In Michigan, the voters in Alpena and Charlevoix counties, which are situated in the northern part of the lower peninsula, responded with a resounding "no" to the question whether the disposal of nuclear wastes should be allowed in their region. This nonbinding advisory referendum question was included on the November ballot after it came to light several months ago that the Energy Research and Development Administration was planning some test drilling into the thick salt deposit that underlies Michigan. The Alpena Power Company mounted a feeble campaign in favor of keeping the waste disposal option open, but it found few takers.

The Michigan electorate as a whole would have had a chance to vote on an initiative similar to those rejected by voters in the other six states except for the fact that not enough signatures were collected for this initiative to qualify for a place on the ballot. The some 100,000 signatures which this initiative's sponsor, the Public Interest Research Group in Michigan (PIRGM), did collect could still be counted against the total that would be required to bring it to a vote in November 1978. But some of the PIRGM leaders are now wondering whether the better course would not be simply to abandon this effort and start afresh, perhaps along the lines Epstein is suggesting.

The Atomic Industrial Forum (AIF), an industry association that has more than 600 corporate and institutional members, is promoting the idea that the voting this year on the nuclear initiatives has amounted to a large and unique plebiscite involving some 20 percent of the total national electorate. Carl Walske, president of the AIF, says the nuclear issue "has been taken to the Village Square, as Einstein predicted, and has been approved by the American voter."

Another well-placed industry observer puts it this way: "We are hoping that there is a message here for the new Administration." In a speech last August at Oak Ridge, Jimmy Carter said he did not favor a nuclear moratorium. But last spring in Portland, Carter endorsed the Oregon initiative, and he has often stressed the need for nuclear safeguards.—LUTHER J. CARTER

Congress: Election Impacts Atomic Energy, Science Committees

When the new Congress convenes in January, the Senate is expected to move to make changes in its committee structure, and a leading candidate for oblivion is the once-unassailable Joint Committee on Atomic Energy.

In Congress at large, a combination of retirements and defeats in the primaries and the general election have created a situation in the committees which deal with science and energy policy rather like a complicated game of musical chairs in which the players have been removed rather than the chairs.

Since the Atomic Energy Commission was fissioned into the new Energy Research and Development Administration and Nuclear Regulatory Agency there has been considerable speculation that the JCAE's days are numbered.

A proposal to remove the legislative authority of all joint committees was made by Democrats in the House 2 years ago as part of a package of committee reforms, but was not included in the changes which were finally instituted. In the last Congress, Representatives Johnathan B. Bingham (D–N.Y.) and Clarence D. Long (D–Md.) continued the effort, but singled out the JCAE.

The Senate has been regarded as the chief proponent and defender of the JCAE because several influential Senate members of the committee—there are nine members from each house—have been particularly staunch advocates of nuclear energy.

This year, however, a select committee which is studying the Senate committee structure (*Science*, 14 May) recommended that the functions of all joint committees be "reconsolidated" into standing committees. This, of course, would include the JCAE.

In practical terms, Senate support for the JCAE has been substantially reduced by the departure from the Senate of five of the nine Senate members. This includes the chairman, the retiring Senator John O. Pastore (D–R.I.), who has been a strong partisan of development of nuclear power. Other departing members are Senator Stuart Symington (D–Mo.), who is also retiring, and Senators Joseph M. Montoya (D–N.M.), James L. Buckley (C-R–N.Y.), and John V. Tunney (D–Calif.), all of whom were defeated in the general election.

Senator Henry M. Jackson who was resoundingly reelected will be the ranking Democrat on the JCAE in the new Congress. Jackson has been a strong proponent of the committee as well as of nuclear energy. But whether Jackson would be inclined to lead a campaign to save the JCAE now seems doubtful. He reportedly has come to feel in recent years that the handwriting is on the wall for the JCAE. The select committee's recommendations provide that military applications of nuclear energy would be taken over by the Armed Services Committee, where Jackson is a senior member, and this well might be to his liking. In addition, Jackson's interest in energy matters has broadened and the JCAE in some way restricts him in that interest.

The JCAE, however, can be expected to have its champions, notably members from the House, who will be returning en masse. Most solicitous for the committee is likely to be John Young (D–Tex.) who stands to take over as chairman under the arrangement which provides for the JCAE chairmanship's shifting between House and Senate in alternate congresses. Opinion in the House, however, is said to be running against the JCAE, particularly among younger members who feel that the committee has, historically, been too partial to the nuclear industry.

The implications of the election, of course, go beyond the JCAE. This election, in fact, will have an unusually strong impact on legislators who played key roles in science policy and energy matters.

On the Senate side, Senator Frank E. Moss (D–Utah) was unseated in the general election. Moss has been chairman of the Committee on Aeronautical and Space Sciences and was the only incumbent Senate committee chairman to be defeated. The Senate space committee has been underemployed since the space program went into decline and, under Moss's chairmanship, efforts have been made to widen its interests and jurisdiction. Science policy was one area where the committee already had a foot-

hold. Under the Senate system of multiple referrals of legislation, the space committee was, for example, one of three committees which shared authority over the legislation which returned science advisory machinery to the White House. And Moss was known to hope that his committee might be recast in the mold of the House Science and Technology Committee, which had moved from a virtually exclusive concern with the space program to a broader dominion over research, including energy research, except nuclear energy. Moss was the chief Democratic sponsor of a special select committee to study the reorganizing of the Senate committee system (*Science*, 14 May), and it was assumed that he hoped one result of such a reorganization would be that his own committee would achieve symmetry with the House Committee on Science and Technology, which among other things, is the authorization committee for the National Science Foundation (NSF).

In the House, the chairman of the subcommittee which handles the NSF authorization, James W. Symington (D–Mo.), was a casualty of the primaries. Symington gave up his seat to run, unsuccessfully, for the Senate seat being vacated by his father, retiring Senator Stuart Symington. (During the past 2 years while NSF has been raked over the coals on Capitol Hill for the vagaries of some of its programs, Symington seems generally to have followed a course of applying pressure on NSF to correct its faults while at the same time protecting

Academy Holds Open Hearing on Research Training Needs

The National Academy of Sciences broke a little new ground in the name of public participation a couple of weeks ago when it held an open hearing to get comments on a report from its committee that has been asked by Congress to decide each year how many new researchers are needed in the biomedical and behavioral sciences and which specialties should get priority. Therefore, what the committee* has to say is of considerable interest to research scientists because its annual recommendations to the Secretary of Health, Education, and Welfare bear directly on who shall get National Research Service Awards, a category of training grant. The occasion was notable for introducing a new element of openness into the conduct of Academy business and because, for this committee at least, such receptivity to public view may well become part of the process by which it does business in the future.

The committee came into being in 1974 when it became apparent that, because of limited funds, someone would have to establish priorities for training grants among competing specialty groups if the country were to avoid training more biochemists, for instance, than it needs. The committee's job puts it in a position of being wrong as far as some groups are concerned, no matter what it does, as was evident at its 4 November hearing in Washington.

The hearing was called to entertain comment on its 1976 report,* issued earlier this year (*Science*, 27 August), that called for a "modest but significant" *reduction* of federal support of students in the basic biomedical sciences and a "significant reorientation" of sponsorship of training in the behavioral sciences, mainly away from support of predoctoral candidates in favor of postdocs in innovative interdisciplinary institutional programs.

The hearing, which began at 9 in the morning and lasted until 10 at night, was not exactly entertaining. In fact, the opening session had a distinctly soporific quality as speaker after speaker came to the podium to plead his special cause. (The fact that so many speakers were special pleaders served mainly to give the committee confidence that its first report was not full of holes.) The gist of what most witnesses said was this: Your ideas about cutting back and rearranging programs makes good sense, except for persons in my discipline which, being more vital than others to the national interest, is a special case. Thus, the committee heard why engineers, epidemiologists, pharmacologists, psychologists, and even anthropologists need to be trained in extra numbers at the taxpayers' expense, and each time, in what had become a kind of litany within the first hour, members invited speakers to prove it—with hard data.

The dozing audience woke up briefly just before the coffee break, however, when Jack Rakosky of Franklin College, Franklin, Indiana, took the stand. Rakosky is a young Ph.D. psychologist who is teaching at a liberal arts college because he could not get a job in research and who has a number of friends who could not get jobs at all. Observing that it is more humane to keep people out of the Ph.D. pool than to train them for jobs that do not and, in his opinion, will not soon exist, Rakosky advised the committee to stick with its feelings about cutting back, and to recommend cutting back still further.

He also startled his audience with a novel suggestion for a program he thinks would benefit laboratory research and liberal arts college teaching at the same time. Rakosky would replace the available pool of young people working in labs and actually doing research day to day with college teachers on sabbatical. That way, he reasons, the research would get done and the teachers, who necessarily lose touch with current research if they do not have access to a high-powered lab, would get a refresher course that would be bound to enliven their teaching. His were about the only really fresh ideas, committee members report. However, the committee members seem to concur that the hearing was useful and believe they may hold another next year to get comment on their 1977 report. Member Peter Barton Hutt, a lawyer who has been fighting for 2 years to get the Academy to hold such a public meeting, was particularly enthusiastic about the outcome of the long day's event, noting that the committee did get some help in setting the course for its deliberations during the coming year. For instance, the 1976 report admittedly does not deal adequately with questions about women and minorities in science. Prodded by testimony from those groups, the committee is now likely to take the matter up this year rather than putting it off any longer. In addition, 40 persons who testified (many of whom made a considerable effort to get to Washington) and another 35 who submitted written statements, were appreciative of the opportunity to be heard, which in itself may justify holding an open hearing.—BARBARA J. CULLITON

*Committee on a Study of National Needs for Biomedical and Behavioral Research Personnel. A copy of its 1976 report can be obtained from committee offices at the National Academy of Sciences, 2101 Constitution Avenue, NW, Washington, D.C. 20418.

the agency from harsh punitive action. Somewhat ironically, Representative John B. Conlan (R–Ariz.), the chief accuser of NSF and often an antagonist of Symington's, also lost his seat in the House after a bitterly fought primary battle for his party's nomination in the Arizona Senate race. So NSF officials doubtless have mixed feelings about the fortunes of politics in the primaries.)

Who will succeed Symington as chairman is not clear, in part because another Science and Technology subcommittee chairmanship is open. Representative Ken Hechler (D–W.Va.), who has headed the subcommittee on energy research, development and demonstration (fossil fuels) also gave up his seat when he ran in the West Virginia gubernatorial primary. He lost to John (Jay) Rockefeller IV, who went on to win the governorship in the general election. Hechler, who was centrally involved in the fight for compensation of miners afflicted with black-lung disease and has been a strong advocate of the prohibition of strip mining, after the reverse in the primary, decided to mount a campaign as a write-in candidate. He came very close—the verdict was delayed for several days—but has been finally counted out.

Part of the uncertainty about subcommittee chairmanships arises from the Science and Technology Committee rules which provide that seniority on the full committee rather than on a subcommittee prevails. This means that a member with sufficient seniority can claim the open chairmanship of a subcommittee other than one on which he serves. But hesitation is also encouraged by questions about the future pattern of congressional authority over energy, particularly about the fate of the Joint Committee on Atomic Energy.

Representative Mike McCormack (D–Wash.) is a member of the JCAE and also chairman of the House Science and Technology Committee's other subcommittee on energy research, development and demonstration dealing with less conventional energy sources. In the event of a demise of the JCAE and reshuffle of authority over energy in Congress, McCormack is an example of those who would want to keep their committee options open until the dust settled.

If all of this seems involuted, it is. But for a legislator, getting the right committee assignment at the right time serves to make life on Capitol Hill more interesting and serves one's political interest at the same time.—JOHN WALSH

TVA Today: Former Reformers in an Era of Expensive Electricity

Since 1973, when fuel prices began their precipitous rise, the country has been caught up in strong currents of debate over the best way to manage its suddenly scarce energy resources. One of the most dramatic chapters in this controversy is taking place in the Tennessee River Valley, where the once-bold Tennessee Valley Authority (TVA), a federal agency created at the height of New Deal reforming zeal, is being accused of being reactionary by today's energy reformers.

"The energy world has turned upside down, and yet it seems to me that TVA is continuing with the same bag of tricks that they started life with," said David Freeman, a nationally known energy expert, to a Nashville audience last February. The statement neatly summarized the views of TVA's critics, who charge that the agency is overbuilding new generating capacity and making a foolhardy commitment to a nuclear future, instead of undertaking serious reforms aimed at using existing generating capacity more efficiently through conservation programs and rate changes.

The TVA, however, is no mean foe; it is a mammoth institution with $6 billion in assets; it is the largest utility in the country; it is a potent political force in the Tennessee Valley. It is committed to using cheap power to promote economic growth, or, as the agency says, "In TVA, electric power is regarded as a tool for economic development." And TVA is justifiably famous for having followed this precept. Beginning in the 1930's at the depths of the Depression, it used cheap electricity to help transform the backward valley into a modern industrial economy. For example, since TVA entered the region, the median income there has risen from 45 to 75 percent that of the national average.

Today, TVA continues to live by this philosophy. It is expanding at the electric utilities' time-honored, historic rate, doubling every 10 years; it wants to preserve its rate structure, which, as in the past, charges higher prices to homeowners than to bulk users, such as industry and government. It argues that its conservation programs, which consist of study and demonstration efforts instead of mass promotion campaigns, are adequate. However, in the view of TVA's would-be reformers, in the valley, in Washington, and in New York, there is a serious question as to whether these policies are adequate in the post-1973 energy era. For, while TVA's rates are still a third lower than the national averages (a resident there in 1975 paid 1.76 cents a kilowatt-hour) they have risen sharply. By valley standards, electricity has become an expensive commodity. In this sense, TVA's problems since the 1973 energy crisis resemble those facing other power suppliers.

The reasons behind TVA's current behavior are rooted in its history. In 1933, the TVA was charged with "planning for the proper use, conservation, and development of the Tennessee River drainage basin and its adjoining territory." TVA started by controlling floods, through building a system of dams, and easing navigation along the steep, turbulent river. As a by-product, TVA produced cheap electricity.

At that time, the country was caught up in a crusade for rural electrification, and the advantages of TVA's cheap power to the poverty-stricken valley were so obvious that TVA obtained an unwritten mandate to proceed with its power generating activities, even though power production was nowhere mentioned in the original TVA legislation. Also TVA lured heavy industry to the valley by offering bulk electric rates that were cheaper than those available to homeowners. The federal government climbed aboard the bandwagon, and located its wartime uranium enrichment facility at Oak Ridge and later an installation at Paducah, Kentucky, because of TVA's bargain bulk rates. In short, the TVA power program grew like Topsy.

Today, although the agency spends $35 million a year, mostly from the federal government, for water resources, fertilizer research, and related activities, the remaining $1.17 billion of the agency's budget goes for its self-financed power program, which has a capacity of