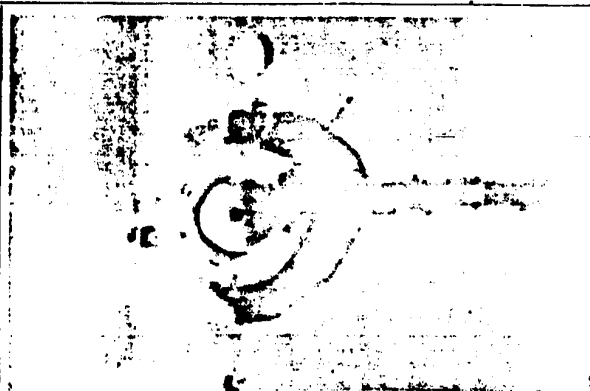




Soviet space progress

The tactics behind the Soviet space programme became clearer last weekend when an unmanned "automatic transport spaceship" took supplies to the Salyut 6/Soyuz 27 space complex. Named Progress 1, the new "cargo ship" took fuel and scientific equipment to Yuri Romanenko and Georgy Grachev, who went into orbit early in November. Unmanned space transports will make it possible for the Soviet astronauts to stay in orbit for long periods. The success of the latest venture—with both manned and unmanned vehicles docking with the space station—shows that the Soviets have made considerable progress in automatic docking. □

Electrons cut PCBs in drinking water

Organic compounds such as DDT or PCBs do not dissolve readily in water yet they can be exceedingly dangerous to fish and other animals including human beings who drink contaminated water because the chemicals accumulate in their fat tissues. Edward Merrill of the Chemical Engineering Department of the Massachusetts Institute of Technology (MIT) has discovered that normal radiation doses as high as 40 000 rads which will disinfect sewage sludge also degrade these compounds. In laboratory tests to try out electron bombardment, he used a Van de Graaff generator to irradiate pure water and soap/water suspensions (model systems of PCB contamination of the environment) and found that in the first case a dose of 10 kilorads or less eliminated 96 per cent of the dissolved PCB. In the "sludge" model, a much higher dose of 400 kilorads was required. He also showed that the herbicide "amatsuron" was similarly broken down. He believes the electron bombardment of the water splits the water molecule into two fragments one of which, the hydroxyl radical, attaches itself to the PCB, making it water soluble.

Dr Merrill said that the toxicity of the transformed species produced when the chemicals break down will be checked during the coming year for mutagenic activity. "On the other hand we can state without hesitation that the total concentration of the transformed products cannot be higher than that of

the initial contaminant."

At the moment, the only alternative treatment is ozonisation requiring lengthy storage in large-scale holding reservoirs. With an electron beam the entire chemical reaction takes place in the flowing water in seconds. Dr Merrill foresees the technique being used to decontaminate municipal drinking water.

Dr Merrill said that the proposed process represents an "unfinished story". Many other compounds may be successfully treated in the same way. □

Industrial liquid could dissolve vision

Long-term exposure to industrial solvents could cause faults in memory and visual defects, according to a paper by Herbert Schaumburg and Peter Spencer in *Science* (vol 199, p 59). Spencer and Schaumburg fed cats 2,5-hexanedione, a metabolite of the common solvent n-hexane.

As well as degenerative changes in the peripheral nervous system, which also showed up in earlier experiments, they also noted degeneration in areas of the brain responsible for visual processing and memory. There have been occasional reports of visual and memory problems among people exposed to n-hexane, but these are rare. The *Science* paper suggests that these effects are uncommon because few doctors measure visual functions in patients suffering from poisoning by industrial solvents and be-

A new breed of drug-sensitive bacteria

Clinicians around the world have become increasingly anxious over the past year about the spread of gonococci resistant to penicillin (*New Scientist*, vol 72, p 3). Now comes a surprising report from two bacteriologists at the University of North Carolina about strains of the same bacteria which are ultra-sensitive to this and other antibiotics. Among organisms isolated from gonorrhea victims in North Carolina, London, Rotterdam, and the Far East, they have found gonococci with a mutation making them highly susceptible to a variety of drugs. Such mutants have been detected among laboratory strains before, but this is the first report of the isolation of hyper-sensitive organisms from patients.

"Paradoxically, antibiotic usage may be selecting gonococci with both greater antibiotic resistance and, indirectly, greater sensitivity," write Drs Barry Eisenstein and Frederick Sparling in *Nature* (vol 271, p 242). They base this argument on the fact that their bizarre strains grow more quickly (in the test-tube, and presumably also in the body) than the resistant bacteria from which they arose. One type, it seems, has a selective advantage in resisting antibiotics, the other is multiplying faster.

Eisenstein and Sparling's discovery has two practical implications. Gonorrhea caused by a hyper-sensitive strain alone (ie not mixed with resistant organisms) should be particularly vulnerable to antibiotics. But untreated, such an infection could develop more quickly.

The resistance/sensitivity in question is independent of the production of penicillinase, the enzyme which protects some bacteria against penicillin. It may be associated with change in protein in the cell membrane. Earlier studies have shown that this type of sensitivity makes gonococci vulnerable not only to antibiotics, but also to detergents and dyes. □

cause many of the solvent-poisoning cases that doctors see involve acute, not long-term, poisoning.

Spencer and Schaumburg predict: "It seems likely that prolonged, low-level industrial or environmental exposure to n-hexane or to the other environmentally prominent compounds that evoke distal axonopathy [that is, destroy peripheral nerves] will provoke subtle changes in areas of the nervous system which may be vital to memory and vision." They add: "Individuals exposed to such compounds might experience premature or accelerated deterioration in vision and memory. As it is (still) the property, a footnote to their paper points out that one of these compounds, acrylamide monomer, has already been found (by Dow researchers) to cause precisely the neural changes they predict. □