signed after Alfonsin took office in early December, and the new government has reiterated its intention to put the nuclear program under civilian control.

The shift to civilian control does not however, necessarily indicate that the Argentine's will make a full reversal of past policies on nonproliferation. Castro Madero in announcing construction of the enrichment plant placed the responsibility for the Argentine decision to build it at least indirectly on U.S. actions which were viewed as frustrating Argentine plans for its nuclear industry. Argentina's ambitions for its nuclear industry are obviously substantial as is the investment it has made in it. Some American observers believe that costs and technical difficulties facing the Argentines in completing the plant may deter them from carrying through on it. But politically, abandoning the country's aspirations to nuclear independence would be difficult because the policy is popular in Argentina, particularly with the Peronists and the military, who form the new government's most serious potential opposition. It is not clear, as one State Department source put it, how far the government "would be willing to expend political capital."

Another factor working against U.S. nonproliferation aims is the charge increasingly made by Argentina and other nonweapons countries that the United States and the Soviet Union have not fulfilled the obligation explicit in the NPT that the superpowers would work effectively to reduce the number of nuclear weapons in their arsenals and to assist nonweapons countries with their civil nuclear programs. The nonweapons states indicate that they, therefore, feel less impelled to accept safeguards.

The Reagan Administration's strategy on nonproliferation is based on the view that the best way to influence countries to accept nonproliferation measures is for the United States to cooperate with them in their efforts on condition that they accept adequate safeguards. The Administration rejected Carter Administration tactics of denying U.S. nuclear technology and assistance to nonweapons countries in the cause of preventing their development of facilities capable of producing nuclear explosives. The Reagan Administration is dealing with an Argentine government evidently more disposed than its predecessors to negotiate safeguards as part of a nuclear quid pro quo. Skeptics in this country contemplating the prospect of a complete nuclear fuel cycle in Latin America worry that both governments and policies can change.—**JOHN WALSH**

Compassion in Medicine

Throughout the field of medicine there is evidence of increasing concern with humanistic values to counteract the universal preoccupation with technological advances. The American Board of Internal Medicine (ABIM), representing medicine's largest specialty, has recently surged to the front of the movement by adding proof of a physician's "integrity, respect, and compassion," to its requirements for certification.

For the next examination, in September, supervisors will be required to furnish evaluations of a candidate's sensitivity to the rights and emotional needs of patients. The exam itself, which has included items on ethics since 1978, will not contain new questions.

Board president John A. Benson, Jr., a professor at Oregon Health Sciences University, says many residency programs are experimenting with ways to incorporate a more humanistic emphasis. He estimates that about one-third of the country's 440 internal medicine training programs are doing this, primarily through informal conferences and lunches. The most avant-garde schools have been involving residents and other hospital personnel in role-playing exercises where they demonstrate how they would manage difficult cases. Real-life situations are also videotaped and subjected to subsequent critiques.

Benson points out that the new emphasis also enables residents to explore problems they have in common, such as lack of self-confidence. For example, at Mount Sinai School of Medicine in New York Richard Gorlin and Howard Zucker run "group therapy–type" meetings where residents can share experiences and reduce their sense of isolation.

Benson says the Board is visiting residency programs and preparing some training scenarios they might use. He stresses that the focus is on creating instruments to "heighten awareness" rather than trying to nail down "humanism" with quantitative assessments.

He sees a real "ground swell" of activity, noting that Johns Hopkins Medical School is taking measures to encourage humanities majors to enter medicine. He also says there are several new foundations created by physicians or their widows that explicitly define humanistic qualities as a key to medical preparation. From being mesmerized by technology the profession is "swinging back a little bit to doctoring . . . I hope," says Benson.

—**CONSTANCE HOLDEN**

Military Claims Growing Share of Britain's R & D

Spending by the British government on research and development has increased significantly in areas relevant to military and industrial need over the past 5 years. However, spending has remained virtually constant in energy research and has dropped in environmental sciences and transportation, according to figures recently published in London by the Cabinet Office.

These trends emerged from the first official attempt to provide a systematic analysis of government-wide R & D expenditures, a promise made in 1982 by Margaret Thatcher's Conservative government.

The report showed that, between 1977–1978 and 1982–1983, government spending on military research and development increased from $1,281 billion to $2,692 billion in current prices. Significantly, the largest increases occurred in 1978–1979 and 1979–1980, the last year of the previous Labour government and the first year of its current Conservative successor. According to the Cabinet Office report, the R & D figures reflect an increasing emphasis on the development of new weapons systems in contrast to weapons carriers, as well as "a willingness to forego the last few percent of weapons performance where this adds disproportionately to the price."

Overall, the proportion of the government's total R & D budget spent on military-related projects increased from 45 percent at the beginning of the 1970's to its current level of 51.5 percent; over the same period, spending on R & D related to the environment and transportation dropped from 5.2 to 1.9 percent of the total budget.

The figures produced by the Cabinet Office revealed that the university community has not fared as badly as is often supposed. Total funds allocat-

ed by the Department of Education and Science to universities for research increased from $664 million in 1977–1978 to $1,338 billion in 1982–1983.

A substantial increase is also revealed for the Department of Industries' support of research carried out by private industry, particularly in areas such as microelectronics and what is referred to as "new products and processes," which grew from $110 million in 1977–1978 to $291 million in 1981–1982.

—DAVID DICKSON

Problems with EDB Not Over Yet

Last week the Environmental Protection Agency (EPA) banned nearly all uses of the pesticide ethylene dibromide (EDB), but problems related to the chemical are not over yet. Although EPA administrator William Ruckelshaus declared an immediate end to the fumigation of stored grain and milling machinery, he still faces the sticky problem of whether to allow continued use of the pesticide to treat citrus fruit. Moreover, there is concern that other chemicals replacing ethylene dibromide may pose health risks from long-term exposure.

EPA set levels that were designed to calm public fears and provide a minimum of disruption to the grain and food industry. The greatest economic impact will be absorbed by food processors, according to Richard Johnson, the agency's main EDB expert. The agency set a 30-parts-per-billion maximum for ready-to-eat foods such as cold cereal and this level could cost manufacturers at most about a half billion dollars over the next few years because of product recalls. EPA expects that supplies of stored grain contaminated with EDB will be depleted in 3 to 5 years, thereby eliminating future long-term exposure to the pesticide.

The problem of pesticide residues in grain, however, might continue. Farmers are replacing EDB, used to kill insects, with a carbon tetrachloride mixture. Animal studies show that carbon tetrachloride causes cancer, gene mutations, and damage to the liver and kidneys. The agency began a special review of the chemical in late 1980 to determine whether it poses an unacceptable risk.

Ruckelshaus said that, within the next few weeks, he will decide whether to ban the use of EDB as a fumigant for citrus fruit to control fruit flies. His decision will affect the export of domestic fruit to countries such as Japan and the importation of fruit from the Caribbean and Central America. Florida citrus growers are now substituting methyl bromide for EDB until the agency makes a ruling. But EPA is also conducting a special review of methyl bromide because animal studies have indicated it is mutagenic.

Finally, food companies may have to contend with a patchwork of state regulations because several states have set lower tolerance levels for EDB than those proposed by EPA.

—MARJORIE SUN

Nuclear Power Faces "Bleak" Future, OTA Says

What is likely to be an influential report on nuclear power came out of the Office of Technology Assessment (OTA) on 7 February forecasting a "bleak" future for the industry in the United States. The study, "Nuclear Power in an Age of Uncertainty," was undertaken for the House Committee on Science and Technology and has been more than a year in the making.

Industry spokesmen were not enthusiastic about the study during its preparation and will hardly be thrilled with its findings. The central conclusion—somewhat obscured in the maze of policy options, strategies, and scenarios—is that the U.S. nuclear enterprise is likely to be feeble if not moribund by 1990 unless it undergoes a radical self-transformation *and* receives help from the government.

The industry's economic troubles and sagging public image have been reported before and are well documented again in this report. What is new is a fairly extensive case for not looking to deregulation as a way out. In discussing the construction delays which are often blamed for the worst cost overruns, the report notes:

> OTA has concluded that the regulatory process per se was not the primary source of delay in nuclear plant construction. Rather, during the 1970's (when leadtimes escalated the most), utilities delayed some plants deliberately because of slow demand growth and financial problems. Plant size was being scaled up very rapidly and construction was begun with incomplete design information. The increasingly complex plant designs meant that more materials . . . were required, and constructors often experienced delays. . . . At the same time, worker productivity declined.

Thus, the study finds that through bad planning and weak supervision in the 1970's, the manufacturers helped bring on the slump of the 1980's. This, combined with the recession and the shock of Three Mile Island, dealt the industry a staggering blow.

There is hope for the future, the OTA thinks, but not without a painful effort at reorganization. In the meantime, the OTA says, foreign reactor builders (in France, Japan, and possibly Germany and Canada) may give some hard competition. In concluding, the report gives a short list of recommendations, none of which is considered adequate in itself to save the day. The government's options:

- Help finance an overhaul of light water reactor designs that would include the changes brought about by Three Mile Island and other "backfit" requirements, with a goal of improving both safety and efficiency.
- Fund programs that would improve the supervision of plants during both construction and operation.
- Require the Nuclear Regulatory Commission to take more care in ordering "backfits" and other changes on existing plants, in order to avoid unnecessary complexity.
- Establish a new program that would certify utilities and contractors as being technically competent to work in the nuclear field.
- Support R & D on standardized systems and entirely new concepts, such as the Swedish inherently safe reactor, the Canadian heavy water reactor, and the high-temperature gas-cooled reactor. (The latter is scheduled to receive $35 million in development funds in fiscal year 1985, according to the Reagan Administration's budget proposals.)
- Reduce controversy by involving critics of the industry "more directly" in the regulation and design of new reactors.
- Control the rate of plant construction to avoid future waste.

—ELIOT MARSHALL