic countries expressing their support for the proposed Nordic nuclear-free zone, but urging that the ban be extended to the relevant areas of the Soviet Union.

Vera Rich

Nuclear waste reprocessing

Germans divide

Heidelberg

The reprocessing of nuclear waste has predictably become an issue in the Hesse and Bavaria elections, now in full swing. The Social Democrats, the major partners in the Bonn coalition with the Free Democrats but fighting separately in the elections for the *Länder* governments, shoulder the chief responsibility for having declared that each *Land* includes a candidate site. The Free Democrats, party to these decisions but united electorally with the more powerful Christian Democrats, are more or less immune from the attacks with which the "Greens" (the environmentalist party) threaten to enliven the elections.

The 14 nuclear power plants in West Germany now produce some 350 tonnes of spent fuel-rods a year. By 1990, 25 power plants will be producing 750 tonnes a year. Under contracts with the French state-controlled Cogema, the rods will be reprocessed at the Cap de la Hague plant in Normandy until 1985, after which the outlook is unclear. Pending the completion of a second 800 tonne per year unit at Cap de la Hague, West Germany will in any case have to take back the highly reactive waste

and put it somewhere.

At present, Cap de la Hague and Sellafield (as Windscale is now called) are the only two commercial reprocessing plants functioning, but there is a chance that the smaller plant at Mol in Belgium may reopen soon (see *Nature* 26 August, p.783). Worldwide, however, there is a desperate shortage of reprocessing facilities, with 200 nuclear power reactors operating and 150 under construction. Only the US interdiction of the reprocessing of spent fuel bridges the gap.

In West Germany, after the abandonment last year of the plan for a 1,400-tonne reprocessing plant at Gorleben in Lower Saxony for political reasons and after massive environmentalist protest, the industry-run organization responsible for reprocessing is considering three 350-tonne per year sites at Frankenberg (Hesse), Schwandorf (Bavaria) and Kaisersesch (Rheinland-Pfalz).

The final storage of wastes, however, remains the responsibility of the federal government. Geologists estimate that salt deposits underlie about a quarter of Northern Europe and in spite of protests and a recent controversial study which revealed unexpected depths of erosion of the salt dome during the last ice age, investigations continue.

Sarah Tooze

Biotechnology briefs

The Cetus Corporation announced last week the first lay-offs in its history and a substantial refocusing of its research and development on projects that would be likely to pay off in the short term. Forty employees have been laid off, and projects dealing with the production of high-purity fructose and energy and chemical processing have been stopped. Cetus raised a record \$107 million with its public offering of shares in March 1981, but Standard Oil of California, a major shareholder, has declined to continue supporting fructose work at the company.

Another biotechnology company with ambitions in the artificial sweetener field is about to make a public stock offering. The Genex Corporation of Rockville, Maryland, is expected to offer 2.5 million shares in late September or early October, which could raise as much as \$33 million according to documents that Genex has filed with the US Securities and Exchange Commission (SEC). Genex already has a production plant for L-aspartic acid, which is used in the production of aspartame, a sweetener marketed by the Searle Corporation that was recently approved by the US Food and Drug Administration. Genex is also interested in genetically-engineered production of calf renin, bovine, porcine and ovine animal growth hormones and various industrial chemicals. The company is 45 per cent owned by the Kopper Co. Inc. of

Pittsburgh, a major chemical concern. The company, which is one of the largest genetic engineering companies in the United States, has grown steadily through contract research, the income from which rose from zero in 1977 to \$3.9 million in 1981.

Eli Lilly and Co. of Indianapolis is expected to announce later in the month the availability of the first genetically-engineered product for human use, human insulin. The work has been carried out by Genentech Corporation of South San Francisco.

Meanwhile, Armos Corporation, also of South San Francisco, a company founded in June 1980 by Brian T. Sheehan, formerly of Genentech, has filed for bankruptcy in the San Francisco courts. Sheehan says that this will enable the company to reorganize and that several investors are interested in its potential.

Another Canadian entry into the biotechnology field is Alleelix of Mississauga, Ontario, whose scientific director, Derek C. Burke, is leaving the University of Warwick in the United Kingdom to work full-time for the company. Alleelix is a joint venture between the Canada Development Corporation, John Labatt Limited and the province of Ontario. Burke says that the assurance of Can\$100 million over the next ten years will prevent the company from having to "panic" in the quest for short-term genetically-engineered products.

Deborah Shapley