recently published 200 semi-weak and semi-semi weak keys of the sort Davies discovered. "But it's debateable how weak is weak. How you are going to attack the system is not clear. I would not hesitate to use a semi-semi weak key. I personally don't think you can do anything with them."

Robert Juneman of Satellite Business Systems agrees with Meyer. These keys, he says, "have certain structural properties that make you lift your eyebrows a little bit." But he knows of no way to use the weak keys to break the DES code. Still, he remarks, "The more I learn the less certain I get about anything. I'm just saying I haven't found a way of putting these keys to any particular use."

One reason that Deavours and Polis find the weak keys so disturbing is that the DES is *the* cryptographic standard in the United States. If anything is wrong with it, there is no well-known or reliable alternative. "It makes no sense to have just one cryptographic standard," says Deavours. "The NSA doesn't use just one code. Why should we?" George Davida of the University of Wisconsin in Milwaukee agrees. "The need for encryption is immense and the absurdity of having just one encryption standard is becoming clearer."

Davida attributes the situation to the government's "attempts to meddle in this area" by, for example, encouraging cryptography researchers to submit their papers to the NSA prior to publication and by restricting the export of cryptological devices. As a result, few investigators in this country publicly do cryptography research. But private corporations, Davida says, are quietly developing their own codes. He consults for some companies that have doubled the DES key length and have altered the internal functions to make the code more secure for their own private use. "What's sad is that the corporations with money will design their own codes anyway. They will have the protection they need but private persons will not."

An intriguing question is whether NSA already has the ability to break the DES code. Since the DES is sold abroad as well as in the United States, the NSA would want to be able to break the code and it is widely believed that it can do so. Deavours points out that the NSA cannot think the DES is particularly hard to break since it only certifies it for "confidential" information. Says Deavours, "That's practically the stuff you read in newspapers." And a former director of research at the NSA told an NSA employee that the agency has always been able to break the code.—**GINA KOLATA**

Large Volkswagens in the Western Sky

A dozen antinuclear groups have filed a lawsuit against the Pentagon in an attempt to get a formal assessment of the world environment in the aftermath of a limited or full-scale nuclear war. The suit, filed on 12 January, specifically seeks a statement on the environmental impact of deploying the MX nuclear missile in Wyoming. But the plaintiffs say that a primary goal is to force the government to predict what happens to the environment when a weapon such as the MX is either used or attacked.

No previous federal environmental impact statement related to the deployment of strategic weapons has included such a statement. The plaintiffs say that this is because no private group ever requested it before. The law mandating such assessments prior to the start of large federal construction projects requires only that they address "adverse environmental effects which cannot be avoided." Thus, a key argument of the lawsuit is that MX deployment sharply increases the likelihood of a nuclear war.

The novel request was prepared by Nicholas Yost, who is a recognized legal expert in this area. Yost served as the attorney for the White House Council on Environmental Quality during the Carter Administration. "We want to be sure they produce an environmental impact statement on the basing mode, whether it be Dense Pack or something else," he said. "We want to be sure there is an opportunity for public comment. And we also want them to look at the effect of the missiles if used as designed." Plaintiffs in the suit include Friends of the Earth, the Council for a Livable World, the United Church of Christ, Environmental Action, Greenpeace, the Sierra Club, the Wyoming Church Coalition, and the Tri-State MX Coalition.

The Reagan Administration has not yet stated whether it plans to do an impact statement of any kind on its final missile-basing proposal. But Senator John Tower (R–Tex.), a major Administration supporter who chairs the Armed Services Committee, said in December that "once a site is selected, the provisions of the National Environmental Policy Act will be fully complied with." Grant Reynolds, an assistant general counsel to the Air Force, which is responsible for MX deployment, would say only that the lawsuit "doesn't have any merit, and will be vigorously defended."

Any formal Administration statement about the aftermath of an attack on Dense Pack could be extremely interesting. In congressional testimony late last year, the Air Force mentioned casually that an attack would send enormous boulders into the sky, "some of them larger than a Volkswagen." Other, more harrowing phenomena would doubtless ensue.

—**R. JEFFREY SMITH**

Britain to Study Health Effects of Nuclear Tests

London. The British Ministry of Defense announced last week that it is planning to carry out a survey of 12,000 servicemen and civilians who were involved in nuclear weapons tests in the South Pacific in the 1950's, to investigate the validity of claims that they face an abnormally high risk of cancer and other related diseases.

The survey is being carried out in response to growing public concern in Britain that the long-term effects of exposure to fallout from the tests are only now becoming apparent. On a program broadcast on 12 January by the British Broadcasting Corporation, for example, it was alleged that at least 130 individuals involved in the tests had died from cancer and other diseases which might have been the result of their participation.

Whether there is a link between an individual's exposure to low levels of radiation during the South Pacific tests, which took place between 1952 and 1958, and their subsequent medical history is currently a major point of controversy among the British government's health experts.

The Department of Health and Social Security, for example, recently agreed to award a war widow's pension to the wife of one serviceman who had suffered from skin sores after helping to hose down an aircraft which had just flown through the center of

the cloud formed by a nuclear explosion, and who died last year from leukemia.

The Ministry of Defense, however, is continuing to state that those who took part in the tests were not exposed to particularly high risks, and it has already rejected six claims for compensation. A spokesman for the ministry said last week that the ministry's position was that health precautions taken at the time were quite adequate, and that there was no evidence to support claims for compensation. "The survey is the only way to put this all on a scientific footing," he said.—**David Dickson**

FDA Assails Safety of Depo-Provera

The Food and Drug Administration (FDA) clashed with the Upjohn Company recently at a hearing in Washington on the approval of Depo-Provera, a contraceptive, for use within the United States. Robert Temple, FDA's acting director of new drug evaluations, told a panel of independent scientists that Upjohn had failed to dispel concerns that the long-lasting, injectable drug causes cancer, while company officials said that its sale would result in few risks and should therefore be approved.

Temple cited the results of several beagle and monkey studies financed by Upjohn in which a significant number of animals developed breast or endometrial cancer. "As a general rule, FDA does not approve animal carcinogens for prolonged use in young, healthy people," Temple said. "We believe that Depo-Provera has not been shown to be safe."

Upjohn attempted to refute the test results by suggesting that beagles and monkeys—the standard species for contraceptive tests—are an inappropriate model for human response to its drug. Upjohn said, for example, that beagles are uniquely susceptible to tumor formation from exposure to progestogens such as Depo-Provera, a point that was disputed by FDA. Company officials also said that existing epidemiological studies in humans indicate that the drug is relatively safe. It is used by women in roughly 80 countries around the world.

"It is never possible to say that a drug is absolutely safe," explains Gordon Duncan, an Upjohn research executive. "But all of the studies indicate that there is no major risk associated with use of the drug at this time, relative to the risks of using oral contraceptives or the risks of dying in childbirth after the failure of a barrier method."

Robert Hoover, the acting chief of environmental epidemiology at the National Cancer Institute, sharply disagreed. "In general, the existing epidemiologic studies of Depo-Provera are inadequate and do not establish the safety of the drug," he said. Four studies conducted in the United States and six conducted overseas are in his view flawed because of small sample size, short exposure periods, brief follow-ups, weak or nonexistent controls, and methodological bias. Upjohn and the World Health Organization have started better studies, but Hoover and the FDA say that these studies will not produce useful information for several years.

The hearing took place before a special Board of Inquiry appointed at Upjohn's request after the FDA's decision, under the Carter Administration, not to approve the drug (see *Science*, 30 July 1982, p. 424). The panelists were Judith Weisz of Pennsylvania State University, Griff Ross of the University of Texas, and Paul Stolley of the University of Pennsylvania. Their decision, expected later this year, will be considered by FDA Commissioner Arthur Hayes, who can overturn or reaffirm the previous FDA position.

—**R. Jeffrey Smith**

Schweiker Quits HHS, Heckler Named to Post

The unexpected resignation on 12 January of Richard Schweiker as Secretary of the Department of Health and Human Services (HHS) leaves the department's health agencies—particularly the National Institutes of Health (NIH)—without a stalwart and sympathetic defender. President Reagan has nominated former Republican Representative Margaret Heckler to succeed him.

In 2 years in office, Schweiker gained a reputation as an effective champion of NIH in battles with the Office of Management and Budget. He was "vitally interested in our programs," NIH director James B. Wyngaarden said in an interview. Institute officials generally are unfamiliar with Heckler.

Heckler, a Massachusetts representative from the Boston area, was defeated in her bid for reelection by Barney Frank, a popular liberal Democrat. Some observers believe that Heckler sacrificed some votes in the tough race when she accused Frank of being in favor of pornography be-

Wide World Photos

Heckler, Reagan, and Schweiker

cause he supported efforts to restrict "adult bookstores" and the like to certain downtown areas. She similarly interpreted a position Frank took on criminal sentencing as making him soft on rape. "The ghost of Joe McCarthy must be grinning," columnist Anthony Lewis wrote in the *New York Times* on 18 October. "What is so puzzling is that Margaret Heckler would want to get into right-wing gutter politics," Lewis said. "She has served eight terms in the House of Representatives, never in a leadership role but respectable and generally liked."

As a member of Congress, Heckler served on the Committee on Veterans' Affairs, the Joint Economic Committee, and, recently, on the Committee on Science and Technology. During the past year, Heckler, usually a strong Reagan follower, voted against the MX missile and for the nuclear freeze. She takes pride in her role in getting the Veterans Administration to establish 15 centers on aging. A graduate of two Roman Catholic institutions (Albertus Magnus College in New Haven and Boston College law school), Heckler opposes abortion but is also against a constitutional amendment to stop it.

—**Barbara J. Culliton**