order provides that a "regulatory analysis" setting forth a careful comparison of alternatives and their economic consequences shall be conducted for all proposed regulations deemed likely to have an effect of $100 million or more on the economy annually or lead to a substantial increase in costs or prices for particular industries, levels of government, or regions.

To complement the order, the President set up the Regulatory Analysis Re-

DOD Vacillates on Wisconsin Cryptography Work

Questions about the implications of academic research on cryptography were raised anew in recent weeks when the government placed, and then lifted, a secrecy order on a professor of computer science at the University of Wisconsin at Milwaukee.

George I. DaVida, the professor, had applied for a patent on a new cryptographic scheme to the Commerce Department. But in late April, he received a letter from the department ordering him not to discuss or write about the "principles" involved.

"It was worded so broadly," DaVida told *Science*, "It could have meant that I couldn't talk about any of the mathematical theory underlying cryptography or my related research." DaVida declined to discuss the specific scheme in the patent, saying that his attorneys had advised him to remain silent about it until after the patent process, now under way, is complete.

But at the time, Werner Baum, chancellor of the campus at Milwaukee, was outraged at what he regarded as an invasion of his faculty's academic freedom without due process. Baum told *Science* that the government's procedure smacked of McCarthy era tactics against universities, and that the law the commerce department acted under dated from that era and might not survive a test of its constitutionality. "How can some unknown bureaucrat classify an individual's research activity without any justification or due process?" he said.

Baum protested the secrecy order publicly, spoke to the Secretary of Commerce by telephone, and appealed to the director of the National Science Foundation (NSF)—which sponsors DaVida's work—for aid in fighting the order. A few weeks later, DaVida received another notice saying that the secrecy order had been lifted.

According to government officials close to the incident, the Commerce Department forwarded the patient application to "a defense agency" for review. The official would not say which agency was involved, but presumably it was the National Security Agency (NSA), the Department of Defense's (DOD) cryptographic organization, which operates in total secrecy (it is not even listed in the Pentagon directory) and is accustomed to total secrecy and a monopoly on the subject of cryptography.

Because the University of Wisconsin's patent applications are filed through an organization not bearing the university's name, that is, the Wisconsin Alumni Research Foundation, and because DaVida's application did not mention that his work had been sponsored by NSF, these officials say that the "DOD agency" reviewing the patent didn't know they were dealing with university research.

The NSA, through spokesperson Carolyn Johnson, declined to comment on the incident, but a Senate Intelligence Committee staffer says:

"Anything dealing with encryption is sent to the DOD to see if the patent applied for is harmful to national security. The DOD made a decision that national security could be harmed by its publication and placed a hold on the application and froze it. . . .

"When the university made known its interest in the patent application, a review was made and they—the DOD—came to the conclusion that the degree of potential damage was one that could be tolerated. The second review rolled back the first hold."

Baum is still not satisfied. In a 19 June letter to NSF director Richard C. Atkinson, he wrote:

"At the very least, an effort should be made to develop minimal due process guarantees for individuals who are threatened with a secrecy order. The burden of proof should be on the government to show why a citizen's constitutional rights must be abridged in the interests of 'national security.' Perhaps a judge, not some unknown 'defense agency' should determine the validity of the government claims. Without such protection, both individual rights and scientific research may suffer irreparable damage."

How to Police Research?

The incident is the second sign that the defense side of the government is concerned and jittery about what fruits the recent growth in university research in cryptography may bear. A group of scientists who have pioneered a breakthrough in cryptography by developing secure codes that could be used by business and the public, last fall, received a letter from J. A. Meyer, an NSA employee, warning them that to publish or talk about the work could violate the export control laws. The NSA disavowed responsibility for the letter and the scientists have continued to publish and talk about their work unharmed (*Science*, 30 September 1977).

The Meyer incident raised the issue of whether the export laws could apply to university research; the DaVida affair raises the question as to whether the patent laws can be used by the defense community to police discoveries.

The NSF's General Counsel, Charles H. Herz, had meetings with attorneys from the Commerce Department and from "a defense agency" concerning the DaVida patent. Herz says "Maybe patents aren't the way to police this thing . . . anything in a patent that arises from university research has probably already been published."

Herz' impression that the "defense agency" is looking for some clear way to evaluate the jewels that could be thrust up from this research—and prevent other nations from obtaining them—is shared by the staffer on the Senate Intelligence Committee. "They realize they have neither the ability nor the legal authority to police it [the academic research] or stop it. All they would like is some clear authority, so that if something comes out of the universities that really does threaten national security, they could move in on it. Suppose a mathematician came up with a brilliant way to crack the most secure codes, for example. They would want that line drawn."—DEBORAH SHAPLEY

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