reaction mechanisms, and electronic and molecular structure of these species. For radicals trapped in solids, the observed perturbations in the electron-spin-resonance spectra are quantitative measures of the interactions of the radical with its environment, and these measures can be used to assign trapping sites and to estimate crystal fields. The ability of a trapped radical to execute partial or free rotation can be determined from the degree to which anisotropic broadening effects are averaged out in the electron-spin-resonance spectra. An interesting area which has recently received considerable attention is the study of phosphorescent triplet-state molecules by electron spin resonance. In the gas phase, mass spectrometric studies have been made not only to study free radicals but also to examine metastable atoms and molecules, and to discover new chemical compounds. The study of electronically excited species by both methods appears to be a very fruitful area of research.

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NEWS AND COMMENT

The MURA Accelerator: Compromise for the Mid-West

The long-simmering midwestern revolt against research and development allocations broke out last month, and, while the noise and emotion are still too thick for any precise assessment of the consequences, it appears that the midwesterners have lost an accelerator and won a profoundly important principle.

Specifically, the $170-million, 12.5-Bev high-intensity accelerator proposed by the Midwestern Universities Research Association (MURA) has been flatly rejected. But in the eruption touched off by this decision, the midwesterners seem to have swung over the Johnson administration to a concept laden with gold—namely, that henceforth regionalism is a factor to be considered in dispensing federal research funds. It can be argued that this principle has often been tacitly at work in the allocation of research activities, but the avowed rule has always been that research expenditures are for research and not for economic development or aid to strapped universities. Just what will come of this is yet to be determined, but among some federal science administrators there is the feeling that, inadvertently or not, the administration has taken a step with enormous implications for the future of federal support of science.

In any case, the events leading up to this step present an intriguing picture of scientific decision making at the highest levels of government.

At the time of Kennedy's death, the midwestern legislators who had banded together in behalf of MURA were confident that the President was sympathetic to their cause (*Science*, 11 Oct. 1963). Some even say that one week before the assassination the President personally assured Senator Hubert Humphrey (D–Minn.) that funds for MURA would be included in the new budget. A spokesman for Humphrey denies this, and offers the view that wishful thinking on the part of some midwesterners may have converted the senator's expression of optimism into a sense of assurance. But the important thing is that, whatever the reality, the appearance was propitious for MURA, and the midwestern congressional delegations were feeling certain that they had won their long struggle. Kennedy had repeatedly demonstrated an eagerness to promote research, the midwesterners had shown their political muscle on the issue, and, with the budget scheduled to be locked up early in December, there were ample grounds for confidence.

Johnson's succession, however, again made the budget an open question, and MURA was soon to be the subject of a series of hurriedly called White House conferences. (Last week, in a letter to Humphrey, Johnson stated, "I devoted more personal time to this [the MURA] problem than to any non-defense question that came up during the budget process.")

At two separate meetings last month, each lasting about an hour, Johnson sought counsel on MURA from a group that included Jerome B. Wiesner, the White House science adviser; Glenn T. Seaborg, chairman of the Atomic Energy Commission; and Kermit Gordon and Elmer B. Staats, director and deputy director, respectively, of the Bureau of the Budget. According to persons familiar with the positions stated at these meetings, Wiesner and Seaborg advocated going ahead with the proposed MURA machine but Seaborg stated that if the AEC had to accept a squeeze on its research budget, he was not willing to proceed with MURA at the expense of other activities. Seaborg is also reported to have said that he was opposed to starting a new national laboratory to house the MURA machine but would be interested in locating the machine at the Argonne National Laboratory.

Qualified Endorsement

As for the scientific merits of the proposed accelerator, Johnson was confronted by the same qualified endorsement that had faced Kennedy. Last May, an advisory panel headed by Norman F. Ramsey, of Harvard, had advocated construction of the machine if it did not interfere with construction of higher-energy machines proposed for the East and West coasts. When the panel was reconvened last fall to see if it could come up with a more explicit recommendation, it reportedly split, 4–4, on the MURA issue, leaving the political decision makers and their budgetary advisers no more enlightened than before about how the nation should proceed with its incredibly expensive and not easily comprehensible program in high-energy physics. The panel, however, did conclude that the MURA machine need not be located at Stoughton, Wisconsin, site of the MURA design group.

After the second meeting with Wiesner, Seaborg, Gordon, and Staats, the President asked representatives of the MURA group to meet with him at the White House a few days before Christmas. In preparation for this meeting he also asked Wiesner's office to prepare a memorandum listing the arguments against MURA. (An earlier memorandum, it is understood, took a "down-the-middle" approach, detailing pro and con.)

This meeting, which took place on 20 December, brought to the White House Bernard Waldman, director of MURA; Edmund L. Goldwasser, professor of physics at the University of Illinois; and Elvis Stahr, who is both president of the University of Indiana and president of MURA. There, in Johnson's anteroom, the three-man group encountered a delegation of midwestern congressmen, including Senator Humphrey, Senator William Proxmire (D–Wis.), and Representative Melvin Price (D–Ill.), and Representative Robert W. Kastenmeier (D–Wis.).

While waiting to be admitted to Johnson's office, members of the assemblage chatted with Wiesner and Seaborg, and received assurances that they had supported the MURA proposal in their meetings with the President.

The group thus went in to see Johnson feeling fairly confident that the MURA prospects were as good as before. They were to be quickly disabused of the idea.

The President is reported to have opened the meeting with a brief discussion of general budgetary problems, with particular emphasis on his desire to reduce federal expenditures. Then, he produced the anti-MURA memorandum and read a few paragraphs from it. When one member of the group asked him about the source of the memo, he answered that it had been prepared in Wiesner's office. Then, without having declared himself one way or the other on the MURA issue, he got up to take a telephone call, indicating that the meeting was over. The MURA group, with a feeling of bitterness, left the White House, particularly incensed that it had not been given an opportunity to rebut the memorandum. Shortly afterward the AEC wrote into its budget a $500,000 item to provide funds for closing out the MURA project.

Anger at Wiesner

The effect of this meeting was twofold: an eruption of anger directed against Wiesner and an increased determination to use reprisals against East and West coast accelerator proposals, if necessary, to save the MURA project. With a great deal of emotion, but precious little knowledge, a number of midwesterners concluded that Wiesner had scuttled the project. As one Senator—not Humphrey—put it, "It had to be Wiesner who double-crossed us. The President didn't know a damn thing about MURA. He probably hadn't even heard of it before the assassination. So, Wiesner was in a position to swing it one way or another, and he naturally played the old game of seeing to it that the East and West coasts get theirs while the Midwest continues to go begging."

A number of midwesterners have now cooled down and are willing to concede that this appraisal of Wiesner's role in MURA is a product of emotion and ignorance. But the basic issue—the midwest's share of the research budget—endured as a spur to political action, and it helped prod the Johnson administration into modifying its verdict.

Pressure on White House

After the White House meeting, midwestern legislators, egged on by their own sense of outrage and by the pained cries of constituent university administrators, let the White House know that they were not going to accept the MURA decision without a fight—specifically, a fight directed at blocking funds for additional East and West coast accelerator design and construction. This message seems to have gotten through the protective filters that inevitably surround any man who occupies the presidency, for the past two weeks have witnessed a series of hasty efforts directed at modifying the MURA decision and assuaging the feelings of the Midwest. Senator Humphrey, an old Senate colleague of the President's and number-two man in the Senate majority leadership, appears to have been the one who made the White House realize that the MURA issue ran deeper than first appearances might have indicated.

While AEC officials were insisting that their budget included nothing for MURA but $500,000 to meet the costs of going out of business, Humphrey was meeting with Wiesner and Seaborg, and around that time the President wrote Humphrey that while he could not justify starting another national laboratory near Argonne, he did not want to see the MURA group dissolved.

Stated the President

I would hope and expect that the fine staff of MURA will be able to continue to serve the midwest through the universities and at Argonne, and I have asked Glenn Seaborg to use his good offices in that direction. I have also asked him to take all possible steps to make possible an increase in the participation of the academic institutions of the midwest in the work of the Argonne Laboratory. . . .

The President then went on to state a proposition that some midwesterners feel is worth the loss of the MURA machine:

> I share fully your strong desire to support the development of centers of scientific strength in the midwest, and I feel certain that with the right cooperation between the government and the universities we can do a great deal to build at Argonne the nucleus of one of the finest research centers in the world.

In conclusion, he referred to a Bureau of the Budget compilation which showed that the eight midwestern states (Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin), with 26 percent of the nation's population, have been receiving about 23 percent of the funds dispensed by the major federal research agencies for on-campus research. (Excluded from the compilation were such major institutions as Cal Tech's Jet Propulsion Laboratory, which received $220 million last year. Though the Midwest is not without such facilities —Argonne is one of them—they predominate on the East and West coasts, a fact that midwestern legislators are quick to point out.) And the President observed, in connection with the presentation of these figures, "I think you will agree that this area [the Midwest] has been treated with fairness." This may or may not be the case, but the observation would seem to derive from the notion that "fairness" in the allocation of research funds is somehow based on per-capita computations, which is a notion with nightmarish implications for any federal research administrator.

Several days after the President's letter to Humphrey, the AEC announced, in a press release titled "Plans for Continued Support of Accelerator Design Announced," that it would not continue support for the MURA accelerator. Having done its best to portray a goat as a show dog, the AEC proceeded to disclose the future for MURA. Under the AEC plan, MURA and its longtime antagonist to the south, Argonne, would team up to join in the design work now being conducted by New York's Brookhaven National Laboratory for an accelerator of up to 1000 Bev. The announcement, worthy of the State Department's most astute communique writers, did not disclose the advance in the hybrid-breeding art that makes it seem worthwhile to bring these three traditionally warring groups together.

It was also noted by the AEC that sites had not yet been selected for the 1000-Bev machine or the 200-Bev machine now under design at the Lawrence Radiation Laboratory in Berkeley, California. This is undoubtedly reassuring to the Midwest, but when the message gets to the East and West coasts it is quite possible that President Johnson will feel compelled to ask the Arms Control and Disarmament Agency to set up a division to promote peace in high-energy physics.

At the moment, MURA says it has assurances that it will receive its usual budget of around $2 million to plan a new life on the premises of Argonne. This is news to the AEC, but MURA officials seem happy with it. And midwestern legislators feel that they have lost an accelerator but gained a principle, which they fully intend to exploit in the new era of pork-barrel science.

—D. S. GREENBERG

Library of Congress: Automation Urged for Bibliographic Control But Not Prescribed as a Panacea

The major significance of the report *Automation and the Library of Congress*, released last week, may lie not in its proposals for automation of some operations of the library, which seems inevitable, but rather in what it adds to pressures now being exerted on the venerable "LC" to assert greater leadership in a national research library system.

After a 2½-year study of the library and of equipment and techniques now available, the study panel came up with recommendations which make it clear that automation offers no *deus-ex-machina* solution to the difficulties of research libraries, but that it can, "within the next decade, augment and accelerate the services rendered by large research libraries and can have a profound effect upon their responsiveness to the needs of library users."

In short, the report says that the immediate future for automation lies in the area of bibliographic control. In two key conclusions the report says, "1) Automation of bibliographic processing, catalog searching, and document searching is technically and economically feasible in large research libraries," and "2) The retrieval of the intellectual content of books by automatic methods is not now feasible for large collections, but progress in that direction will be advanced by effective automation of cataloging and indexing functions."

Another conclusion of the panel is that "automation will enhance the adaptability of the libraries to changes in the national research environment and will facilitate the development of a national library system."

Underlying this carefully worded prediction is the clear assumption that the Library of Congress will not only pioneer automation but will develop as the heart and nerve center of a national research library system. And in fact in the final words of the report the panel states this premise by saying, "It is also strongly recommended that the Library of Congress, because of its central role in the Nation's library system, take the lead in the automation venture."

What the report tactfully avoids discussing is that the Library of Congress has one set of problems relating to the rising tide of information, which it shares with other research libraries, and quite another set of problems produced by the LC's peculiar relationship to its patron and boss, the U.S. Congress.

The Library of Congress is called on to play multiple roles, which are not all fully sanctioned by statute or the sentiment of the legislators. In 1962, a memorandum on "what the Library of Congress does and what it ought to do for the Government and the Nation generally," prepared for Senator Claiborne Pell (D–R.I.) by the Harvard Library associate director, Douglas W. Bryant, set forth what might be fairly described as the general views of the research librarians and researchers concerned with information problems.

(For the Library of Congress, the research librarians from major universities and industry have served as both claque and critics. As their own problems in dealing with the postwar flood of information have become more acute, they have grown more concerned and more united in prodding LC to more decisive action.)

The Bryant memorandum points out that the Library of Congress by design and by accident has come to serve four main functions.

1) As the name implies, LC is a congressional library founded to provide a reference service to the legislative branch.

2) It serves other federal agencies, as well, as a reference library.

3) The Library of Congress has received all American publications by copyright deposit for more than a cen-