a radically different approach is needed.

In the case of universities, for example, the two main opposition parties have issued a joint pledge to significantly increase their freedom from state controls, if necessary by repealing the higher education law introduced after much controversy at the beginning of 1984 and allowing the creation of private universities modeled on the American system.

"The best thing that could happen for French science would be a progressive move toward a system of properly autonomous universities" says Pierre Aigrain, minister of research in the previous administration and currently chief scientific adviser to the electronics company Thomson.

Plans for the reorganization of the CNRS are likely to be equally controversial. With its 23,500 employees covering all branches of science and represented by strong labor unions, CNRS is seen by its critics as epitomizing the excessively centralized and "corporatist" organization of French science. For this reason, it is likely to become one of the first symbolic targets of the opposition if voted into power.

Several opposition members have recently stated their opinion that the CNRS should become less of an executive agency and more of a granting body like the National Science Foundation. This could be achieved, they argue, by transferring control of many of the laboratories currently run by the CNRS to universities with which they are already associated, as well as by creating new granting agencies for specialized research areas (for example, social sciences).

The real test for whichever party forms the next government, however, is likely to lie not in areas where change can be relatively easily brought about, such as the universities and CNRS, but in selling new research styles and new research priorities to those parts of the scientific community that have prospered most from the Colbertian legacy.

The right argues that the necessary change can be brought about by encouraging more competition between public institutions (for example, between universities for the best students) and a greater openness to market pressures. However, it remains seduced by the political attractions of a powerful state-backed technology that Colbert offered Louis XIV.

The left counters that the opposition's program for "liberalizing" the research community risks allowing entrenched interests to dig themselves in still further, and that—given the particular traditions of French society—American-style solutions are inappropriate, since only strong state direction can bring about the necessary changes. ■

DAVID DICKSON

After the Spydust Settled . . .

THE "spydust" crisis in U.S.–Soviet affairs has ended. The fanfare was less than deafening on 14 February when the State Department released its final report on the case, perhaps because there was so little to release.

The State Department says that Soviet agents have been sprinkling a chemical called NPPD* in places where Americans would come in contact with it, creating a chemical trail they could follow later. Last year, the U.S. government warned that NPPD might pose a cancer threat and spent 6 months researching the proposition. In February, the department came up empty handed. The bottom line, said department spokesman Charles Redman on 14 February, is that NPPD "does not pose a health hazard" to anyone.

Arthur Hartman, U.S. Ambassador to Moscow *Ordered a "pointed" search for spydust after EPA found none.*

Six months earlier, on 21 August, Redman told the press that the United States was protesting "in the strongest terms" the "use of chemical substances against its diplomatic representatives in the USSR." Redman said that NPPD tested positive in the Ames test, which uses bacteria to check a chemical's ability to cause genetic mutations. U.S. diplomats, it seemed, were working in a biohazard zone. The department's assistant medical director, Charles Brodine, flew to Moscow to break the news to the American community and give counsel to those who might be alarmed. U.S. senators inveighed against the assault. One said the Moscow embassy should be closed, not a good omen for the Reagan-Gorbachev summit scheduled to take place 3 months from then.

In late August, following the initial blast of invective, the United States sent a team of scientists to Moscow to find the evidence. The experts collected samples, analyzed the data, and wrote up several reports in December. The central paper, by Karen Hammerstrom and Richard Levy of the Environmental Protection Agency, was not released until February.

Hammerstrom directed the sample collecting effort, which she described in her paper as a random survey aimed at discovering the extent of exposure to NPPD in the entire U.S. community. The scientific team collected 418 "surface wipe" samples and 18 samples of lint or vacuumed material. Each was analyzed at Versar, Inc., a laboratory in Springfield, Virginia. The results were negative. "NPPD was not found in any of the samples," the report said. It concluded that "no purpose would be served by further random sampling of the general population."

However, the authors guessed that the State Department might be dissatisfied with the results and might want to continue looking for evidence. In this case, it said, the department should "identify those individuals and locations most likely to be exposed to NPPD and conduct sampling only among the members of that group." That is just what happened, on orders from U.S. Ambassador Arthur Hartman, who demanded "a more pointed sample."

Accordingly, the embassy in Moscow resumed the search for NPPD in January. A technician who runs medical tests for the embassy collected 189 additional samples from 30 cars used by officials who might be of interest to the Soviets. The Versar lab analyzed the samples in January and February and found five positive for NPPD. However, the lab noted that the NPPD in the samples had a slightly different spectrographic signature from the laboratory standard NPPD issued by the State Department.

*The chemical is an aromatic aldehyde, 5-(4-nitrophenyl)-2,4-pentadien-1-al.

Meanwhile, another group of scientists under Ernest McConnell at the National Institute for Environmental Health Sciences (NIEHS) in Research Triangle Park, North Carolina, had been running tests on this American-made NPPD. (The researchers did not use NPPD collected in Moscow, because they had none, and the amounts collected later would have been too small to use in testing.)

The department's conclusion is that NPPD poses essentially no health hazard.

The researchers found that the NPPD induced no significant effects in mouse bone cells or hamster ovary cells. A skin test revealed that it is not easily absorbed, but that once it is in the body, it is quickly metabolized and flushed out within 48 hours. The department's conclusion is that NPPD poses essentially no health hazard, and that anyone worried about skin irritation should simply wash with soap and water.

The embassy's search for NPPD in January turned up a second sleuthing compound in some of the cars. It is called luminol and is available commercially in the United States. It has many applications, including as an agent to detect latent blood deposits. Although mutagenic in the Ames test, luminol is not dangerous, the State Department concluded, because the safety data sheet issued for it in the United States carries no health warnings. The government did not investigate further.

One useful by-product of this curious investigation is a spot test for detecting NPPD in the field, developed by NIEHS. The paraphernalia is compact enough to fit in a spy's pocket, says its inventor C. W. Jameson, chemist for the National Toxicology Program. In his test, a solution or a swab turns pink in the presence of NPPD. The technique is highly specific and can detect minute quantities of the chemical a day or two after it has been deposited. The Russians may be interested.

Did the State Department overstate the risks last August? Brodine says it did not, for he believes the U.S. community never regarded the cancer threat as terribly serious, even at the peak of the furor. Redman was asked whether he had any second thoughts about the wisdom of sounding the alarm so sharply on the eve of the summit. "None whatsoever," he answered, "absolutely none." ■ ELIOT MARSHALL

Briefing:

FDA Approves Pasteur's AIDS Test Kit

In a development that could bring to a head a long-standing patent dispute between the Pasteur Institute and the U.S. government, the Food and Drug Administration has approved a test, manufactured by Genetic Systems Corporation of Seattle, to screen blood samples for antibodies to the virus that is widely believed to be the prime cause of AIDS. The test was developed by Genetic Systems under license to the Pasteur Institute.

The FDA approval removed the final regulatory barrier to marketing the test in the United States. A Genetic Systems spokesperson said that the company will begin shipping the test to blood banks and other customers by the end of February. Genetic Systems could, however, still face a legal problem.

The U.S. government holds a patent on an AIDS antibody test resulting from work by a team headed by Robert C. Gallo of the National Cancer Institute, and federal officials maintain that the Genetic Systems test is covered by that patent. Five companies have already been licensed by the U.S. government to develop and market AIDS antibody tests, and have agreed to pay royalties amounting to 5 percent of their profits. Marketing of the Genetic Systems test without such a license could be a direct infringement of the U.S. patent, these officials argue.

The Pasteur Institute claims, however, that the U.S. patent is invalid because a group at the institute headed by Luc Montagnier was the first to isolate the putative AIDS virus, and a patent on an antibody test was filed in both Europe and the United States several months before the U.S. government filed its application. The Pasteur Institute is seeking to have the U.S. patent overturned and, in a separate action, has filed suit against the U.S. government claiming Gallo's group misused information and materials supplied by Montagnier's group (*Science*, 3 January, p. 11).

Exactly what the U.S. government intends to do about the Genetic Systems test is not clear. Lowell Harmison, a senior official in the Department of Health and Human Services who has been coordinating the government's scientific response to the Pasteur Institute's patent claims, says the matter is still under discussion. However, Harmison notes that companies who took licenses to the U.S. patent have had a working test for well over a year, while the Pasteur Institute's licensee is only now ready to market its test. "There is no question as to who the rightful owner of the invention is," says Harmison.

Although the Genetic Systems test is entering the U.S. market late, the company believes it has a better product because it gives fewer false positives than the existing tests.

The existing U.S. tests are based on a virus isolated by Gallo's group, which he calls human T-lymphotropic virus type III, or HTLV-III. The virus is mass-produced in a line of T cells called the H9 cell line. Surface antigens on the H9 cells can sometimes react in the test to give false positive results, requiring expensive follow-up tests to confirm the initial finding.

Genetic Systems' test is based on a virus first isolated by Montagnier's group early in 1983, which the Pasteur team calls lymphadenopathy/AIDS virus, or LAV. (LAV and HTLV-III have been shown to be variants of the AIDS virus.) It is mass-produced in culture in a line of T cells called CEM. The CEM line does not have the surface antigens found on the H9 line, however, and thus, according to a statement by Genetic Systems, it "virtually eliminates" the problem of false positives in the antibody test. ■

COLIN NORMAN

U.S. Tops Soviets in Key Weapons Technology

A new report from the Pentagon's top scientist, Donald Hicks, states that the United States leads the Soviet Union in virtually every basic technology that could affect military capabilities over the next 10 to 20 years. In particular, the report indicates that the United States enjoys a strong advantage in technologies that may be relevant to the creation of a defense against ballistic missiles, such as electro-optical sensors, guidance and navigation, microelectronics, robotics, signal processing, signature reduction, and telecommunications.

The report, which is published annually, states for the second time in a row that the United States has widened its lead in computers and software. It also says that the United States is first in life sciences, materials, production, propulsion, radar, and submarine detection. The Soviets, in contrast, lead in no areas, and match the United States only in aerodynamics, warheads, directed energy, optics, and power sources, according to the report.