to reflect a growing trend among scientists and educators, both here and abroad, toward noncooperation with the military. In 1965 a somewhat similar furor in Chile forced the U.S. Army to cancel Project Camelot, a study of the dynamics of revolution in foreign countries (*Science*, 10 September 1965). Partly as an outgrowth of that fiasco, the American Anthropological Association has resolved to "scrupulously avoid" involvement with U.S. intelligence activities abroad (*Science*, 23 December 1966 and 21 April 1967). And, for a variety of reasons, American scientists seem less and less interested in doing defense research (*Science*, 21 April 1967). Classified research has come under particular fire. *A Wall Street Journal* survey that was published 25 October found that "universities in growing number are spurning government contracts that call for secret research."

The full ramifications of the controversy in Japan won't be known for some time. But Allan V. Cox, a Stanford University geophysicist who has been active in the NSF-sponsored U.S.–Japan Cooperative Science Program, fears the wrangle over Army funds will undermine scientific cooperation between the two countries and may prove a harbinger of controversies to come in other lands where U.S. armed forces are supporting scientific research. Says Cox: "Participation of the U.S. military or the CIA is the kiss of death in any kind of cooperative venture. Even if the motives are benevolent, it does much more harm than good."

—PHILIP M. BOFFEY

New Towns: Geological Survey Has Key Role in Experiment

The outstanding contemporary U.S. example of a "New Town" is Reston, Virginia, a community being developed on a 7400-acre tract of rolling countryside 18 miles northwest of Washington. Reston aspires to be much more than just another residential suburb, and hopes that many of its breadwinners will work as well as live in the community. Accordingly, Reston's promoters were delighted last year when it was announced that the U.S. Geological Survey, one of the government's most venerable scientific agencies, would come to Reston and build a $35-million headquarters housing nearly 2800 employees.

However, the effect of this decision—once Congress provides the money to implement it—is likely to go well beyond that of bringing hundreds of new families and jobs to the infant community. Indeed, the Survey's most important influence locally may be to reinforce Reston's resolve not to become merely another complacent outpost of the affluent society.

At Reston's dedication ceremonies in May 1966, Secretary of the Interior Stewart L. Udall prefaced his disclosure of plans to put the new Survey facility in Reston with some cautioning remarks. If Reston were to achieve more than the limited success of earlier New Towns, Udall said, it would have to surmount two hurdles—income and color. "A true New Town," he said, "must be a cross-section of America or it must be deemed a failure, despite the brilliance of its design and the insight of its community planning. In this land of equal opportunity, *no* town can claim to be truly American if it is an enclave of the well-to-do or the private preserve of any single ethnic or racial group."

Udall was expressing more than a mere hope that Reston would be a broadly representative community. In the formal agreement by which the government accepted a gift of 50 acres of land from Reston and bought another 35 acres, Reston promised to meet the housing needs of Survey employees by building a variety of reasonably priced housing units for them. This would be in keeping with Reston's avowed policy of encouraging all who work in the community to live there, regardless of race or level of income.

To date, the evidence that Reston will live up to this policy is incomplete. Those middle-class Negroes who have been attracted to the community do appear to have received a warm welcome. But no low-income Negro or white family could afford to rent or buy the apartments and houses thus far made available. The cheapest houses have sold at about $22,500, and few have been offered at that price. Rent for three-bedroom apartments now starts at $225 a month.

According to an announcement by the new town's managers, however, Reston has just been promised a low-interest loan from the Department of Housing and Urban Development (HUD) for the construction of 200 units of low-cost housing. Another sign of Reston's good intentions is the major part it is playing in a HUD-financed study and pilot project on the use of new technology to produce such housing.

Even though still a middle-to-upper middle-class enclave, Reston cannot fairly be said to have lacked high-mindedness. On the contrary, had it been less concerned with creating an environment of extraordinarily high quality for all of its residents, it probably would not now be $45 million in debt. Reston is, in truth, the carefully reared brainchild of a man who has the look of an idealist.

Reston's founder—and, until recently, its manager—is Robert E. Simon, Jr., a 53-year-old New York real estate developer whose initials form the first three letters of the community's name. Simon bought most of the Reston tract in 1961, then proceeded to act on his vision of what a New Town should be. This vision, which borrows from a variety of contemporary and traditional sources, is, briefly, as follows.

When fully developed, Reston would be a community of about 75,000 people, who would live in seven villages of 10,000 to 12,000 population each. The village centers, offering the kinds of stores and services typically found in a shopping center, together with such facilities as a library and community hall, would be pedestrian-oriented, with automobiles banished to a parking area on the outer fringe.

Lake Anne Village, the first of Simon's villages to be built, faces an arm of a 30-acre lake—its waterfront plaza giving Reston a touch of Venice and tempting strollers to linger. Its massive sculptures generally please the adult eye and always challenge the climbing instincts of small children. In spring and summer, dwellers in the high-rise apartment on the plaza and those living in apartments over the village stores tend to make the plaza a lively place even during evening hours —a contrast to the barrens most shopping centers and many downtown areas become at the close of the work day.

According to Simon's plan, Reston would also have an industrial park of about 1000 acres, plus a 100-acre central commercial district serving an area much wider than Reston itself. One of the community's most distinctive features, however, would be its distribution of high-density areas throughout most of the 7400-acre tract. Seventy percent of the residents would live in clusters of common-wall "town houses" and in garden apartments, while, of the remainder, half would live in high-rise apartments and the other half in detached houses. The emphasis on the town-house cluster concept was intended to preserve woodlands and provide land for such things as a music center, ball fields, golf courses, lakes, and riding stables.

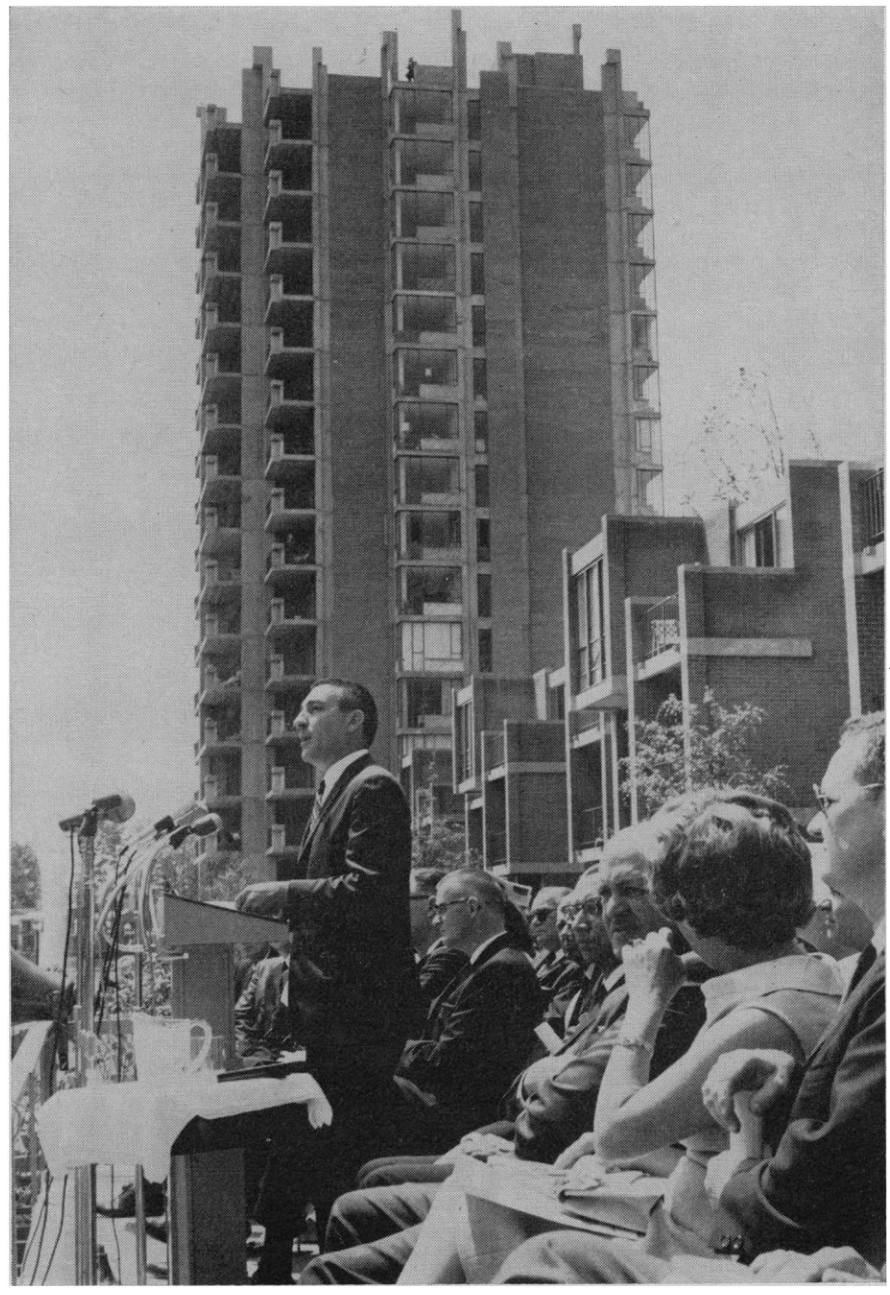
Indeed, the master plan sets aside 42 percent of the Reston tract for public use. Before the plan was adopted, the Fairfax County government had to agree to accept a new "Residential Planned Community" zoning concept, for under traditional zoning laws Reston would not be able to plan for both high population density and abundant green space.

Thus far, Reston is clearly a success in the view of many architects and professional planners. Although the New Town has only 2700 residents, completion of the Lake Anne Village center and of a number of town-house clusters and garden apartments permits some evaluation. Last year an awards jury of the American Institute of Architects praised Simon for his "courage and vision," saying he had tried to achieve high standards of community planning and building design in an undertaking having few precedents and involving high risks.

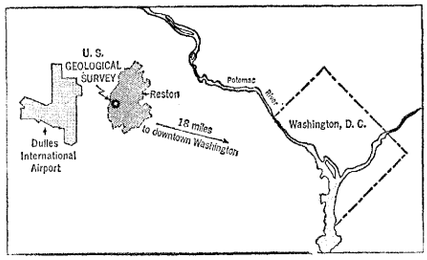
Despite such praise, Reston is in financial trouble. Prospective home buyers have been less enthusiastic about the town houses than the professional critics, and sales have lagged. At best, Reston's heavy debt would be hard to carry. The Gulf Oil Corporation, to save its $15-million investment in Reston, assumed control of the new town's affairs in September, allowing Simon to retire gracefully from the active management and become chairman of the board of what is now called Gulf Reston, Inc.

But on 27 October the board voted to drop Simon as chairman and a director, leaving him no connection with Reston except as a minority shareholder. "It became apparent that he could not accommodate himself to the new management situation," a Gulf spokesman said. One element in the new situation was the departure of many, though not all, of the top staff people Simon had assembled. Moreover, when Simon proposed that he be included on the board's new executive committee, he was turned down. "Apparently, they wanted me to be just a figurehead," Simon later commented.

In an interview with *Science*, Simon discounted the possibility that Reston's new management would depart sharply from any of his basic policies. But this remains a matter of speculation. His successor as president is Robert H.



Secretary of the Interior Stewart L. Udall at Reston's dedication in 1966.



Ryan, 47, a self-styled "brash, opinionated Irishman" who holds degrees from Harvard College and the Harvard Graduate School of Business Administration.

Ryan, whose background has been chiefly in real estate and industrial development work in Boston and Pittsburgh, is addressing himself to the question, "Can these New Towns that promise so much make economic sense?" Gulf Reston plans to stick to Simon's master plan, Ryan says, but for the moment it will put less emphasis on town houses and modern architecture in the hope of stimulating the sale of homes. It is clear, however, that if the development of traditional, detached houses is allowed to go much beyond what Simon planned, green space will be sacrificed and Reston will come increasingly to resemble a conventional subdivision. Moreover, an emphasis on promoting sales and minimizing risks might keep Gulf Reston from pursuing wholeheartedly its plans to provide the inexpensive housing which low-income whites and Negroes can afford.

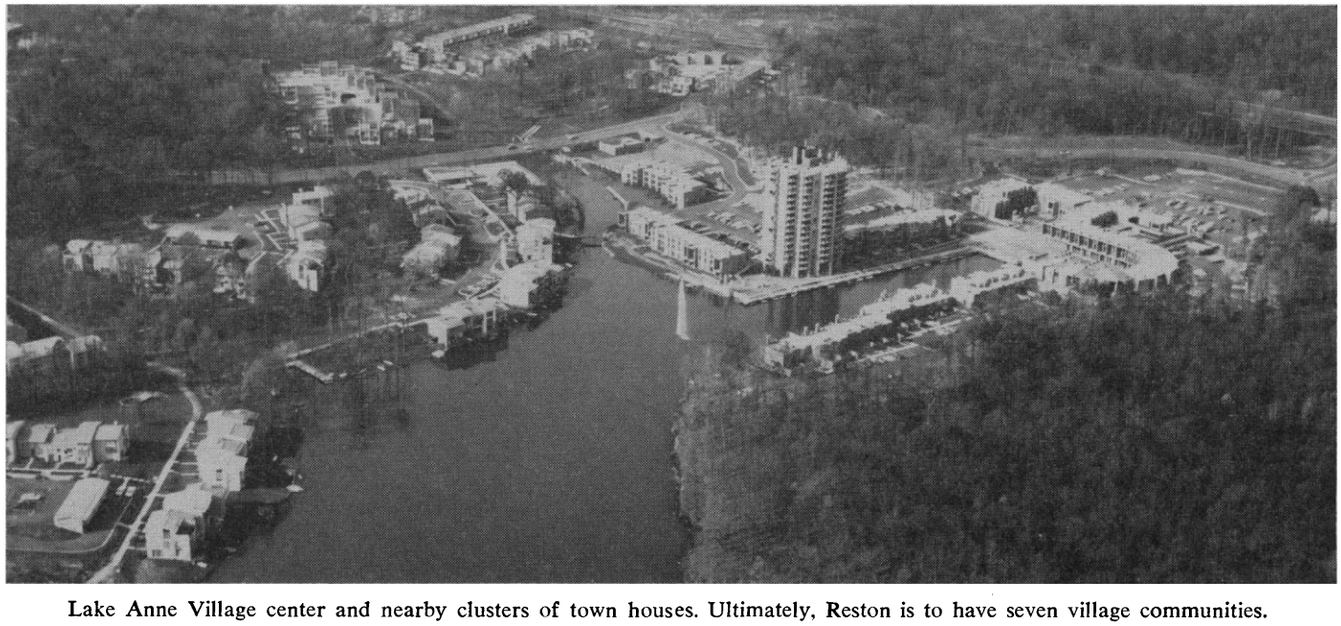
The Geological Survey's early arrival on the scene quite clearly would help Reston hold to its avowed course. The Survey headquarters is by far the largest of the "industries" thus far committed to come to Reston. (Eight firms, all technically oriented, have established plants there, and a number of others are committed to follow suit.) Before construction of the Survey facility was completed Reston would be bound, under its agreement with the government, to take steps to provide hundreds of units of low-cost housing. More than half of the Survey employees are in the non-professional and lower professional ranks, and earn no more than $10,000 a year, and sometimes as little as $4000. Many of the lower-income employees are Negroes.

The HUD-sponsored study in which Reston is participating may point the way to satisfying the housing needs of such personnel. Various possible solutions are being considered—town-house clusters, terraced hillside housing, and garden and highrise apartments. If carried through as announced, the study will include a test of factory-fabricated steel houses of 1200 square feet and two, three, and four bedrooms. Homes built in Reston as a follow-up to the study are not to be set apart in a low-income ghetto. People living in them are expected to share the schools, playgrounds, and other public facilities used by Reston's more affluent families.

While construction of the Survey building would force the pace of Reston's development and mix some low-income people in with the attaché-case set, the principal reason for establishing the facility is, of course, to permit the Survey to bring together its badly scattered Washington offices. Survey functions are now housed in 31 buildings in various parts of the metropolitan area. "By any yardstick of good management, this situation demands correction by the swift completion of a centralized facility," Secretary Udall has said. Not only is efficiency impaired by the fragmentation of the facilities but much of the space the Survey now occupies is leased at a high price. The new Survey building would be a campus-type facility designed to encourage intellectual exchange among the geologists, hydrologists, and other technical people who are employed in its laboratories.

Reston was not the Survey's first choice for a headquarters site, but when other desirable sites nearer Washington proved to be unavailable, Reston's proffered gift of a 50-acre tract was attractive, especially in view of the assurances of adequate housing. The idea of establishing this major federal facility in a satellite town was in keeping with the government's "Year 2000 Policies Plan" for guiding the national capital region's growth and discouraging further urban sprawl. Two other scientific agencies, the Atomic Energy Commission and the National Bureau of Standards, already had left Washington for sites in Germantown and Gaithersburg, Maryland, respectively.

To the Survey, the prospect that Reston would offer the amenities and orderly development of a planned com-



Lake Anne Village center and nearby clusters of town houses. Ultimately, Reston is to have seven village communities.

munity was a special bonus. The few Survey employees who already have moved there appear pleased. Reston people gripe about the special fees and other costs associated with maintaining play areas, parking lots, and other common property, but these burdens seem tolerable.

In short, the decision to put the Survey headquarters in Reston was felicitous. It is not at all certain, however, that Congress will appropriate the money to begin construction next year, or even that the President will include a request for such funds in his budget. The budgetary exigencies of the Vietnam war leave little room for optimism. Yet to postpone this Survey project would delay not only construction of a much-needed government facility but also the government's taking a possibly critical role in an experiment for meeting urgent problems of urban culture.

—LUTHER J. CARTER

Thermal Pollution: Senator Muskie Tells AEC to Cool It

The growing number of nuclear power plants scheduled for construction in the United States is forcing greater attention to the pollution associated with the production of this power. This concern is not only dictated by the necessity for arranging safe disposal of radioactive wastes but also by the great quantities of heat which such plants transfer into the water used for cooling.

During the past few years, Congress has passed significant water-pollution and air-pollution legislation. [The Air Quality Act of 1967 (*Science*, 20 October) passed the House of Representatives by a 362–0 vote on 2 November, thus removing the last real obstacle to presidential signing of the bill.]

Last week, the key member of Congress on pollution matters, Edmund S. Muskie (D–Maine), chairman of the Senate Public Works Subcommittee on Air and Water Pollution, served notice that nuclear power plants might be next on the congressional pollution-control agenda. On 30 October, Muskie announced that his subcommittee would hold hearings in New England on water pollution from nuclear power plants after congressional adjournment. If Muskie finds pollution from nuclear plants a potential problem in New England, he will expand his hearings to encompass the rest of the nation as well.

Muskie's decision was prompted by concern over two planned nuclear power plants in New England. The first is the Vermont Yankee plant, which is to be located in southeastern Vermont just north of where the Connecticut River flows into Massachusetts. As initially proposed, Muskie noted, this Vermont plant would require 60 percent of the maximum flow of the Connecticut River for cooling and would discharge heat that would raise the temperature of the river 15 to 20 degrees. (An Interior Department water-pollution-control official has commented that such a massive discharge of heat would "kill" the river biologically; "the Connecticut River would become a cooling system for Vermont Yankee," he said.) A second proposed nuclear power plant which bothers Muskie is one to be built in his home state of Maine on Bailey Point, Wiscasset, which is northeast of Bath and north of Boothbay Harbor. On 5 October, the Atomic Energy Commission (AEC) announced that the Maine Yankee Atomic Power Company had applied for a permit to build a plant at the Maine site; Muskie wrote the AEC that he was worried about "potential thermal and radioactive pollution hazards . . . to Back River and Montsweag Bay." Although Muskie has so far confined himself to commenting on these New England plants, he is well aware that possible pollution from nuclear plants has aroused concern in several sections of the nation; for instance, there is controversy in Oregon and Washington about nuclear plants to be built along the Columbia River and also in New York about such projects on the Hudson River.

Since the AEC must grant licenses for privately owned nuclear power plants, Muskie contends that the commission has the responsibility for seeing that thermal pollution from such plants will be controlled under the provisions of the Water Pollution Control Act and of Executive Order 11288 which implements part of the act. In writing to the AEC, Muskie has cited Section 7 of the executive order which calls for agency review of facilities and operations supported by federal loans, grants, and contracts to determine adherence to water-pollution control and which states that such control needs shall be considered in the planning for each new installation. Muskie contends that AEC licenses are as much contracts as are the insurance agreements entered under the Price-Anderson Act. Among the standards of the executive order which Muskie cited were:

> If discharge of cooling water is expected to create problems by significantly increasing the temperature of the receiving waters, facilities shall be installed, or operating procedures shall be established, to maintain water temperatures within acceptable limits.
>
> No waste shall be discharged into waters if it contains any substances in concentrations which will result in substantial harm to domestic animals, fish, shellfish, or wildlife, if methods of treatment or disposal are available that will remove or render harmless such pollutants. If such methods are not available, but can reasonably be developed, they will be developed and used at the earliest possible date. A determination that such methods are not available or cannot reasonably be developed will not be made without the concurrence of the Secretary of the Interior.

Muskie made his views known to AEC Chairman Glenn T. Seaborg on 20 September in a letter questioning an AEC statement that the commission could not deal with thermal water pollution caused by the proposed Vermont plant. In that letter, Muskie said that "it is the opinion of the Senate Subcommittee on Air and Water Pollution that excessive heat is as much a pollutant as municipal wastes or industrial discharges." Muskie asked Seaborg for a prompt reply.

On 23 October, Muskie received his reply, but it was signed by Harold L. Price, the AEC Director of Regulation, not by Seaborg. (It is fairly common to have lower-ranking agency officials answer letters from congressmen, but it