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technology, and this may explain why the restrictions on their development are so lax in SALT II. Scoville, for one, would have preferred an outright ban on cruise testing, at least during the treaty's protocol. But this was not achieved. As a result, the verification task of the next SALT team, if there is one, will be considerably greater than the task facing SALT II's enforcers.

A cynical view, expressed by strategic thinker Edward Luttwak, former adviser to James Schlesinger when he was Secretary of Defense, is that as the technology of weapons becomes more complex and the Soviet sophistication grows, American treaty enforcers will find that they have no incentive to point out Soviet violations. The newest and best weapons will be unphotographable, Luttwak claimed. "Some analyst comes up with a fuzzy photo," he said, "and then what does the presidential adviser do? He says, 'It can't be a missile; go back and check it again.' " Once the Soviets have a superior nuclear force—which Luttwak believes SALT II will provide—the United States will not want to publicize treaty violations that will further enhance perceptions of a Soviet advantage. In that situation, according to Luttwak, "We could whine, but we couldn't do anything" about cheating.

Arms controllers vehemently reject this thinking. They deny that the United States will become in any sense a second-rate power, and of course they see no reason for the United States to turn pusillanimous.

Keeney, for example, pointed out that the United States challenged the Soviet Union several times between 1972 and 1974 with infringements of the ban on antiballistic missile (ABM) technology. Bringing the charge required the United States to make a detailed and subtle case against the Soviets' use of a legal radar in an illegal "mode." The Soviets insisted that they had not misused their radar, but according to the formal State Department report: "A short time later, we observed that the radar activity of concern . . . had ceased." The record shows, says Keeney, that the United States enforces its agreements.

However difficult it may be to monitor Soviet activities today, it is clear that the task would be more difficult without an arms agreement. As one expert pointed out, SALT II forces the Soviets to be honest. If they understate their arsenal, they lose some political clout their weapons might otherwise entitle them to. If they overstate it, the treaty forces them to dismantle the surplus. Furthermore, SALT II requires the Soviets to divulge "baseline data" on their weaponry for purposes of verification—information no Russian government has ever shared with foreigners. The treaty compels the Soviets to engage in technical discussions of seeming violations in the Standing Consultative Commission—a good source of insight into the Soviet military system and its technology. The treaty forbids the Soviets from interfering in U.S. reconnaissance programs, and if it is passed, could lead to another treaty outlawing attacks on U.S. satellites. In short, the arms agreement breaches the wall of secrecy between the Soviet military and the rest of the world.

—ELIOT MARSHALL

What Can Government Do for Innovation?

In Administration's domestic policy review of innovation industry makes a strong pitch for reducing "disincentives"

President Carter has been sent an options paper suggesting what the federal government can do to stimulate innovation. The paper, product of a yearlong Domestic Policy Review of Industrial Innovation, was forwarded to the White House at the end of June. The hard part comes now, however, for the elements of a federal program which will be effective, economically feasible, and politically palatable are far from self-evident.

It is generally accepted that innovation is a complex process which depends not only on R & D, but on action across the spectrum of financing, engineering, production, and marketing. As to what government can do, there is widespread sentiment that government could help most if it stopped hindering. The blame is put squarely on "disincentives" built up in federal regulatory rules, tax policy, and patent and antitrust laws.

Such an analysis comes through strongly in the reports of the domestic review subcommittees* dealing with major aspects of the innovation problem. Subcommittee members were selected for particular expertise so that each group was fairly homogeneous in background and outlook. As a result, the reports express specific points of view in rather distilled form. And a majority of the reports reflect views dominant these days in industry. Although labor and public interest subcommittees presented views which often contrasted with those of industry, the reports, on balance, offer a powerful admonition to government to get out of the way.

Industry appears to have responded to government requests for cooperation on the review by sending top-rank corporate officials, including high-level research administrators. Having been asked for advice and expended considerable time and effort in giving it, industry now seems to expect that the White House and Congress will take that advice seriously. Letters are beginning to arrive making that point. In other words, the domestic policy review seems to have created a constituency which will demand action.

In what form the industry views were transmitted to the President is not clear, since they went through the mill of the domestic review process. The reports were discussed in draft at a series of symposiums in January. The separate reports were then sent on to a federal interagency task force headed by Commerce assistant secretary Jordan Baruch, who directed the review. The job of the task force was to send the White House a set of options that would be efficacious, consistent with federal policy, and politically acceptable. The task force forwarded its options paper at the end of June. The

*The original subcommittee reports were on Economic and Trade Policy; Regulation of Industry Structure and Competition; Patent Policy; Federal Procurement Policy; Environment, Health and Safety Regulations; Direct Support of Research and Development; and two reports which were statements by the Labor Advisory Subcommittee and Public Interest Advisory Subcommittee. A report on the effects of domestic policies of the federal government upon innovation by small business was completed this spring.

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subcommittee reports have been made public; the options paper has not.

Industry panels see underinvestment in R & D and other activities that lead to innovation as a central issue. Capital for such investment is described as inadequate, in part because of inflation. Costs of capital are driven up by inflation, which also forces business to make faster recovery of capital than is often possible through investment in innovation. The panels, emphasizing the dismantling of "disincentives" imposed by government, offered a wide range of recommendations for changing tax policy, patent and antitrust laws, and government procurement practices.

In broadest terms, the panels would like the United States to have a tax structure that encourages investment rather than consumption. Current tax policy is evidently viewed as influenced by a left-over Keynesian bias for dealing with Depression conditions by increasing effective demand rather than savings for investment.

The economic and trade policy subcommittee makes this appeal on the general treatment of industry.

> What the Subcommittee would like to emphasize is that the specifics are almost less important than the general notion of increasing the profitability and the cash flow of American industry by such measures as reducing the capital recovery period for investment in plant and equipment, eliminating the double taxation of corporate dividends, and broadly speaking, moving toward a tax system that encourages savings instead of consumption. Specific programs that are more narrowly focused on providing incentives for business to direct a greater portion of the current, inadequate supply on investment dollars into innovation are in the end just so much tinkering at the margin.

The industry-oriented panels recognize the special problems afflicting small business. While small business has been generally regarded as an important source of innovation, the decline in investment, particularly in the availability of risk capital, has hit small business particularly hard. Furthermore, many of the existing tax incentives for investment are seen as favoring large enterprises rather than small business. The panels, there-

Snapshots of Camp David

President Carter sallied forth last week onto what he terms "the battlefield of energy" with a $140 billion plan to sharply reduce this nation's dependence on foreign oil. The plan, as well as the extraordinary drama in which it was wrapped, were the products of an unusual round of meetings at the President's retreat at Camp David, Maryland. Below are comments on the process and reactions to the President's speech by several of those who visited Carter while he deliberated.

David Freeman, chairman of the Tennessee Valley Authority; **Russell Peterson**, president of the National Audubon Society; and **John Sawhill**, the president of New York University, were in a group of energy experts summoned on 8 July for perhaps the most technical discussion of the week. For 7 hours, the visitors conversed around a long table in one of the main cabins. President Carter sat in shirtsleeves at the table's head, with Rosalynn, Stuart Eizenstat of the domestic council, and other guests nearby. Carter took copious notes while the discussants went through a prepared agenda on supply, conservation, and alternative sources of energy. "The President was upbeat," says Sawhill, "but he was also acutely aware of the problems facing this country." "Everyone approached the issue of getting on the road to self-sufficiency from a national perspective," reports Freeman. "No petty, selfish, or parochial views were voiced."

All agreed, for example, that domestic oil production had long since peaked and that production worldwide would do so shortly. But two of the participants did collide. **Thornton Bradshaw**, president of the Atlantic Richfield Company, told the President that, given appropriate government assistance, the industry could obtain 2 million barrels of oil a year from oil shale, moderated only by the unpredictable demands of environmentalists "lurking out there in the shadows." Peterson rejoined that environmentalists are fully out in the open, and that loosening environmental laws is hardly necessary to increase production. The assertion went unchallenged, and the thread of environmental damage from a crash synthetic fuels program was not again picked up. In his speech the following Sunday, Carter said, "We will protect the environment. But when this nation critically needs a refinery or pipeline—we will build it." Peterson says he was disappointed and irritated by the words, "which wave a red flag to those who worked hard to establish the protective laws."

On the following day, Carter summoned **Robert Bellah**, a professor of sociology at the University of California at Berkeley; **Claire Randall**, general secretary of the National Council of Churches; and four other theologians to discuss the capacity of the American people to make further sacrifices and to rally around their President. Carter and his advisers were concerned about the selfishness of the American people and their concern for material wealth; some had been reading Christopher Lasch's latest book on narcissism; several, including the President's pollster, Patrick Caddell, had been uncomfortably watching the growing secularism of American society which Carter believes is inimical to American ethics and traditional values. Carter said he thought the American people were partly to blame for the energy crisis. "It is self-righteous for us to complain about OPEC control over our destiny, when we have had control of their destiny for such a long time," Carter is quoted as saying by one of the participants.

The atmosphere for this dialogue was "very warm and relaxed," says Bellah. "Carter feels at home with the religiously sincere; he opened and closed with a prayer. It was actually very moving; we felt like we'd been at a religious experience."

The President did not, as it turned out, follow their advice closely. He did, as they suggested, become a "teaching, preaching" President in his initial speeches last week. But conservation, and what Bellah calls "the deeply rooted system of incentives and rewards for self-indulgence" in this nation were hardly addressed. Randall says she "accepts what Carter attempted to say, but it is now up to the religious community to respond more fully to these concerns." Bellah says it was a mistake to call for sacrifice without societal change and more democratic control of the economy.—R. JEFFREY SMITH

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fore, put forward a number of changes in tax laws, particularly in those governing taxing of capital gains, to encourage investment in small business.

Small business is also seen as especially vulnerable under the present patent system. The subcommittee on patents says protection under the system has eroded and that reforms are needed to make the examination and granting of patents less complicated and patent litigation less lengthy and costly. Small business would benefit signally from such reforms.

Federal regulation aimed at protection of health, safety, and the environment has been the target of increasing criticism (*Science*, 6 July). The industry subcommittees charged that much regulation is inconsistent and unreasonable and leads to an unproductive diversion of resources. The panels made some specific suggestions for remedies, such as a request for a stretch-out time for compliance, but most of the comments were general. Uncertainty, bred by apparently capricious regulatory agency actions that make industry planning difficult, is condemned as the worst aspect of regulation. And regulatory agencies were scored for mandating how industry is to meet environmental standards—as in the case of requiring flue gas scrubbers on power plants—rather than allowing industry to be innovative in meeting the standards.

Antitrust laws were seen as inconsonant with the new circumstances. The effect of court actions penalizing companies that achieve competitive advantage through innovation was said to be a discouragement to innovation. And U.S. antitrust laws were regarded as restraining American companies in meeting the challenge of foreign industry in world markets. American firms must conform to U.S. antitrust laws in competing abroad with foreign firms which are not subject to such laws. And foreign competitors are not subjected to the same rules as American firms in the American market.

Not surprisingly, the labor advisory subcommittee's report reflected a different set of priorities. The labor panel put major emphasis on full employment and increased job opportunities. It was suspicious of innovations that might cause the displacement of workers and loss of jobs and income, and stressed the necessity of labor-management cooperation which would make possible an early-warning system and follow-through program of compensation and retraining for workers adversely affected by innovation.

The labor panel urged that regulatory action to protect health and safety not be downgraded. In economic policy, the group expressed the view that selective expansionary policies for the economy would stimulate innovation.

The public interest advisory groups said that government has a legal and moral responsibility "to promote innovations of a type that will further the goals of our society and will fulfill the basic social and human needs of its citizens. It is not sufficient to promote innovation per se."

. . . the domestic policy review seems to have created a constituency which will demand action.

The group also calls for a concept of "public accounting," which would apparently amount to a sort of innovation assessment process, and wants to see good social indicators fashioned to make it possible to evaluate the social costs and benefits of innovation.

Wary of industry, the subcommittee says it "is concerned lest this Domestic Policy Review be used as a vehicle through which corporations can proclaim that it is regulations that are impeding innovation. The way society looks at regulations is critically affected by power, by the power and resources to gain the ear of the people, by the extent to which corporations set the cultural definitions that shape society's responses, and by the extent to which the values of business penetrate the values of government."

Where there was general agreement was that American productivity is lagging, particularly in comparison with major competitors such as Japan and West Germany. The decline in the growth rate of productivity (output per unit of input) is regarded as a major factor contributing to inflation and the decline of the dollar.

While the domestic review subcommittees' reports are, in effect, prescriptions for overcoming the lag in productivity, they are short on analysis of the causes of the slump. Productivity, in fact, is an issue of growing interest and lively debate among economists and policy-makers these days and will be the subject of another article.

One topic of apparent consensus in the domestic review was that dealt with by the subcommittee on direct federal support of research and development. The report was the shortest of the lot and contained recommendations that were, apparently, uncontroversial.

The panel, made up mostly of research administrators in large firms, operated on the premise that while there is no established causal relationship between R & D and innovation, there is a correlation between the rate of innovation and the total R & D effort.

The panel focused on government-university relations. The group said that it senses "an ever-widening gap between university and industrial communities" and saw a resulting diminution of university influence on innovation such as earlier prompted the growth of high-technology industry on Route 128 outside Boston and on the San Francisco peninsula.

Measures by government to stimulate university-industry cooperation were recommended. Fostering closer collaboration through such things as tax and patent concessions were suggested. And establishment of a network of Cooperative Technology Centers was urged to carry out "generic" R & D whose results would be generally available.

The panel report reflected a skepticism endemic in industry toward closer government involvement in planning and managing R & D, and proposed measures that have already been discussed and achieved some support in Congress.

What the White House reaction is to the options paper on innovation the framers do not yet know. President Carter and his advisers have been dealing with problems more politically pressing, but the early signs of recession indicate that innovation demands attention.

Action on innovation would seem to present the same sort of dilemmas as those that beset the energy issue. Expectations have been raised by an elaborate preparatory process and the risk of anticlimax hovers. Public initiatives will be taken that affect a vastly complicated private economy when knowledge of the consequences of these initiatives will be, at best, imperfect. Simple solutions are apt to be simplistic. And, with innovation as with energy, the President is likely to find it difficult to separate special interests from the national interest.—JOHN WALSH