One is China's lack of any foreign money to buy sophisticated equipment from the West; China has very few exports with which to get her hands on foreign currency in quantity. Another will be the small base of manpower on which China can build; in that huge country, with a population of 800 million, only 1 in every 1300 people is attending college. (By contrast, the United States has 1 college student for every 40 members of the population.) And China has a two-tiered college educational system; most college students receive practical, vocational training, rather than a curriculum that would lead to careers in science or engineering.

But the most important obstacle to developing a strong science and technology base could be Communist political ideology. Both the perpetrators of the 1966 Cultural Revolution (who closed down the universities) and the now-dethroned "Gang of Four" subscribed to a historic element of Chinese Communism, namely, the notion that university training fosters elitism and hence class struggle. For this reason, exams were abolished for a time. For the same reason, even now, the question of whether to offer an admissions test is highly sensitive politically.

Recent visitors to China, who otherwise feel they understand what is going on, confess that they have no clear idea as to what is happening in the universities and whether technical training is being allowed to proceed in a more or less normal fashion. Even experts say it is still not clear whether China will follow the education policies necessary, in the long run, to train a new generation of experts capable of helping the country make a new leap forward.

—DEBORAH SHAPLEY

IEEE: A Policy Challenge for Big Engineering Society

The Institute of Electrical and Electronic Engineers (IEEE), the biggest of the technical professional societies, is being pressed to reexamine its policies and programs. For a case of this kind, the challenge is coming from an unusual group of dissidents. These include some of the best-known names in engineering in industry and academe: five past presidents of IEEE, a recent President's science adviser, Edward E. David, Jr., the president of Massachusetts Institute of Technology, Jerome B. Wiesner, and president of Hewlett-Packard, William R. Hewlett.

Calling themselves the Good Government Group (GGG), they have formulated a statement of "goals" which concludes with the declaration that "In order to assist the members to identify the most able leaders, we propose to seek and endorse candidates for positions as officers and Directors of the Institute" (see box).

The avowed aim of the GGG is to bolster the quality of the technical information and educational services of the IEEE, which were the institute's original functions. Members of the group share a feeling that IEEE in recent years has overemphasized "professional activities," particularly lobbying on economic and political issues affecting engineers. They argue that such efforts have been at the expense of technical and educational activities, and the result is an actual decline in the status and influence of the organization.

At this stage, both GGG members and the board are quite circumspect in discussing their differences. They avoid personal attacks and tend to talk in generalities. While the GGG wants to strengthen the technical side of IEEE, its members insist that professional activities—up to a point—are a proper concern of the organization. Board members, for their part, insist that the technical information and education functions still take a major share of the $14 million plus IEEE budget and should continue to do so. Because the argument is about balance and emphasis and, to some extent, about the criteria for choosing IEEE leaders, an outsider is likely to find some of the issues elusive. Getting a sense of the conflict is complicated by the fact that both GGG and the board endorse the same presidential candidate.

That candidate is Ivan A. Getting, president of Aerospace Corporation, who is retiring in September. Getting's selection as a board candidate is something of a departure from practice in recent years since Getting has not been an upper-echelon office holder of the organization. The GGG endorsed Getting because he fulfills their criteria for able leadership.

Getting's opposition in the presidential race is Irwin Feerst, a petition candidate who has run unsuccessfully for the presidency twice before. Feerst has been a gadfly critic of IEEE in recent years. A consulting engineer, he spends much of his time monitoring IEEE affairs and commenting through a monthly newsletter. As a self-styled champion of rank-and-file engineers, Feerst complains that the IEEE is dominated by industry executives and academics. He charges that

The Race for Veep

In the forthcoming IEEE elections for 1978 offices the key endorsement by the new Good Government Group (see accompanying story) is that of C. Lester Hogan, vice-chairman of the board of Fairchild Camera and Instrument Corporation, for IEEE executive vice president. Hogan qualified as a "petition candidate" by submitting nominating petitions with more than the required 1430 signatures before the 29 July deadline. Hogan will run against Carleton A. Bayless, division manager of Pacific Telephone and Telegraph in Sacramento, Calif., the candidate backed by the IEEE board of directors. Bayless was himself a petition candidate last year who beat the board-backed candidate and was this year endorsed by the board. The executive vice president and president are the only two IEEE officers elected by the general membership, and the executive vice president's job is regarded as the second most influential policy post.

university engineering faculty are motivated by a need for engineering students to fill their classrooms and that industry managers want a heavy flow of graduate engineers to keep competition for jobs sharp and salaries low. He is identified with proposals to restrict training of engineering manpower, although he insists what he favors is a "quality filter."

Tensions between those who espouse the traditional technical functions of the institute and others concerned with the newer professional lobbying activities became acute in the late 1960's when recession conditions, particularly the decline in federal R & D spending on space and military electronics, caused a sharp rise in unemployment and a squeeze on salaries among electrical and electronics engineers.

These recession pressures led to demands from lower and middle-level engineers that IEEE become active in behalf of engineers' economic interests. A proposal for a constitutional amendment put on the ballot by petition in 1971 would, in effect, have converted IEEE to an organization largely devoted to professional activities. This was narrowly defeated and the next year board-backed amendments gave professional activities parity with technical and educational purposes in the IEEE constitution. These were passed overwhelmingly.

To carry out the mandate, the IEEE levied a special assessment for professional activities on its U.S. members. IEEE is an international organization with 180,000 members, 150,000 of them in the United States. Basic dues are $35 a year with U.S. members paying an added $10 assessment, so over $1 million a year is available for professional activities.

IEEE's professional activities are carried out mainly through a U.S. Activities Board (USAB) made up of IEEE members and by a Washington office with a

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Professors, Politics, and Palaver

The American Enterprise Institute, a conservative think tank, recently held a symposium on "professors, politicians and public policy" in hopes of casting some light on the effect of the increasing numbers of academics in government.

The panel, moderated by former ABC news executive John Daly, featured four heavy hitters in the cerebral department: Senator Daniel Patrick Moynihan (D–N.Y.), Senator S. I. Hayakawa (R–Calif.), former solicitor general Robert Bork, and political theorist Irving Kristol.

Hayakawa, who has a reputation for dozing off during boring meetings, testified to the vim of the proceedings by remaining alert throughout, as the four professors traded quips and quotes from Shaw, Wilde, Orwell, Popper, Schumpeter, and such.

Moynihan packed two cracks into his opening breath: he corrected Daly's pronunciation of "academia" to "academia, as in academia nuts," and went on, inexplicably, to quote Oscar Wilde's evaluation of Niagara Falls: "It would be more impressive if it flowed the other way."

Touching briefly on substantive matters, the panelists agreed that the professoriat in recent years have infiltrated government to a significant extent. Moynihan recalled there had been six professors in President Ford's Cabinet (including himself as U.N. ambassador), a signal of the "big change from the long hegemony of lawyers in American political life." Bork agreed that "professors are probably the single most influential group in public policy in the U.S."

Kristol ventured as explanation his view that "professors, along with their satellite group, the media," are sought for their expertise because they're the only people who are not looked upon as a special interest group. And academics embrace this role, he said—in the past they philosophized and moralized in their ivory towers, but "now all professors think they should be sought out."

The panel went on to mull over how well suited those whose trade is words are to running things. Hayakawa the semanticist thought the takeover by the "verbalists" was an unfortunate trend. The "symbol handlers"—those for example who deal in grain futures but never

Richard Pellici

tilled the sod—"have no checkpoints in the nonverbal world," he said, unlike the "thing handlers," pastry chefs for example, whose concepts "are validated in nonverbal events" such as puffy pastries.

Kristol was sympathetic to this view. "Government is a practical, not a theoretical, art," he asserted.

Wrong! cried Moynihan. "Government is ALTOGETHER a theoretical art. It is fundamentally a matter of manipulation of symbols."

Uh-uh, said Hayakawa. "You have a theory of housing for the poor. That's why we still have a housing problem for the poor."

Moynihan swept that aside. "In the end, the important things you are going to have to ask the professors. The really serious questions—not housing for the poor—but questions like what is the difference between a dog dying and a fetus dying? These are the important questions. These are not answerable. You have to resort to symbols."

That topic dispatched, the panel took a quick excursion through capitalism and utopianism and finally arrived at a conclusion on which all agreed: Chicago Mayor Richard Daley was the best mayor in America.

Unlike politicians who have been conditioned to look to the "experts," Daley ran on common sense, said Kristol. "Mayor Daley would have made a great Secretary of State. He knew how to get along with people, he was shrewd, he knew who to stab in the back. It didn't matter that he didn't know where half the countries in the world were."

But, said Hayakawa, "men of words don't understand men like Daley."

Wrong again! from Moynihan. He had discussed Daley with colleagues at the Center for Urban Studies at Harvard and "we all agreed Daley was the best mayor in America. And he would make a Hell of a secretary of state."

Moynihan emerged from the symposium as the unqualified advocate for the range and resourcefulness of the academic mind. Hawakaya displayed a democratic resentment toward the privacy of the "verbalists"; Bork shared his reservations, mainly on the basis that "the professoriat have distinct policy biases that tend to be left liberal" which he thought might have "long-term serious implications." Kristol wound up with an observation on the media's contribution to the elevation of intellectuals. "Professors do tend to be a lot more articulate than busi-

full-time staff. The Washington office conducts a lobbying and information program which focuses mainly on economic issues. During the recession, many engineers lost pension rights when they were laid off or forced to change jobs, and a good deal of IEEE effort has been put into working for pension rights for professionals in an industry with somewhat transitory employment patterns. Currently, considerable attention is centered on what is called "salary busting." Engineers who work for firms performing service contracts for the government have faced special problems when these contracts expired. In many cases their firms have had to enter lower bids in order to win contract renewal and, consequently, they have cut employees' pay. In a tight job market, engineers, particularly those over 40 who had nowhere else to go, had no option but to accept the cuts. IEEE has been lobbying to win extension to professionals of the federal Service Contract Act, which provides protection of the pay of blue-collar workers on federal contracts.

Protection of the interests of inventors whose employers' claim patent rights is another aim of the professional activities program. In addition, surveys to indicate changes in employment and other engineering manpower indicators are taken and made available. Attitudes of members are also polled to give guidance to the USAB and the board on policy.

Critics of the institute's professional activities say that the IEEE is taking policy stands on too many controversial issues which have little to do directly with engineers' interests. Most often cited is the IEEE position opposing the California initiative for strict control of nuclear power development in the state. The IEEE action was protested vigorously and led to an internal debate over official policy-making which was aired in the IEEE's monthly journal, *Spectrum*. The

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nessmen or bankers. They survive on TV. Businessmen do terribly on TV."

But do professors make the government run better? Put four of them onto that question and the answer is an admirably puffy, but not necessarily edible, pastry.

Court Rules Against Woman Biochemist

Sharon Johnson, a biochemist at the University of Pittsburgh, has lost a 5-year battle to prove that the university's refusal to grant her tenure was a case of discrimination based on sex.

On 2 August, a federal district judge ruled that the decision was "legitimate and nondiscriminatory" and based on the "ineffectiveness of her teaching and lack of relevancy of her research."

Johnson was refused tenure in 1971. Although her teaching contract was not renewed in 1973 she obtained an injunction from the district judge, William L. Knox, that prevented the university from dismissing her. Her case has been financed by the National Organization for Women (NOW).

In his opinion, Knox said the evidence showed that Johnson's teaching performance was poor and that many of her first-year medical students found her incomprehensible. He cited the claim that over half the students had resorted to attending a supplemental evening course covering the same material.

Johnson's NOW lawyer, Sylvia Roberts, said Johnson was not the only lecturer students complained about. As for Johnson's research on enzyme mechanisms, which the professors in the biochemistry department termed "remote" from the department's concerns, Roberts said one eminent biochemist (not at the university) found it outstanding. (Upon being contacted by *Science*, though, this biochemist agreed that the research was "very remote.")

Whatever the merits of Johnson's charges, the trial—which lasted 74 days and produced 12,085 pages of testimony—illustrated the difficulties of proving or disproving charges of sex discrimination, particularly in academe.

Roberts said NOW took the case because it was "strongest on its facts of any that we know of." She said there that at least two men with inferior qualifications had been promoted over Johnson, and that the biochemistry department had never had a tenured woman. To Roberts, the case proved that the courts require nothing less than a blatant admission of sex discrimination on the part of the defendants. She also noted that "there has never been a decision in this country which takes on peer review" in higher education.

As for Johnson, the injunction keeping her at her post has been dissolved and no one is saying whether or not she will be kept on. Lawyer Roberts says no decision has been made on what to do next. She says Johnson has sent out 400 job applications in the past 2 years but hasn't had any offers.

Curbs on Strippers Celebrated

"Coal has always cursed the land in which it lies," wrote Harry Caudill in his Appalachian classic, *Night Comes to the Cumberlands*.

It almost seemed the curse was being dissipated in the warm night over the Potomac in Washington as hundreds of revelers, including people from the coal lands of Appalachia and the West, gathered to celebrate on the eve of the signing of the new national strip-mine law.

Although there were few if any members of the coal industry present, the party, held in a boathouse by the river, had an air of national unity. There were assembled representatives from dozens of environmental groups, as well as bureaucrats, babies, mountain folk, and sundry others. People drank beer stashed in an ice-filled canoe, danced to the twangings of a bluegrass group, and filled the air with acronym-studded Washington talk.

The party was put on by the Environmental Policy Center, a Washington-based lobby that has been pushing hard for a national strip-mine law since its formation in 1971. At the door welcoming guests was EPC's coal expert Louise Dunlap, looking radiant as any bride, as people congratulated her for her unremitting labors. "Louise won't admit it, but she's done more than any other individual to get this thing through," said one guest.

She was rewarded with a presidential smooch the next day, 2 August, in the Rose Garden where another large group assembled to witness Carter fulfilling his campaign promise to sign the bill.

The bill, the Surface Mining Control and Reclamation Act of 1977, for the first time establishes national standards for leasing, mining, and reclaiming strip-mined land. It has undergone many adventures and hundreds of amendments since Illinois Senator Everett Dirksen introduced the first national strip-mine bill 37 years ago. It was finally passed by both houses twice in the last Congress but was vetoed twice by President Ford.

Constance Holden

current IEEE president, Robert M. Saunders, former dean of the school of engineering at the University of California at Davis, acknowledges that the initiative position drew intense fire, but says he is convinced that the stand reflected the views of perhaps 90 percent of the membership.

Controversy has also swirled around a past president of IEEE who was centrally involved in development of the institute's professional activities. He is John Guarrera, currently director of research for the school of engineering at California State University, Northridge.

Guarrera was president of an electronics company investigated by the Securities and Exchange Commission. The SEC in 1976 filed a complaint against the company and four of its officers, including Guarrera, charging them with making misleading financial statements and aiding manipulation of the market in the company's stock. Guarrera signed a consent decree which means the signer does not admit or deny guilt but consents not to engage in proscribed practices in the future. Guarrera was president of IEEE in 1974 at the time the matter first attracted public notice. His troubles have apparently not affected his standing with his peers in the IEEE hierarchy. He was elected to the vice presidency overseeing professional activities last year by the IEEE assembly. GGG members tend to regard Guarrera as a central figure in a group which has dominated IEEE affairs since the early 1970's, and to question whether, in view, of the SEC complaint, he should be playing the lead role in the IEEE professional activities program which includes development of professional ethics.

More recently, Guarrera has figured in a flap caused by the presence of several people identified with IEEE on the advisory board of the American International Open University in St. Louis. Feerst and others have criticized Guarrera for permitting himself to be associated with the nonaccredited school and for using the title "Dr." after being awarded an honorary doctorate by the school. Saunders notes that while individual IEEE officers and staff members are free to be active in the Open University's affairs, the IEEE board is concerned to make clear that the institution is not endorsed by IEEE.

What seems to disturb the GGG members most about the IEEE professional activities program according to GGG steering committee member C. C. Cutler, director of Bell Labs in Holmdel, N.J., is what they see as a trend toward restrictions on entry to the field and trade union–style political activity. Especially alarming to them is the discussion in IEEE of the possibility of developing a political action committee on the union model of collecting contributions from members and then endorsing candidates for public office and making campaign contributions to them.

Opinions tend to vary among GGG members on the desirable limits of professional activities for IEEE. All seem to feel that action, for example, to make pensions "portable," is appropriate and desirable and that other similar issues should be pursued by IEEE. But they have not provided any detailed design of where they feel professional activities should begin and end.

What they do agree on is the need for a particular kind of leadership for IEEE. The GGG statement puts it as follows:

"To attain its goals and to provide its members with quality technical and professional services, the Institute needs able leadership. It should seek those who have demonstrated their capabilities in both their technical and professional careers, as well as those who are sensitive to society's needs."

This view is based on the belief that the technical strength of an organization like IEEE is what gives it status. They think that IEEE leaders should be drawn, in the main, from the top echelons of university and industry engineers, those most highly regarded by their peers and by government officials and legislators. Implicit in this is the suggestion that such leaders will be more effective working in behalf of the interests of IEEE membership than will ordinary pressure-group tactics.

Throughout much of the 1960's, top posts in IEEE were, in fact, held by engineers who were highly visible in the profession. Then, along with the surge of grassroots sentiment which brought the constitutional change, the pattern of selection for office changed. The top posts came to be filled more often by IEEE members who had done apprenticeship at the branch and regional level and then levitated to national office. The organizational structure of IEEE abetted this development and, critics say, a new clique emerged and kept effective control.

This is not to say that IEEE was run by nonentities or only by those who rose through long labor in the IEEE vineyards. Most had solid credentials, and a substantial proportion of those named to the board and to top offices were academics. But the GGG argues that the prevailing practice excluded the top industrial executives or academics who were simply too busy to serve a long qualifying stint.

One effect of the demand for extensive involvement in IEEE affairs by those who wish to be active in influencing the organization, say GGG members, is a trend among many able academics and executives to withdraw from IEEE activities and to lose interest in the institute. Such disenchantment, they argue, will seriously weaken the organization.

GGG members realize they are likely to be accused of being elitist. Karl Willenbrock, dean of engineering at Southern Methodist and an organizer of GGG and member of its steering committee, acknowledges the possibility of such a reaction, particularly because of the density of academic and industrial dignitaries on the GGG list.

He insists that group members "don't want to be elitist." He says that letter response indicates that there is wide support for the group's views throughout the membership. GGG members intend now that the group is established, that it will continue to be active in IEEE affairs after the current election. "We hope that it will be judged on the basis of the candidates we back and the stands we take." The group plans to endorse candidates for top regional posts.

As a presidential candidate, Getting is in the relatively comfortable position of being asked to run by the board and of then receiving the blessings of its opposition. He sees the tensions in IEEE as "a reflection of what's happening in the whole society, particularly of the economic problems which engineers face."

As for the internal politics of IEEE, he sees Feerst's views as "a reaction to economic problems," and the GGG as "a reaction to Feerst." Getting says he regards Feerst and GGG as representing extreme approaches. If elected, he would hope to help "prevent schism and avoid unreasonable strife."

It is tempting to describe the encounter at IEEE as a clash between elitist and populist positions, but that would oversimplify it. IEEE is a very large organization with members whose specialties range from electric power to computers. Some work in industries with serious economic problems and histories of treating employees cavalierly. These engineers not surprisingly look to IEEE for practical aid. Others see IEEE essentially as a fount of technical information. Perhaps big professional societies will split along the lines of technical and economic interests. What is likelier is that IEEE and other societies will persist at the difficult task of finding a way to preserve a balance, if an unsteady and uneasy one, between the two.

—JOHN WALSH