were imposed concerning previous school or job achievement, police or prison records." Of the 24 who started the course, 22 successfully completed the training program and about 20 are still at work at the laboratory. A second group of trainees—comprised of four American Indians, four Spanish-Americans, and four Negroes—has subsequently been sent to Oak Ridge.

Still, the laboratory's efforts to employ minority groups have not been an unqualified success. More than 20 percent of the laboratory's nonprofessional employees are black, but the percentage drops rapidly as the jobs increase in skill. Laboratory officials tend to blame this situation on the inequities in the society at large, rather than on any shortcoming in their recruiting procedures.

In the area of fair housing, the laboratory has been active and has achieved some success. The Illinois legislature still refuses to pass an open-housing statute, but at least 59 communities in northern Illinois had adopted local fair-housing ordinances as of 6 March 1970. Laboratory officials have testified in favor of such ordinances in the surrounding communities and, in some cases, according to Williams, the laboratory's voice has played an "important part" in the final decision to enact local fair-housing codes. Moreover, the laboratory helps its black employees find housing, it sometimes rents apartments and subleases them to black employees, or it otherwise guarantees to assume responsibility for the leases signed by its black employees—thus depriving landlords of a reason or excuse for turning down black tenants. Williams claims there has been only one housing problem so far where the landlord turned down an obviously qualified applicant, but he says the mayor of the town involved subsequently called "and assured us it wouldn't happen again."

How effective has the laboratory been at changing social attitudes? Wilson himself is making no great claims. "It is easier to accelerate particles," he has observed, "than it is to accelerate societies." Some officials of civil rights organizations go even farther and express disappointment at the "slow pace" of the laboratory's social programs. "Attempts are being made to use the project constructively, but it's low profile," says Hampton McKinney, program director of the Chicago Urban League. "The laboratory is not operating in a way that causes any big excitement. It's not as if they were really moving." Similarly, Ben Bekoe, head counselor for the Urban League's apprenticeship project, says that while the laboratory itself has an aggressive minority hiring program, it should "put the screws on the contractors" to hire many more blacks than are actually on the job.

Still, the laboratory's heart is unquestionably in the right place, and its minority group programs might well serve as a model for other large scientific and educational institutions that have sizable payrolls and large construction and purchasing budgets. Accelerator officials suggest that individual scientists and small institutions which lack the accelerator's muscle might want to band together in national or regional clearinghouses to make their collective weight felt on matters of racial justice.

In these days when increasing numbers of scientists are seeking a way to make their work "relevant" to society, they might well look, not to the substance of their work, but to such bread-and-butter matters as whom they employ and from whom they buy things. If high energy physics, the most arcane and remote of all subjects, can make itself relevant that way, so can all other disciplines. —PHILIP M. BOFFEY

Campus Politics: Decentralization Is Pattern at Berkeley, Stanford

Trendwatchers agree that the most significant campus reaction to the invasion of Cambodia by U.S. forces has been a large-scale involvement of students and faculty in nonviolent political action. Visits to the Stanford and Berkeley campuses made by this reporter during a 10-day trip to the San Francisco Bay area starting in mid-May tend to confirm this generalization, with the important qualification that campus efforts are not being channeled into conventional party organizational activity.

The strongest impression given is of decentralized activity. For the moment, at least, the campus confrontation seems to have become less important. The diffusion of political activity makes it much more difficult for the reporter or, in fact, for students, faculty, or administration to describe the situation on a particular campus comprehensively. For that reason alone, any analysis of current developments is best taken as partial and provisional.

In California the surge in nonviolent political action comes at the same time that destructive acts against campus facilities by individuals or small groups are increasing. The "fire bombing" of the computer center at Fresno State College in May did damage estimated at up to $1 million, and incidents of arson and "trashing" (window breaking) and vandalism of other kinds have multiplied this year. At Stanford and elsewhere many students and faculty members seem to have been impelled to take up nonviolent political action in part, at least, in response to the escalation of violence on campus.

This is not to question the impact of the Cambodian action on faculty and student opinion. Cambodia appears to have been the strongest catalyst to date in bringing large numbers of faculty to take active antiwar positions. At Berkeley, more than half the engineering faculty signed a statement urging an immediate end to the war and a vigorous attack on domestic problems. The statement, which noted that engineering students for the first time have become "deeply involved in a protest against government policy," is regarded as symptomatic of the depth of feeling because engineers have been regarded collectively as the least likely to protest.

For the universities, the most significant aspect of recent weeks may well be the character of the "strike" called in response to the Cambodian action. The boycotting of classes that occurred on many campuses was much less important than the accomodations made at Stanford, Berkeley, and else-

where to allow students and faculty to combine academic work and political activity. Requirements on such things as grading, examinations, "incompletes," and course credit were relaxed, and faculty members were given great flexibility to make arrangements with classes and individuals. The general understanding was that those who wished to engage in political activity would be given the opportunity, but those who preferred to continue with academic work would not be prevented from doing so. The ad hoc arrangements were not universally successful, but the institutions kept functioning and faculty-student relationships seemed better than they have been for some time. Some faculty, however, have misgivings about the effects of the post-Cambodia period on intradepartmental relationships, feeling that the spirit of home rule and emphasis on politics may seriously increase tensions among faculty.

How far it is possible to generalize from the events at Stanford and Berkeley is, of course, difficult to say. The Free Speech Movement made Berkeley the Fort Sumter of student unrest, and the Berkeley community has continued as an incubator of radical activity. Stanford last year was the site of the first major campaign focused specifically on "war research" (*Science*, 2 May 1969) and has this year sustained heavy damage to its physical plant. Kent State and Jackson State have, of course, surpassed both California schools on the scale of violence, but universities on the Western Front still act as pacesetters in producing activist ideas and life styles.

One phenomenon noted at Stanford and Berkeley which seems to be increasingly common elsewhere is the involvement of high school students and other off-campus types in campus demonstrations or vandalism. The radicalization of high school students also appears to be reflected in the increased participation of university freshmen and sophomores in campus protests. A graduating student leader at Stanford observed that incoming freshmen these days arrive expecting to engage in campus protests as part of their university experience in much the way that other generations brought stereotyped ideas, for example, about fraternity life. These new arrivals seldom have very clearly defined political views, but they are easily ignited by calls for militant action.

At Stanford the reaction to the Cambodian invasion occurred in an atmosphere charged by a campaign led by campus radicals to expel ROTC training from the Stanford campus. The progress of the ROTC conflict is too involved to recount briefly, but the "Off ROTC" campaign had gained momentum in mid-April when a narrow majority in a campus referendum favored keeping ROTC on campus without credit. A few days before the Cambodian action began, a confrontation occurred on campus in which police used tear gas for the first time at Stanford. The militants, however, had not attracted wide campus support and were facing opposition from moderates. After the start of the Cambodian action Stanford experienced two of the worst nights of violence in its history. Militants' clashes with police resulted in a number of injuries on both sides, and there were serious "trashing" binges on campus.

Precedents Available

At Stanford the shift to nonviolent political action was made easier because there were a number of ready precedents available. Vietnam Moratorium activities had been both vigorous and well organized and had emphasized action in the local community. Students and faculty were also able to build on experience gained in a program called Stanford Workshops on Political and Social Issues (SWOPSI), a student initiated project that grew out of the curriculum reform movement at the university. The aim of the program is to involve faculty and students, including graduate students, in seminar-workshop courses dealing directly in research on social and political problems designed to produce viable solutions to the problems.

The most direct reaction to the situation came when a big lecture class in social psychology taught by Philip G. Zimbardo met and produced a list of possible political activities providing opportunities for involvement ranging from slight to great. Zimbardo said that the campus had been simply reacting to the radicals, and he urged that students make "conscious decisions" about their own actions. Primary emphasis seems to have been placed on antiwar work in the community, some of a fairly general character and aimed at establishing contact outside the campus boundaries. Other efforts support particular candidates or issues. About 2000 persons have been enlisted.

One group is engaging in a campaign for the redemption of U.S. Savings Bonds as a means of exerting economic pressure on the government. Another group of behavioral scientists and students is working on a training manual based on attitude-change and persuasion techniques to be used by workers in voter registration drives in behalf of peace candidates. Stanford appears to be committed to its own version of the "Princeton plan," which would adjust the academic calendar to allow students to be free for full-time political activity before the fall elections.

At Berkeley, the reaction to the Cambodian invasion ended a relative lull in large-scale disturbances which had prevailed since the bitter strife last year over the "People's Park." Since the moratorium last fall, the peace had been disturbed mainly by an attack in mid-April on the Naval ROTC building which led to several hundred arrests including many of nonstudents.

After Cambodia the faculty voted to oppose the war and President Nixon's action despite strong feeling in the Academic Senate that such a move would invite further retaliation against the university by state authorities.

On the Tuesday following the President's speech on the Cambodian action, a convocation of 15,000 students and faculty voted overwhelmingly for a statement that "This campus is on strike to reconstitute the university as a center for organizing against the war in Southeast Asia." The resolution was introduced by political science professor Sheldon Wolin representing an "Ad Hoc Faculty-Student Peace Committee."

Faculty Involvement

Observers said that the occasion marked the first time in years that a mass meeting at Berkeley had been devoted to a discussion of nonviolent political action and also that faculty had been involved in large numbers.

It was just at this time that California Governor Ronald Reagan ordered the state institutions of higher education shut down temporarily to preserve order. What the shutdown amounted to was a closing of classroom buildings, labs, libraries, and offices, while dormitories and dining facilities remained open. The result was that the time was spent largely in organizing political action projects.

Attempts to centralize efforts seem to have bogged down in bickering, and much of the activity that ensued at Berkeley was based on organization

done within departments, typically through meetings between students and faculty.

What evolved was diagnosed by Rowland Evans and Robert Novak in their nationally syndicated column as a drastic curtailment of academic freedom. The column recounted an intrusion into philosophy professor John Searle's classroom by a "student strike leader who berated Searle and conducted his own 'reconstituted' course," and said that a majority of the class feared for their safety and asked Searle to hold further classes in his home.

The column went on to say that "The School of Environmental Design has become a headquarters for political action. The Department of Anthropology runs radical seminars instead of regular classes. So do much of the Sociology and Psychology Departments."

Evans and Novak concluded that Berkeley chancellor Roger Heyns had "compromised between academic freedom and student activism in a way that pleases nobody," and had left it to the state government to preserve liberal education at the universities, a task to which, as the columnists say, the California state government has proved itself inadequate.

Heyns and the chancellors at other university branches had reported to the regents that the strike had produced incidents of pressure on faculty but not of coercion and that academic freedom was not being infringed. The student involved in the Searle incident has been placed on interim suspension, and at the time of this reporter's visit neither campus police nor the faculty ombudsman had reported complaints by faculty of pressure tactics or threats, although apparently some students or parents had complained through the chancellor's office.

The situation, in fact, seems to be a remarkably fluid one. As the California University system's president Charles H. Hitch said last week, campus protest has for the first time involved a majority of the academic community. Certainly, a substantial number of Berkeley faculty feel that the idea of "reconstituting" the university will be used by radicals to further erode the institution. On the other hand, many observers note that at Berkeley and elsewhere the level of violence has ebbed appreciably during the strike, and students and faculty alike remark on a newfound sense of "unity" and "community" on campus.

This unity appears to be based mainly on a shared sentiment that is antiwar in the sense of opposition to the Cambodian action. Although there are some exceptions—300 faculty, students, and staff at the Stanford Medical Center signed a petition supporting Administration policy—reaction has been generally critical of the Administration, and a fairly heady political atmosphere has been generated.

Since initiative during the strike period has centered in the departments, political attitudes have become issues within departments, perhaps most noticeably in behavioral and social science departments. Action by departments has in many cases been decided by meetings involving faculty and graduate students and, in some cases, undergraduate students, with majority votes often deciding issues. At Berkeley, which has a tradition of its senior faculty exercising the power of grandees, the strike period has probably

Cambodia Speech Sinks Nomination

One domestic casualty of the Cambodian incursion seems to have been the nomination of Caltech's George S. Hammond to the deputy directorship of the National Science Foundation (NSF). Hammond was widely expected to be the choice for the NSF No. 2 job, but on 1 May he joined other Caltech faculty members in speaking publicly against U.S. operations in Cambodia, and subsequently Hammond learned that the White House would not send his nomination to the Senate.

In remarks prepared for a meeting on campus, Hammond was mild in his direct criticism of President Nixon, saying, for example, "I do not believe that his intent is evil, but [the action is] an indication of the great difficulty in dealing with the situation." However, Hammond also said in reference to Nixon, "I believe that he was sincere when he said that the decision might blow the national election. I hope it does."

Administration sources, including Presidential Science Advisor Lee A. DuBridge, indicated that the White House decision to abort the Hammond appointment had been made not because he criticized the Cambodian action but because he expressed the hope that the President's party would lose the election.

DuBridge told *Science* that, after seeing press reports of the speech, he had talked to Hammond on the telephone and asked for a copy of his remarks. DuBridge said that he had not subsequently discussed the matter with Hammond, but observed that "when you declare political warfare on the President, it gets a little awkward."

In his remarks Hammond, who is chairman of the division of chemistry and chemical engineering at Caltech, had referred to the rumor that he might undertake a "period of national service." He said the post would involve a Presidential appointment; "My first instinct is to refuse," he continued. "If I thought my refusal would be effective in changing the President's mind, I would. I cannot make such a decision, because I believe it would be a false indulgence of my own emotions. If the spurning of government service in another area could reverse the decision in Cambodia, I would do so immediately. Of course my decision could have no such effect and should not. I believe that I have something to contribute to the area of government service for which I am being considered, and to refuse it would serve no good end for any of us."

Hammond said that NSF director William D. McElroy discussed the matter with him by phone a week after the conversation with DuBridge. Hammond concluded that the nomination was dead and wrote to McElroy asking him to begin again the search for a deputy director.

Hammond had been rumored to be the likely nominee since early spring. He says that his nomination ran into early resistance in the White House clearance process because he was a registered Democrat, but he understood in April that the way had been cleared.

The post of deputy director, created in a reorganization plan enacted 2 years ago (*Science*, 3 April 1970), has yet to be filled.—J.W.

meant less a loss of authority by deans and department chairmen than a gain in influence for graduate students and junior faculty allied with sympathetic senior men. One-man–one-vote will probably not soon become the governing principle in departmental affairs, but what is likely to persist is the effect of direct, rude, and often very personal criticism of faculty by their juniors on political grounds. At best, the experience could lead to a democratization of departmental politics and, at worst, to a further polarization of faculty and even to the rise of political tests.

Any list of the problems of the universities this spring should probably be led by the campus guerrillas. At Stanford, the cost of campus disruptions during the spring quarter alone is estimated at $580,000, about half in out-of-pocket expenses and the rest attributable to lost time not worked by employees. About $100,000 is chalked up to window breaking, not covered by insurance, and other damage. Skyrocketing costs of insurance and campus security measures have hit university budgets at a time when many institutions are operating in the red. For many radicals, the university is simply an extension of the establishment they are attacking and a source of recruits to their ranks. As a target, the university is an easy mark. Among the many problems the university faces in defending itself is that in moving for the prosecution in the civil or criminal courts, or through campus judicial machinery, of those accused of causing serious disturbances or damage; radicals often gain impact on campus with charges of persecution.

Of the new cadres of nonviolent political activists one must ask whether their present ardor will endure through all that slogging in the precincts and through the probable disappointments of the next election and the next. It should also be noted that perhaps a majority of these activists are not interested in what one calls "trivial change." Their disenchantment with Congress as it operates, for example, is thorough. Perhaps most significantly, many of those who have decided to work within the system to change it hope, but only half-believe, it can be done that way.

Berkeley has provided a lot of symbols and, in the ideological bazaar that the Sather Gate plaza has become, it was possible last month to hear Buddhists and Baptists bear witness within sound of each other, to listen to the Arab guerrillas extolled, and to read a banner whose top line proclaimed the hopes and perhaps the doubts of people involved in the new politics on campus: "Violence has made the people aware. Sanity may win them."

—JOHN WALSH

Domestic Communications Satellites: FCC Still Looking at the Options

When the Federal Communications Commission (FCC) first asked for suggestions for a domestic communications satellite system, in 1966, there was no shortage of responses.

- The Communications Satellite Corporation (Comsat) submitted a plan for a system which it proposed to build and operate.
- The American Telephone and Telegraph Company (AT & T) joined Comsat's proposal, though the two firms differed on who should own which parts of the system.
- The Ford Foundation recommended that revenues from a domestic satellite system be utilized to help support educational television.
- The General Electric Company (GE) suggested that communications satellites could ultimately provide a whole range of communications services —not only traditional telephone and television transmission but also computer communications and fast "telemail" (rapid transmission by satellite of business letters and documents).

Four years later, there is still no domestic satellite system. The FCC has yet to decide the issue, and, though the agency promises quick action, no one is quite sure what will happen—or when. Comsat and the three major television networks are urging a quick decision.

The problem is not technology. For the last 5 years an international satellite system (called Intelsat) has steadily expanded its operations; it now has satellites over three oceans (Atlantic, Pacific, and Indian), a round-the-world transmission capacity, 75 members, and 41 earth stations.

Comsat, specially created by Congress to do the job, supervised the growth of Intelsat, of which Comsat (a private corporation) owns more than 50 percent. But the technology is not so exotic as to be limited to the United States; the Canadians are already working at plans for their own domestic satellite system, with the actual satellites to be launched (as Intelsat's are) by the National Aeronautics and Space Administration.

What, then, stymies development of an American system?

Because the nation's communications system (unlike those of many other countries) is now run privately, Congress decided that a satellite system—to be interconnected with the existing land network—should also be privately run.

Naturally, then, the owners of the existing terrestrial communications system (principally AT & T) haven't pressured the FCC to rush into approving a potential competitor. Also, today's ground system is still giving most users what they want, though telephone service has deteriorated and some experts say the ground system alone can't keep pace with future demands.

One immediate advantage of a satellite system would be its flexibility in handling peak communications demands from different geographical areas at varying times during the day. For the moment, however, television transmission appears to be the one big customer for a satellite system. The more exotic uses suggested by GE may be farther in the future.

Without anyone's crying "crisis," the government has been free to ponder and reponder the major questions involved in authorizing a domestic satellite system: Who should be permitted to own the system, and under what conditions?

Despite apparent agreement in 1966 between Comsat and AT & T, the two companies now may present plans for separate systems. There are other possible contenders, too: the University