that the applied work at this "center of excellence" will gobble up funds that now go to "Code 480" projects. As one said: "The crux of the matter is that there has never been a successful laboratory that has an in-house and an external program. They [in Bay Saint Louis] will set up initially with an in-house and an external research program, but in the first reorganization in a year or so the boundary will be eliminated and the guards to protect basic research will break down."

There is rumor that Roy Gaul, director of the Long Range Acoustic Propagation Project, is the leading candidate to direct the new center. University oceanographers know Gaul primarily as an applied research man who is an unknown quantity in terms of his interest in protecting basic research. Gaul refused to comment on the possibility. Snyder said that the job of directing the facility was at the moment so ill-defined that no individual is under consideration for the job.

These fears for the future may or may not prove well founded. There are those within the Navy and among its long-term scientific advisers who believe that the move would not be such a bad thing after all.

One scientist close to Navy decision-making says that a move to the district of any powerful member of Congress could benefit oceanography and basic research. He claims that lack of congressional champions is one reason that oceanography and basic research have been chronically weak when competing against other Navy projects (such as acoustic applications, aircraft carriers, and the Trident submarine) for funds and facilities. According to this logic, the proposal to move to Bay Saint Louis is less political pork for Stennis than a bid for power within the Navy bureaucracy by one part of the Navy which is friendly to oceanography. "Oceanography has no defenders in the Navy because oceanographers are stupid," he says. "They haven't played their political cards right." This reasoning, of course, does not justify relocating to rural Mississippi—but it does offer a counter to the cries of doom of the university oceanographers.

Snyder says that he has recently added some "checks and balances" to his proposal to assure that the "Code 480" program for basic science will remain protected. "The basic research money necessary to the vitality of the future Navy must be protected against everyday attempts to solve today's crises," he says. Hence, some "Code 480" staff will remain in Washington, and policy, as well as coordination with NSF and NOAA, will be conducted from Washington. Moreover, the "Code 480" group in Mississippi will continue to report to the chief of Naval Research and head of ONR, Rear Admiral M. D. Van Orden, just as it does now. But as the skepticism of some university oceanographers and certain members of Congress indicates, Snyder has a chore ahead persuading doubters that the move to Bay Saint Louis—however checked and balanced—is indeed the best way for the Navy to conduct basic oceanographic research.—DEBORAH SHAPLEY

American University in Beirut: Walking a Precarious Line

Beirut.—The beleaguered republic of Lebanon has been flirting with civil war for more than a month. Since early April, Palestinian refugees have clashed in the streets, killing more than 430 people and paralyzing the Middle East's most sophisticated capital and financial nerve center.

During the fighting, the American University of Beirut (AUB), plagued in recent years by political strife and student unrest, has been uncharacteristically serene. The campus' peaceful veneer, however, is deceptive. For some time now the university, which has produced many of the Middle East's most eminent Arab leaders and dissenters, has been struggling to survive.

Beirut's American University has been the United States' most visible and influential educational and cultural center in the Middle East for more than a century. Founded by American missionaries in 1866 as the Syrian Protestant College, it has awarded some 20,000 degrees. Its alumni include 3 Arab presidents, 10 prime ministers, more than 30 cabinet ministers, and 35 ambassadors. But in important ways AUB's stature is fast becoming a liability. While Arab faculty members insist that maintaining a large American presence in the university is its best assurance of continued autonomy, a growing number of student dissidents and local politicians see AUB as an anachronistic symbol of American paternalism.

A bitter and divisive student strike last year over tuition increases, coupled with the same kinds of financial problems that afflict universities back home, have contributed to AUB's malaise. Underlying the university's present angst is a fundamental question: Is there still a place for an American university in the Middle East?

The answer is by no means clear. Many of the reasons for which AUB was founded no longer apply now that there are numbers of universities in the Middle East, where once there were few. And in an age of rapid international communications, AUB is no longer the only repository of Western knowledge that it once was. Nevertheless, AUB remains an unparalleled center of academic excellence in this part of the world and is one of the few universities where students and faculty can freely debate controversial political issues.

The American University introduced American-style education to the Middle East: small classes, high faculty-to-student ratios, and modern teaching methods that emphasize independent thought and individual autonomy. The private, nonsectarian college that began with 16 undergraduates a century ago now has an enrollment of more than 5000 students. It occupies 80 buildings, including an enormous medical complex, on 73 acres of some of the most beautiful and expensive land in the heart of Beirut. Situated majestically in foothills overlooking the Mediterranean, set against a backdrop of snow-capped mountains, abounding in exotic trees and brightly colored flowers, AUB's beauty belies the university's precarious economic health.

Like universities in the United States, AUB is caught in a severe financial squeeze that stems from past expansion and current financial vagaries beyond the university's control. This year, the $31,386,000 university budget is expected to fall $2 million short of operating costs and will be $4.7 and $6 million short in the next 2 years. Unless new sources of income are found, AUB's administrators project a $16 million deficit by 1980.

The AUB's largest supporter is the U.S.

American University of Beirut Main Gate.

Agency for International Development (AID), which is providing $8.7 million this year in grants and contracts—almost 42 percent of the university's operating budget, excluding the medical center. Additional sources of funding include tuition, a $14 million endowment, gifts from individuals, grants from the Ford, Rockefeller, and other foundations, and income from auxiliary services and businesses with interests in the Middle East.

In large part the university's projected $2 million deficit reflects Lebanon's soaring rate of inflation and progressive devaluation of the dollar. As Lebanon's second largest employer after the government, the university has been quick to feel the effects of government efforts to keep wages in step with consumer prices. Two recent cost-of-living raises imposed by the Lebanese government have eroded AUB's resources, and a third wage hike of 12.5 percent expected this spring will cost the university nearly $1 million more. Fluctuations of the international money market have taken a toll as well: the Lebanese pound (100 piasters) has been growing in value in recent years (from 3.30 to 2.25 per dollar), and each increment of 1 piaster costs the university $23,000 a year.

Samuel B. Kirkwood, the university's president, says his most pressing problem is a reliable supply of ready cash. But neither of two logical solutions—curtailing activities or raising tuition—offers immediate relief. (The AUB's cash flow crisis is partly due to delays in passage of the AID bill in the U.S. Congress. Less than half of AUB's annual appropriation has been paid, although 9 months of the university's fiscal year have passed.)

The university's belt is near its last notch, according to Arthur Whitman, director of the office of development. Faculty complain that a policy of reduction by attrition has left random and illogical vacancies in such key departments as education, where several instructors teach philosophy of education but no one is left to teach the mechanics. Funds for the university computer center, its five libraries, and university-sponsored research have all been cut back; four professors have left the Center for English Language Research and Training, an important unit for teaching the language to non-English speakers; and the School of Pharmacy, established in 1871, is tentatively marked for elimination.

Tuition covers up to half the cost of a student's education at AUB, so it was understandable that the university tried to alleviate its financial problems by upping tuition 10 percent last spring.

The tuition increase, however, sparked the longest, most violent strike in AUB's history. Classes were suspended, buildings occupied, and more than 60 demonstrators removed from campus and arrested by the Lebanese "red beret" security police during the 36-day strike, which coincided with a wave of strikes throughout colleges and other institutions in Lebanon. Following the incidents, 103 students were expelled. Nevertheless, students won one of their demands—that half of the tuition increase be pledged to additional scholarship aid.

The strike, a symptom of the university's financial woes, led to the deterioration of already strained relations between administrators and faculty who were angered by budget cuts and increased work loads. More significantly, it shattered many long-standing friendships among faculty members, and between instructors and students. The strike, moreover, was an expression of deeper dissatisfactions: anger with what many students and some faculty perceive as the administration's encouragement of "bourgeois elitism" through admissions policies; frustration with the Lebanese government; and objections to the American presence in the university and to U.S. foreign policy in the Middle East.

In many ways the American University is a microcosm of the troubled nation in which it operates. Lebanon is less a nation than a delicately cemented and volatile aggregate of religious and ethnic groups, and the extent to which the university reflects the proportions of this aggregate is of enormous local importance. The university's critics accuse it of admitting "lambs rather than lions"—the higher income, Christian Lebanese students in preference to such potential "troublemakers" as Palestinian and other Arab nationalists. In fact the university community seems nearly as diverse as the delicately contrived balance of Maronite, Sunni Moslem, Shiite Moslem, Greek Orthodox, Greek Catholic, Druze, Armenian Orthodox, and Protestant officials that comprises the government itself. AUB currently has students from 70 nations and 23 religious groups. The university's office of development, for example, mirrors the structure of the Lebanese government, with—literally—an administrator from every principal minority group. The predominance of Americans in the university's top administration, however, is still a source of tension. The AUB's board of trustees, for instance, governs the university from meetings in New York, where it is incorporated.

At the same time, many students believe, as do several faculty members, that AUB is becoming an essentially Lebanese Christian bastion in an increasingly Islamic Arab world. Students object to the "domination" of top university posts, not only by Americans, but also by Lebanese Christians, including the chairman of the admissions committee, the dean of arts and sciences (President Kirkwood's chief adviser), and Charles Malek, Distinguished Professor and a former Lebanese government official.

University officials vigorously deny charges of a Christian tilt. Several faculty members think that "discrimination" at AUB works against, rather than in favor of, Lebanese Christian students. "If admissions were based solely on academic merit," said one young Arab instructor, "Lebanese students, and Christians, in particular, would comprise 80 to 90 percent of the student body."

Recently, however, there has been a subtle but significant change in the composition of AUB's student body. Several

years ago, students from Lebanon comprised the university's largest minority group; now they make up only a little over half the student body. According to a member of an AID committee that investigated AUB's financial and academic problems last spring, students from Lebanon would account for an even larger percentage had AID not sent some 485 students each year from other Near East nations to study at AUB on full-cost scholarships.

Isolated from a Lebanese context, allegations of subtle bias in admissions or in the tone of instruction might not be so inflammatory. But in the emotionally and politically charged Lebanese environment, such perceptions are as important as reality.

An even more difficult problem confronting AUB is the growing anti-American sentiment stemming largely from the U.S. government's staunch support of Israel. George Hakim, AUB's vice president for public relations and development, recently said publicly what most professors and administrators will only admit privately: "Dissatisfaction with U.S. support of Israel has definitely hurt AUB. We are certainly not responsible for those U.S. policies, but the school suffers because of them."

During the strike, students accused the university of having an overly "American perspective." What had previously been AUB's primary selling point—an American-style education—is now seen by many in the era of rising Arab nationalism as a political disability. Indeed, many American instructors emerged from the bitter strike less confident that AUB still has a contribution to make in the Middle East. "We were personally reviled, insulted, and abused," said one long-tenured professor. "Students whom I had taught and with whom I thought I had rapport were denouncing us as CIA agents."

American support for Israel is an important cause, but not the only one, of a cooler attitude toward AUB in the Arab world. The Middle East's oil-based wealth has given Arab nations new alternatives to Western-style education. In 1945, there were only 18 universities in Arab nations; today, there are 36, in almost all of which classes are taught in both English and Arabic. Besides their own universities, many Arabs can now afford to send their children directly to the United States for undergraduate or graduate study, rather than to AUB—a good school, but certainly not competitive with the best American universities.

Thus, Terry Prothro, former dean of the School of Arts and Sciences and head of the department of behavioral studies, believes that AUB faculty and administrators must at least examine the possibility that the university, as it is now constituted, is an anachronism.

"When I came to AUB," mused Prothro, "it took me 3 weeks by ship to reach Beirut. There was no central heating, no air conditioning; communication facilities were terrible. I brought knowledge and teaching techniques that were not available here. I introduced B. F. Skinner to AUB, to Lebanon. Today, we are no longer the sole purveyors of American education or technological know-how. Does foreign education make sense in a satellite era?"

Many AUB boosters insist that it does. They concede that the university's role must change and assert that the institution is, in fact, evolving to meet the new demands of the region. The university has expanded and strengthened its courses in nu-

Briefing

Senators Blast German, French Nuclear Sales

The Ford Administration tried unsuccessfully in April to dissuade West Germany from selling Brazil a full array of nuclear technology, Senator John Pastore (D-R.I.) has disclosed. In an emotional speech on the Senate floor on 3 June Pastore, the vice-chairman of the Joint Committee on Atomic Energy, expressed anger and dismay at Germany's intention to sell nuclear reactors, a fuel reprocessing plant, and a uranium enrichment plant to Brazil (*Science*, 30 May).

Pastore said a delegation of American officials went to Bonn in April in an effort aimed particularly at stopping the transfer of the reprocessing and enrichment plants to Brazil, which indicates a continuing interest in building nuclear explosives. The Bonn parliament approved the sale on 30 April.

"Despite the protestations of our State Department, the West Germans have decided to go ahead because they apparently look on this as 'business as usual,' " Pastore said. "Nothing could be further from responsible action, no matter who the supplier might be."

The State Department reportedly did persuade West Germany to obtain special assurances from Brazil that the nuclear plants, to be sold during the next 10 to 15 years, would be used only for peaceful purposes. It was not clear, however, that this ruled out "peaceful" nuclear explosives. In any case, U.S. officials remain concerned that Brazilian scientists and engineers could legally duplicate the reprocessing or enrichment plants and turn the home-built plants to military purposes. As Senator Stuart Symington (D-Mo.) put it, "there is nothing that stops Brazil from building their own indigenous plants using the technology the West Germans give them." Symington said he was "shocked" at news reports of the pending deal.

At the same time, Senator Abraham Ribicoff (D-Conn.) said that France was providing nuclear fuel reprocessing technology to Pakistan, South Korea, Taiwan, and Argentina. Arms controller analysts are particularly concerned about the spread of reprocessing technology, whereby plutonium is chemically extracted from spent reactor fuel. In his remarks in the Senate, Ribicoff quoted Rudolph Rometsch, who is the inspector general of the International Atomic Energy Agency (IAEA), as saying that "So long as people try to make a business out of reprocessing, it won't be brought under control. It could be very costly to verify [safeguard] the small reprocessing plants that France is seeding throughout the world."

Ribicoff said the U.S. government could, if it chose, exercise considerable leverage on French and West German sales of nuclear technology. He said that large numbers of the nuclear reactors currently being sold by these countries are based on American designs duplicated under licenses sold by Westinghouse and General Electric. "Why," Ribicoff asked, "should the United States have permitted France and West Germany to engage in the reexport of U.S. nuclear technology under safeguards conditions that are less stringent than those we impose on our own exports?"

Ribicoff called for an "understanding" with other nations selling nuclear technology to limit exports only to those countries willing to refrain from building nuclear explosives and willing to place all nuclear power and fuel facilities under IAEA safeguards and inspection procedures.—R.G.

trition, interdisciplinary medicine, agriculture, nursing, and medical technology. The AUB hospital offers outpatient clinics, which provide the Lebanese public with inexpensive, quality medical care. Because Beirut has become the Middle East's business and banking center, AUB has expanded the number of courses in business administration, which now has the largest enrollment of any concentrate within the university. The Faculty of Engineering and Architecture sends its graduates throughout the Middle East to work on the Arab world's massive new public works projects.

The university has also moved, after prodding by AID officials, to solve its financial difficulties. A special committee, formed 3 years ago to investigate AUB's impending money problems, has made several recommendations for reform which will be presented to AUB's board of trustees in July. The university's planning committee will recommend a shift of the academic program's emphasis from undergraduate to professional, graduate training. Samir Thabet, the energetic and talented university provost who heads the planning committee, explained that AUB is attempting to maintain its traditional focus on subjects "sacred" to undergraduate, liberal arts education—philosophy, history, literature, and the like, while expanding AUB's teaching of such "saleable skills" as science, engineering, and business. "We are, after all, a private university," said Thabet in a recent interview. "We are under no obligation to teach everything."

Among other steps, the planning committee will recommend structural reorganization of university departments so that tuition fees begin to represent the real cost of operation. (The recommendations call for selective tuition increases.) Moreover, the committee has proposed better exploitation of AUB's most valuable asset—its land. Although talk of the sale of some land has sparked angry objections in the local community, the trustees will consider sale or lease of part of AUB's campus if necessary.

Ultimately, AUB's future in the Middle East may depend on its ability to raise money from Arab sources. At present, the university has more than $4.5 million in requests for aid pending before Arab governments. University administrators, however, are pessimistic about the prospects.

At the same time, American officials are increasingly reluctant to underwrite AUB when most universities in the United States are economizing. The Arab governments, on the other hand, are building their own universities, and, more important, are reluctant to support an "American" institution in the Middle East. "We're caught in the middle," says development director Whitman, "Both the Americans and the Arabs feel it is the other's obligation to support AUB."

Vice president Hakim points to other factors which inhibit contributions from the Arab world. Despite a strong Islamic tradition of "alms-giving," Arabs do not, as a rule, contribute to academic institutions. Although contributions from alumni have increased in response to AUB's appeals, there is still little awareness among many graduates of a financial responsibility to the university which has educated them. Moreover, tax structures in many Middle Eastern countries discourage such gifts. (In Lebanon, for example, gifts of more than 10,000 pounds are taxable.) Finally, Hakim believes that contributions from the Arab world are limited by the Arab perception of the university as an extension of the American government and an instrument of its foreign policy. "Arab universities are not independent from *their* governments," says Hakim. "Even our own students have difficulty comprehending why the American government is willing to support AUB with no strings attached."

In an urgent effort to keep abreast of the times, the university is attempting to "Arabize" its image in the Middle East. A special committee on admissions policy is trying to work out ways to absorb more students from the wealthy Persian Gulf nations. In addition, the board of trustees has begun to include more Middle Easterners within its ranks. Seven of the 25-member board are Arabs.

Paradoxically, those who are most enthusiastic about an American university in the area are young, Arab faculty members, many of whom privately oppose the "Arabization" of AUB. "The American presence in the university is essential for autonomy," said one faculty member who did not wish to be identified. "There are few places in the Middle East where students can discuss political and human values as openly and honestly as at AUB—nowhere else does such freedom of expression exist."

Many of these Arab faculty members are searching for what they consider an ideal solution: independent Arab supporters, who will perpetuate the university's tradition of independent thought, civic responsibility, and high academic standards. In the meantime, AUB will undoubtedly continue to play an important, though perhaps altered, role in the Middle East, walking an increasingly precarious line between two worlds.—JUDITH MILLER

(The author is a free-lance writer based in Washington.)

RECENT DEATHS

Manuel F. Allende, 56; clinical professor of dermatology, University of California, San Francisco; 26 March.

James A. Baker, 64; professor of virology, New York State Veterinary College, Cornell University; 14 April.

Roderick D. Barden, 74; professor emeritus of agricultural engineering, Ohio State University; 15 March.

David E. Bergmann, 71; organic chemist and former chairman, Israeli Atomic Energy Commission; 6 April.

Randolph K. Brown, 65; former professor of medicine, Howard University; 1 April.

Ralph B. Crouch, 52; former vice president for academic affairs, Drexel University; 5 April.

Charles E. Hadley, 82; former professor of biology, Montclair State, Upsala, Wabash, and Ryder colleges; 25 March.

Robert B. Hall, 78; professor emeritus of geography, University of Michigan; 4 April.

Henry S. Houghton, 95; former dean of clinical services, University of Iowa; 21 March.

Richard J. Hartesveldt, 53; professor of biology, San Jose State University; 27 March.

Dale E. Kaufman, 44; professor of electrical engineering, Kansas State University; 30 March.

John E. Kirk, 69; director of research, gerontology division, Washington University; 7 April.

Melvin H. Knisely, 70; former chairman, anatomy department, Medical University of South Carolina; 30 March.

Louis W. McKeehan, 88; former professor of physics, Yale University; 28 March.

John W. Means, 88; professor emeritus of surgery, Ohio State University; 30 March.

J. James Smith, 63; professor of medicine, Cornell University; 17 March.

Harold J. Stewart, 79; clinical professor emeritus of medicine, Cornell University; 1 April.

Louis A. Strait, 67; professor emeritus of biophysics, University of California, San Francisco; 23 March.

John E. Vance, 69; professor emeritus of chemistry; New York University; 19 March.

Harry G. Wheat, 84; professor emeritus of education, West Virginia University; 29 March.

Leslie A. White, 75; former chairman, anthropology department, University of Michigan; 31 March.