has changed a lot during the past few years," and affirming that NIH "must definitely remain a part of HEW," Fredrickson would nonetheless like to see it reestablish some measure of the independence it once enjoyed. He anticipates creating an office of analysis and planning to this end, one whose effectiveness may be proportional to its ability to see the world realistically. Among its jobs would be to consider the total biomedical research budget, including that of the administratively elite and comparatively very wealthy National Cancer Institute.

Cooper, for his part, claims that he is not unwilling to have NIH take more responsibility for its own destiny, as long as it is realistic. But he is not going to dramatically relinquish the power that has been building up in the office of the assistant secretary for health.

What any of this means is hardly clear. Even if Cooper and Fredrickson establish the best of working relationships, there remains the authority of the HEW secretary over them, and at the moment the lingering uncertainty about whether Caspar Weinberger will stay or leave. There is the OMB which, having been trained as an organization to involve itself in every aspect of government, is not likely to graciously step aside so that NIH can have the luxury of making its own choices. And, there is the Congress which likes to know what is going on, although it is more inclined to give money than to take it away.

Cooper and Fredrickson are optimistic. Edwards, apparently, thinks that may be unwarranted. In a "now that I'm out of office I'll talk" article in the 13 March *New England Journal of Medicine* he charges that nowhere in either the legislative or executive branches is there sufficient leadership in health. During his tenure as assistant secretary, he reports, there was an effort made to plan for health legislation in various areas in a way that would take into account the future consequences of federal involvement. The result of that effort was called the Forward Plan. It was intended to help government officials make decisions.

Edwards, somewhat bitter after his last year in office and fights about the budget for FY 1976, writes:

> Having been informed that the health budget would have to be substantially reduced as part of the President's economic strategy, we were able to make careful and defensible decisions about the most prudent way to curtail the Department's controllable expenditures for health programs. But the OMB is simply not receptive to the guidance provided by [HEW] on spending and other health priorities.

Cooper and Fredrickson will have to deal with the same problems that led Edwards to quit and saw Stone fired. Nobody in this arena has prevailed for quite a while. Perhaps this time.—BARBARA J. CULLITON

Health Education in California: The Grand Design in Trouble

Faced with a ballooning population and a growing dependence on other states for its supply of doctors, California set out in the late 1960's to dramatically expand its small but excellent system of public medical education. Under an ambitious 10-year plan that promised important strides toward medical self-sufficiency for the nation's most populous state, the University of California proposed to create three new medical schools in addition to making improvements at the two already established at San Francisco and Los Angeles.

No other state in recent times had undertaken quite so rapid an expansion of tax-supported medical education; but with the voters' approval of a $156 million health sciences bond issue in 1972, it seemed as if California might well succeed.

Three years later, however, California's grand design has begun to blur. Although three new medical schools are open and functioning—at UC campuses in San Diego, Davis (near Sacramento), and at Irvine in Southern California's Orange County—all three are still making do with temporary accommodations and the medical school at Irvine is still borrowing beds at a county hospital for its clinical facilities. Moreover, for several reasons, of which inflation is only one, it now looks as if the 1972 bond issue will fall $35 million short of providing the basic science and clinical facilities originally envisioned as permanent homes for the three new schools. As the university's regents struggle to divide a shrunken pie, there is gloomy talk about closing the medical school at Irvine, apparently because it has the smallest enrollment of the three and it is the only one where construction is not under way or imminent.

Officials at Irvine and at the statewide university headquarters in Berkeley regard closure of the Irvine medical school (which has 225 faculty, 281 students, and 449 residents) as a remote but not inconceivable resolution of the medical education system's worsening financial problems. The first suggestion for folding the school and merging it with the Davis campus came last December from the state government's influential legislative analyst, A. Alan Post. Ever since then, says one UC budget official, the university has been doing "absolutely all it can to avoid closure. We can't rule out the possibility, but we're turning over every stone to avoid it."

The future of the Irvine medical college ultimately rests in the hands of California's new governor, Edmund G. Brown, Jr., who must decide whether to budget money for development of permanent campus and clinical facilities as originally planned. Brown's father, who preceded Ronald Reagan in the governor's office, was an unflinching patron of the university, but the younger Brown's attitudes toward the financing of higher education have been something of an enigma. Though nominally a liberal Democrat, the new governor has defied traditional political labels; in his statements on fiscal matters he sometimes seems as conservative

as Reagan. Observers say he's scruitinizing the education budget as closely as the former governor did, and that he has, thus far, approved no new capital expenditures for health sciences. This could change, however, before his budget goes to the legislature this month.

Meanwhile, the possibility of the school's demise, remote as it may be, has caused understandable anxiety among some faculty members (the school's chief urologist, for instance, departed for a more stable environment at the end of March). The uncertainty also has paralyzed efforts to hire new faculty, although 20 percent of Irvine's faculty positions are vacant.

"The faculty is taking this pretty well. They're a hardy bunch," Dean Stanley van den Noort said in a recent telephone conversation. "But I can't recruit. I can't, and I wouldn't, ask someone in Chicago to sell his house and move out here with the legislative analyst running around saying we may close the place down."

University officials, van den Noort among them, regard the rationale for five state medical schools as valid today as it was in the late 1960's. The university's two medical schools at San Francisco and Los Angeles and the three private medical schools in California have a well-deserved reputation for academic excellence. But the output of doctors, dentists, veterinarians, and allied health professionals has fallen far short of the state's needs. Van den Noort, for example, says the state still graduates fewer M.D.'s than it loses each year to death, retirement, and out-migration. California, he says, ranks 35th among the states in per capita support of medical education and graduates only about half as many doctors annually as New York. The state has long been a lure for medical talent trained in Midwestern schools, which have, indirectly, substantially subsidized health care in California.

The 10-year health sciences plan that formed the basis for the 1972 construction bond issue never promised medical self-sufficiency. But it did propose to reduce California's dependence on other states for its doctors from 70 percent to about 50 percent. Now, in the face of financial problems, the university has lowered its sights and postponed that goal to an "indefinite" time in the next decade.

Unlike many of the nation's public and private medical schools, those in the University of California system have largely escaped crushing deficits in operating budgets and a consequent need for retrenchment. Generally the California legislature has supported the basic medical education operating budget; hence the university's main problems are on the capital side of the ledger.

Inflation, of course, has taken a heavy toll of the $156 million construction fund. The bond issue proposal contemplated a 6 percent annual escalation in construction cost; lately costs have been accelerating at a rate of 12 percent.

Long bureaucratic delays in spending the money have magnified inflation's bite to a scale of tens of millions of dollars. First, a Democratic legislature held up appropriations from the bond issue until the university could give assurance that the medical schools would use their new facilities in expanded programs of community health care, especially for the poor. Then, as state revenues plummeted along with the fortunes of the aerospace industry, former Governor Ronald Reagan, ever

The Challenger and the Explorer

When the deep-sea drilling ship *Glomar Challenger* arrives at the port of Málaga on 10 April, the United States should learn whether the Soviet Union intends to continue its cooperative research venture with the *Challenger*—the sister ship and technological precursor of the *Glomar Explorer*, which secretly dredged up part of a sunken Russian submarine near Hawaii last summer. Officials of the National Science Foundation (NSF), which runs the deep-sea drilling project in cooperation with Scripps Institution of Oceanography, say they have had no indication thus far that the Soviets will pull out, embarrassing to them as this association may be.

During the past 18 months the Soviet Academy of Sciences has been paying about 10 percent of the ship's $10 million annual operating cost. One Soviet geoscientist is on board and others are expected to join the scientific crew in mid-April as the ship begins a new drilling leg through the Mediterranean and into the Black Sea. Project officials hope the changeover goes as planned.

Concern that it might not was aroused by a Washington *Post* report on 20 March that the *Challenger* may have used a "diving bell" in 1970 to photograph the sunken submarine, a portion of which the Central Intelligence Agency recovered last summer with the *Glomar Explorer*, the latter having ostensibly been built by Howard Hughes for undersea mining. NSF officials say the *Challenger* has been under continuous control of Scripps since 1967, has never been equipped for deep-sea photography, and that publicly available logs show that it never came closer than about 800 miles to the reported resting place of the submarine. On that cruise, in 1969, two Soviet scientists were aboard.

Apart from technological similarities, the only connection between the drilling ship and the salvage ship appears to be that the same company—Global Marine, Inc., of Los Angeles—designed and operates both of them. A large petroleum exploration firm, Global Marine still owns the *Challenger*. Along with much else in the submarine salvage tale, the ownership of the *Explorer* remains obscure, although the CIA apparently paid much, all, or even more than its estimated cost of $250 million and thus probably holds title to the ship.

Equally obscure are the fruits of the salvage operation. One intelligence source told *Science* that the CIA had recovered some indirect evidence and some direct physical evidence—"but not much"—that the sunken, diesel-powered Golf-class sub carried nuclear-armed torpedoes. But published reports that at least two nuclear-armed torpedoes had been recovered "went much too far." Whether cryptographic equipment or any of the three strategic nuclear missiles presumably on board were recovered remains a matter of enthusiastic speculation.—R. G.

vigilant for fat in the university, strove to eliminate or postpone capital expenditures. The federal government's severe reduction of matching funds for health science construction took still another bite from the bond issue's buying power.

Furthermore, the university now finds itself facing the possibility of staggering new expenses to bring its medical facilities into conformance with recently revised seismic and occupational safety standards. The overall bill for structural improvement is estimated at around $50 million, and the university is under pressure to pay it out of bond issue money—all but $56 million of which has already been appropriated.

As its construction capital began slipping like water through its fingers, the university quite naturally began looking for places to scrimp. Or, as one observer at Irvine puts it, "when starvation threatens, you begin to think about cannibalism."

What focused attention on the Irvine medical school as a prime sacrificial prospect was its intention to buy a large but substandard county hospital 13 miles from campus and fix it up as the school's first clinical facility. In keeping with a precedent set by the new medical schools at San Diego and Davis, Irvine planned to buy the 600-bed Orange County Medical Center, reduce it by 300 beds, and turn it into a modern teaching hospital emphasizing emergency and intensive care. Complementing this, Irvine planned a new 200-bed hospital on campus and four smaller neighborhood health centers around the county. All of this, plus a new medical sciences building on campus, was to cost $44.5 million.

San Diego and Davis medical schools had already acquired county hospitals on the premise that fixing up an old one would be cheaper than building a new one from the ground up. But by the time Irvine was able to come to terms with Orange County, after 2 years of negotiations, the idea had lost much of its appeal. For one thing, both the county hospitals acquired by San Diego and Davis were having trouble supporting themselves. And to make matters far worse, the medical school at Davis had, to put it mildly, bought a pig in a poke. The 500-bed Sacramento Medical Center came complete with $19 million in uncollected bills, $11 million of which are still outstanding. On top of that, the university discovered belatedly that the hospital needed $25 to $50 million worth of seismic reinforcement and new construction. (This is in addition to the $50 million in structural improvements needed elsewhere in the university.)

Further, a hard-won contract with the county has thus far left the university—and consequently the state—holding the bag for some $2 million annually in emergency care formerly paid for by Sacramento County.

Last December, legislative analyst Alan Post contended in a tartly worded report that Irvine might be in for a similar drubbing. Post noted that some of the university regents had themselves expressed concern that the rising cost of medical education and of the patient care that it entails was draining money away from other academic programs. Some of the regents had noised about the possibility of closing one or more state medical schools as one solution, and Post suggested that the idea "merits closer review." He then went on to recommend that the College of Medicine at Irvine "be terminated and its program absorbed into the other medical schools," specifically, the one at Davis.

Misjudgment

The legislative analyst's opinions often carry weight in California, but they are binding on no one. In this case, the prevailing view among the state's medical educators is that Post was the victim of poor staff work. "I've seldom seen Alan Post make such a serious misjudgment as this. It makes no sense at all," Philip R. Lee, a former chancellor of the medical school at San Francisco, said. A series of state Assembly committees seemingly have concurred; a $5.5 million appropriations bill that would buy the county hospital is making progress through the legislature. Whether Governor Brown will sign it is, of course, anyone's guess.

In any event, the Irvine medical college is adamant about building a $20 million, 200-bed research hospital on campus as well. Dean van den Noort and many of his faculty see a traditional, on-campus research hospital as vital if the medical school is to succeed in its function of imbuing students with a sense of medical science as well as practice. They argue that a physical split between research and teaching facilities runs counter to accepted tenets of medical education and runs the risk of losing control over interns and residents to community doctors. Moreover, van den Noort believes that students, interns, and residents should have access to a broader social mixture of patients than usually is available at county hospitals, regardless of who owns them.

"Medical educators have been working 20 years to integrate the instruction of the basic sciences and the clinical sciences," van den Noort says. "This integration can hardly be enhanced by a 13-mile separation . . . there is a tendency for a free-standing university to grow and escape the academic management of the parent university."

Carrying this thought further in a 3 March memo to university headquarters, van den Noort argued that a split campus would likely evolve into a "trade school variant of a medical school," and that the only alternative to the two-hospital plan would be to close the medical college. "Better no school than a poor one," the dean wrote.

Originally, $39 million or 25 percent of the 1972 bond issue was earmarked for the Irvine college's science and clinical facilities. Now that this commitment is wavering, van den Noort is drawing lines in the dust to defend it. He notes that faculty were recruited on the understanding that construction would ensue, and without it—in particular without the campus hospital—"there will be a very severe attrition of faculty, and our continued accreditation would become dubious."

As for himself, van den Noort said in a telephone conversation, "If the university at least tries to get the money, I'll stay. If it says we can get along with nothing, then I say to hell with the university."

The fact remains, however, that circumstances have changed. The construction fund clearly won't buy all that was intended. And too, the population boom that gave the 10-year expansion plan much of its initial urgency has abated. Thus, one question is whether California still needs and can still afford five state medical schools.

In Berkeley, university administrators searching for a way to preserve Irvine's medical college as inexpensively as possible have been frustrated by a lack of policy signals from Governor Brown. "We have got to come to grips with this," said one budget official in summing up the situation. "The school could die for lack of decision."

—ROBERT GILLETTE