can be made in a few years toward a system which will be somewhat more clearly rational than that which we are now forced to use. Thus, we hope eventually to be able to cite fairly precise figures relative to the average amount of total research support available to academic scientists, by field of science, and to augment such data with judgments from competent people in the various fields on the question of reasonable ranges of support levels for each discipline."

While the foundation and other granting agencies seek ways to deal with the problems that Haworth covers in his report, it is worth speculating on the origins of these problems and on whether the leadership of the scientific community actually had to wait until this late date to seek ways to come to grips with them. Congressional insistence on keeping tight strings on federal funds has unquestionably contributed to the distortions that the grant system has created in the academic community. But it can be argued that a number of the problems which now trouble the Washington advisory set were, by and large, within its control throughout the postwar growth period of federal support for science. Why, for example, is the foundation only now acknowledging the fact that the granting system has functioned so that "younger, unknown investigators have difficulty obtaining support"? The admission doesn't conform with the long-standing contention that the panel and study-section systems judge the applicant and his project on scientific merit alone. And if, as Haworth correctly points out, "scientists and administrators may alter the preferred balance of research in order to favor those efforts they judge most likely to receive Federal support," why has the foundation permitted itself to be a party to such a process?

If it is unhappy about applicants drawing up research proposals to conform to the foundation's interests, perhaps it had better consider whether it's been interested in the right things. It is easy to say that things would be easier if Congress would appropriate more money for science, but it might as well be recognized that Congress will never appropriate enough to please everyone, and that, in the absence of unlimited funds, the scientific community could profit from more sensitive management of those things that are wholly in its control.

—D. S. GREENBERG

Congress: One New Member Brings an Engineering Ph.D., Background in Research, Business to the Job

Weston E. Vivian is a first-term congressman from Michigan who, according to the Legislative Reference Service of the Library of Congress, which keeps tabs on such things, is the only man in Congress with a Ph.D. in engineering. He seems to be the first national legislator—in recent memory, at least—to hold a doctorate in science or technology.

Vivian, a Democrat, left an upper-echelon job in a flourishing electronics company in Ann Arbor to run and win in a district with a history as a Republican fief. His assignment to the House Science and Astronautics Committee promises to enable him to make direct use of his professional background, an opportunity which newcomers to Congress do not always enjoy.

Of medium height and build, Vivian has the look and the brisk manner of the young engineers with dispatch cases you see at the airports at Washington and the aerospace and electronics cities. And on the record, his career, until last spring, was broadly typical of the generation of successful technical men produced by World War II and its aftermath.

Now 40, Vivian was 17 when he joined the Navy in 1943 and was put into the V-12 program—the Navy's wartime way of mass-producing ensigns—at Union College in Schenectady. In 1946, out of the Navy, with a B.S. and married, he got a job at the Sperry plant on Long Island. He worked on gyroscope drives and soon decided that he needed more education in electronics than he'd acquired as an undergraduate.

He went back to school, to M.I.T., spent a lot of time in the old buildings which had housed the Radiation Lab during the war, and earned an M.S. in electrical engineering in 1949.

The next stop was the West Coast. Like a lot of others then and after, he was attracted by the "mountains, ocean, and change." He wound up at Boeing working on research in radar scattering and involved in preliminary design on the Bomarc missile system.

It may have been partly the work on missiles that made him reach the conclusion at this time that nothing was more important than the country's international and national policies. He debated whether to become a lawyer and go into politics or become a research scientist, still keeping the politics option open.

He chose research, feeling that either research or law could provide an assured income in case of reverses in politics. His wife Anne was from Michigan, so it was eastward to Ann Arbor and work at the University of Michigan aeronautics research center as a research engineer. By the mid 1950's he had shifted into the university's electrical engineering department and set his sights on a Ph.D., concentrating on engineering physics.

He got into politics quite literally at the neighborhood level when his wife joined a drive to get sidewalks in their part of town, in the interest of the children, including their own. Vivian went on to run twice—both times unsuccessfully—for councilman, and then got interested in working with the Democratic mayor on an urban renewal project for the town. Becoming active in local party affairs, he served as Democratic city chairman in 1959–60.

During this period he was holding down a full-time job as well as working on his thesis. In 1959 he was awarded his Ph.D. in engineering. The next year, when the Conductron Corporation was formed, he was one of the first half-dozen employees. A "spinoff" firm drawing its original engineering talent from the university, Conductron was financed largely by Paramount Pictures (which no longer holds any voting stock).

Conductron concentrated in the field of electromagnetic scattering and surveillance radar. Most of its business has been done directly or indirectly with the government, and the firm has prospered. From $1 million in 1961, Conductron has roughly doubled its gross each year, reaching $8 million in 1964. Vivian was vice-president for engineering and one of three company members on the eight- or nine-man board of directors. He was deeply involved in engineering planning and in selling his firm's product, and he traveled a good deal.

Then a year ago with the elections coming up, party leaders in the district asked Vivian to run for the Michigan Second District seat in Congress. The incumbent was Republican George Meader, an attorney who was in his seventh term in Congress and who appeared to be deeply dug in.

Prospects for a Vivian candidacy did not seem brilliant. Redistricting had slightly changed the boundaries of the Michigan second, which now covers

four counties west of Detroit and a small slice of northwestern Wayne County (Detroit), but the changes were not thought to have upset the Republican balance. Vivian, a newcomer to district politics, would face not only an entrenched incumbent but an energetic opponent in the Democratic primary. He decided to make the race, cut back his commitments at the office, and plunged into the campaign. He won the primary by a bare 72 votes.

In the general election campaign he depended heavily on volunteers—many of them university faculty—for his organization, and he stressed personal campaigning, demonstrating a willingness to go anywhere anytime there was a coffee party or a rally. There is no television station in Vivian's district, and this helped keep campaign costs down—Vivian says that total costs for both primary and general elections amounted to about $15,000, which is a modest figure for contested congressional elections these days.

In his campaign Vivian talked a good deal about international affairs and identified himself with the national Democratic ticket. He says he took no special pains to emphasize his technical or business background. He says he was aware of "anti-Goldwater, anti-Meader sentiment" in his district and aimed at the Republican "crossover" vote. Vivian won a close one in November, about 77,500 to 76,000, and went to Congress as the first Democrat to represent his district since the early days of the New Deal.

After the election, says Vivian, he gave up any active role in the Conductron organization and, after his appointment to the Science and Astronautics Committee, to preclude any conflict-of-interest implications he sold all stock in the company save 100 shares in the name of each of his children.

In his first weeks in Washington Vivian was subjected to the distractions and minor frustrations which seem to beset all newcomers to Congress. No sooner had he been assigned his office in the oldest of the three House office buildings—after waiting, as freshmen usually must—than painters moved in, pushing the congressman, his staff, and his files into forced togetherness in first one and then the other room of the two-room suite.

Vivian is no stranger to Washington. His business trips often took him to the "downtown" agencies, particularly the Pentagon, but, as to proceedings on

Congressman Vivian (right) briefed at NASA Langley Research Center.

Capitol Hill, he says that at the outset, "like most freshmen, I saw I didn't fully comprehend what was going on." It is not simply a matter of old customs and intricate parliamentary rules. Vivian recognizes that to understand the workings of Congress it is necessary to understand the personality conflicts and behind-the-scenes developments. "Information is power," in Congress, says Vivian, "and those who have information are not going to give it away."

He found that plans for an orderly office routine are soon blasted by the demands of committee sessions and action on the floor. A few weeks ago, for example, he had been invited to the White House to witness the award of the National Medals of Science, and wanted to go. He was prevented, however, by a Whip call that went out to keep Democrats at hand for an imminent vote on an agricultural appropriations measure containing a controversial provision cutting off aid to Egypt. As it turned out, action was not taken on the bill until well into the afternoon and Vivian could have gone to the award ceremony. He recognizes that such things can't be precisely controlled in a legislative body such as the House, and feels that "much of the procedural structure of the House is well worked out."

Even early in the session, Vivian finds that keeping informed on legislation pending in the House is a formidable task. And then there is mail. Top priority in almost all congressional offices goes to mail from constituents. In many offices these letters are handled routinely by staff members. New congressmen who have won close elections, however, tend to be even more sensitive to their constituents' problems and opinions. And Vivian is one of these. His staff people may do research and draft answers, but Vivian tries to read all letters from his constituents and take a direct hand in answering them. His attention to the mail generally keeps him working well into the night in Washington. A 15-hour day has been routine for him here. (Vivian has a staff of ten—six in Washington and four in his home district—,5 of whom are part-time employees. He is a demanding boss and says they are able and hardworking people.)

The demands on a Congressman's "free" time are heavy. National organizations inundate legislators with invitations to luncheons, dinners, receptions, even breakfasts, with lobbying on some piece of legislation often in view. People from all over the country frequently come to Washington for these events and they like to see their congressmen and senators there. Vivian tries to attend these events when folks from home are to be on hand, but he almost invariably declines when they are not.

Vivian's Washington week is a compressed one since he spends as many weekends as possible in Ann Arbor with his wife and four children. After four days in the Capital he will fly back non-V.I.P. air coach (congressmen don't have expense accounts). The catch is that when he gets back to the district there are constituents to see and fences to mend, and he is lucky if he can spend half the time with his family.

Another lien on Vivian's time is his self-imposed project of visiting NASA installations to prepare himself better for his committee work. He spent a recent Saturday at the NASA center at Langley, Virginia, and went to Cape Kennedy on 15 February for the Saturn launching.

The technical depth of the committee has incidentally been increased by other new members this year. Representative George E. Brown (D-Calif.) holds a B.A. in industrial physics from U.C.L.A. Brown, a second-termer transferred from the Education and Labor Committee to Science and Astronautics. Freshman Representative William R. Anderson (D-Tenn.) is the retired Navy captain who commanded the nuclear submarine *Nautilus on* its history-making voyage beneath the ice at the North Pole. An Annapolis graduate,

Anderson also served in the AEC's Division of Reactor Development in Washington.

Vivian's committee assignment he regards as a good fortune. He is grateful to space committee Chairman George P. Miller for his part in including Vivian among the five Democrats who joined the committee this year, and he is highly complimentary to Miller after observing his handling of committee business.

Vivian's immediate concern in the committee is to learn the ropes, but he obviously has some questions on his mind. "What," he asks, for example, "should be the guidelines for scientific expenditures after the Apollo project [manned lunar landing] has run its course?" How much of the budget should go into space expenditures, he says, is "not obvious," and he expresses concern about overall planning for science.

He is of the opinion that the "spin-off argument" in justifying space expenditures is a poor one, since he feels the technology in question "has developed way beyond our ability to use it except in space ventures."

For the most part, however, Vivian emphasizes that he has questions for which he doesn't pretend to have the answers. And he is adjusted to the realities of committee life, which decree that junior members, even in a comparatively free-wheeling committee such as the space committee, are expected to make only modest contributions.

Within the limits of the time available Vivian has interested himself in foreign affairs problems, and late in January he joined the bipartisan congressional delegation which traveled to Selma, Alabama, to observe the voter registration campaign there. Vivian has made no speeches on the subject and says he went simply to look for himself and to try to understand the situation better.

In the last two months Vivian has learned that there are plenty of differences between the life of a congressman and that of an electronics company executive. There are also some surface similarities—long hours and lots of traveling are the main ones.

One of the chief differences, says Vivian, is that "in a company you can see successes and failures day after day—you can't lie down.

"In Congress, however, your fate at the polls, which is your only measure of success, is only evident from election to election. And the ironical thing is that this fate may be almost unrelated to whether or not you worked hard on the legislative matters of great consequence."

Vivian is forthright in talking about what is recognized as a major problem for a new congressman who, in a landslide year, wins a close election in a district which habitually goes the other way—the problem of getting reelected. He notes that "a freshman congressman has little influence and there are sound reasons for wanting to be reelected."

It is not uncommon for congressmen from unsafe districts to devote themselves so passionately to long-range campaigning for reelection that they have little time for anything else.

As for himself, says Vivian with a smile, "I'm trying to avoid being obsessed with the idea. I'm trying to work on things which are interesting and important and to exert influence in a few places here."

What made Vivian run for Congress when it involved giving up a job that carried considerable responsibility, good opportunities, and an income that exceeded the $30,000-a-year congressional salary, and created a number of financial, professional, and family problems?

In simplified form, Vivian's answer seems to fall into two parts. First, he had been interested in politics, domestic and international, for a long time and had acquired the kind of practical experience that politicians recognize. And he says, simply, that "being a Member of Congress was a lifetime ambition."

Second, when he was making the decision, he found, he says, htat in contrast to the possibilities of congressional service, it was "depressing to think that I would spend the next *n* years hawking military hardware."

Vivian, as the sole Ph.D. in science or technology in Congress, does not constitute a trend, but he does demonstrate that one can get into politics and get elected.—JOHN WALSH

Water Pollution: Bill Endorsing Strong Federal War on Polluters Received Favorably in Congress

Despite accusations to the contrary, Congress does on occasion like to legislate, and it appears to be on the verge of endorsing a bill that would signal a major change in the government's power to do something about the increasing pollution of the nation's waterways. The bill, which passed the Senate by a wide margin on 28 January, goes a long way toward replacing the policy of merely curbing pollution with an active program of prevention. There is still some opposition in the House (where a similar Senate-passed bill died in the Rules Committee last session) but support for the new program is widespread in Washington, and several close observers have predicted that the bill will be law by April. Though endorsed by the White House, it is chiefly the work of two congressional conservationists, Senator Edmund Muskie (D–Maine), chairman of the special subcommittee on air and water pollution of the Senate Committee on Public Works, and Representative John A. Blatnik (D–Minn.), chairman of the rivers and harbors subcommittee of the House Committee on Public Works.

The bill contains several provisions to increase federal monetary and logistical support for pollution abatement on the state and local level. It provides for research and demonstration grants on ways of separating what has come to be recognized as a major pollution problem—the combined storm and sewer systems that feed huge overflows of untreated waste into rivers during heavy rainfalls. And it also contains a section to encourage abatement of pollution in shellfish bed areas, reflecting the concern over the economic consequences of such pollution that was responsible for Muskie's initial interest in the whole subject. The heart of the bill, however, is in two provisions that are more administrative than financial. The first of these would remove authority over water pollution activities from the Public Health Service (PHS) and transfer it to a new unit within the Department of Health, Education, and Welfare (HEW). The new unit, to be called the Federal Water Pollution Control Administration, would have its own high-level chief and would be further strengthened by the appointment of a new Assistant Secretary, who would have primary responsibility for all the Department's water pollution activities. The second key provision of the new bill gives the Secretary of HEW authority to promulgate standards of water quality for virtually all the interstate waters in the country. Both sections have been the focus of ocntroversy.

The proposal to withdraw pollution control programs from the Public Health Service reflects congressional disbelief that the old-line, health-oriented