versy over the locus of the science advisory machinery in talks with scientists. And when Kennedy led off the House hearings it was evident that his place in the presidential preference polls was very much in the minds of his congressional questioners. Kennedy indicated that he was generally sympathetic to the idea of a return of a science adviser and staff to the White House, but qualified his comment by saying he would prefer to "await the results of these hearings."

In practical terms, it will be easier to return the science adviser to a place figuratively down the hall from the Oval Office than to achieve the major objectives set by the Killian report. The major weaknesses of the science adviser–OST-PSAC apparatus in its later days were that it had been displaced in White House evaluation of military projects, suffered declining influence with OMB, and had lost regular access to the President. This last and obviously most important index of decline became evident in the Johnson era. The causes of this decline were complex but the effects were unfortunate for both science and public policy.

Restoring science advisory machinery to the White House appears to be acquiring a certain inevitability. Making sure that machinery functions effectively at the top levels of government will be a lot more difficult, but that is what really deserves the best efforts of scientists and policy-makers.

—JOHN WALSH

Malcolm R. Currie: World's Largest R & D Manager

The Pentagon's top research manager, the DDR & E or Director of Defense Research and Engineering, has a job of unusual scope. The sixth ranking civilian in the Defense Department, he oversees the development of weapons from the moment of being gleams in the researcher's eye to the stage of mass production; he devises for the U.S. arsenal everything from night vision devices to antiballistic missile systems; and he guards the country and its allies from being technologically surprised in conventional wars or strategic posture. To accomplish this task, he presides over a budget which, if Congress gives the Defense Department all it is asking for, will total $9,332,469,000 in the fiscal year starting this month.

The present DDR & E is Malcolm R. Currie, a 47-year-old electronics engineer who has been in office for just over a year. Currie's three predecessors had all been director of the Livermore Laboratory (where nuclear warheads are designed) before becoming DDR & E. This pattern of succession was broken with Currie whose career has been in industrial, not government, laboratories. He spent 15 years with the Hughes Aircraft Company, becoming vice president and general manager of the research and development division. Then followed 4 years with Beckman Instruments, a nonmilitary firm, where he was vice president for R & D concerned with such unwarlike activities as enzyme research and polypeptide synthesis.

"It was very deliberate that I do have a business background," Currie said of his appointment in a recent interview. "That can help in having business systems and management here rather than science for the sake of science."

The business orientation comes over strongly in his presentations to Congress; so too does his belief, if not in science for the sake of science, at least in the power of technology to make decisive changes in military affairs. R & D, as he put it to a recent gathering of strategic missile designers, "gives us almost indefinite leverage of the future."

Although Currie frequently emphasizes the importance of the "technology base," Defense Department spending on basic and applied science remained relatively static in the FY 1975 budget, the first he has presented to Congress, as it has done for some years. Currie said last week that he intends these funds from now on to "increase monotonically."

In his boyish good looks Currie bears a strong resemblance to his predecessor John S. Foster, and congressional committees might find it equally hard to distinguish the two by the philosophy of their presentations. Both are seized with unusual eloquence when telling Congress of the importance of technology and the cunning of the Russians—two entities which serve as the carrot and the stick of the DDR & E's budget. But Currie is not a simplistic cold war warrior. He supports détente and the increased trade that goes with it, although he has been worried by the amount of production technology being sold to the Soviet Union. A few months ago he asked publicly for a clarification of government policy on high technology trade (a polite way, maybe, of saying that there didn't seem to be a policy at all). Since then, discussions between the Departments of Defense, State, and Commerce have created a forum in which, Currie says, "We have been able to articulate our point of view and to take a reasonable stance—not to say 'Hell, no' to everything that comes up."

Currie's position is moderate in view of his belief that production technology is the cutting edge of American superiority. "I don't think we are scientifically better than other countries—it's the technology of management, all of the things it takes to translate basic science into viable products, which is our bag."

A popular theory of the arms race holds that it is driven by an action-reaction cycle, each side striving to leapfrog the advances made by the other. The theory—which casts the DDR & E as the American Mr. Arms Race—does not find favor with Currie. "I don't basically see the Soviets being in a reactive mode to everything we do," he says. "I think the evidence from the last 10

years shows the Soviets are walking down their own path, they have charted their own course."

The most recent occasion on which Soviet and American weapons technology crossed tracks was the Middle East war. Heavy Israeli losses of tanks and planes in the early days of the war suggested that Soviet weapons designers had sprung a number of technological surprises on their American counterparts. "We have given a lot of thought to this question," Currie replies. "We were not really surprised by any of their capabilities—the Sagger [antitank missile], SA-6, SA-7 [antiaircraft missiles]—but the massive deployment of these weapons by the Soviets, and the ability of the Arabs to use them, was perhaps a surprise in the sense that it became a reality. Our own R & D community was essentially validated as being on the right track."

Tactical wars, such as that in the Middle East, are where most of the action in military technology is now taking place. Devices such as terminally guided weapons and remotely piloted vehicles amount to what Currie has called "a true revolution in conventional warfare." As for strategic weapons, "In many areas of advanced technology we have already achieved much of the theoretically achievable gains," Currie told Congress last year. Asked what demands on technology were imposed by the new strategy of counterforce (which entails aiming more American missiles at Russian missile silos instead of cities), Currie says that "retargeting has nothing to do with technology." Doesn't it require better accuracy to hit a missile silo instead of a city? "Not in the sense of demanding some R & D which we haven't got—the basic capability has been there for 10 years," he replies. Nevertheless, $77 million is being requested this year for improving the accuracy, size, and maneuverability of the Minuteman missile.

Vast though his empire is, the DDR & E is not absolute master of all he surveys. Every bureaucrat has other bureaucrats to fight, and in his case each of the three services can put up determined opposition. The Army, Navy, and Air Force conduct their own programs of research, development, test, and evaluation (RDT & E) and each has its own assistant secretary for R & D. The basis of the DDR & E's power is that he supervises the total Pentagon budget for RDT & E, and has a staff of more than 200 professionals to develop his positions.

Although the battle lines are not regular, the DDR & E tends to find himself in opposition to the service chiefs in two different ways. The chiefs are generally in favor of anything that creates new weapons but in any budget crunch are quite prepared to cut R & D funds, which the DDR & E may have to fight hard to save. Conversely, the service chiefs are reluctant to scale down the quantity or quality of any weapon nearing the production stage. It is hard for the DDR & E to kill small programs he does not like (the services have the "reprogramming authority" to reassign funds up to $2 million), and programs in their later stages can only be killed with the support of the Secretary or Deputy Secretary of Defense. But the DDR & E has a lot of leeway in delaying big systems by starving them. Though he can't pick too many battles at a time, there are always a large number of bargains that can be struck. Currie's scoresheet, the foes and allies he has made in his year of office, are part of the Byzantine obscurity of the Pentagon's internal politics. But one weapons systems which he has publicly acknowledged delaying is the Surface Effects Ship, a 2000-ton hovercraft which the Navy wanted to rush ahead with before testing a smaller version.

The DDR & E's job was originally created by the now defunct White House science advisory apparatus with the idea that he would both see that the services took advantage of the best science available, and would place some rational bound on their seemingly limitless appetite for new weapons. Critics of Foster argue that he sold out to the services by becoming the advocate instead of the impartial appraiser of new weapons. (The DDR & E's budget in fact remained fairly constant, at least during the first 5 years of his reign.) Nonetheless, Foster—unlike his two predecessors—never changed his view that technology should be pursued whithersoever it lead. Herbert F. York, the first DDR & E, is now an ardent supporter of arms control and Harold Brown is a delegate to the SALT talks.

Whatever bureaucratic battles Currie is fighting in the Pentagon, he has to play his cards close to his vest, and it remains to be seen if he will undergo a sea change like York or, like Foster, become the advocate of building whatever weapons the state of technology allows.

—NICHOLAS WADE

Middle East Studies: Funding Wilts as Arab—U.S. Friendship Flowers

Events of the last few weeks have given the impression that the President has launched a new era of friendship between the United States and the Arab nations of the Middle East. Ironically, however, since the Nixon Administration came into office 6 years ago, it has repeatedly tried to eliminate funds for university programs concerning the Middle East, as well as those concerning other parts of the world. So, at a time when scholarly expertise on the politics, economics, and culture of the Middle East are in great demand, the future of support for training such experts is highly uncertain.

Since World War II, the U.S. government has in one way or another aided the growth of interdepartmental university centers, which serve as foci for American scholarship for given areas of the world. By the late 1960's, there were 12 such centers specializing in the Middle East, with the aim of building up a reservoir of expertise in this area. The government also supports scholars interested in foreign regions through the various Fulbright-Hays programs. Scholars also can, of course, find private support.