DEFENCE RESEARCH

But the project has nevertheless left a legacy in the US genetics community, researchers say. Genetic manipulation software being developed both at NIH and at LBL uses many of the same logic programming techniques as the original fifth-generation software, if none of its actual components. And the project led US genetics researchers to talk among themselves about new computer techniques, says Cassandra Smith, who heads the LBL team. Those collaborations, at least, are still bearing fruit.

ICOT has also tried to link up with biologists at Kyoto University. As in the case of Argonne and NIH, the institute donated personal sequential inference machines to the university that could, in theory, be linked to the mother computer in Tokyo. But because ICOT is not a university and is not part of MITI, its scientists have not been able to establish a computer link.

Nevertheless, MITI officials see the genome project as one possible way to keep at least a part of the fifth-generation project alive after the end of the current fiscal year. And the biochemical industry division of the ministry will soon form a committee to coordinate this and other genome-related research activities supported by MITI (*Nature* **356**, 181; 1992).

However, companies which have been participating in the fifth-generation project have no interest in seeing it continue. They are tired of having some of their best researchers tied up in the project, particularly now that industrial research budgets are being cut. ICOT has 90 researchers, nearly all of them drawn from industry, and another 200 researchers are working for the project at their companies.

Some young ICOT researchers are very keen for the project to continue so that they can develop and test out software on it. But ICOT's director, Kazuhiro Fuchi, thinks it will be very difficult for the project to continue beyond March 1993.

David Swinbanks & Christopher Anderson

Classification Catch-22

Washington

US DEFENCE officials have accused an outspoken critic of the Patriot missile and the "Star Wars" missile defence system of publishing secrets. But they are unable to prosecute him because he will not allow them to tell him what those secrets are.

The critic, Theodore Postol, a Massachusetts Institute of Technology (MIT) physicist, says that he used only unclassified data in his calculations for an article that claims that the Patriot missile was "an almost total failure" in the Gulf War. But if he lets defence officials identify what they believe is classified information in the article, he says, it will become by definition secret and he will not be allowed to talk about it, even if it was based on unclassified data.

This Catch-22 may have put Postol in the public eye for the moment as the latest in a list of researchers who have run aground in this still uncharted corner of the classification rules. The problem is a concept known as 'compilation'. Simply put, when nominally unclassified data is assembled in such a way that the end result is more secret than the sum of its parts, it can become too secret to publish.

In 1979, *The Progressive* magazine got into trouble with an article that described how to build a hydrogen bomb. Culled from unclassified interviews with nuclear scientists and publicly available information, the article triggered a lengthy legal battle before it was finally allowed to be published.

A few years later, Bruce Blair, an analyst at the Brookings Institute in Washington, DC, found that he had crossed the line in compiling an unclassified report about the electromagnetic pulses that follow nuclear explosions. Even Blair himself was not allowed to keep a copy of this suddenly secret report. Since then, even Stansfield Turner, a retired admiral and former director of the Central Intelligence Agency, ran afoul of officials who sought

to remove details from his 1985 book, *Secrecy and Democracy*. They told him that, while the information was not secret, it had been compiled with the help of classified knowledge.

In Postol's case, there are actually two issues. The first is whether there is, indeed, anything secret about his article, which appeared earlier this year in *International Security*. He says no, and he has invited defence officials to check his claim by examining all 100 unclassified references. Postol says that he obtained other figures in the article by doing simple calculations based on publicly available information; to determine the top speed of a Patriot missile, for example, he did a mass distribution calculation based on an unclassified photograph.

But the other issue is trickier. Before coming to MIT, Postol held a top-level classified position with the Navy, where he evaluated advanced weapons. Since then, he has retained his security clearance and recently sat in on two classified talks on issues relating to the Patriot. He says neither of the talks provided him with any information for the article.

He has offered to show the classification officials where and how he obtained each figure in his article. But he says they do not want to bother, and they have told him not to discuss the article until the issue is resolved. Last week, he told the Government Operations Committee of the US House of Representatives that such abuses of the classification system censor free speech and "pose one of the most serious and overriding threats to democracy and its institutions".

Postol's case rests with Congress and the Defense Department. But critics of the current classification system say there are many similar cases in which reports and papers based on unclassified disappear after they are deemed too sensitive. "It's an all-too common extension of an already aggressive classification policy," says Steven Aftergood, a security expert with the Federation of American Scientists.

Turner calls it "a way of improperly classifying material". Avoiding a 'secret' stamp on sensitive articles is not easy, he says, especially if a researcher has a security clearance. "You have to establish that an ordinary person without special skills couldn't have done [the work]" it says. "While there's no law that says you need to prove your innocence, that in fact is what you have to do."

One solution to the problem is to avoid issues that embarrass the government. Failing that, says Roy Woodruff of the Los Alamos National Laboratory, "use good research judgement and dig in your heels when they complain."

Christopher Anderson

Talking about a new generation

JAPAN's Ministry of International Trade and Industry (MITI) is determined to avoid some of the pitfalls of the fifth-generation computer project (see previous page) as it begins a follow-up computer project of comparable scale and duration.

Rather than setting its sights on one specific type of hardware and software, the ministry is planning a multi-pronged approach that will include development of neural network and optical computing systems as well as a general-purpose massively parallel computer. In another departure from the earlier project, MITI plans to farm out much of the work to companies, national research laboratories and universities both within and outside Japan.

MITI also seems determined to erase any connections with the preceding fifth-generation project. MITI has named it 'four-dimensional' (*yojigen*) computer for home consumption and the 'real-world computing program' in English.

Once again, however, MITI is setting itself a very ambitious and specific target. Its ten-year goal is to build a computer with one million processors, some thousand times the goal of the fifth-generation project. **D.S.**